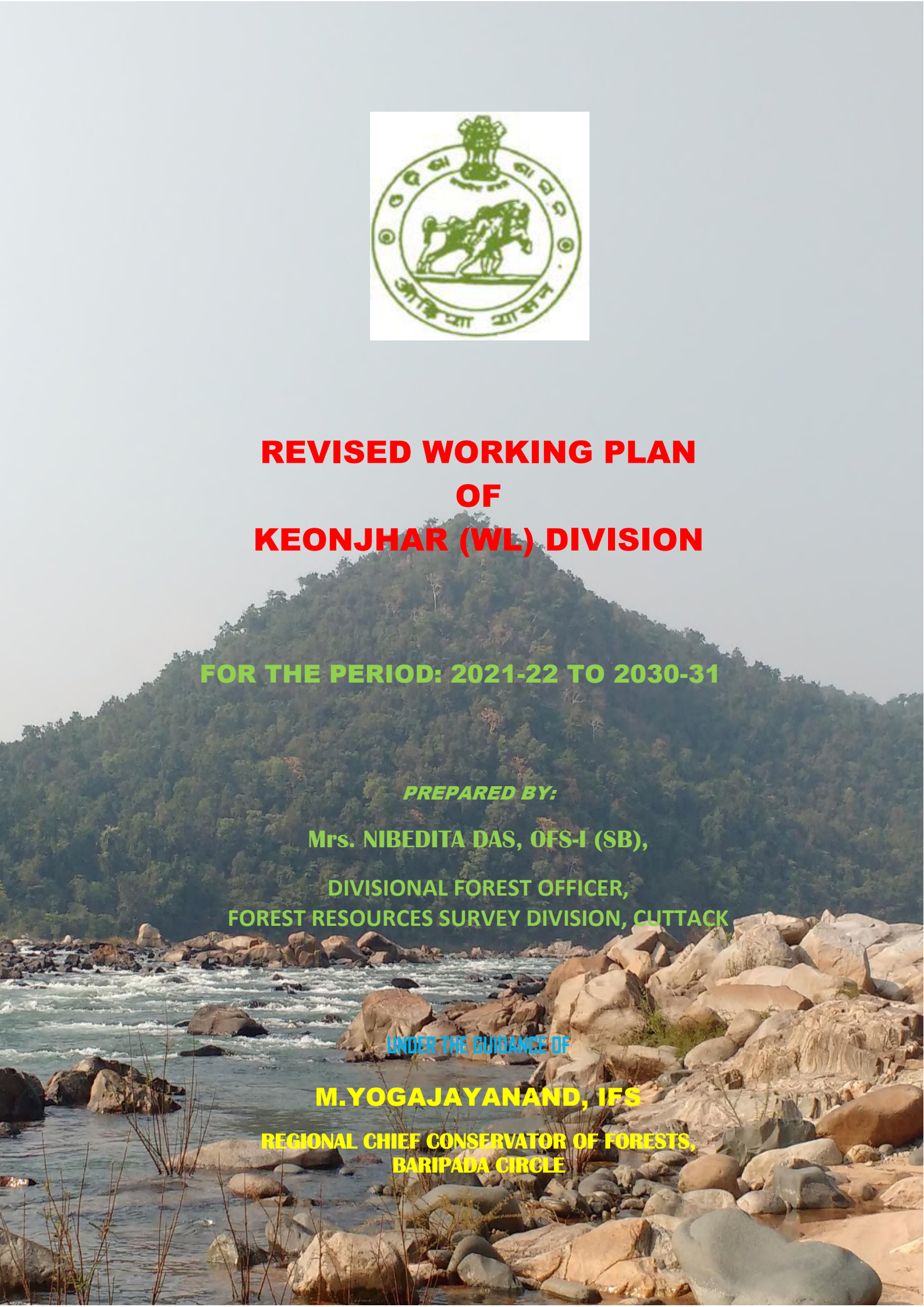


REVISED WORKING PLAN
OF
KEONJHAR (WL) DIVISION

FOR THE PERIOD: 2021-22 TO 2030-31

PREPARED BY:

Mrs. NIBEDITA DAS, OFS-I (SB),

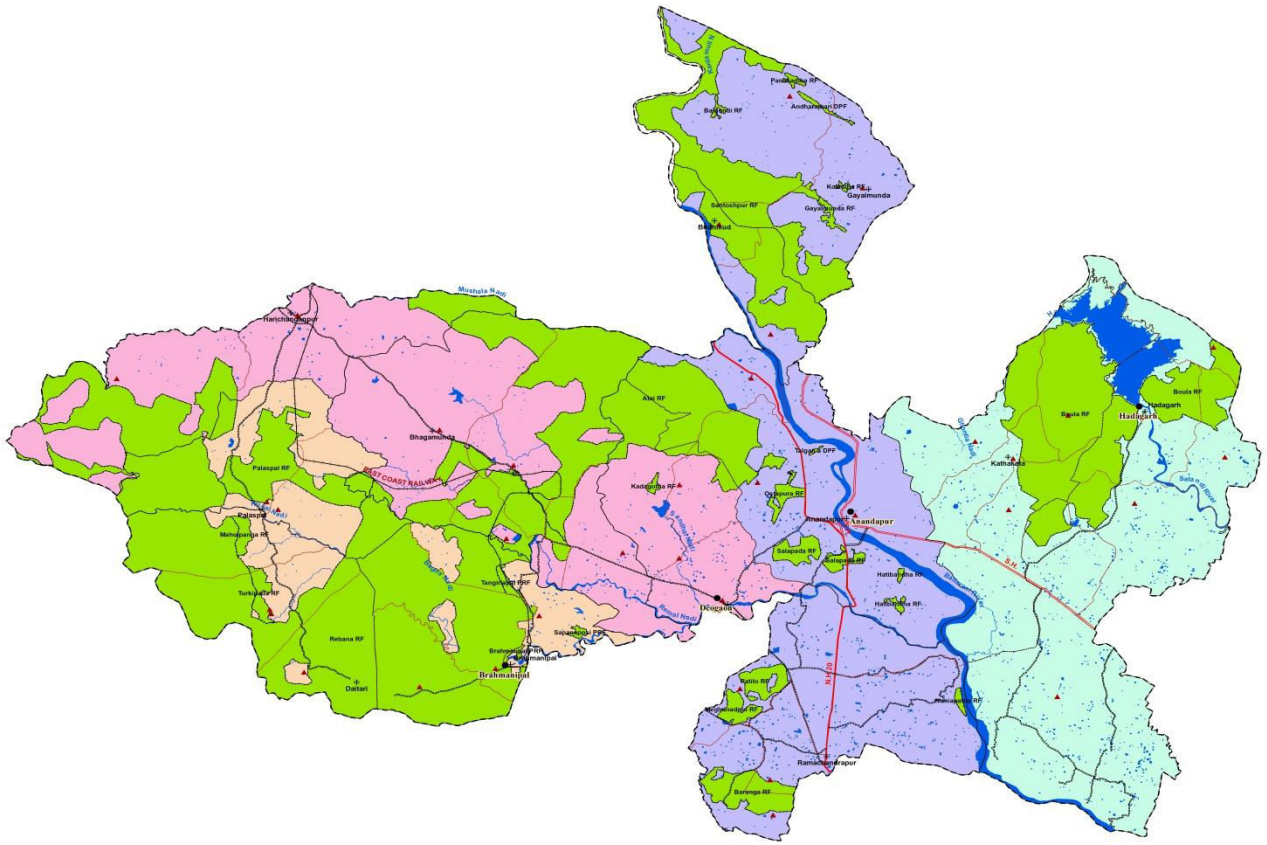
DIVISIONAL FOREST OFFICER,
FOREST RESOURCES SURVEY DIVISION, CUTTACK

UNDER THE GUIDANCE OF

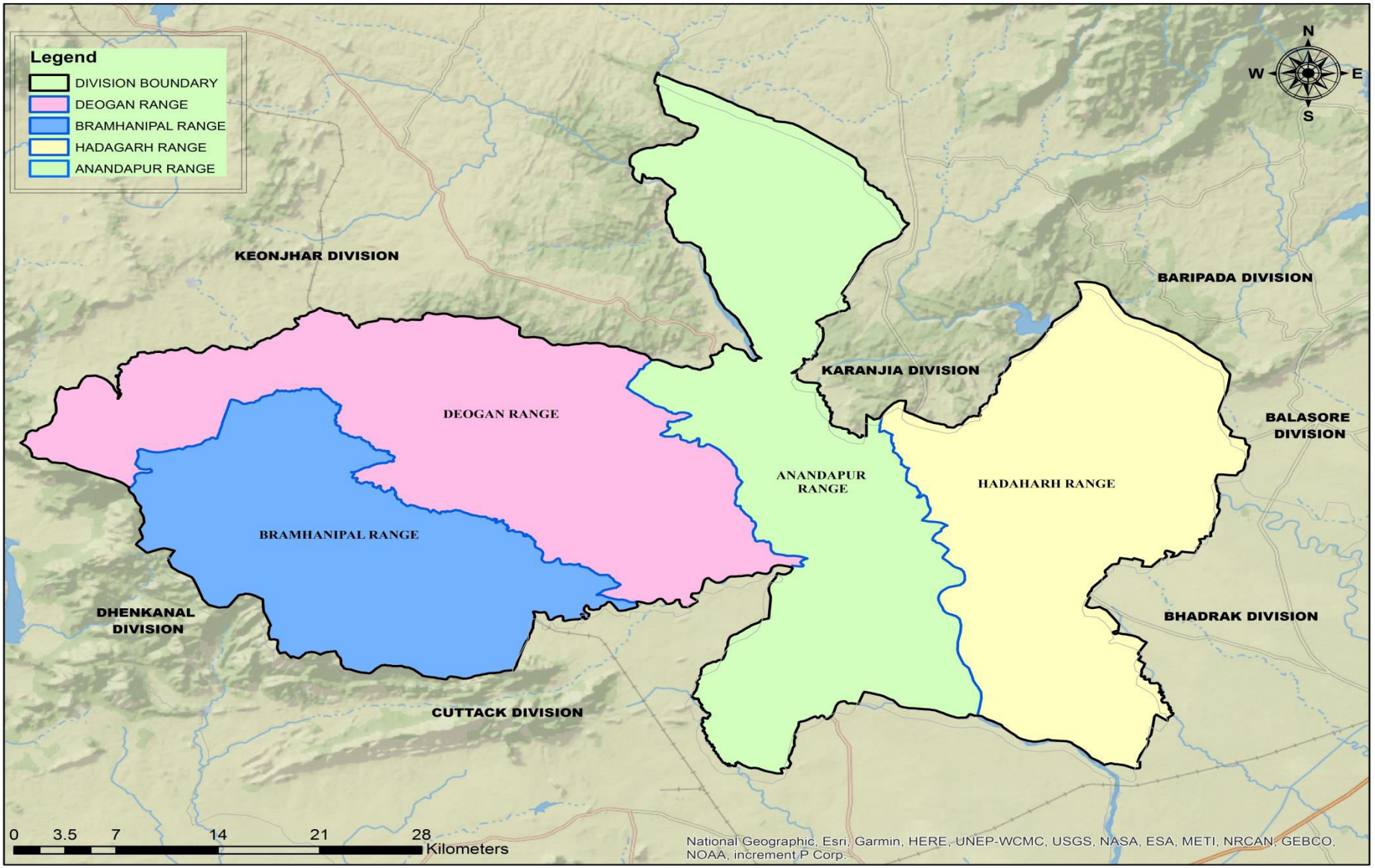
M.YOGAJAYANAND, IFS

REGIONAL CHIEF CONSERVATOR OF FORESTS,
BARIPADA CIRCLE

FOREST ADMINISTRATIVE MAP
KEONJHAR WILDLIFE DIVISION


Mushala Nadi
Harichandanpur
Bhagamunda
Palaspal RF
Palaspal
Mahagania RF
Turkuda Tarf RF
Rebana RF
Dalari
EAST COAST RAILWAY
Kadamba RF
Ahi RF
Tangora DPF
Anandapur
Salapada RF
Hatibarina RF
Harichandra RF
Dhobapani
Sajanakhol EPF
Brahmanipal RF
Brahmanipal
Kathio RF
Mahulsahidpur RF
Ramachandrapur
Barlanga RF
Gayalmunda
Gayalmunda RF
Baula RF
Hadagarh
Kathabada
Boula RF
Baitarani River
Ghatagaon
Kanjipani
Jhumpura
Champua
Joda
Kolha
Gurudijhatia
Sukinda
Kaliapani
Jajpur Road
Bhadrak
Balasore
Kharagpur
Midnapore
Howrah
Kolkata
Bhubaneswar
Cuttack
Puri
Berhampur
Sambalpur
Rourkela
Jharsuguda
Balangir
Koraput
Jeypore
Nabarangpur
Malkangiri
Rayagada
Gunupur
Bhawanipatna
Kalahandi
Nuapada
Phulbani
Baudh
Sonepur
Angul
Dhenkanal
Keonjhar
Bonai
Sundergarh
Bamra
Jashipur
Baripada
Mayurbhanj
Nilgiri
Chandbali
Bhadrak
Jaleswar
Balasore
Basta
Soro
Bahanaga
Khaira
Dhamnagar
Chandipur
Remuna
Nilagiri
Bhograi
Simulia
Jaleswar
Bhadrak
Chandbali
Dhamra
Rajnagar
Rajkanika
Mahakalapada
Aradi
Tirtol
Kujang
Jagatsinghpur
Paradip
Kendrapara
Pattamundai
Aul

MAP SHOWING KEONJHAR WL DIVISION ,ANANDAPUR



STATE FOREST HEAD QUARTERS, ODISHA
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS,
ARANYA BHAWAN, CHANDRASEKHARPUR, BHUBANESWAR-23

Memo No. 19407 **/11F (SFM)- 21/2019**
Dated, Bhubaneswar the 16th **November, 2021**

To

The Divisional Forest Officer,
Keonjhar (WL) Division.

Sub: - **Approval of draft Revised Working Plan of Keonjhar (WL) Division for the period 2021-22 to 2030-31.**

In inviting a reference to the aforesaid subject, I am to say that Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrasekharpur, Bhubaneswar vide their Letter No 8(31)38/2016-FCE dt.12.11.2021 (copy enclosed) have accorded the approval of the Revised Working Plan of Keonjhar (WL) Division for the period from 2021-22 to 2030-31 with certain General and Specific Conditions mentioned therein.

You are, therefore, requested to follow the instructions of Government of India as stipulated in the above order during implementation of the Working Plan in the Division.

Encl:- As above.

Addl. Principal Chief Conservator of Forests (P&SM)

Contd..P/2

Memo No 19408 **dt.** 16.11.2021

Copy along with a copy of Letter No. 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrsekharpur, Bhubaneswar forwarded to Smt. Nibedita Das, Ex-DFO,FRS Now DFO, (KL) Sambalpur for information and necessary action with reference to her Memo No.1740 dt.17.09.2021.

16/11/2021
Conservator of Forests
(Working Plan)

Memo No 19409 **dt.** 16.11.2021

Copy along with a copy of Letter No. 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrsekharpur, Bhubaneswar forwarded to the Divisional Forest Officer. FRS, Cuttack for information and necessary action.

16/11/2021
Conservator of Forests
(Working Plan)

Memo No. 19410 **Dt.**/ 16.11.2021

Copy alongwith a copy of Letter No. 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrasekharpur, Bhubaneswar forwarded to the Additional Chief Secretary to Government of Odisha , Forest & Environment Department, Bhubaneswar for information and necessary action.

16/11/2021
Conservator of Forests
(Working Plan)

Memo No 19411 **dt.** 16.11.2021

Copy along with a copy of letter No 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrsekharpur, Bhubaneswar forwarded to the Managing Director, Odisha Forest Development Corporation Ltd., Kharvelanagar Nagar, Bhubaneswar for information and necessary action.

16/11/2021
Conservator of Forests
(Working Plan)

Contd.P/3

Memo No_____dt.

Copy along with a copy of Letter No. 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrsekharpur, Bhubaneswar forwarded to the Regional Chief Conservator of Forests, Baripada Circle for information and necessary action.

16/11/2021
Conservator of Forests
(Working Plan)

Memo No_____dt.

Copy along with a copy of Letter No. 8(31)38/2016-FCE dt.12.11.2021 of Government of India, Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Chandrsekharpur, Bhubaneswar forwarded to the P.S to PCCF / PCCF(PP&A)/Additional Principal Chief Conservator of Forests (P&SM)/Chief Executive Officer (CAMPA)/ O/o the PCCF & HoFF, Odisha for information and necessary action .

16/11/2021
Conservator of Forests
(Working Plan)

भारत सरकार / Government of India
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय / Ministry of Environment, Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय / Integrated Regional Office
ए/3, चंद्रशेखरपुर / A/3, Chandrasekharpur
भुवनेश्वर - 751 023, ओड़िशा / Bhubaneswar - 751 023, Odisha
Telephone: 0674 - 2301213, 2302432, 2301248, 2302452, 2302453. E-mail: roez.bsr-mef@nic.in

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No.8(31)38/2016-FCE

12th November, 2021

To,

The Addl. Chief Secretary,
Forest & Environment Department,
Govt. of Odisha,
Bhubaneswar.

Sub: Approval of draft Revised Working Plan of Keonjhar (WL) Division for the period from 2021-22 to 2030-31 - reg.

Ref: The PCCF & HoFF, Odisha letter No. 5578/11F (SFM) 21/2019 dated 11.03.2021 and letter No. 17477/11F (SFM) 21/2019 dated 11.10.2021.

Sir,

The revised draft Working Plan of Keonjhar (WL) Division for the period 2021-22 to 2030-31 submitted by the PCCF, Odisha has been examined and accordingly, the Central Government (MoEF&CC) with the powers vested under Forest (Conservation) Act, 1980, has decided to accord approval of the working plan of Keonjhar (WL) Division for the period 2021-22 to 2030-31, subject to the following General and Specific conditions:

The formal endorsement / approval from the State Govt. may also be obtained.

General Conditions:

1. The orders of Hon'ble Supreme Court of India in the matter of W.P. No. 202/95 Godaverman Therumulkpad Vs Union of India and related Interlocutory applications shall be strictly complied with. Any prescription or operation at variance with the order of Hon'ble Apex Court shall be kept in abeyance till such order is in force or otherwise not modified.
2. Further, in strict compliance with Hon'ble Supreme Court's order dated 22.09.2000, the State Government of Odisha shall ensure that regeneration of forest is commensurate with fellings, if any, to be carried out under the present working plan.
3. Consequently, **no felling should be carried out without making allocation of requisite funds for undertaking regeneration operation** in order to ensure regeneration to be commensurate with fellings. In case of failure of regeneration or any shortfall in achieving the target of regeneration, further harvesting shall remain suspended till backlog/ shortfall in regeneration is made up and subsequent formal approval from the Eastern Regional Office is to be obtained.
4. This working plan is approved for the period **2021-22 to 2030-31.**
5. Standing snags/dead or dying trees should not be removed and shall be preserved for wildlife habitat/shelter. In site specific coupes / sections having unduly large no. of such trees needing removal, the State Forest Department may take special permission from Integrated Regional Office, MoEF&CC, Bhubaneswar.
6. Deviation statement along with the prescribed documents shall be reported and got endorsed from the competent authority by the end of the year of operation. Accordingly a summary of the report/certificate shall be submitted along with the Annual Action Taken Report to the IRO, MoEF&CC, Bhubaneswar for information and record.

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7. No new road shall be constructed and no fresh forest area shall be broken for widening / reconstruction of existing roads without obtaining prior approval under Forest (Conservation) Act, 1980.

8. Approval of the working plan does not permit to carry out any non-forestry work including construction of building, for which necessary permission under F(C) Act shall be obtained, as may be required.

9. CF (T) shall submit to the CCF (WP) / PCCF the yearly action taken report against the physical & financial targets of felling & regeneration against each working circle of this W.P. by the end of the year of operation.

10. Immediate action may be taken for repairing of old pillars, if any. Prescriptions may be provided for revisiting all pillars every five years for purpose of maintenance and appropriate action be taken depending on condition of boundary pillars. Staff in charge of beat will verify physically the boundary pillars and shall give a certificate annually to the DFO with copy to the CCF, Working Plan confirming that no fresh encroachments have taken place. Vulnerable areas will be verified by the Range Officers.

11. The detail copy of the PF/RF Notification, if any, may be compiled and a copy of each shall be kept with the DFO/Working Plan Officer and CCF, Working Plan for reference.

12. The encroachment details, if any, may be furnished along with a map.

13. Identification of locally important medicinal plant species, if any, which are becoming rarer, should be provided in the Working Plan.

14. State Forest Department shall initiate the process for the preservation of old available maps.

Specific Conditions:

The prescriptions under the proposed working circles are approved with observations stated above and with specific condition that:

1. Sporadic, wind fallen / uprooted trees, if any, shall also be allowed to be harvested in addition to the approved working scheme prescriptions for the year 2021-22 after its special approval of the list of enumerated trees by the CF (T) / RCCF (T) forwarding a copy to Integrated Regional Office, Bhubaneswar. In case of large scale wind fallen, damaged and epidemic outbreak, special permission for tree felling may be obtained from the Regional Office of MoEF&CC, Bhubaneswar. The volume extracted out of wind fallen/ uprooted trees shall be deducted out of the total volume of yield as calculated and permission for felling is allowed for balance volume only.

2. A mid-term evaluation of the implementation of working plan prescriptions and its impact on the forests may be done after the end of initial five years for which reasonable number of benchmark / sample plots may be maintained.

3. After recording the GPS and checking the records of each planting site DFO to certify that plantation is not taken up in the existing old plantation sites, without the prescribed action required prior to replanting.

4. Plantation details along with current status (conditions of plantation and survival) may also be included along with GPS surveyed boundary locations shown on a map, so that chances of mismanagement, confusion, encroachment and problem of identification of the site are reduced.

5. The Department should prepare a programme for DGPS survey of forest boundaries and prepare geo-referenced maps with important administrative and management details, if not done earlier.

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6. Prescriptions must be provided for demarcation of un-demarcated balance forest area. The area details of un-demarcated forest area, number of pillars and funds required to demarcate it and year wise plan for demarcation so as to complete it at the earliest should be provided.
7. No forest, bearing naturally grown trees shall be clear felled for any purpose what so ever.
8. The prescriptions are to enable necessary co-existence of development with nature, and to ensure implementation strictly adhering to the provisions of Indian Forest Act, 1927, Wildlife (Protection) Act, 1972, Forest (Conservation) Act, 1980, Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA), Biological Diversity Act, 2002, and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
9. People Biodiversity Register (PBR) formulation as well as Access of Benefit sharing Regulation has to be implemented and monitored.
10. Listed wetland, defined under the Wetland (Conservation & Management) Rules, 2017 situated in and outside forest to be restored and sustainable managed. Annual target along with riparian restoration will be done strictly in accordance under the provision of aforesaid Rules.
11. Raising of genetically improved seedlings/clonal propagation needs emphasis for timber productivity enhancement for future. Accordingly, year-wise raising of clonal seedlings will be fixed in proportion in the Division.
12. No permanent structure for Eco-Tourism purpose should be allowed. Ecotourism should be focused with identification of sites, traditions, community practice and future management involving local communities. Benefit accrued from eco-tourism to be plowed back to local communities. Number of visitors shall be fixed as per the carrying capacity study. Safety audit to be carried out in all he eco-tourism sites.

Central Govt. reserves the right to review, modify or withdraw this approval at any time, if any, of the conditions of approval are not implemented or relevant modifications in the Working Plan, if any, is required so as to keep it in conformity with the orders, circulars and guidelines issued by the Central Govt. under Forest (Conservation) Act, 1980 or any other statute and National Forest Policy.

Yours faithfully,

Padma Mahanti

(Padma Mahanti) 12/11/21
Dy. Inspector General of Forests (C)

Copy to:

1. The Addl. Director General of Forests (FC), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Agni Wing, Aliganj, Jorbagh Road, New Delhi-110 003 for kind information.
2. The Principal Chief Conservator of Forests, Forest Department, Govt. of Odisha, Aranya Bhawan, Chandrasekharpur, Bhubaneswar for kind information and necessary action.
3. The Addl. PCCF (P&SM), Forest Department, Govt. of Odisha, Aranya Bhawan, Chandrasekharpur, Bhubaneswar for kind information and necessary action.
4. The Managing Director, Odisha Forest Development Corporation Limited, Bhubaneswar for kind information.
5. Guard File.

Padma Mahanti.

Dy. Inspector General of Forests (C) 12/11/21

ଶିଶିର୍ କୁମାର୍ ରଥ
SISIR KUMAR RATHO

ପ୍ରଧାନ ମୁଖ୍ୟ ବନ ସଂରକ୍ଷକ
ଓ ବନବାହିନୀ ମୁଖ୍ୟ, ଓଡ଼ିଶା
PRINCIPAL CHIEF CONSERVATOR OF FORESTS
& HEAD OF FOREST FORCE, ODISHA

FOREWORD

The Revised Working Plan of Keonjhar WL Division has been approved vide Letter No. 8 (31) 38/2016-FCE dt. 12/11/2021 of the Govt. of India Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Bhubaneswar. This is the 2nd revision of Working Plan of this Division created during 2003 and this is for the period from 2021-22 to 2030-31.

This Working Plan is exclusively for the forests of Keonjhar WL Division excluding the forests of erstwhile Keonjhar Forest Division. SWOT Analysis has been done meticulously to prepare the Plan with realistic prescriptions to achieve expected outcome. Seven Working Circles, both exclusive & overlapping, are prescribed in this Working Plan covering a total area 58610.92 Ha. There is one new exclusive Protection Working Circle added in the Plan with an aim to protect eco-fragile, catchment of reservoirs and steep precipitant slope with higher altitude. Forest land diverted from non-forestry use under Forest Conservation Act, 1980 and The Scheduled Tribe & Other Traditional Forest Dwellers" (Recognition of Forest Rights) Act, 2006 are excluded from the purview of this Working Plan.

As this Division is adjacent to Similipal Tiger Reserve, tiger conservation has been given importance along the identified tiger corridor by NTCA in Santoshpur, Rebena & Atei Forest Blocks.

Smt Nibedita Sahu, DFO, FRS Division, Cuttack under the guidance of higher authorities has carried out an excellent job in revising the Working Plan to meet the challenging circumstances linked to modern forest management. I congratulate all the Forest Officers associated with preparing this plan and hope this plan will serve as a technical and scientific document to achieve its stated objectives.

(Sisir Kumar Ratho, IFS)

ଅରଣ୍ୟଭବନ, ଜିଡି-୨/୧୨, ଚନ୍ଦ୍ରଶେଖରପୁର, ଭୁବନେଶ୍ୱର-୭୫୧୦୨୩, ଫୋନ: ୦୬୭୪-୨୩୦୦୮୫୩
Aranyabhawan, Plot No.: GD-2/12, Chandrasekharpur, Bhubaneswar-751023, Tel: 0674-2300853, Email : pccf.hoff@odisha.gov.in, Web: odishaforest.in

PREFACE

The Divisional Forest Officer, Forest Resources & Survey Division at Cuttack is assigned with the revision of Working Plan of Keonjhar (WL) Division vide Memo No.10F(TR)67/2017 13642/ F&E dated 03.07.2015. For the first time a separate Working Plan for Keonjhar (WL) Division has been prepared. This working plan has been prepared based on National Working Plan Code-2014. The vegetation of the forest blocks can be broadly classified into two types of sub-type 3C/C2e, Three Types of sub group 5B, along with sub-type E4 $5/DS_1$.

The data on forest composition, structure, regeneration and growth were collected by the Team from 17 RFs & 3 PRFs of Keonjhar (WL) Division. The data on non-wood forest products, socio-economic structures and forest based livelihood of forest fringe villagers were collected from the socio-economic survey of Ama Jungala Yojana. Geographical Information System (GIS) maps depicting layers of forest density and estimation of carbon obtained from NRSC are also presented in the Working Plan.

I believe that present working plan would be useful to foresters and concerned officials of Keonjhar (WL) Division in the management of forests.

(SMT. NIBEDITA DAS)
Divisional Forest Officer,
Forest Resources Survey Division,
Cuttack

ACKNOWLEDGEMENT

I am indebted to the former RCCF's of Baripada Circle Sri H. K. Bist, IFS, Sri P.K. Maloth Mohan, IFS and Sri Amitav Brahma, IFS for their timely guidance and valuable suggestion for the revision of this Working Plan. My deep gratitude to Sri M. Yogajayanand, IFS, Field Director, STR-cum-RCCF, Baripada for his immense help and valuable suggestion for completion of this plan. Further I would like to thank to Dr. Akshya Kumar Pattnaik, IFS, Chief Conservator of Forests, Training & Development, Cuttack for his encouragement and immense help in my efforts to revise this Working plan. Completion of this text would have been impossible without constant advice and timely checking & correction of Chapters by Sri A. K. Jaiswal, IFS, Conservator of Forests, Working Plan.

I am thankful to Sri Sangram Keshari Behera, IFS, the then Divisional Forest Officer, Keonjhar WL Division for drafting the PWPR who had drafted the PWPR which helped a lot to go ahead with revision of this plan.

Thanks to Sri Ajit Kumar Satpathy, OFS, Gr-A(S.B), Divisional Forest Officer, Keonjhar (W.L) Division for his timely facilitation of field works which rev up the writing of this plan. I am thankful to Sri Suresh Ku. Sethy, ACF, Keonjhar (WL) Division and all the field staff as well as office bearers of Keonjhar (W.L) Division for their willing assistance and supply of informations required for revision of this plan. The Divisional Manager, OFDC, Keonjhar have also provided much help by furnishing the useful information and data required for this plan. It is noteworthy to mention here that the contribution of NRSC, ORSAC and GIS Cell of the PCCF & HoFF, Odisha.

It would not have been possible to draft the revised Working Plan in the perspective attempt here without active support of Sri Suresh Ku. Rath, Ex-ACF, Gr-A (J.B), Sri Tusar Ray, ACF, Gr-A (J.B) and Sri D.C.Jit, Ex-Range Officer of this Division. The active and un-tired in field work regarding collection of data, ground truthing and survey works by Sri Krushna Chandra Sahoo, Range Officers, Foresters and Forest Guards is indispensible for revision of this Working Plan and all they have contributed significantly. My heartful appreciation to the efforts of my ministerial staff and specially to Sri D.K.Swain, Jr.Stenographer for their continuous hard work ungrudging and endeavour to complete assignments even at morning to evening irrespective to their personal inconveniences. It is my pleasure to appreciate the remarkable field work and data compilation by Sri Dillip Kumar Satpathy, Forester of this Division in preparation of this plan.

I am very much thankful to my seniors Sri Jitasatru Mohanty, IFS (Retd.), Sri N.C. Mohanty, IFS (Retd) and Sri Abhaya Kumar Ray, ACF (Retd.) for their splendid contribution and subject specific guidance in formulation of this Working Plan. I may be excused for the lack of name of those persons who have directly or indirectly contributed in completion of this plan. This manuscript of this plan has been edited several times to make it error free still then I owe full responsibility if any errors and limitations remained, unwillingly.

(SMT. NIBEDITA DAS)
Divisional Forest Officer,
Forest Resources Survey Division,
Cuttack

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INTRODUCTION

Prior to 1896 certain rules were framed by the then Maharaja Keonjhar for conservation of forests. In 1907 the British Govt. took over the direct management of forests of whole Keonjhar district. The first Working Plan for scientific management of the forests of Keonjhar Division was prepared by Dr.H.F.Mooney, the then Dy.Conservator of Forests in the year 1929 for the period from 1930 to 1960. Subsequently, however the plan was revised by late A.B.Lal officiating Forest Officer, Keonjhar State in the year 1945 by covering a period of 20 years i.e. 1945-46 to 1964-65.

The Working Plans prepared by A.B Lal after its expiry was taken for revision during 1964 by Sri G.C Das, Dy. Conservator of Forests followed by Shri P.K.Pani, Dy. Conservator of Forests as well as Shri U.N. Sarangi, IFS completed the Part-II of the plan. Further Sri S.K.Prasad, IFS redrafted the plan de-nove which got approval during 1983 for the period 1964 to 1983. The subsequent Working Plan for the period from 1984-85 to 1993-94 was prepared by Sri B.C. Mohapatra,IFS which got extension up to 2003-04 vide Letter No. 13-RCM/05 dtd.1.11.93 of Chief Conservator of Forests (Central), Govt. of India.

Keonjhar (W.L) Division has been carved out from Keonjhar (T) Division vide F&E Department Notification No. 1F(A)-99/2003/13214/F&E dtd. 8th August,2003. For the first time one separate Working Plan has been prepared for Keonjhar (W.L) Division after separation. The first Working Plan was from 2007-08 to 2016-17, prepared by Mr. Narayan Samal, AIFC, OFS(I). This Working Plan has been approved in phases i.e. 2011-12, 2012-13, 2013-14 & lastly for 2014-15.

Earlier, this Division was under administrative control of Rourkela Circle. For better & integrated management & protection of Wildlife, this division brought under the administrative control of Baripada Circle vide Notification No. EE-EE1-FE0031-2017/7571/F&E dtd.15.4.17 of F&E, Govt. of Odisha.

The Divisional Forest Officer, Forest Resources & Survey Division at Cuttack is assigned with the revision of Working Plan of Keonjhar (W.L) Division vide Memo No. 10F(TR)67/2017-13642/F&E dtd. 31.7.2015.

The PWPR prepared by RCCF, Rourkela was approved during 2016 which contained guidelines for specific field works and outlined formation of working circles and broad principles of management. This plan has been prepared keeping in view of principles contained in the National Forest Policy 1988 with conservation of biodiversity and peoples participation in commensurate with National Working Plan Code-2014.

The entire Boula R.F is under Hadagarh (WL) Sanctuary, which is managed under a separate Wildlife Management Plan.

In Keonjhar (WL) Division, there are 19 nos. of RFs, 03 Nos. of PRFs, 10 DPFs,8 Nos. of P.Fs(Compensatory Afforestation Area) and 56 Nos. of V.Fs. Out of whichSalapada RF (1553.84 Ha.) has been de-reserved for 757 Ha.and balance 796.43 Ha is under active encroachments. Hence, this RF has been excluded from the purview of Working Plan area. Thus, the total Working Plan includes 17 nos. of RFs and the total Working Plan area is 58,610.92 ha.excluding Salapada R.F and Baula R.F as Baula R.F is included in Hadagarh Wildlife Sanctuary.

Some of the salient features of the plan are :

1. *Settlement operations for lands under Keonjhar (W.L) Division were carried out during 1975-79. Accordingly, ROR has already been issued before 40 years. For the 1st time the exact areas of the RF and P.R.F blocks have been tried for computation.*

2. *Regeneration survey for different species has been carried outin all the Forest Blocks.*

3. *3% enumeration of plantation areas has been taken up to assess the status/ success of plantations.*

4. *Demand of timber, firewood and fodder has been assessed.*

5. *Compartments have been demarcated in the field.*

6. *30 numbers of permanent sample plots have been demarcated and sinages have been displayed. Also all the trees, shrubs and herbs present there have been enumerated along with regeneration status and maintained in separate registers for future analysis and actions.*

7. *Collection period, usable parts, scientific method of collection, processing, value addition of major NTFP and MAP have been discussed.*

8. *Attempt has been made to enlist the Orchids, Ferns andLichens available in Keonjhar Wildlife Division.*

9. *Also butterflies and dragonflies are enlisted.*

10. *For the first time, proposals of three preservation plots (Dhaura, Kangada& Sal) have been prescribed whose stand structures are to be studied in future.*

11. *05 regeneration plots have been laid down in the field and regeneration status in the said plots has been studied. Variation in regeneration status can be studied in coming years.*
12. *Instead of traditional method of strip enumeration, as per the guidelines of Working Plan Code, 2014 grid based sample point enumeration method is followed on the points provided by NRSC, Hyderabad using remote sensing technology over 294 sample points. The newmethodology facilitated calculation of approximate stem and volume in different girth classes and also difference canopy cover.*

13. *For the first time carbon sequestration has been estimated for forest block wise in this plan and a permanent 30 enumeration points (plots) has been fixed for future analysis of carbon sequestration as a carbon sink which is now the index of climate change.*

The outgoing Working Plan envisages total 7 Nos of working circles except S.W.C. Out of this wildlife, NTFP are overlapping working circle. In this plan total 7 nos of Working Circles are envisaged (1) Improvement Working Circle, (2) Rehabilitation Working Circle, (3) Protection Working Circle, (4) Plantation Working Circle,(5) Wildlife (Overlapping) Working Circle, (6) JFM (Overlapping) Working Circle and (7) NTFP (Overlapping) Working Circle.

EXECUTIVE SUMMERY

Vision Statement: -

The present working plan has been drafted with a vision to achieve different goals on various parameters by the end of this plan period i.e. 2030-31. The parameters are:-

- Increasing green cover by encouraging outside forest plantations like farm forestry, avenue plantation, institutional plantation etc.
- Creation of soil and water conservation structures to conserve water thereby maintaining the hydrological cycle.
- Creation of large value of carbon sinks by massive afforestation.
- Improving people's participation towards management of forests.
- Adoption of Modern Technology like Remote Sensing, GIS, DRONE in forestry.
- Conservation of wildlife and restoration of habitat.

I(b) Goals and objectives formulated for this working plan:-

1. To protect and manage forests & wildlife resources with a view to conserve and enrich bio- diversity.
2. To conserve and improve the existing vegetative-cover for soil and water conservation with a view to ensure ecological and environmental stability.
3. To manage forest resources scientifically by following suitable principles.
4. To rehabilitate the depleted forest through artificial regeneration.
5. To promote development of sustainable and non-destructive livelihood opportunities for local communities.
6. To promote Joint Forest Management involving Vana Samrakhyana Samiti for sustainable management of forests. Ensure sustainable production of Non-Timber Forest Products and thus enhance livelihood opportunities of the communities dependent on forests.
7. To meet needs and requirements related to forest produce of local people and local communities living in and around forest areas.
8. To enhance their livelihood, ensure usufruct benefit sharing and protect their traditional knowledge and traditional / cultural practices.
9. To educate people regarding the importance of conservation of nature and natural resources through proper measures.

10. To ensure capacity building of local forest dependent community towards conservation of nature and natural resources.
11. To introduce modern tools for scientific management of the forests.
12. To enhance Carbon Sequestration in forest by following most desirable level of biomass production and find ways for adoption with change in climate.

I(d) SWOT ANALYSIS :-

Strengths, Weaknesses, Opportunities and Threats identified for prescription of strategies for achieving goals and objectives are as listed below.

Strengths :-

Various strengths of the division have listed as follows.

1. Availability of vast stretch of forests with luxuriant and varieties biodiversity.
2. The existence of Baitarani, Mushal, Salandirivers to support the existence of flora and fauna in the region.
3. Ameliorative potential of areas to provide recreation facilities to people.
4. Huge potential of area to work as an excellent field for research studies in Forestry and Wildlife as the tract is adjoining to Hadagarh (WL) Sanctuary.
5. Trained manpower to large extent to execute activities prescribed in the plan.
6. Rich mineral deposit in the division area to support the economy of the nation.

(i) Weaknesses :-

Weaknesses identified are listed below:-

1. Increased human interference on forest resources from large number of human settlements adjoining forest areas.
2. Huge dependency on forest resources to ensure livelihood of local forest dependent community.
3. Degrading wood stock and other NTFPs because of biotic pressure out of human population explosion.
4. Fragmented forests lands posing threat to wildlife connectivity.
5. Scarcity of water due to edaphic factor.
6. Lack of know-how (new technologies and tools for sustainable forest management).

7. Lack of tools for assessment of various interventions and integration to plan.
8. Difficulties to enforce various acts and rules.
9. Forest land tenure problems.

(ii) **Opportunities :-**

Various opportunities identified are as follows :-

1. Updated forest management plan standards.
2. Biodiversity conservation through protection
3. Capacity building of both forest staff and VSS members.
4. Creation of environment awareness to forest fringe villages.
5. Research of Forest & Wildlife.
6. Sustainable utilization of natural resources.
7. Infrastructure Development for protection and management of forests.
8. Joint Forest Management activities and inclusion of the VSS under AJY
9. Convergence activities with line departments to promote livelihood of forest dependent community.

(iii) **Threats** :-

Identified threats are as follows:-

1. Vulnerability to Forest Fire.
2. Areas vulnerable to Encroachment of forest land and resultant forest loss.
3. Chances of Diseases.
4. Mining activities for extraction of minerals and resultant reduction in forest cover.
5. Land use change.
6. Floods mostly from River Baitarani
7. Climate Change.

EXPECTED OUTCOME

1. Increase in productivity of the Forest ecosystem and maintenance of the vitality.
2. Enhancing water conservation capacity of the forest ecosystem by constructing site specific SMC measures.
3. Reduction in soil erosion, enhancement of fertility of the soil.
4. Increase the condition of crop by planting indigenous plants.
5. Protection of forest by involving common people through JFM.
6. Sustainable NTFP collection.

ABSTRACT OF THE PLAN PRESCRIPTION

Abstract of plan prescription has tabulated in the Table-1(e)

Table – 1 (e) : Abstract of the plan prescriptions

Chapter No.	Para No. / Sub-Para No.	Prescribed activity	Remarks
A	B	C	D
Part-II Chapter 2	2.11.1	Sequence of improvement operation	Demarcation of annual coupes to be done during the preceding year of the year due for felling in winter season by a Forest Officer not below the rank of trained Forester and checked by Range Officer and Assistant Conservator of Forests and Improvement series have been made & each divided into 10 year.
Part-II Chapter 2	2.11.2	Soil-moisture conservation	Suitable SMC structures to be undertaken considering the slopes.
Part-II Chapter 2	2.13	Subsidiary silvicultural operation	Climber cutting, cleaning & thinning to be undertaken.
Part-II Chapter 2	2.15	Other regulations	Protection from grazing, fire protection, collection of NTFP items are to be carried out.
Part-II Chapter 3	3.4	Area allotment for RWC	Care has been taken to allot the area in a series restricted to one Range.
Part-II Chapter 3	3.11.2	Demarcation of rehabilitation coupe	For ensuring timely field operations, the annual rehabilitation areas are to be delineated in the map and demarcated in the field in the year preceding the year in which it is due for working.
Part-II Chapter 3	3.11.3	Preparation of treatment map	An officer not below the rank of Range Officer should inspect and examine area carefully and prepare a treatment map of the same area, which should exhibit measures to be taken up for different patches within the annual rehabilitation area.
Part-II Chapter 3	3.11.3	Preparation of treatment map	Considering degree of degradation the forest area has been divided into 3 categories.

		for Category-1, Category-2 & Category- 3 sites.	
Part-II Chapter 3	3.12	Rehabilitation measures	Silvicultural Operation Soil moisture conservation
Part-II Chapter 3	3.13	Associated Regulation and Measures	Control and grazing and fire protection measures have prescribed.
Part-II Chapter 4	4.5.1.1	Planting series	Blank areas having devoid of root stalk have been included.
Part-II Chapter 4	4.5.1.2	Tending series	Plantations having more than 40% survival rate are included.
Part-II Chapter 4	4.5.1.3	Plantation restoration series	Old plantations with less than 40% survival rate have been included.
Part-II Chapter 4	4.10.2	Demarcation of annual plantation coupes	Annual coupes to be surveyed one year in advance.
Part-II Chapter 4	4.10.3	Preparation of treatment map	Identified site should be demarcated and mapped on 1:25000 scale topo considering slope, contours etc.
Part-II Chapter 4	4.10.3.1	Nursery site preparation Planting & Post planting	Schedule of planting operation given.
Part-II Chapter 4	4.12	Associated Regulations and Measures	Plantation journals to be maintained properly.
Part-II Chapter 5	5.5	Analysis of crop	Forest on steep slopes which are in degraded condition have been treated under Protection Working Circle.
Part-II Chapter 5	5.9.1	Method of execution of operation	Different method of protection discussed
Part-II Chapter 5	5.9.2	Engagement of Anti-Smuggling Squad	Protection squads are to be stationed at vulnerable areas.
Part-II Chapter 5	5.9.3	Strengthening of infrastructure	Provision of Arms and vehicles should be made. Training of field staff from time to time is required.
Part-II Chapter 5	5.9.4	Fire Protection Measures	VSS members & Forest Fringe Villagers should be involved in combating Forest Fire.
Part-II Chapter 5	5.9.5	Communication system	Strengthening of VHF System is required where there is network problem.
Part-II Chapter 5	5.9.6	Intelligence Networks	Strong intelligence network system is required to combat crime.
Part-II Chapter 5	5.9.7	Incentives rewards	There should be provision of incentives rewards to common people, VSS members and Staff.

Part-II Chapter 5	5.9.8	SMC	Suitable soil moisture conservation measures to be carried out.
Part-II Chapter 5	5.11.1	Misc regulation	Monitoring evaluation system should be developed.
Part-II Chapter 6	6.9.1	Demarcation of assigned areas to VSS	It helps to resolve tenurial conflict between villages and gives the VSS members a sense of ownership and specific identify which eventually motivates them to protect the forest and helps for the better management.
Part-II Chapter 6	6.9.2	Preparation of micro plans	The micro plans should be prepared keeping in view the overall prescriptions of the concerned working circles, thorough PRA exercise.
Part-II Chapter 6	6.9.4	Motivation	It is important that the motivation level of the people to protect the forests should be sustained for a long period to respond to the protection provided.
Part-II Chapter 6	6.9.5	Entry point activities	To motivate the villagers or to build a sense of confidence some required works to be done.
Part-II Chapter 6	6.9.5	Income Generation activities	Income generating activities (IGA) like sericulture, vermiculture, lac and honey collection to be encouraged through VSSs.
Part-II Chapter 6	6.9.6	Rewards / Incentives to VSSs / Training	Good JFM practices to be incentivized / rewarded.
Part-II Chapter 6	6.9.8 & 6.11	Capacity Building of Staff & Villagers towards JFM activities	In order to execute activities proposed under JFM it is important to equip the implementing staff and villagers with required skills. It is therefore proposed to conduct capacity building of staff and villagers in this regard.
Part-II Chapter 6	6.12.1	Control measures	All the areas assigned to the VSS should be marked on the top sheets of 1:50000. The works taken up in these VSS areas should be entered in the compartment histories. The checking of compartment histories should form a part of the office inspections by the Conservator of Forests and the DFO.
Part-II Chapter 6	6.13	Regulation of Rights and concessions	Rights and concessions in this Working Circle shall be regulated in accordance with the provisions of the relevant gazette notifications of the respective forest blocks and the Govt. of Orissa policy with regard to JFM.
Part-II Chapter 7	7.7	Method of treatment	Scientific method of collection, processing& storage of 10 NTFP items have been discussed.
Part-II Chapter 7	7.10.1	Method of execution – Enrichment of NTFP species.	20% of the block & ANR Plantation should be of NTFP species. In VSS areas the choice of species is need based.
Part-II Chapter 7	7.10.2	Augmentation of regeneration of NTFP	The areas having good regeneration should be taken care of.

Part-II Chapter 7	7.10.4	Marketing of NTFPs	Most of the NTFPs are not collected because of lack of marketing facilities. The marketing aspects of various NTFPs need to be researched and improved.
Part-II Chapter 7	7.10.4	Ensure Fair prices of NTFPs	The district administration has to shoulder all responsibility to ensure that price fixation for procurement of NTFPs are done every year in time and regular return on NTFP collection are submitted by the traders and procurers to the Range Officers.
Part-II Chapter 7	7.11	Control of collection of NTFPs	Collection of NTFPs should not be allowed beyond the carrying capacity and regeneration potential of the forests.
Part-II Chapter 7	7.13	Regulation of Rights and Concessions	Rights and concessions of local people shall be regulated in accordance with the provisions of relevant acts and rules in this regard.
Part-II Chapter 8	8.7	Method of treatment	3 (three) method of treatments have been prescribed :- 1. Remedial measures 2. Preventive measures 3. Control measures
Part-II Chapter 8	8.7.1	Remedial measures	Habitat improvement should be done by improving forest cover, improving availability of food, improving availability of water, improving natural salt lick and corridor development.
Part-II Chapter 8	8.7.2	Preventive measures	It can be achieved by creation of public awareness, animal health surveillance, strengthening of information system.
Part-II Chapter 8	8.7.3	Control measures	It can be achieved by strengthening communication network, prevention of forest fire & restoration of elephant corridor.
Part-II Chapter 8	8.8	Specific observations	Baranga RF of Anandapur Range under Keonjhar (WL) Division is having sizeable population of spotted deer. For safeguarding their life ….. • Cattle population of nearby villages should be immunized periodically. • Large check dams should be created to provide perennial water source. • Watch tower should be constructed near Kusumei pond. • Compensation amount should be given to the villagers for crop raid by Deer. • Small grassland in the nearby areas of water hole should be created.
Part-II Chapter 8	8.9	Misc. Regulation	Fire and grazing protection should be given.
Part-II Chapter 9	9.3	Eco-tourism sites	1. Eco-tourism sites at Gadachandi 2. Eco-tourism sites near Baranga RF
Part-II Chapter	10.2	Forest consolidation	• Ten number of DPFs should be resurveyed. • Consolidation of area under compensatory

10			afforestation sites pending so long.
Part-II Chapter 10	10.3	Maintenance of Forest Block boundary	Annual boundary pillar maintenance programme prescribed.
Part-II Chapter 10	10.4	Irregular & Petty felling	Trees required for scientific investigation for establishing new fire line, for establishment of new nursery should be marked for felling.
Part-II Chapter 10	10.8	Fire protection	• Annual maintenance of fire lines. • Preparatory work for taking preventive measures should be done. • Forest road should be closed for vehicular traffic as per Rule 284 of Odisha Forest Code.
Part-II Chapter 10	10.9	Control of grazing	• Weed eradication in the area lying between village boundary & forest should be uprooted. • Large unproductive cattle can be replaced by cross breed high yielding cattle.
Part-II Chapter 10	10.10	Encroachment	Existing encroachment should be marked with geo reference immediately & steps should be taken to evacuate the same.
Part-II Chapter 10	10.11	Maintenance of Building	Drinking water facility alongwith staff quarter at section and Beat level should be undertaken.
Part-II Chapter 10	10.12	Maintenance of comp. History& Control form	It should be maintained as per Chapter IX & X of National Working Plan Code 2014.
Part-II Chapter 10	10.13	Establishment of Central Nursery	A central nursery should be established.
Part-II Chapter 10	10.17	Forest Right Act	Demarcation of settled areas should be carried out within coming 3 years. Management of FRA areas have been prescribed.
Part-II Chapter 10	10.18	Study on Preservation Plot, Regeneration Plots & Permanent Sample Plots	Protection should be given to these plots so that studies can be taken up in subsequent years.
Part-II Chapter 11	11.2	Permanent Sample Plot	• Register of 30 Permanent Plots have been maintained. • The height girth of trees & herbs, shrub along with their carbon content has been maintained.
Part-II Chapter 11	11.3	Regeneration Plot	5 (five) number of Regeneration Plots out of 30 number of Permanent Sample Plots have been selected to study the regeneration status of different species.
Part-II Chapter 11	11.4	Preservation Plot	3 (thee) preservation plots have been selected having area 20 Ha each & demarcated in the field to study the growth status of 3 principal species i.e. Sal, Kangada, Dhaura. 5 (five) number of 0.1 Ha plots have been laid down in the each preservation plot. The Trees, herbs, shrubs present there have been enumerated.

Part-II Chapter 12	12.3.1	Addressing Drivers of Deforestation and Degradation	• Provision of alternative energy sources. • Enhancement of fodder availability.
Part-II Chapter 12	12.3.4	Conservation and enhancement of forest carbon	• Plantation of indigenous species. • Plantation in Gochar land. • Protection from fire. • Intensive soil moisture conservation methods. • Enhancement trees in urban areas. • Agro forestry for creation of carbon sinks outside forest.
Part-II Chapter 13	13.2	Forest & Water	Forest provides clean drinking water, helps in buffering & filtering pollutants, reduce soil erosion, reduce risk of flooding
Part-II Chapter 13	13.3	Climate change & hydrology.	Climate change affects adversely on hydrology.
Part-II Chapter 13	13.4.3	Water budget	There is shortage of water.
Part-II Chapter 13	13.5	Management interventions	• Increase in SMC structures and creation of WHS is needed. • The density of Forest should be increased by increasing the forest cover.
Part-II Chapter 14	14.3	Scope for increasing TOF	• Plantation around Farm pond. • Institutional plantation. • Avenue Plantations • Agro Forestry.

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GLOSSARY

LIST OF VERNACULAR NAMES OF FLORA AND FAUNA OF KEONJHAR (WILDLIFE)

FLORA

VERNACULAR/LOCAL NAME	BOTANICAL NAME.	FAMILY
	T R E E S	
Achhu	*Morinda tinctoria*	Rubiaceae
Akacia	*Acacia auriculaeformis*	Mimosaceae
Amaralata	*Bauhinia racemosa*	Caesalpiniaceae
Amba	*Mangifera indica*	Anacardiaceae
Ambada	*Spondias pinnata*	Anacardiaceae
Amla	*Emblica officinalis*	Euphorbiaceae
Ankulo	*Alangium salviifolium*	Cornaceae
Arjuna	*Terminalia arjuna*	Combretaceae
Asan	*Terminalia tomentosa*	Combretaceae
Asoka, Ashoka	*Saraca indica*	Caesalpiniaceae
Aswasth	*Ficus religiosa*	Moraceae
Babul	*Acacia nilotica*	Mimosaceae
Badahatikana	*Litsea nitida*	Lauraceae
Baghamari	*Bauhinia retusa*	Caesalpiniaceae
Bahada	*Terminalia belerica*	Combretaceae
Bandhan	*Ougeinia ougenensis*	Papilionaceae
Bankopasiak	*Kydia calycina*	Malvaceae
Bara	*Ficus bengalensis*	Moraceae
Barbakulia	*Dalbergia paniculata*	Papilionaceae
Baruna	*Crataeva religiosa*	Capparidaceae
Batra	*Melia composita*	Meliaceae
Bel	*Aegle marmelos*	Rutaceae
Benta	*Naringi crenulata*	Rutaceae
Bhalia	*Semecarpus anacardium*	Anacaradiaceae
Bheru	*Chloroxylon swietenia*	Meliaceae
Bija (Piasal)	*Pterocarpus marsupium*	Papilionaceae

Borkuli	*Ziziphus mauritiana*	Rhamnaceae
Chakunda	*Cassia siamea*	Caesalpiniaceae
Champa	*Michelia champaca*	Magnoliaceae
Chandan	*Santalum album*	Santalaceae
Char	*Buchanania lanzan*	Anacardiaceae
Charaiguri	*Vitex leucoxylon*	Verbenaceae
Chauldhua (Paldhua)	*Glycosmis pentaphylla*	Rutaceae
Chauli (Mukha)	*Cassia glauca*	Caesalpiniaceae
Chhatian ,Chhachina	*Alstonia scholaris*	Apocynaceae
Chhuipatali	*Stereospermum angustifolium*	Bignoniaoceae
Chikni (Kalicha)	*Glochidion lanceolarium*	Euphorbiaceae
Chotarai	*Dillenia aurea*	Dilleniaceae
Damghurudu	*Diospyros montana*	Ebenaceae
Damkurdu	*Gardenia latifolia*	Rubiaceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Combretaceae
Dhauranjo (Kanju)	*Holoptelea integrifolia*	Ulmaceae
Dimiri	*Ficus retusa*	Moraceae
Eucalyptus (patas)	*Eucalyptus spp.*	Myrtaceae
Gadkhair	*Acacia lenticularis*	Mimosaceae
Gaigutia	*Dimorphocalyx glabellus*	Euphorbiaceae
Gambhari	*Gmelina arborea*	Verbenaceae
Gandhan	*Premna latifolia*	Verbenaceae
Gandhapalas	*Miliusa velutina*	Anonaceae
Garkhari	*Acacia ferruginea*	Mimosaceae
Genduli	*Cochlospermum gossypium*	Bixaceae
Ghontol, Ghanta	*Ziziphus xylopyrus*	Rhamnaceae
Giridhini	*Sterculia urens*	Sterculiaceae
Gohira	*Acacia leucophlaea*	Mimosaceae
Gurudu	*Gardenia gummifera*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Hinjal	*Barringtonia acutangula*	Lecythidaceae
Jaisanda	*Litsaea glutinosa*	Lauraceae
Jamu	*Syzygium cumini*	Myrtaceae

Jari	*Ficus racemosa*	Moraceae
Jeutha	*Artocarpus lakoocha*	Moraceae
Kadamba	*Anthocephalus cadamba*	Rubiaceae
Kaitho	*Limonia acidissima*	Rutaceae
Kalicha	*Diospyros sylvatica*	Ebenaceae
Kamalagundi	*Mallotus philippinensis*	Euphorbiaceae
Kangada, Tangan	*Xylia xylocarpa*	Fabaceae
Kanso, Kansa	*Hymenodictyon excelsum*	Rubiaceae
Karada	*Cleistanthus collinus*	Euphorbiaceae
Karadha (Khurundu)	*Gardenia turgida*	Rubiaceae
Karanja	*Pongamia pinnata*	Mimosaceae
Kasi	*Bridelia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Khair	*Acacia catechu*	Mimosaceae
Khakada	*Casearia elliptica*	Samydaceae
Kodala	*Sterculia villosa*	Sterculiaceae
Kotokol (Katak)	*Strychnos potatorum*	Loganiaceae
Kuchila	*Strychnos nux-vomica*	Loganiaceae
Kumbhi	*Careya arborea*	Lecythidaceae
Kurei	*Holarrhena antidysenterica*	Apocynaceae
Kurum, Haldu ,Koim	*Adina cordifolia*	Rubiaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Limbur moi,Sarupatri moi	*Protium serratum*	Burseraceae
Lodha	*Symplocos racemosa*	Symplocaceae
Mahalimb, Mahal	*Ailanthus excelsa*	Simarubaceae
Mai or Moi	*Lannea coromandelica*	Anacardiaceae
Makharkendu	*Diospyros embryopteris*	Ebenaceae
Mamuri	*Antidesma diandrum*	Euphorbiaceae
Manda	*Macaranga peltata*	Euphorbiaceae
Mirigachara	*Grewia elastica*	Tiliaceae
Mohua, Mahula	*Madhuca indica*	Sapotaceae
Muchukunda, Baila	*Pterospermum acerifolium*	Sterculiaceae
Mukha	*Schrebera swietenioides*	Oleaceae
Mundi (Mitikinia)	*Mitragyna parvifolia*	Rubiaceae
Neem	*Azadirachta indica*	Meliaceae

Palas	*Butea monosperma*	Fabaceae
Paldhua	*Erythrina indica*	Fabaceae
Panasa, Panas	*Artocarpus integrifolia*	Moraceae
Panigambhari	*Trewia nudiflora*	Euphorbiaceae
Panikodala	*Sterculia colorata*	Sterculiaceae
Panipatuli	*Lagerstroemia parviflora*	Lythraceae
Patmossu	*Polyalthia cerasioides*	Anonaceae
Patuli (Barapatuli)	*Stereospermum chelonoides*	Bignoniaceae
Phasi	*Anogeissus acuminata*	Combretaceae
Pitakarichio (Pitakalchi)	*Wrightia arborea*	Apocynaceae
Pitamoi	*Garuga Pinnata*	Burseraceae
Poichandia	*Putranjiva roxburghii*	Euphorbiaceae
Poijamu	*Syzygium nervosum*	Myrtaceae
Rai	*Dillenia pentagyna*	Dilleniaceae
Rajmohi	*Lannea coromandelica*	Anacardiaceae
Rakta chandan	*Pterocarpus santilinus*	Fabaceae
Ritha, Rentha, Soap nut	*Sapindus emarginatus*	Sapindaceae
Rohini	*Soymida febrifuga*	Meliaceae
Saguan (Teak)	*Tectona grandis*	Verbenaceae
Sahada	*Streblus asper*	Moraceae
Sajna (chhuin), Munga, Mungha	*Moringa pterygosperma*	Moringaceae
Sal , Sargi, Rengal	*Shorea robusta*	Dipterocarpaceae
Salai	*Boswellia serrata*	Burseraceae
Salapa	*Caryota urens*	Palmaceae
Sidha, Sena	*Lagerstroemia parviflora*	Lythraceae
Sijhu	*Euphorbia royleana*	Euphorbiaceae
Silveroak	*Grevillea robusta*	Proteaceae
Simili	*Bombax ceiba*	Malvaceae
Siris	*Albizzia lebbek*	Mimosaceae
Sissu	*Dalbergia sisoo*	Papilionaceae
Sissu (Pahadi)	*Dalbergia latifolia*	Papilionaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tala	*Borassus flabellifer*	Palmaceae
Tambal	*Ficus hispida*	Moraceae

Tangar champa (Patharchampa)	*Ochna obtusata*	Ochnaceae
Telkuruma	*Ixora arborea*	Rubiaceae
Tentra	*Albizzia procera*	Mimosaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae
Thelku	*Randia malabarica*	Rubiaceae
Tilai	*Wendlandia tinctoria*	Rubiaceae
Toon	*Toona ciliata*	Meliaceae

S H R U B S

Agnijhal	*Vernonia aspera*	Compositae
Ankhukoli	*Carissa spinarum*	Apocynaceae
Arakha	*Calotropis gigantea*	Asclepiadaceae
Arguna, Argha, Odasamari	*Cycas orixensis*	Cycadaceae
Ata	*Anona squamosa*	Annonaceae
Badichang	*Symphorema polyandrum*	Verbenaceae
Baibiring	*Embelia tsjeriam-cottam*	Myrsinaceae
Baincha	*Flagellaria indica*	Flagellariaceae
Ban kulthi	*Atylosia scarabaeoides*	Papilionaceae
Bana tulasi	*Oscimum basilicum*	Labiatae
Banachiretia	*Leea asiatica*	Ampelidaceae
Banamalli	*Jasminum arborescens*	Oleaceae
Bankhajuri	*Phoenix acaulis*	Palmaceae
Basanga	*Adhatoda vasica*	Acanthaceae
Begunia	*Vitex negundo*	Verbenaceae
Bhenta	*Limonia acidissima*	Rutaceae
Budel, Murdha	*Butea parviflora*	Papilionaceae
Chakunda, (Chhota chakunda)	*Cassia tora*	Caesalpiniaceae
Dalsingha	*Canthium glabrum*	Rubiaceae
Dhatki or Jhatki	*Woodfordia fruticosa*	Lythraceae
Gangai	*Melastoma malabathricum*	Melastomaceae
Gangasiuli	*Nyctanthes arbortristis*	Oleaceae
Giliri	*Indigofera pulchella*	Papilionaceae
Guakuli	*Diospyros ferrea*	Ebenaceae

Jari	*Schefflera venulosa*	Araliaceae
Jhumpuri	*Phyllochlamys spinosa*	Moraceae
Jojoka	*Commiphora caudata*	Burseraceae
Kakusia	*Strobilanthes scaber*	Acanthaceae
Kamini	*Murraya paniculata*	Rutaceae
Kantasiju	*Euphorbia nivulia*	Euphorbiaceae
Kaskasi Jhari	*Ficus parasitica*	Moraceae
Kirkichikanta	*Mimosa rubicaulis*	Mimosaceae
Koko aru, Badurli	*Olax scandens*	Olacaceae
Korei	*Holarrhena antidysenterica*	Apocynaceae
Kumti (Telgunia)	*Clerodendron viscosum*	Verbenaceae
Lajwanti (Lajkulilata)	*Mimosa pudica*	Mimosaceae
Lal Berela	*Sida rhombifolia*	Malvaceae
Lantana (Bholupodi)	*Lantana camara*	Verbenaceae
Madanga (Epiphyte)	*Loranthus longiflorus*	Loranthaceae
Marmuri	*Antidesma diandrum*	Euphorbiaceae
Muraphal, Murimuri, Anita	*Helicteres isora*	Sterculiaceae
Nalbali	*Cipadessa fruticosa*	Meliaceae
Narasingh Khara	*Ardisia solenacea*	Myrsinaceae
Narguni	*Atalantia monophylla*	Rutaceae
Patalgaruda	*Rauwolfia serpentina*	Apocynaceae
Phanphana (Phapundi)	*Oroxylum indicum*	Bignoniaceae
Pokusunga	*Pogostemon plectranthoides*	Labiatae
Potua	*Catunaregam nutans*	Rubiaceae
Rani Dantakati	*Flemingia chappar*	Papilionaceae
Rani Dantakati(Salpini)	*Flemingia Paniculata*	Papilionaceae
Sijhu	*Euphorbia royleana*	Euphorbiaceae
Sonaragoda	*Grewia helicterifolia*	Tiliaceae
Tulshi	*Ocimum sanctum*	Labiatae
Kalagaham	*Blepharis maderaspatensis*	Acanthaceae
Gulsham	*Eranthemum purpurascens*	Acanthaceae

H E R B S

Apamaranga	*Achyranthes aspera*	Amarantaceae
Pokasunga	*Ageratum conyzoides*	Compositae
Mundia saga	*Allmania nodiflora*	Amarantaceae
-	*Alysicarpus pubescens.*	Papilionaceae
Kuranti	*Ammannia baccifera*	Lythraceae
Bhuineem (Chireita)	*Andrographis paniculata*	Acanthaceae
Bhutamari	*Anisomeles indica*	Labiatae
Sarpuni	*Argemone mexicana*	Papaveraceae
Rudrajata	*Aristolochia indica*	Aristolochiaceae
Banakulthi	*Atylosia scarabaeoides*	Papilionaceae
Amarpoi	*Bryophyllum calycinum*	Crassulaceae
Dandipohala	*Canseora decussata*	Gentianaceae
Bhuin chakunda	*Cassia obtusifolia*	Caesalpiniaceae
Ganjachulia	*Celosia argentea*	Amarantaceae
Banalanka	*Chloris Pallida*	Gramineae
Biskandari	*Chlorophytum aurindinaceum*	Liliaceae
Day flower (Kansiri)	*Commelina benghalensis*	Commelinaceae
Gaigobara	*Costus speciosus*	Zingiberaceae
Ambaada	*Curcuma amada*	Zingiberaceae
Banapalua	*Curcuma angustifolia*	Zingiberaceae
Karkhasi	*Curcuma aromatica*	Zingiberaceae
Haldi	*Curcuma longa*	Zingiberaceae
Salpani, Krishnupani	*Desmodium polycarpum*	Papilionaceae
Samdulan	*Elephantopus scaber*	Compositae
Gongatulasi	*Hyptis suaveolens*	Labiatae
Nilachara	*Indigofera trita*	Papilionaceae
Gayash	*Leucas aspera*	Labiatae
Paniloi	*Merremia umbellata*	Convolvulaceae
Lajakuli	*Mimosa pudica*	Mimosaceae
Banakadali	*Musa ornata*	Musaceae
Bana tulasi	*Oscimum basilicum*	Labiatae
-	Peucedanum nagpurense	Umbelliferae
Pipali	Piper longum	Piperaceae

-	*Dipteracanthus prostratus*	Acanthaceae
Murga	*Sanseviera roxburghiana*	Liliaceae
Ankaranti	*Solanum surattense*	Solanaceae
Jalajali	*Stachytarpheta indica*	Verbenaceae
	Strobilanthes scaber	Acanthaceae
Bisalyakarani	*Tridax procumbens*	Compositae
Baidyachhanapata	*Triumfetta rhomboidea*	Tiliaceae

C L I M B E R S

Achindi	*Calycopteris floribunda*	Combretaceae
Akanbindhi	*Cissampelos pareira*	Menispermaceae
Anantamula	*Hemidesmus indicus*	Asclepidaceae
Arkala	*Millettia extensa*	Papilionaceae
Asadhua	*Capparis zeylanica*	Capparidaceae
Atundi, Kala Achindi	*Combretum decandrum*	Combretaceae
Baghchaar	*Argyreia setosa*	Convolvulaceae
Baidank	*Mucuna monosperma*	Papilionaceae
Bana Alu	*Dioscorea pentaphylla*	Dioscoraceae
Banakunduri	*Trichosanthes cucumerina*	Cucurbitaceae
Bhadalia(Kara)	*Opila amentaceae*	Olacaceae
Bichhuati	*Tragia involucrata*	Euphorbiaceae
Budli (Palasnai)	*Butea superba*	Papilionaceae
Dantari(Naikunti)	*Acacia pennata*	Mimosaceae
Gila, Gilo	*Entada scandens*	Mimosaceae
Gopkan, Gopakanu, Gar	*Cryptolepsis buchanani*	Asclepidaceae
Gudmari	*Gymnema sylvestre*	Asclepiadaceae
Handiphuta	*Pueraria tuberosa*	Papilionaceae
Kaincha, Ranja, Gunja,	*Abrus precatorius*	Papilionaceae
Kamba Alu	*Dioscorea alata*	Discoraceae
Kanta Alu	*Dioscorea glabra*	Dioscoraceae
Kanta Beta	*Calamus guruba*	Palmaceae
Kantaikuli	*Ziziphus oenoplia*	Rhamnaceae
Karba Alu	*Dioscorea pentaphylla*	Discorsceae

Korondia Alu	*Dioscorea belophylla*	Discoraceae
Kosa Alu	*Dioscorea anguina*	Discoraceae
Latanageshwar	*Hiptage madablota*	Malpighiaceae
Maharada	*Canavalia virosa*	Papilionaceae
Makirla	*Trichosanthes tricuspidata*	Cucurbitaceae
Malkamni, Korsana	*Celastrus paniculata*	Celastraceae
Malti	*Aganosma caryophyllata*	Apocynaceae
Mrigalendi	*Gnetum scandens*	Gnetaceae
Muthuri	*Smilax zeylanica*	Liliaceae
Mutri	*Smilax macrophylla*	Liliaceae
Mutri	*Smilax perfoliata*	Liliaceae
Noipalas (Latapalas)Murdha	*Butea parviflora*	Papilionaceae
Pani Alu	*Dioscorea oppositifolia*	Dioscoraceae
Pani Beta	*Calamus viminalis*	Palmaceae
Pankanch	*Vitis spp.*	Ampelidaceae
Pichhuli Noi, Rakta Pichhuli	*Gouania tiliaefolia*	Rhamnaceae
Pita Alu	*Dioscorea bulbifera*	Dioscoraceae
Prasaruni	*Paederia scandens*	Rubiaceae
Satabari	*Asparagus racemosus*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniaceae
Suam Noi	*Ichnocarpus frutescens*	Asclepidaceae
Tunga Alu	*Dioscorea wallichii*	Dioscoraceae
Uturdi	*Pergularia daemia*	Asclepiadaceae

O R C H I D S

Dendrobium herbaceum	Orchidaceae
Eulophia spectabilis Ground orchid)	Orhidaceae
Habenaria plantaginea (Ground Orchid)	Orchidaceae
Malaxis versicolor	Orchidaceae
Acampe praemorsa	Orchidaceae
Vanda testasea	Orchidaceae
Vanda tessellata	Orchidaceae

B A M B O O S

Badi bansa	Bambusa nutans	Poaceae
Bolongi bans	Cephalostachyum pergracile	Poaceae
Daba bans /Kanta bans	Bambusa arundinacea	Poaceae
Salia	Dendrocalamus strictus	Poaceae

Carnivorous plant.

Common Name	Scientific Name	Family
Tropical Sundew	*Drosera burmannii*	Droseraceae
Indian sundew	*Drosera indica*	Droseraceae
Golden bladerwort	*Utricularia aurea*	Lentibulariaceae
Bifid bladerwort	*Utricularia bifida*	Lentibulariaceae
Blue bladerewort	*Utricularia caerulea*	Lentibulariaceae
Hairy bladerwort	*Utricularia hirta*	Lentibulariaceae
Minute bladerwort	*Utricularia minutissima*	Lentibulariaceae
Blue bladerwort	*Utricularia polygaloides*	Lentibulariaceae

G R A S S E S (P E R E N N I A L)

BOTANICAL NAME	VERNACULAR /LOCAL NAME	FAMILY
Chhana	*Apluda mutica*	Poaceae
Ghodalanja	*Aristida setacea*	Poaceae
Indian Blue Grass	*Bothriochloa pertusa*	Poaceae
Guguchia	*Chrysopogon aciculatus*	Poaceae
Dhanwantary	*Cymbopogon citratus*	Poaceae
Duba grass	*Cynodon dactylon*	Poaceae
Marvel grass	*Dichanthium annulatum*	Poaceae
Nandi blue grass	*Dichanthium caricosum*	Poaceae
Bogai/Sabai/Panasi	*Eulaliopsis binata*	Poaceae
Spear grass(Sinkola)	*Heteropogon contortus*	Poaceae
Thatch grass	*Imperata cylindrica*	Poaceae

G R A S S E S (A N N U A L)

-	*Eragrostis coarctata*	Poaceae
-	*Eragrostis interrupta*	Poaceae
-	*Eragrostis unioloides*	Poaceae
-	*Eragrostris Viscose*	Poaceae
-	*Setaria glauca*	Poaceae
Foxtail grass	*Vetiveria zizaniodes*	Poaceae
Khas-khas		Poaceae

F E R N S

COMMON NAME	SCIENTIFIC NAME	Family
Spikemoss	*Selaginella indica*	Selaginellaceae
Maidenhair Creeper	*Lygodium flexuosum*	Lygodiaceae
Climbing fern	*Lygodium microphyllum*	Lygodiaceae
fern	*Christella parasitica*	Thelypteridaceae
Soft fern	*Christella dentata*	Thelypteridaceae
Marsh fern	*Thelypteris confluens*	Thelypteridaceae
Tongue fern	*Pyrrosia adnascens*	Polypodiaceae
fern	*Pyrrosia lanceolata*	Polypodiaceae
Oakleaf fern	*Drynari aquercifolia*	Polypodiaceae
Tree fern	*Asplenium simonsianum*	Aspleniaceae
fern	*Adiantum caudatum*	Pteridaceae
Mayursikha	*Adiantum incisum*	Pteridaceae
fern	*Adiantum philippense*	Pteridaceae
Rabbit ear fern	*Parahemionitis cordata*	Pteridaceae
Thinleaf brake fern	*Pteris biaurita*	Pteridaceae
Ribbon fern	*Pteris cretica*	Dryopteridaceae
Striped fern	*Pteris quadriaurita*	Dryopteridaceae
Silver back fern	*Cheilanthes anceps*	Pteridaceae
Fern	*Cheilanthes tenuifolia*	Pteridaceae
Wood fern	*Dryopteris cochleate*	Dryopteridaceae

M O S S

English Name	Botanical Name	Family
Flower horn	*Anthocerous angustus*	Anthocerotaceae
	Asterella angusta	Aytoniaceae
Silver green bryum	*Bryum argenteum*	Bryaceae
	Cyathodium cavernarum	Cyathodiaceae
	Dumortiera hirsuta	Weisnerellaceae
Cord moss	*Funaria hygrometrica*	Funariaceae
	Herpetineuron toccoae	
	Heteroscyphus argutus	Geocalycaceae
	Marchantia linearis	Marchantiaceae
	Marchantia palmata	Marchantiaceae
Ribbonwort	*Pallavicinia lyellii*	Pallaviciniaceae
Overleaf pellia	*Pellia epiphylla*	Pelliaceae
	Plagiochasma appendiculatum	Aytoniaceae
	Riccardia levierii	
Floating crystal worb	*Riccia fluitans*	Ricciacea
	Riccia glauca	
	Targionia hypophylla	Targioniaceae
	Targionia indica	Targioniaceae

L I C H E N

	Dirinaria picta	Caliciaceae
	Dirinaria applanata	Caliciaceae
	Flavoparmelia sp	Parmeliaceae
	Parmellia sulctata	Parmeliaceae
	Pyxine sorediata	Caliciaceae
Christmas wreath lichen	*Cryptothesia sp.*	Arthoniaceae
	Permotrema sp.	Parmeliaceae
	Bulbothrix isidiza	Parmeliaceae
	Pertusaria sp.	Pertusariaceae

FAUNA

LOCAL NAME	ENGLISH NAME	ZOOLOGICAL
M A M M A L S		
Badudi	Greater shortnosed fruit bat	Cynopterus sphinx
Badudi	Indian flying fox	Pteropus giganteus
Bagha	Tiger	Panthera tigris
Bajrakapta	Pangolin	Manis crassicaudata
Banabiradi (Katash)	Jungle cat	Felis chaus
Barha	Wild boar	Sus scrofa
Beleramusa (Napali)	Indian giant squirrel	Ratufa indica
Bhalu	Sloth bear	Melursus ursinus
Bilua	Golden jackal	Canis aureus
Chausingha	Four-horned antelope	Tetracerus quadricornis
Cheetah Biradi	Leopard cat	Felis bengalensis
Chemgha	Black-bearded tomb bat	Taphozous melanopogon
Chhuchhundra	Asian house shrew	Suncus murinus
Gada Bhalu	honey badger	Mellivora capensis
Gayalar	Indian Bison	Bos gaurus
Gunduchimusa	Indian palm squirrel	Funambulus palmarum
Gunduchimusa	Northern palm squirrel	Funambulus pennanti
Gurandi	Mouse deer (Indian spotted chevrotain)	Moschiola indica
Harina	Spotted deer (Cheetal)	Axis axis
Hati	Indian elephant	Elephas maximus
Heta bagha	Hyena	Hyaena hyaena
Jhinka	Porcupina	Hystrix indica
Kalarapatria bagha	Leopard (Panther)	Panthera pardus
Kokisiali	Fox	Vulpes bengalensis
Kutura	Barking deer	Muntiacus muntjak
Mankad (Hanu)	Hanuman langur	Presbytis entellus
Mankad (Pati)	Rhesus macaqe	Macaca mulatta
	Rat	Rattus rattus
	White tailed wood rat	Rattus blanfordi
Musa	Indian garbills or antelope rat	Tatera indica
	Long tailed tree mouse	Vandeleuria oleracea

Neula (Hatia)	Indian grey mongoose	Herpestes edwardsi
Neula (Kuji)	Small Indian mangoose	Herpestes auropunctatus
Odha	Smooth-coated otter	Lutra perspicillata
Ramsiali (Bheriya)	Wolf	Canis lupus
Saliapatani	Common palm civet	Paradoxurus hermaphroditus
Dali odha	Small indian civet	Viverricula indica
Sambar	Sambar	Cervus unicolor
Thekua	Hare (Rufous tailed Hare)	Lepus nigricollis

REPTILES & AMPHIBIANS

SNAKE

Ahiraja	King cobra	Ophiophagus hannah
Ajagarh	Indian python	Python molurus
Bamhuni	-	Nabix stolata
Boda	Common sand boa	Eryx conicus
Boda	Red sand boa	Eryx johnii
Chiti	Common Krait	Bungarus caeruleus
Dhamana	Indian rat snake	Ptyas mucosus
Dhanda	Checkered keelback	Xenochrophis piscator
Chandra boda	Russels viper	Daboia russelli
Dhulia boda	Saw scaled viper	Echis carinatus
Domundia	John's sandboa	Eryx stolata
Kandanali	Bronze backed tree snake	Dendrelaphis tristis
Laudonkia	Common vine snake	Ahaetulla nasuta
Naga (Gokhar)	Indian cobra	Naja naja
Pani Dhanda	Checkeered keel back	Natrix piscator
Rana	Banded krait	Bungarus fasciatus
Tampa	Monocled cobra	Naja kaouthia
Teli Sapa	Common blind snake	Indotyphlops braminus
	Bamboo pit viper	Trimeresurus gramineus
	Green keelback	Rhabdophis plumbicolor
	Copper head trinket snake	**Coelognathus radiatus**

LIZARDS

	Fat-tailed Gecko	Eublepharis hardwickii
-	Banded geeko	Crytodoctylu spp.
-	Indian chameleon	Chameleon zeylanicus
Bahurupi	Garden gecko	Calotes versicolor
Endua	Leschenault's leaf-toed gecko	Hemidactylus leschenaulti
Bakalajhitipiti	Skink / Mabuya	Mabuya bibro
Champai neula	Rock gecko	Hemidactylus maculatus
Endua	Bengal monitor lizard	Varanus bengalensis
Godhi	House lizard	Hemidactylus flaviviridis
Jhitipiti		
Pani Godhi	**Water monitor**	**Varanus Salvador**

TURTLES

Kurma	Indian tent turtle	Pangshura tentoria
Pankua Kaincha	Indian flapshell turtle	lissemys punctata
FISHES (FRESH WATER)		
Balia	-	Wallago attu
Baligarda	-	Glossogobius giuris
Banasa pati	-	Ailia coha
Bhakur	-	Catla catla
Chenga	-	Channa gachua
Chital	-	Notopterus chitala
Dandkiri	-	Esomus danricus
Gadisa	-	Channa punctatus
Illisi	-	Hilsa ilisa

	-	Pangasius pangasius
Jalanga		
Jallha	-	Chela argenteam
Kantia	-	Mystus seenghala
Kerandi	-	Puntius sophore
Kou	-	Anabas testudineus
Magura	-	Clarias batrachus
Mahurali	Mola carplet	Amblypharyngodon mola
Mirakali	-	Cirrhinus mrigala
Neuli	Glass goby	Gobiopterus chuno
Pabata	-	Callichrous bimaculatus
Phali	Bronze featherback	Notopterus notopterus
Pohale (Chuna)	Reba carp	Cirrhinus reba
Pohale (Denga)	-	Labeo bata
Rohi	Rohu	Labeo rohita
Serana	Barbus	Barbus sarana
Seula	Snakehead murrel	Channa striatus
Singi	Asian stinging catfish	Heteropneustes fossilis
Todi	Fresh water eel	macrognathus pancalus
Todi	Zig-zag eel	Mastacembelus armatus

BIRDS

LOCAL NAMES	ENGLISH NAMES	LATIN NAMES
Kunda	Common Babbler	Argya caudata
-	Jungle babbler	Argya striata
-	Babbler rufous	Argya subrufa

-	Barbet crimson breasted or Coppersmith	Psilopogon haemacephalus
-	Barbet large green (Brown headed barbet)	Psilopogon zeylanicus
Baya	Baya (weaver bird)	Ploceus philippinus
-	Bee eater blue tailed	Merops philippinus
-	Bellied (Tawny –bellied) Babbler	Dumetia hyperythra
Bulbul or Gobrachadhei	Bulbul (Red vented)	Pyononotus cafer
Pahadi Bulbul	Bulbul Red whiskered	Pycnonotus jocosus
-	Chloropsis Gold fronted or Green bulbul	Chloropsis aurifrons
-	Choloropsis Gold mantled	Chloropsis cochinchinensis
Phutki	Common Tailor Bird	Orthotonus sutorius
Panikua	Cormorant (little)	Microcarbo niger
Dhauka or Kumbhatua	Coucal or Crow pheasant	Centropus sinensis
Kau	Crow house	Corvus splendens
Damarkau	Crow jungle (Large billed crow)	Corvus macrorhynchos
Koili	Cuckoo Common Hawk	Hierococcyx varius
Koili	Cuckoo Indian	Cuculus micropterus
-	Dove Emerald or Bronze Winged	Chalcophaps indica
Kapota	Eurasian collard dove	Streptopelia decaocto
Kapota	Dove spotted	Streptopelia chinensis
Kajalpati	Drongo Black or King crow	Dicrurus macrocercus
Bhrungaraja	Drongo racket tailed	Dicrurus paradiseus
Hansa	Duck Grey	Anas poecilorhyncha
-	Eagle Crested Hawk	Nisaetus cirrhatus
-	Eagle crested Serpent	Spilornis cheela

-	Eagle Owl	Bubo bubo
-	Eagle Tawny	Aquila rapax
Baga	Egret Cattle	Bubulcus ibis
Baga	Egret little	Egretta garzetta
-	Falcon shahin / Peregrine Falcon	Falco peregrinus peregrinator (Sundevall)
-	Flowerpecker Thickbilled	Dicaeum agile
-	Flowerpecker Tickell's	Dicaeum erythrorhynchos
-	Flycatcher Blue throated	Cyornis rubeculoides
-	Flycatcher blue/ Black naped, Blacknaped Monarch	Hypothymis azurea
-	Flycatcher blue/ Black naped, Blacknaped Monarch	Hypothymis azurea
-	Flycatcher Grey headed Canary	Culicicapa ceylonensis
-	Flycatcher Paradise	Terpsiphone paradisi
-	Flycatcher Red breasted	Ficedula parva
-	Flycatcher Tickell's blue	Cyornis tickelliae
-	Flycatcher verditer	Eumyias thalassinus
Bataka	Goose Barheaded	Anser indicus
Hansarali	Grebe little or Dabachick	Tachybaptus ruficollis
-	Green Bee eater	Merops orientalis
-	Gull Black headed	Chroicocephalus ridibundus
-	Harrier Marsh Western	Circus aeruginosus
-	Harrier Pallid	Circus macrourus
Kantiabaga	Heron Pond or paddy bird	Ardeola grayii
-	Hoopoe	Upupa epops

Bhaliakhai	Hornbill common grey	Ocyceros birostris
Kuchilakhai	Hornbill malabar pied	Anthracoceros coronatus
-	Ibis white	Threskiornis melanocephalus
-	Indian Pied Hornbill	Anthracoceros albirostris
-	Iora	Aegithina tiphia
Banakukuda	Jungle fowl grey	Gallus sonneratii
Banakukuda	Jungle fowl red	Gallus gallus
-	Kestrel common	Falco tinnunculus
-	King fisher Brown headed or Stork billed	Pelargopsis capensis
Machharanka	King fisher pied	Ceryle rudis
-	King fisher small blue /Common King fisher	Alcedo atthis
-	King fisher white breasted	Halcyon smyrnensis
Sankhachilla	Kite Brahminy	Haliastur indus
Chilla	Black Kite (pariah)	Milvus migrans
-	Koel	Eudynamys scolopaceus
-	Lapwing red-wattled	Vanellus indicus
-	Lapwing yellow-wattled	Vanellus malabaricus
-	Lark bush (singing)	Mirafra cantillans
-	Minivet scarlet	Pericrocotus flammeus
-	Munia spotted	Lonchura punctulata
-	Myna Bank	Acridotheres ginginianus

Sari	Myna hill	Gracula religiosa
Bani	Myna Indian	Acridotheres tristis
-	Myna Jungle	Acridotheres fuscus
Ghukalika	Myna pied /Asian Pied Starling	Gracupica contra
-	Night Jar common Indian	Caprimulgus asiaticus
-	Nightjar Indian	Caprimulgus asiaticus
Haladi basanta	Oriole black hooded	Oriolus xanthornus
-	Osprey/Fish eating Eagle	Pandion haliaetus
Pecha	Owlet spotted	Athene brama
-	Parakeet Blossom headed	Psittacula cyanocephala
Sua	Parakeet large Indian	Psittacula eupatria
-	Parakeet rose ringed	Psittacula krameri
Teetiri	Grey francolin	Francolinus pondicerianus
Mayur	Peafowl common	Pavo cristatus
-	Petronia Chestnut-shouldered	Gymnoris xanthocollis
Chatak	Pied Crested Cuckoo	Clamator jacobinus
Deuliapara	Pigeon (Blue) rock	Columba livia (Gmelin)
Harada chadei	Yellow footed gren pigeon	Treron phoenicopterus
-	Pigeon imperial green	Ducula aenea
-	Pipit Indian	Anthus novaeseelandiae (Gmelin)

-	Pitta Indian	Pitta brachyura
-	Plover little ringed	Charadrius dubius
Gunduri	Quail blue legged or common or bastard	Turnix suscitator
Teetri	Quail Bush jungle	Perdicula asiatica
Teetri	Quail Bush painted	Perdicula erythrorhyncha
-	Robin indian	Saxicoloides fulicatus
Nilkantha	Robin magpie	Copsychus saularis
Bhadbhadalia	Roller or blue jay	Coracias benghalensis
Chakua-Chakoi	Ruddyshel duck or Brahmini	Tadorna ferruginea
-	Sandpiper common	Actitis hypoleucos
-	Shama	Kittacincla malabarica
-	Shikra	Accipiter badius
-	Snipe common or fantail	Gallinago gallinago
Gharchatia	Sparrow House	Passer domesticus
-	Sparrow yellow-throated / Chestnut-shouldered	Gymnoris xanthocollis
-	Spurfowl Red	Galloperdix spadicea
-	Stilt black-winged	Himantopus himantopus
Gendalia	Stork openbilled	Anastomus oscitans
-	Stork white-necked / Woolly necked stork	Ciconia episcopus
-	Sunbird purple	Cinnyris asiaticus
-	Sunbird purple-rumped	Leptocoma zeylonica

-	Swallow wire tailed	Hirundo smithii
Chataka	Swift House	Apus affinis
-	Teal common	Anas crecca
-	Teal cotton / Common Pygmy goose	Nettapus coromandelianus
-	Teal lesser whistling/ Lesser whistling Duck	Dendrocygna javanica
-	Tern river	Sterna aurantia
-	Thrush white-throated ground/Orange headed Thrush	Geokichla citrina
-	Tree Pipit	Anthus trivialis
Saguna	Vulture king	Sarcogyps calvus
Saguna	Vulture white backed	Gyps bengalensis
-	Wagtail large pied/White-browed wagtail	Motacilla maderaspatensis
-	Wagtail white	Motacilla alba
-	Wagtail yellow headed	Motacilla citreola
-	Warbler Wren ashy	Prinia socialis
-	Warbler Wren Indian	Prinia subflava
-	Warbler wren/ rufous fronted Prinia	Prinia buchanani
-	Woodpecker LesserGolden backed	Dinopium benghalense
Kathkhumpa	Brown capped pygmy woodpecker	Picoides nanus
-	Yellow breasted (Stripped tit Babbler)	Mixornis gularis

Butterfly

Family-Hesperiidae	
Common Name	**Scientific name**
Common Snow Flat	*Tagiades japetus* (Stoll,[1781])

Common Small Flat	*Sarangesa dasahara* (Moore, [1866])
Indian Skipper	*Spialia galba* (Fabricius, 1793)
Golden Angle	*Caprona ransonnetii* (C. & R. Felder,1868)
Common Grass Dart	*Taractrocera maevius* (Fabricius, 1793)
Conjoined Swift	Schäffer, 1869)
Straight Swift	*Parnara guttata* (Bremer & Grey, [1852])
Small Branded Swift	*Pelopidas mathias* (Fabricius, 1798)
Large Branded Swift	*Pelopidas subochracea* (Moore, 1878)
Common Dartlet	*Oriens goloides* (Moore, [1881])
Indian Palm Bob	*Suastus gremius* (Fabricius,1798)
Chestnut Bob	*Lambrix salsala* (Moore,[1866])
Grass Demon	*Udaspes folus* (Cramer, [1775])
Common Redeye	*Matapa aria* (Moore, [1866])
Paint Brush Swift	*Baoris farri* (Moore, 1878)
Pale Palm Dart	*Telicota colon* (Fabricius, 1775)
Family: Papilionidae	
Common Mormon	*Papilio polytes* Linnaeus, 1758
Blue Mormon	*Papilio polymnestor* Cramer,[1775]
Lime Butterfly	*Papilio demoleus* Linnaeus, 1758
Common Rose	*Pachliopta aristolochiae* Fabricius, 1775
Crimson Rose	*Pachliopta hector* Linnaeus, 1758
Tailed Jay	*Graphium agamemnon* Linnaeus, 1758
Common Jay	*Graphium doson* Felder &Felder, 1864
Common Banded Peacock	*Papilo crino* Fabricius, 1793
Common Mime	*Papilio clytia* Linnaeus, 1758

Family: Pieridae	
Common Grass Yellow	*Eurema hecabe* Linnaeus, 1758
Three Spot Grass Yellow	*Eurema blanda* Boisduval, 1836
Small Grass Yellow	*Eurema brigitta* Stoll, 1780
Common Emigrant	*Catopsilia pomona* Fabricius, 1775
Mottled Emigrant	*Catopsilia pyranthe* Linnaeus, 1758
Common Wanderer	*Pareronia hippia* Fabricius, 1787
Striped Albatross	*Appias libythea* Fabricius, 1775
Common Jezebel	*Delias eucharis* Drury, 1773
Psyche	*Leptosia nina* Fabricius, 1793
Common Gull	*Cepora nerissa* Fabricius, 1775
Family: Lycaenidae	
Apefly	*Spalgis epeus* (Westwood, [1851])
Common Pierrot	*Castalius rosimon* (Fabricius, 1775)
Rounded Pierrot	*Tarucus nara* (Kollar, 1848)
Common Silverline	*Spindasis vulcanus* (Fabricius, 1775)
Long Banded Sliverline	*Spindasis lohita* (Horsfield, [1829])
Pale Grass Blue	*Pseudozizeeria maha* Kollar, 1844
Dark Grass Blue	*Zizeeria karsandra* (Moore, 1865)
Tiny Grass Blue	*Zizula hylax* (Fabricius, 1775)
Zebra Blue	*Leptotes plinius* (Fabricius, 1793)
Grass Jewel	*Freyeria trochylus* Freyer, 1845
Forget-me-not	*Catochrysops strabo* (Fabricius, 1793)
Gram Blue	*Euchrysops cnejus* (Fabricius, 1798)
Monkey Puzzle	*Rathinda amor* Fabricius, 1775
Indigo Flash	*Rapala varuna* Horsfield, 1829
Lime Blue	*Chilades lajus* (Stoll, [1780])
Common Hedge Blue	*Acytolepis puspa* (Horsfield, [1828])
pea blue	*Lampides boeticus* (Linnaeus, 1767)

Slate flash	*Rapala manea* Hewitson, 1863
Family: Nymphalidae	
Striped Tiger	*Danaus genutia* Cramer 1779
Plain Tiger	*Danaus chrysippus* Linnaeus, 1758
Blue Tiger	*Tirumala limniace* Cramer, 1775
Common Crow	*Euploea core* (Cramer, [1780])
Common Bush-brown	*Mycalesis Perseus* Fabricius, 1775
Dark Branded Bush Brown	*Mycalesis mineus* Linnaeus, 1758
Common Evening Brown	*Melanitis leda* Linnaeus, 1758
Common Palmfly	*Elymnias hypermnestra* Linnaeus, 1763
Common Duffer	*Discophora sondaica* Boisduval, 1836
Common Sailer	*Neptis hylas* Linnaeus, 1758
Chestnut Streaked Sailer	*Neptis jumbah* Moore, 1857
Baronet	*Symphaedra nais* Forster, 1771
Grey Count	*Tanaecia lepidea* Butler, 1868
Common Castor	*Ariadne merione* Cramer, 1777
Angled Castor	*Ariadne ariadne* Linnaeus, 1763
Common Baron	*Euthalia aconthea* Cramer, 1777
Gaudy Baron	*Euthalia lubentina* Cramer, 1777
Commander	*Moduza procris procris* Cramer, 1777
Common Fourring	*Ypthima huebneri* Kirby, 1871
Common Fivering	*Ypthima baldus* Fabricius, 1775
Tawny Coster	*Acraea terpsicore* (Linnaeus, 1758)
Common Leopard	*Phalanta phalantha* Drury, 1773
Danaid Eggfly	*Hypolimnas misippus* (Linnaeus, 1764)
Great Eggfly	*Hypolimnas bolina* Linnaeus, 1758
Grey Pansy	*Junonia atlites* Linnaeus, 1763
Blue Pansy	*Junonia orithya* Linnaeus, 1758
Yellow Pansy	*Junonia hierta* Fabricius, 1798

Peacock Pansy	*Junonia almana* Linnaeus, 1758
Lemon Pansy	*Junonia lemonias* Linnaeus, 1758
Chocolate Pansy	*Junonia iphita* Cramer, 1779

DRAGON FLIES

Common Name	Scientific Name	Family:
Blue-tailed Green Darner	Anax guttatus (Burmeister, 1839)	*Aeshnidae (Darners)*
Parakeet Darner	Gynacantha bayadera Selys, 1891	*Aeshnidae (Darners)*
Brown Darner	Gynacantha dravida Lieftinck, 1960	*Aeshnidae (Darners)*
Common Club Tail	Ictinogomphus rapax (Rambur, 1842)	*Gomphidae (Clubtails)*
Deccan Bow Tail	Macrogomphus annulatulus (Selys, 1854)	*Gomphidae (Clubtails)*
Common hook Tail	Paragomphus lineatus (Selys, 1850)	*Gomphidae (Clubtails)*
Trumpet Tail	Acisoma panorpoides (Rambur, 1842)	*Libellulidae (Skimmers)*
Rufous backed Marsh Hawk	Brachydiplax chalybea (Brauer, 1868)	*Libellulidae (Skimmers)*
Little Blue Marsh Hawk	Brachydiplax sobrina (Rambur, 1842)	*Libellulidae (Skimmers)*
Ditch Jewel	Brachythemis contaminata (Fabricius, 1793)	*Libellulidae (Skimmers)*
Granite Ghost	Bradynopyga geminate (Rambur, 1842)	*Libellulidae (Skimmers)*
Ruddy Marsh Skimmer	Crocothemis servilia (Drury, 1770)	*Libellulidae (Skimmers)*
Black-tipped ground Skimmer	Diplacodes nebulosa (Fabricius, 1793)	*Libellulidae (Skimmers)*
Ground Skimmer	Diplacodes trivialis (Rambur, 1842)	*Libellulidae (Skimmers)*
Black Marsh Skimmer	Indothemis carnatica (Fabricius, 1798)	*Libellulidae (Skimmers)*
Asiatic Bloodtail	Lathrecista asiatica (Fabricius, 1798)	*Libellulidae (Skimmers)*

Fulvous Forest Skimmer	Neurothemis fulvia (Drury, 1773)	*Libellulidae (Skimmers)*
Ruddy Meadow Skimmer	Neurothemis intermedia (Rambur, 1842)	*Libellulidae (Skimmers)*
Pied Paddy Skimmer	Neurothemis tullia (Drury, 1773)	*Libellulidae (Skimmers)*
Blue Marsh Hawk	Orthetrum glaucum (Brauer, 1865)	*Libellulidae (Skimmers)*
Tricoloured Marsh Hawk	Orthetrum luzonicum (Brauer, 1868)	*Libellulidae (Skimmers)*
Crimson Tailed Marsh Hawk	Orthetrum pruinosum (Burmeister, 1839)	*Libellulidae (Skimmers)*
Green Marsh Hawk	Orthetrum sabina (Drury, 1770)	*Libellulidae (Skimmers)*
Taeniolata Marsh Hawk	Orthetrum taeniolatum (Schneider, 1845)	*Libellulidae (Skimmers)*
Blue tailed forest Hawk	Orthetrum triangulare (Selys, 1878)	*Libellulidae (Skimmers)*
Blue Tailed Yellow Skimmer	Palpopleura sexmaculata (Fabricius, 1787)	*Libellulidae (Skimmers)*
Wandering Glider	Pantala flavescens (Fabricius, 1798)	*Libellulidae (Skimmers)*
Yellow-tailed Ashy Skimmer	Potamarcha congener (Rambur, 1842)	*Libellulidae (Skimmers)*
Rufous Marsh Glider	Rhodothemis rufa (Rambur, 1842)	*Libellulidae (Skimmers)*
Common Picture Wing	Rhyothemis variegata (Linnaeus, 1763)	*Libellulidae (Skimmers)*
Coral Tailed Cloud Wing	Tholymis tillarga (Fabricius, 1798)	*Libellulidae (Skimmers)*
Pygmy Skimmer	Tetrathemis platyptera Selys, 1878	*Libellulidae (Skimmers)*
Red Marsh Trotter	Tramea basilaris (Palisot de Beauvois, 1805)	*Libellulidae (Skimmers)*
Black Marsh Trotter	Tramea limbata (Desjardins, 1832)	*Libellulidae (Skimmers)*
Crimson Marsh Glider	Trithemis aurora (Burmeister, 1839)	*Libellulidae (Skimmers)*
Black Stream Glider	Trithemis festiva (Rambur, 1842)	*Libellulidae (Skimmers)*
Long-legged Marsh Glider	Trithemis pallidinervis (Kirby, 1889)	*Libellulidae (Skimmers)*

Greater Crimson Glider	Urothemis signata (Rambur, 1842)	*Libellulidae (Skimmers)*
Brown Dusk Hawk	Zyxomma petiolatum Rambur, 1842	*Libellulidae (Skimmers)*
DAMSEL FLIES		
Stream Glory	Neurobasis chinensis (Linnaeus, 1758)	*Calopterygridae (Glories)*
Black-tipped Forest Glory	Vestalis apicalis Selys, 1873	*Calopterygridae (Glories)*
Clear-winged Forest Glory	Vestalis gracilis (Rambur, 1842)	*Calopterygridae (Glories)*
River Helioder	Libellago lineata (Burmeister, 1839)	*Chlorocyphidae (Stream Jewels)*
Stream Ruby	Rhinocypha bisignata Hagen in Selys, 1853	*Chlorocyphidae (Stream Jewels)*
Milky Dartlet	Agriocnemis lecteola Selys, 1877	*Coenagrionidae (Marsh Darts)*
Pygmy Dartlet	Agriocnemis pygmaea (Rambur, 1842)	*Coenagrionidae (Marsh Darts)*
Azure Dartlet	Amphiallagma parvum (Selys, 1876)	*Coenagrionidae (Marsh Darts)*
Coromandel Marshdart	Ceriagrion coromandelianum (Fabricius, 1798)	*Coenagrionidae (Marsh Darts)*
Golden Dartlet	Ischnura aurora (Brauer, 1865)	*Coenagrionidae (Marsh Darts)*
Three lined Dart	Pseudagrion decorum (Rambur, 1842)	*Coenagrionidae (Marsh Darts)*
Saffron Faced Blue Dart	Pseudagrion rubriceps Selys, 1876	*Coenagrionidae (Marsh Darts)*
Emerald Striped Spreadwing	Lestes viridulus Rambur, 1842	*Lestidae (Spread Wings)*
Blue Bush Dart	Copera vittata Selys, 1863	*Platycnemididae (Bush Darts)*
Coorg Bambootail	Caconeura ramburi (Fraser, 1922)	*Protoneuridae (Bamboo Tails)*
Black-winged Bambootail	Disparoneura quadrimaculata (Rambur,1842)	*Protoneuridae (Bamboo Tails)*
Black Bambootail	Prodasineura verticalis (Selys, 1860)	*Protoneuridae (Bamboo Tails)*

LIST OF PISCES

Balia	*Wallgoaniaattu*
Bhakura	*Catlacatla*
Chital	*Notopterus chital*
Magura	*Clariasbatrachus*
Pohala	*Cirrhinareba*
Mirkali	*Cirrhinamrigala*
Rohi	*Labeorohita*
Seula	Ophiocephalusstriatus

PART -I

SUMMARY OF FACTS

ON WHICH PROPOSALS ARE BASED

CHAPTER-I

THE TRACT DEALT WITH

Keonjhar (W.L) Division has been carved out from Keonjhar Forest Division vide F&E Department Notification No. 1F(A)-99/2003/13214/F&E Dated 8th August 2003 with Headquarter at Anandpur due to reorganisation of Forest Divisions during 2003. During British Rule upto1947, the forest areas dealt in this working plan were a part of the ex-ruler princely State of Keonjhar under the former ruler, the 'Dewan' of Keonjhar and now has been constituted into a district after its merger with the province of Orissa in 1948. The Dewan managed the forest resources by creating Forest Department headed by "Forest Officer". After Independence by accession the Ex-state of Keonjhar merged with State of Orissa on 1st January 1948. After separation from the Keonjhar Division, this is the first time that one separate Working Plan has been prepared in respect of Keonjhar (W.L) Division. Earlier Keonjhar(WL) Division was under RCCF Rourkela Circle. But for smooth functioning of administration the Govt. of Odisha vide Notification No.FE-FE1-FE-0031-2017/7571/F&E;dated 15.04.2017 transferred the Keonjhar (WL) Division from the administrative control of RCCF, Rourkela to the administrative control of Field Director, Similipal Tiger reserve-cum- Regional Chief Conservator of Forests, Baripada.

The part of tract dealtin this workingplan comprises of all Reserve Forests, Proposed Reserve Forests, Demarcated Protected Forest, ProtectedForests andVillage Forests of Keonjhar (Wildlife) Division ofBaripada (T) Circle except Baula Reserve Forest which has been declared as Hadagarh Sanctuary for which a separate Wildlife Management Plan operates.

1.1 NAME AND SITUATION :

1.1.1 The entire Keonjhar (WL) Division and its forest area are situated within geographical co-ordinates 21°32' 04" N to 21° 01'52" N Latitude and 85° 36'41.76" E to 86° 21' 37.44" E. Longitude. The area is covered within topo sheet F4502, F4503, F4504, F4507, F4508, F4511, F4512, F4515 and F4516 of Survey of India.Keonjhar (W.L) Division is bounded by Balasore W.L. Division, Baripada Division and Karanjia Division in the north-east, Keonjhar Division in the north-west, Cuttack Division and Dhenkanal Division in the South, Bhadrak (W.L) Division in the south-east.The total boundary length of Keonjhar (W.L.) Division comes to 376.14 Km. The Division boundaryshare the common boundary of different Divisions and districts as given below.

Table No.1.1.A. Boundary length sharing with different division

Sl.No.	Name of District	Name of Division	Boundary Length (In Kms)
1.	Keonjhar	Keonjhar	111.5
2.	Mayurbhanj	Karanjia	74.2
3.	Mayurbhanj	Baripada	14.73
4.	Dhenkanal	Dhenkanal	9.2
5.	Balasore	Balasore W.L	9.41
6.	Jajpur	Cuttack	112
7.	Bhadrak	Bhadrak W.L	45.1
			Total 376.14
	Source: DFO, Keonjhar(WL)		

The headquarters of Keonjhar (W.L) Divisionlocated at Anandpur which is situated at the confluence of two holy rivers of Odisha named Baitarani in the East and Kusei in the South. The pilgrim town of Ghatagaon (Tarini pitha) is at a distance of 35 km from Anandapur, the headquarter of this Division.

1.1.2 **Administrative Set up of the Division** :

The administrative unit of Keonjhar (WL) Division, Anandapur and its geographical area is given below.

Table No.1.1.B Administrative & Geographical Area

Sl.No.	Keonjhar (W.L) Division	Total Area(Ha.)
01.	Administrative Area	203010 Ha.
02.	Recorded Forest Area	76129.032 Ha.
Source: DFO, Keonjhar(WL)		

The Keonjhar (W.L) Division has its jurisdiction comprising ofentire Anandapur Civil Sub-Division consisting of Anandapur C.D Block, Ghasipura C.D Block, Hatadihi C.D Block and part of Harichandanpur and Ghatagaon C.D Blocks of Keonjhar Sadar Sub-Division.

Other offices etc, which exist within the geographical jurisdiction of this Division, have been displayed in the Table No. 1.1.

Table No. 1.1.C : Other offices

Sl. No.	Name of Office	No.
1.	Sub-Collector	1
2.	Tahasil	4
3.	C.D Block	4
4.	Police Station	7
5.	N.A.C/Municipality	1
Source : Keonjhar Gazetteer		

1.1.3 The Keonjhar (Wildlife) Division consists of 4 Ranges, 12 Sections and 36 Beats. The detail of Ranges, Sections, Beats and their headquarters with area is furnished in Table No.1.2.

Table No.1.2 : Administrative Unit of Keonjhar (WL) Division, Anandapur and its geographical area in Sq. K.M.

Name of the Range	Total area.	Name of the Section with Hqrs.	Total area.	Name of the Beat with Hqrs.	Total area.
1. Anandapur	594.53	1. Anandapur	218.77	1. Anandapur	138.64
				2. Dhakotha	38.16
				3. Ostapura	41.97
		2. Budhikuda	42.61	4. Budhikud	30.95
				5. Taneipal	11.66
		3. Gayalmunda	170.42	6. Gayalmuynda	56.16
				7. Panasdiha	114.26
		4.Ramachandanpur	162.73	8. Baranga	15.50

				9. Ganpur	83.42
				10. Patilo	63.81
2. Hadagarh	476.54	5. Hadagarh	339.4	11. Baidakhia	229.59
				12. Baniapanka	41.34
				13. Hadagarh	40.49
				14. Raighati	9.54
				15. Sangam	18.44
		6. Kathakata	137.14	16. Bahia	19.92
				17. Kantipal	47.48
				18. Kathakata	26.50
				19. Pitanau	43.24
3. Deogaon	568.77	7. Bhagamunda	164.98	20. Bhagamunda	98.00
				21. Gaduan	22.04
				22. Sagadapata	44.94
		8. Deogaon	155.39	23. Barabahali	38.16
				24. Baripal	49.39
				25. Basantapura	26.50
				26. Deogaon	41.34
		9. Harichandanpur	248.4	27. Gargadbahala	162.40
				28.Harichandanpur	86.00
4. Brahmanipal	390.26	10. Brahmanipal	136.4	29. Baliparbat	26.20
				30. Brahmanipal	42.40
				31. Mahabiraposi	67.80
		11. Palaspal	146.8	32. palaspal(E)	52.00
				33. palaspal(W)	94.80
		12. Talapada(Daitari)	107.06	34. Rebana(N)	38.00
				35. Rebana(S)	39.06
				36. Talapada	30.00
Total	2030.10		2030.10		2030.10
Sources - DFO, Keonjhar (W.L) Division, Anandapur.					

1.1.4 **Demography :**

Keonjhar (W.L) Division constitutes part of Harichandanpur Block and part of Ghatagaon Block of Keonjhar Sub-division and Ghasipura Block, Anandapur Block, Hatadihi Block and Anandapur Municipality of the Anandapur Sub-division.Though a very small portion of Ghatagaon C.D Block comes under jurisdiction of Keonjhar Wildlife Division, it has been excluded from demography point of view due to non-availability of,fragmented census data of that particular portion.

According to 2011 census the total population of Keonjhar (W.L) Division is 6,04,587, out of which 3,04,886 are male and 2,99,701 are female. Out of total population of 6,04,587, urban population is 43,650 and rural population is 5,60,987. The population has registered a net accretion of 74103 persons to the 2001 census. Block wise population figure according to 2011 census is given in the Table No. 1.3.

Table No. 1.3: Block wise population (As per Census'2011)

Name of Sub-Division	Name of Block	Total Population
Keonjhar	Harichandanpur	142150
Anandpur	Ghasipura	148554
	Anandpur	109669
	Hatadihi	164629
	Anandapur Municipality	39585
	Total	604587
Source : Keonjhar Gazetteer		

The decennial growth rate of population of 2001 to 2011 works out to be 13.96% as against the state average of 14.05%. A comparative statement showing details of population as per 1991 census, 2001 census and 2011 census is given in the Table No. 1.4.

Table No.-1.4: Comparison of population.

Block	Census 1991 census			Census 2001 census			Census 2011		
	M	F	Total	M	F	Total	M	F	Total
Rural									
Anandpur	42602	41748	84350	48705	47869	96574	55016	54654	109669
Ghasipura	62899	61156	124055	67479	66193	133762	74858	73696	148554
Harichandanpur	50358	49205	99563	59631	58492	118123	69253	68832	138085
Hatadihi	62076	60358	122434	72387	70441	142828	83135	81494	164629
Urban									
Anandpur Municipality	15883	14395	30278	17939	17109	35048	20462	19123	39585
Daitari city	2364	2074	4434	2273	1966	4239	2162	1903	4065
Source : Keonjhar Gazetteer.									

According to 2011 census, number of females per 1000 males comes to 982 no. as against 976 numbers during 2001 census. The sex ratio according to last three census data is given in the Table No. 1.5.

Table No.1.5 : The decadal average sex ratio				
Census Year	No. of Males	No. of Females	Total	No. of females per 1000 males
1991	235882	228932	464814	970
2001	268414	262070	530484	976
2011	304886	299701	604587	982
Source : Keonjhar Gazetteer				

The schedule caste and schedule tribe population in Keonjhar (W.L) Division contributes 16.79 % and 32.63% of the total population respectively, which is given in the Table No. 1.6.

Table No. 1.6: Population analysis of Keonjhar (W.L) Division as per Census data of 2011.					
Name	Total population 2011	ST Population	%age	SC Population	%age
Anandapur	109669	53302	49	14060	13
Ghasipura	148554	30209	20	27918	19
Harichandanpur	142150	79726	56	10215	7
Hatadihi	164629	30018	18	41987	26
Anandpur	39585	4056	10	7367	19
Total	**604587**	**197311**	**32.63**	**101547**	**16.79**
Source : Keonjhar Gazetteer					

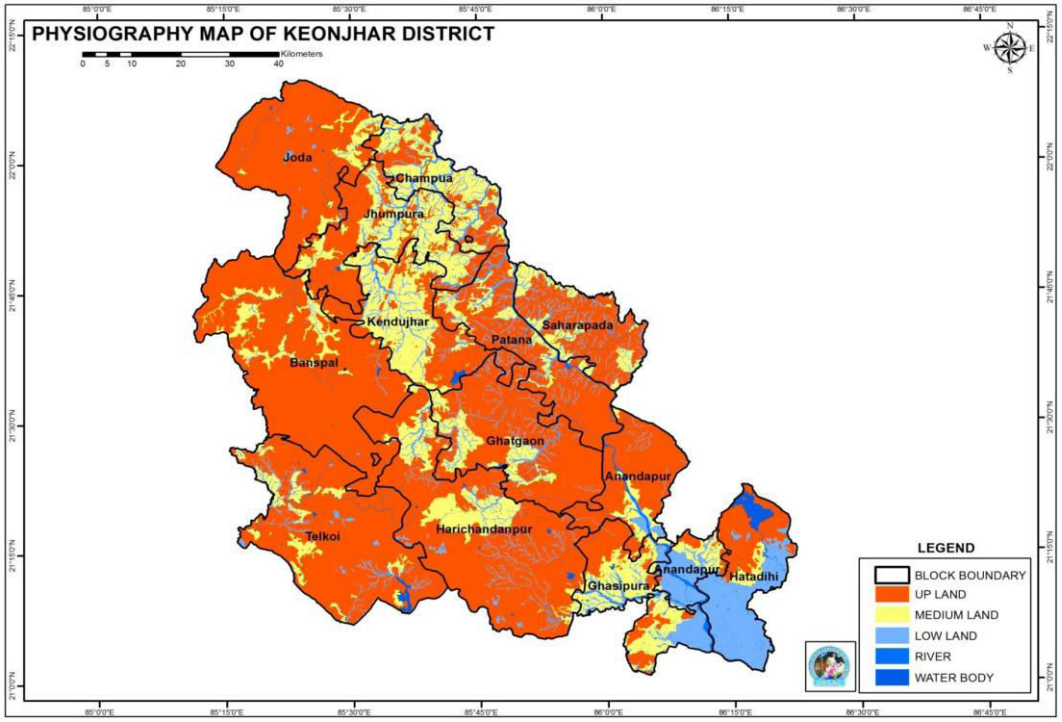
The literacy rate of Keonjhar (W.L) Division in 2011 census comes to 63.90 %. The main workers constitute 59.45% of the total work force and the marginal workers constitute 40. 54% of the total work force.

1.2 CONFIGURATION OF THE GROUND :

1.2.1 The tract covered in this plan has no sharp features to divide it into different physiographical zones. The whole tract is generally flat, interspersed with low lying hills. Keonjhar (WL) Division, Anandapur is distinctly divided into two parts which are highly dissimilar in nature i.e. hilly area (South-West) and plain lands.

Anandapur is the major Sub-Division of Keonjhar District. It can be divided into two parts which are highly dissimilar in nature i.e upper Anandapur Sub-Division filled with dense forest growth having cool climate and lower Anandapur Sub-Division filled with thin forests andmostly cultivated land (Hatadihi Block) adjoining to Bhadrak Dist. The upper Anandapur Sub-Division is filled with mountains and in-habitated by theSantal and Munda Tribes.The physiography map of Keonjhar District is given in Map No.1.1.

Map No. 1.1



1.2.2 The Division is having a chain of mountains on its western and southern border having distinct slopes towards river Baitarani on the North and Brahmani on the South. The prominent hill picks are Boula, KhalariHudi, Dholmundi, Kalighati Parbat and Baliparbata whose heights are given in the Table No. 1.7.

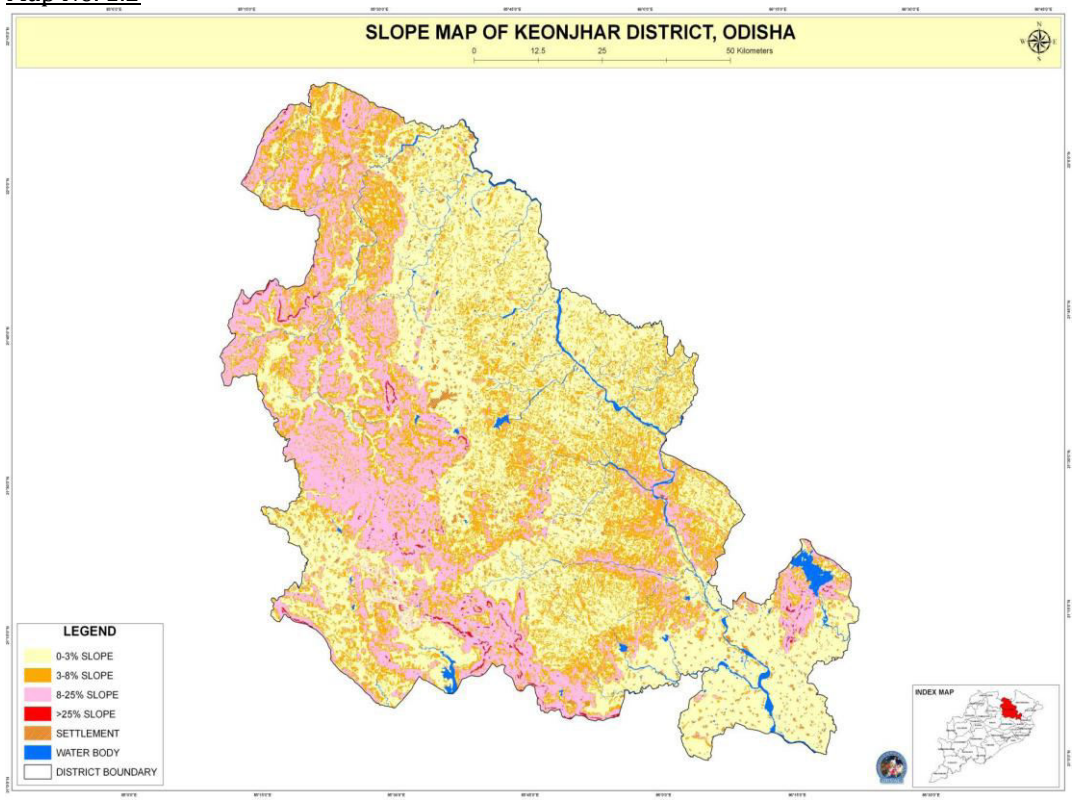
Table No. 1.7 :Height of different Peaks of Anandapur Sub-Division

Sl. No.	Name of the Peak	Height in mtrs MSL	Topo sheet reference
1	Boula	55	F4503
2	KhalariHudi	246	F45N16
3	Dholmundi	641	F45N16
4	Kalighati Parbat	916	F45N16
5	Baliparbata	990	F45N16

1.2.3 The most characteristics feature of Anandapur Sub-Divisionis plateau and open plains except the hill ranges. The Administrative area of this Division is well populated and under agricultural practices. It is noteworthy to mention here that the plateau is slowly descending from Ghatgaon (335mtr) to the low-laying plain of Anandpur Civil Sub-Division.

The lowest elevation i.e 20.3mts is at Raghabapur village where river Baitarani enters into Jajpur Dist. The monotony of Anandapur plain is broken by presence of two masses of hill, lying East and West of Salandi River at Boula. A dam has been constructed on river Salandi and Hadagarh reservoir for irrigation purpose. The hill range of Boula is simply an extension of Noto Reserve Forest of Kaptipada Range of Baripada Forest Division which is adjoining to Similipal Sanctuary of Mayurbhanj District.Themap showing the slope of Keonjhar District is given in Map No. 1.2.

Map No. 1.2



1.3 GEOLOGY, ROCK AND SOIL :

Geology: - The Geology of Anandapur Sub-division is very interesting due to its mineral potential. It can be broadly divided into two distinct physiographic units i.e. (i) Eastern alluvial plains of Anandapur and a portion of Keonjhar Sub-division (ii) Western mountainous terrain containing lofty hills with intervening narrow valleys. The area is densely forested and represented by high hills.

1.3.1 Rock: -The rocks of Anandapur Sub-division belong to the Iron ore series of the Dharwars, an exceedingly ancient system of Archean rocks. This mass gives passage after a short distance south of Keonjhar boundary to rocks of Gandawana system, to Archean rocks (Khondalite and Charnockite) at its west, southwest and to quaternary rocks at its southeast. Shale, Phyllites, Schists, Sandstone conglomerates and quartzite occur often with extensive basic intrusion. Most part of this district is covered by rocks of Iron ore group represented by BHJ, BHQ & BMQ which provides the iron ore deposits. This group of rocks is overlain by younger granites. The details of rock found under different Geo Group are given in the Table No. 1.8.

Table No.1.8 : The formation of different rocks from the geological groups.

Sl. No.	Name of Geo'l group	Name of Rocks
1	Archean	Khondalite, Charnockite, Porphyritic Granite Gneiss, Pyroxene Granulites Schist, Garnetiferous, Quartzite, Quartz schist etc.
2	Gondwana	Feldspathic, Gritty Sandstone, Green Shale, Barkar, Carbonaceous Shale, Talchirs, Panchetsetc
3	Intrusive	Pegmatite, Quartz veins, Dolerite etc.
4	Recent	Alluvium, Laterite etc
Sources - Director of Mines, Bhubaneswar.		

Description of Rocks:

The description of different rocks and its availability in the forest blocks have been discussed briefly in the Table No. 1.9.

Table No.1.9 : Description of Rocks		
Sl. No.	Name of rocks	Description
1.	Khondalite	Khondalite is the common rock made up of metamorphosed sediments in the series. This is an oldest and prevalent rock formation in this zone. It contains varying proportions of Quartz, Feldspar, Garnet and Sillimanite. In some patches it contains Graphite and Biotite. They are medium to very coarse-grained containing large crystals of pink garnet. It exhibits schistose to gneissose texture. Quartzites are hard, compact and dirty white to light gray in colour.
2.	Charnockite	The Charnockite rocks are noticed in high rugged hills due to their resistance to weathering and erosion. The rocks are medium to fine grained and compact. The rocks have waxy appearance and are found to consist mostly of gray feldspar and pink garnets. It is characterized by granulites texture and presence of hypersthenes. Its constituents are Quartz, Orthoclase, Plagioclase and Augite. The Quartz – muscovite schist make of the long chain of east-west hill ranges of Nadia reserve forest. Being less resistant to weathering and erosion it is found as mounds in low laying area along nallahs.
3.	Quartz Veins	The band of syenite occurs within band of granular Quartzite. It is medium to course grained in texture and white in colour. It is composed mainly of feldspar with minor amount of biotic and hornblende. It is quite big in size and contains Quartz. It is marked along the foliation plains.
4.	Pegmatite	The pegmatite is found as intrusion into the country rock. It is acidic in nature and occurs as zoned or simple small bodies. At the intermediate zone the pegmatite shows development of distinct Quartz core and mineralisation of muscovite mica. The pegmatite contains gem quality beryl crystal of transparent variety. Its colour varies from light blue to greenish.
5.	Sand-stone	The youngest group of rocks belonging to the Gondwana group of sediment is found to occur as isolated low hill of typical hunch shape in the eastern part of this Division. The lower group of Gondwanarocks are marked as greenish laminated shale inter bedded with dirty gray sandstone. It contains un-decomposed feldspar suggestive of prevalent cold condition during the period of deposition.
6.	Shale	The shale corresponded to the needle shale of Talcher. It is the youngest group of rocks belonging to the Gondwana group. It is found in isolated low hills.
7.	Barkar	It is the group of rocks consisting of white to fawn colourfeldspatchic sandstone and gritty with occasional informational conglomerate beds and shale. The sandstone often contains decomposed feldspar in course angular grains of Quartz. Gradation of medium grained sandstone to pebbly stone through grit is observed at different places, which may be grouped under Barker.
8.	Iron-stone	A group of rocks represented by alternate beds of purple red shale and micaceous sandstone occur at places. It corresponds to the upper Gondwana formation.
Source : DFO, Keonjhar (WL)		

The geological formations and rock types:The geological formations and rock types met within the district as per the report prepared by the Geological Survey of India, Bhubaneswar is as

follows.

Recent to Quaternary:-Alluvium, Soil, laterite
Kolhan group(1500-1600million years):-sands stones, shales, lime stones &conglomerates.

Unconformity

Newer Dolerite

Mayurbhanj Granite (2000-2001 million years)

Ultramafic Intrusive

Dhanjori Groups:-Dhanjori-Similipal Lava (2100 million years), Quartzites and Conglomerates
Singhbhum Granite (2950 million years)
Iron Ore Group:- Upper lava formation
Upper phyllite formation
Banded Iron ore formation
Lower phyllite formation
Lower lava formation
Sandstone and Conglomerate

1.3.2 **Older Metamorphics (3200 million year) :**

The most important mineral group i.e. iron ore groups of rocks comprising of tuffites, shales, banded haematite jasper, traps and quartzite immerge subsequently and gave rise to rich and extensive iron and manganese deposit of the district. These groups of rocks were intruded by Singhbhum granite. This granite is made-up of at least twelve magmatic bodies of biotite-granodiorite-granite emplaced in three closely related phases. These are later intruded by dolerites and ultramafics.

Ultramafics occur mainly in Boula–Nuasahi area. The pre-cambarian mafic- ultramafic igneous complex of Boula-Nuasahi consists of bi-physic ultramafic and mafics with a polymetallicsulphaide mineralized zone at the interface of the two litho units. The N-S tending complex is intruded in to the Precambrian metasediments of iron ore group. This period was commenced from wide spread volcanic activities.

Keonjhar is very rich in Iron ore deposits. While Orissa has about 30% of the country's resources of Haematitic ore, Keonjhar district alone is contribution about 75% of the reserves of the state. Important iron ore deposits are found at Daitari of Brahmanipal WL Range. The Rebana RF area of Daitari is situated in these areas. The soil is normally reddish, yellowish to Brownish and as such is ferruginous in nature.

The iron group of rocks comprises mainly Banded Iron Formation (BIF) and associated volcano-sedimentary rocks. The iron rich bands mainly comprise haematite, martite, magnetite, specularite and goethite, whereas silica-rich bands consist of quartz or jasper. The other rock types include quartzite shale, phillite, tuff, dolomite, mafic lavas and manganese ores. The total iron ore deposits of the district which includes proved, probable and possible categories estimated up to 3100 million tons as against 4177 million tons of the state as on 1.4.2000. (Source: Jt. Director, Geology, Keonjhar) of both high grade ore (Fe^{+}65%), Medium grade ore (Fe- 62 to 65%) and low quality ore (Fe< 62%).

In the last phase, the conglomerate, shale, limestone and sand stone belonging to Kolhans were deposited by the side of Baitarani river.The conglomerate, shale, limestone and sand stone belonging to Kolhans were deposited by the east of Baitarani river in Kanto-Santoshpur area. Widespread weathering and erosion continued and during quaternary period extensive lateritisation was marked on the high lands and soil and alluvium are deposited on the planes.

For the purpose of easy description of mineral deposit the district can be divided in to 04 regions.

1. The Rebana region including Charigarh
2. The great central plateau of Kanto including Santoshpur on the east of Baitarani River.
3. The massive alluvial plain of Anandapur.
4. Boula- Nuasahi hilly region.

1.<u>The Rebana region including Charigarh</u>:-

This region contains extensive hill ranges stretching along Dhenkanal Border of Anandapur. Quartzite, Quartz schist, BHJ and phyllite of the rocks of iron ore group are available in this area. High grade quartzite occurrence has been reported near Barapada area with Sio_2% up to 99.Ultra basic and basic intrusions are also seen at the margin. In an exception, iron ores are available in Daitari and Sundarmundia. Kyanite occurrences have been reported around near Kulang, Magarmuhan and Kardangi area. The Kyanite bands range from 2 cm. to 1.60 cm. and the in-situKyanite bands analyse $Al_2 O_3$ content ranging from 23 to 38%.

2. <u>The great central plateau of Kanto including Santoshpur on the east of Baitarani River</u>:-

This region which stretches from south of ChampuatoAnandapur Sub-Division is dominantly covered by granites. The granites are of different textures. They are usually coarse and porphyritic. Medium to fine grained granite exposures are also seen. The massive forests of AteiandSantoshpurRF are situated in this region are mainly unfertile.

3.<u>The massive alluvial plain of Anandapur</u>:-

In this region, the vast Anandpur plane is situated. Due to its planeness, and thick soil cover good agricultural land is available. At some places, around Barapada, Paharpur, Pandua and Panchara.Quartzites are also available. Lateritic soil patches are also seen in this area which are usually barren and devoid of vegetation. The soapstone which is locally utilized for preparation of stone wears and statues is found in Dhakota in between Ghatgaon and Anandapur.

4. <u>Boula-Nuasahi hilly region</u>:-

This area comes within the Hadagarh Sanctuary and its Eco-sensitive Zone. In this region occurrence of quartzite and quartz schist on both sides of river Salandi is seen. On northwest of Nuasahi Manganese pockets and lenses are seen in association of gabbro. On the north of Sajanpal, granite outcrops are seen in the valleys and low lying hills. Chromite deposits are also found in this area. The lease wise resources of Chromite are as follows:

Boula (FACOR)	4.0	Million Tons	UP to 225 mtr of depth from G.L
Bangur (OMC0	2.0	Million Tons	Up to 60 mtr of depth from G.L
Nuasahi (IMFA and ICCL)	2.2	Million Tons	Up to 100 mtr of depth from G.L

Thus, a total reserve of 8.20 million tons of Chromite with cut off ranging from +10 to 30% $Cr_2 O_3$ has been estimated in Keonjhar District.

Although good agricultural lands are available south of this region, thin soil and debris covered in this hill base does not serve as good agricultural land. Miscellaneous crops are predominantly found in this region with hardly any Sal crop. Incidences of Platinum group of elements (PGE) have been reported in the ultramafitesandmafites of Baula - Nuasahi igneous

complex of the district. PGE contents in the rocks vary from 0.075 to 5.451 ppm. Platinum and palladium content vary from 0.03 to 2.048 ppm and 0.01 to 3.011 ppm respectively.

1.3.3 Minerals :

The area under this division has been visited from time to time since 1943-44 by several geologists of the Geological Survey of India and the State Directorate of Geology for investigation of minerals. The important minerals noticed in this tract along with their description and distribution has been discussed in brief in Table No. 1.10.

Table No. 1.10 :Description of minerals

Sl. No	Name of Minerals	Description	Name of blocks
1	Graphite	Crystalline flaky Graphite is sparsely disseminated as streaks and lenticels along the foliation of the gneiss. The gneissic rack is superficially almost rotten and crumbling. Separation of the Graphite from the associated components of the gneiss is not very difficult. The local concentration of Graphite has been noticed in limited places. The percentage of Graphite is nowhere high enough for the occurrence to be commercially exploited.	Rebana,Santoshpur, Hatibandha,Koldiha
2	White Clay	The result of disintegration and decomposition of the feldspathic elements of the Gondwana formation developed White Clay. The development of this White Clay on the top of the Gondwana grits has been noticed in different nala of this tract. These minerals have considerably developed in an elevated area between two tributaries.	Mahulpanga, Palaspal, Nuniapatna, Barang, Panasadiha
3	Iron-ore	The gritty formation in the Gondwana system often shows fairly rich hematite and limonitic materials in them. The accumulation of ferruginous materials is also very common in this zone. In the past, the local smelters used the ferruginous concentration in their charcoal furnaces worked for extraction of pig iron. This is evidenced by the huge accumulation of slag in many villages of this area.	Daitari, Brahmanipal, Sapanaposi, Tangiriapal
4	Mica	The pegmatite is composed of muscovite transparent Quartz and plagioclase feldspar. Muscovite bearing pegmatite dykes have been found intrusive into the garnetiferous gneissic formation. Mica bearing pegmatite of cream colours is fairly numerous in rocky tracts. The materials as judged from the surface indication are not of commercial important.	Santoshpur, Atei, Rebana, Turkipada, Gayalmunda, Kadagotha
5	Rock crystal	Coarsely crystallized Quartz occurring in a highly fractured Quartz dyke has been seen in this zone. The crystals aggregate occur as nest crowding the cracks and crevices of the dyke. The crystals attain a considerable size but they are not perfect for manufacturing.	Meghanadpoi, Ostapura, Patilo, Barang, Baigundi, Brahmanipal, Tangiriapal, Sapanposi,Atei

6	Chromium	It resembles iron in its behavior and usually occurs as an oxide. Its availability is reduced by bad drainage and organic matter content and deficiency may occur in soil, which are rich in organic matter or bad drained and with a high water table or are calcareous in nature. Oxidizing bacteria also render it unavailable to plant.	Boula
Source : DFO, Keonjhar Wildlife Division			

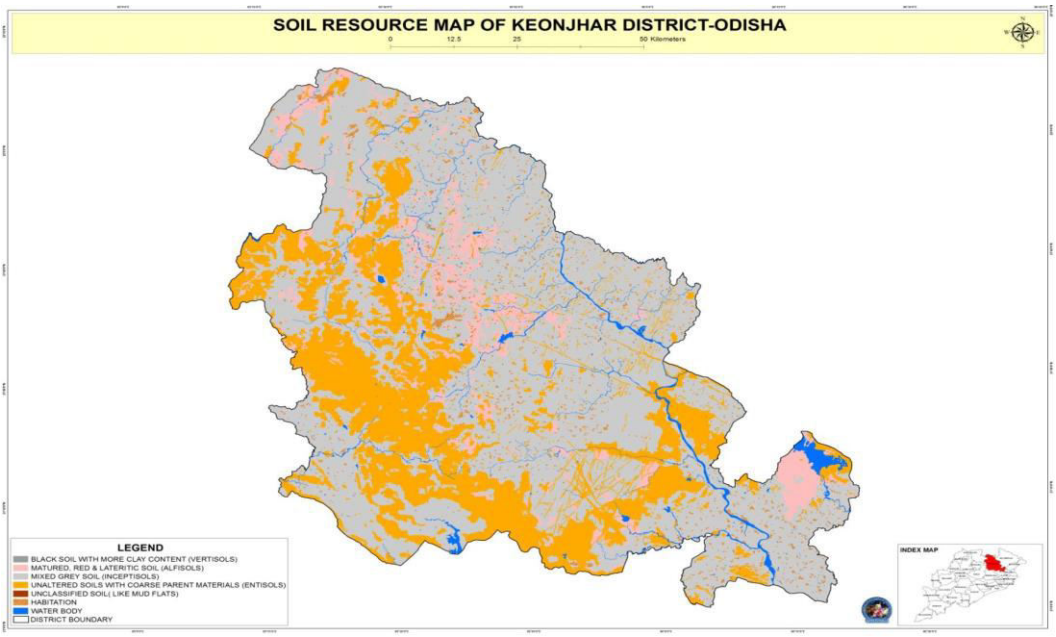
1.3.4 **Soil :**

As per the latest classification, the soil of the Sub-Division belongs to two major categories i.e Alfisol and Vertisol. In the soil formation process the climate plays a major role. But deviation are noticed on hilly areas where the top soil is subjected to shift, they are immature and have formed no stable profile although the rocks from which they are derived may the exceedingly ancient. A limited area in this plan possessing more or less uniform climate condition with hilly country has immature soil and the parent rock continues its influence the soil in consequence retains some of their original lithological characteristic. Therefore the soil can be classified under the rocks from which they are derived.

1.3.4.1 Sandy or gritty soil in the hilly forest areas are produced moderately from the granite rocks. The clay fraction is derived from the decomposition of fesspar. It usually flashed down into the lower ground to enrich the agricultural land. The clay particles are generally carried down by percolating water into variable depths in the soil where the slope is gentle leaving the sandy layer on and very nearer to the surface. Such type of soil constitutes loams or clay loams, which are very favourable to the growth of forest species as seen in many forest areas. The soil derived from granite from hilly areas or from rocks with high percentage of quartzite is capable of supporting inferior forest areas as seen in Atei and Santoshpur blocks. The top dying of Sal trees is mainly due to the presence of gritty soil derived from granite rocks.

1.3.4.2 The dolerite dykes are inclined to weather their sharp ridges with a screed of rounded boulders. It is not favourable for the growth of forest species. Their support to the forest is very little in hilly slopes. The dolerites and epidiorites weather to good clay and produce very good fertile agricultural soils in the valley. Where soil depth is sufficient with moderate to gentle slope it forms reddish or buff clay. This is favoured by mixed forests of species like *Dhaura, Karada*, *Kuruma* and *Asan* etc. Where this red soil is having sufficient depth Sal may also occur. The most interesting feature is that when the soils are formed in hilly ground from these rocks, they are red and normally contain a high percentage of iron and magnesium. But in valleys, they form black clays, rich in organic matter and at times, contain concentrations of lime in the form of calcium carbonate (CaCO3) nodules. These clay soils are often mature and show a definite profile with clear columnar structure due to high proportions of clay.The Soil Resource Map of Keonjhar District is given in the Map No. 1.3.

Map No. 1.3



1.3.4.3 The shales form a reddish or buff loamy-clay soil. This shale and soil in various depths with good sub-soil drainage provides a very good scope of availability of soil moisture. The good Sal forests in the northeast of these districts occur on the soils derived from the shales and are generally found on the lower slopes of the hills and in the valley. The shales produce good agricultural soil but not up to the standard of granite and basic rocks. When the shales tend to be calcarious, sabai grass is mainly grown in the area.

1.3.4.4 The phyllites and schists are generally converted to good loamy forest soils in the valleys and usually support forests where the rocks are basic in character. The quartzite and quartz schists are very impenetrable to weathering which are commonly seen in Kalapat hills and JuangPirha area. Due to this factor, the slopes in this area are commonly devoid of soil and hence poor vegetation. But in the valleys where the soil is able to accumulate good loams and sandy loam soils are seen and are favourable to *Sal*. But most of the valleys in this area are steep and narrow. However, such type of soil available for *Sal* forest is limited. Where sufficient moisture is not available on the slopes, the shallow quartzite soil supports dry mixed forest with predominance of *Bheru*, a common small tree.

1.3.4.5 The sand stone are of very limited extent and yield infertile sandy soil. In such soil, the crop is very poor and open crop of Sal is seen with varieties of dry type species including the grass-*Aristidasetacea.*

1.3.4.6 Calcarious soils are of common occurrence in the form of calcarious clays with kankar nodules. These are associated with the granites and give rise to eroded ravine lands. The vegetation on such ground is little.

1.3.4.7 The laterite rock is associated with igneous rocks and iron ores at higher elevations . Laterite soils are normally porous and permeable and forms a very good forest soil favourable to Sal when found to extend into sufficient depth. Detrital, porous and permeable laterite has good effect on forest vegetation and on the water supply of different localities. Water retaining capacity is high in such type of soil for which numerous springs are seen in the area. It is mainly due to the lateritic mantle forming a cap on the iron ore deposit.

The Soil samples from different sample points were taken and sent to soil testing laboratory, Keonjhar for analysis. The average compartment and R.F wise data received from Soil Chemist, Keonjhar is depicted in**Appendix -I.**

Further, interpretation of different Soil Parameters with different class is given in the Table No. 1.11

Table No. 1.11 : Interpretation of Soil Parameters of different class.

Soil Parameter	Test Value	Class	Remarks
pH	<6.5	Acidic	
	6.5-7.5	Neutral	
	>7.5	Alkaline	
Electrical Conductivity	<Immhos/cm		Normal
	1-2 mmhos/cm		Critical for germination
	2-3 mmhos/cm		Critical for growth of salt sensitive crops
	3-4 mmhos/cm		Critical to most crops
Organic Carbon%	<0.25%	Very low	
	<0.5%	Low	
	0.51% to 0.75%	Medium	
	>0.75%	High	
Available Phosphorus	<6 Kg/ha	Very low	
	6-14 Kg/ha	Low	
	14-40 Kg/ha	Medium	
	>40 Kg/ha	High	
Available Potash	<118 Kg/ha	Low	
	118-200 Kg/ha	Low/ Medium Range	
	200-280 Kg/ha	High Medium Range	
	>280 Kg/ha	High	

1.4 CLIMATE AND RAINFALL :

1.4.1 Climate :

The climate of Anandapur Revenue Sub-Division is characterized by three main seasons. They are summer, rainy and winter seasons. Summer season mainly starts from first part of March and continues up to middle of June. The monsoon generally breaks during mid of June and continues up to September. The winter season reaches its peak in December and continues up to March end. The transition period is clearly felt, which is known as spring season. During this period days are hot and nights are cold. Leaf shedding occurs in this period.

The four seasons prevailing in this forest division are :

1) Hot and Dry summer : (March, April & May) :

The mean summer maximum temperature is 36°C. There is rise of temperature up to 38° to 39°C. On an average the months of March & April receive rainfall less than 15mm whereas May receives between 120-150 mm.

2) Hot & humid wet season (June, July August & September) :

Usually the monsoon sets in towards the second week of June. The range of rainfall varies from 250-350 mm during the period from June to September. The rainfall intensifies during the month of July and August. The temperature reaches high (max 32°C) & humidity is high. Monthly total rainfall in two rain gauge station in mm from year 2007-2018 is given in the Table No. 1.15.

3) The autumn (October to November) :

During this period the minimum – maximum temperature runs between 27°C to 30°C and minimum – maximum temperature between 12°C to 19°C 7 weather remains bright. The sky remains clear & insulation is uninterrupted.

4) The winter (December, January & February) :

December is the coldest month of the year. The average minimum temperature is 14.33 and maximum temperature is 26.4°C. The sky remains clear.

The details of Year wise Temperature and Rainfall data of Keonjhar District is given in the Table No. 1.12.

Table No. 1.12 : Year wise Temperature and Rainfall data of Keonjhar District

Year	Average Mean Monthly Temp. Max (^{0}C)	Average Mean Monthly Temp. Min. (^{0}C)	Rainfall (mm)	Relative Humidity
1986	30.4	20	1636.3	72
1987	37.8	11.7	1126	69
1988	37.4	11.7	1531.5	68
1989	38.6	10.1	1505.1	64
1990	36.6	12.2	1870.8	73
1991	38.1	11.2	1431.3	72
1992	38.2	9.4	1054.2	69
1993	38.8	10.1	1461.3	70
1994	38	9.3	1292.7	70
1995	40.9	5.2	1179.3	60
1996	43	13.2	927.4	66
1997	41.5	8	1446.2	80
1998	43.6	5.3	1174.2	73
1999	42.8	6.5	1595	Not available
2000	41.1	5.7	1160.92	69
2001	41.7	6.3	1389.96	71

2002	41.8	5.9	861.83	69
2003	42	5.4	1385.69	74
2004	42	6.4	1093.18	64
2005	42.8	7.6	1621.14	72
2006	40.7	8.4	1551.17	71
2007	41.5	7.9	1910.23	74
2008	42.6	7	1644.5	75
2009	43.6	9.5	1326.24	66
2010	42.8	6.6	1213.36	71
2011	40.3	5.2	1908.77	72
Source : Gazetteer of Keonjhar				

The details of Average Temperature Data of Keonjhar District from 2007 to 2017 given in the Table No. 1.13.

Table No. 1.13 : Average Temperature Data of Keonjhar from 2007 to 2017

MONTH	2007		2008		2009		2010		2011		2012	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
January	27.6	11.3	26.7	11.9	28.5	14.1	26.2	11.3	27	10	24.8	12.2
February	28.1	14.8	27.2	13.7	32	16.9	31.1	15.4	29.4	14.2	30.1	14.1
March	32.7	18.1	34.3	19	35.1	20.4	36.2	20.3	34.7	18.6	35.2	17.7
April	38.3	21.9	37.2	22.4	39	23.9	40.5	24.9	34	20.2	37.7	22.4
May	36	23.3	39.3	24.1	36.5	24.7	37.2	23.9	36.8	22.8	39.9	24.8
June	33.1	24	31.1	23.6	35.9	25.9	35.2	24.2	32.4	22.9	36.4	26.2
July	30	23.4	30.2	24.1	29.2	24.2	30.8	23.2	30.9	22.5	30.3	23.7
August	27.7	22.9	29.8	23.9	30.9	24	31	23.3	29.9	22.2	30.2	23.1
September	29.6	22.4	30	22.9	31	23.5	30.4	22.6	29	21.6	30.7	20.6
October	31	19.2	31	20.4	29.9	18.4	29.6	20.4	31	19.3	29.8	16.3
November	28.2	16.1	29.1	16.8	28.3	16.9	29.3	17.8	28.9	14.5	27.3	12.8
December	26.7	12	27.9	14	26.6	12.7	24.9	11.3	26.4	11.2	27.4	10.5
Source : Meteorological Centre, Bhubaneswar												

N.B.:- Temp in Degree Celsius

MONTH	2013		2014		2015		2016		2017		2018	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
January	26.6	10.7	26.9	10.1	25.7	13.1	27.5	12.5	27.5	12	34	9.4
February	29	13.6	29.1	11.9	32.1	14.4	31.3	18	31.6	15.2	31.5	15.5
March	35.1	17.7	32.4	16.4	33.6	18.3	34.3	20.2	33.9	18.7	34.9	19.2

April	37.3	20.7	38.2	20.4	35.7	21.9	41	26.2	39.2	23.5	35.3	21.5
May	38.6	23.9	38	22.2	38.3	24.3	37.5	23.9	38	24	36.2	23.3
June	32.2	22.8	35	22.6	32.7	23.7	33.9	24.2	34.2	24.7	34.1	24.6
July	30.4	22.3	29.6	21.2	30.8	23.2	30.1	23.8	29.4	23.9		
August	30.3	22	30.4	23.6	31.4	22.6	30.3	23.4	31.1	24		
September	30.6	21.6	30.9	20.1	31.6	22.3	30.7	23	31.6	23.9		
October	28.2	19.3	30	17.1	32.1	20.8	30.5	19.8	30.6	21.4		
November	27.9	13.5	29	14.4	30.3	17	28.8	14.4	27	15.9		
December	26.2	9.5	25.8	10.6	26.3	14.8	27.5	12	26.1	11.3		
Source : Meteorological Centre, Bhubaneswar												

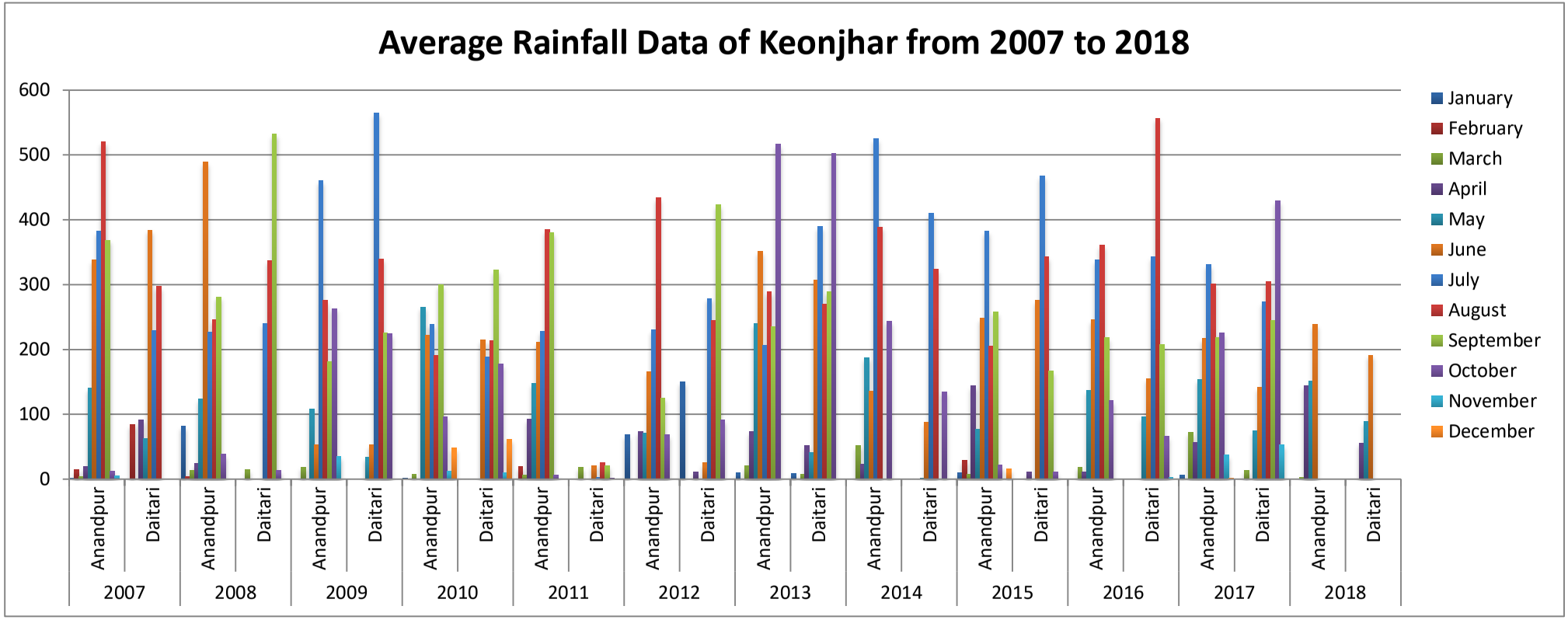
1.4.2 **Rainfall** :

The average rainfall in the district is 1534.5 mm. The rain generally increases from the plain towards the interior hilly parts of the Forest Division. The south-west monsoon breaks in the district by second week of June and withdraws late in September. About 75% of the annual rainfall is received during south-west monsoon.

Table No. 1.14: The Comparison Data of Rainfall of Anandapur and Daitari from the year 2007 to 2017is given below.

Month	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari	Anandpur	Daitari
Jan	1.6	0	81.2	0	0.2	0	1	0	0	0	68.4	150	9.4	8.4	0	0	9.8	0	0	0	6	0	0	0
Feb	15	83.6	3.8	0	0	0	0	0	19.2	0	0	0	0	0	0	0	28.8	0	0	0	0	0	0	0
Mar	3.8	0	13.5	14.2	18.6	0	7.6	0	5.8	17.8	0	0	20	7.6	51.2	0	6.8	0	18.6	0	71.6	13.2	2.8	0
Apr	19.4	91.3	24.2	NA	0	0	0.6	0	92.6	0	73.6	11	73.6	51.8	23.2	0	143.8	11	10.4	0	55.9	0	144.4	55.8
May	140.6	62.3	123.8	NA	108.3	34	265.5	0	147.3	0	71.2	0	240	41	187.2	1	77	0	136.5	95.8	153.8	74.2	151	88.8
Jun	337.8	384.1	489	NA	53	53.4	221.6	214.3	211.2	21	165	24.8	350.9	306.9	135.2	87.6	248	275.2	245.4	154.6	216.4	141	238.8	191.2
Jul	382	228.7	226.6	240.2	460	564.2	238.4	188.6	227.3	2	230.4	278.6	206.8	389.2	525.3	410.1	382.4	467.2	338.1	342.4	330.8	273		
Aug	520.4	297.6	246.2	336.4	275.2	339.6	190.4	213.8	384.4	25	433.6	244.2	288.8	269.2	388.7	324	204.6	343.2	361.2	556.6	301.2	304		
Sep	368.4	NA	281	531.8	180.6	225.8	300	322.8	379.4	20	125.2	422.6	235.2	288.4	0	0	258.2	166.8	218.6	207.4	218	244		
Oct	12.6	NA	38.2	13	263	224.4	96.4	177.1	5.8	1	68	91.2	516.2	502	243.6	134.8	21.3	10.8	120.8	66.4	225.4	429		
Nov	4.4	NA	0	0	34.6	0	12	9.2	0	0	0	0	0	0	0	0	0	0	0	2.2	37.4	53.2		
Dec	0	0	0	0	0	0	47.8	61.4	0	0	0	0	0	0	0	0	15.3	0	0	0	1.4	0		

Source : Meteorological Centre, Bhubaneswar


Average Rainfall Data of Keonjhar from 2007 to 2018
600
500
400
300
200
100
0
Anandpur
Daitari
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
January
February
March
April
May
June
July
August
September
October
November
December

Rainfall Data of Keonjhar :

Actual rainfall data year wise of Keonjhar district are given in the Table No. 1.15 (A)

Table No. 1.15(A) : Rainfall data year wise of Keonjhar District

Year	Normal	Actual	Deviation from Normal (in mm)	Year	Normal	Actual in mm)	Deviation from Normal
1987	1534.5	1126	-408.5	2002	1534.5	861.83	-672.67
1988	1534.5	1531.5	-3	2003	1534.5	1385.69	-148.81
1989	1534.5	1505.1	-29.4	2004	1534.5	1093.18	-441.32
1990	1534.5	1870.8	336.3	2005	1534.5	1621.14	86.64
1991	1534.5	1431.3	-103.2	2006	1534.5	1551.17	16.67
1992	1534.5	1054.2	-480.3	2007	1534.5	1910.23	375.73
1993	1534.5	1461.3	-73.2	2008	1534.5	1644.5	110
1994	1534.5	1292.7	-241.8	2009	1534.5	1326.24	-208.26
1995	1534.5	1179.3	-355.2	2010	1534.5	1213.36	-321.14
1996	1534.5	927.4	-607.1	2011	1534.5	1908.77	374.27
1997	1534.5	1446.2	-88.3	2012	1534.5	1255.5	-279
1998	1534.5	1174.2	-360.3	2013	1534.5	1652.9	118.4
1999	1534.5	1595	60.5	2014	1534.5	1369.6	-194.9
2000	1534.5	1160.92	-373.6				
2001	1534.5	1389.96	-144.5	Source : Keonjhar Gazetteer			

1.4.3 The comparison between the rainfall figures for the period between 1986 to 1996 and 1997-2007 and 2007-2018 show that the rainfall in Keonjhar District has been erratic and unpredictable. For example,while 1990 & 2007received high rainfall, 1996& 2002 became drought year.

1.4.4 Impacts of Climate Change:

Table No. 1.15 (B)

Sl. No.	Odisha's Rainfall	Contribution of seasonal rainfall	Contribution of seasonal rainfall of Keonjhar District.	
	Co-effective of variation of rainfall		Based on data 1971-1980	Based on data from 2007-2016
	Annual -19-29%			
1.	Pre-monsoon-40-80%	Pre-monsoon-8%	11%	14%
2.	SW-monsoon-17-30%	SW monsoon -79%	78%	74%
3.	Post monsoon-58-130%	Post monsoon-10%	9%	12%
4.	Winter-90-170%	Winter-3%	2%	2%

If we scan the above climate data, in climate change lens we find that

a) both maximum and minimum average daily temperature are increasing but minimum temperature are increasing at a faster rate than maximum temperature.
b) Frequency of heat wave has increased from 1990 onwards. Frequency and disaster may increase and cyclones may further intensify with climate change. So far as rainfall is concerned, the district is receiving less rainfall during monsoon. Percentage of pre monsoon and post monsoon showers have been increased which is detrimental for both agricultural crop and forest plantations.

1.4.5 Climate risk in Keonjhar District:

1. Flash flood during rainy season.
2. Heat waves in summer.
3. High variability of rainfall.
4. Increasing dry spells.

As per report by The Energy and Resources Institute (TERI), 2003, Keonjhar is highly vulnerable to climate change.Odisha State Disaster Management Authority has done a multi-hazard mapping for all the thirty districts of the State. Keonjhar district is coming under high risk zone & moderate risk zone so far as wind and cyclone is concerned and highly risk for drought.

Bio-physical factors and sectoral segmentation of climate induced vulnerability in Odisha.

Vulnerability in Forestry Sector	Result
Long dry spells	Less of eco-system service
Intensity of land use change	Less of livelihood for people dependent on forestry resources.
Fragmentation of habitats.	Decline & ambient air and water quality leading to health hazards.
Species invasion	Extinction of species.
Desertification and land degradation	Extinction of species.

1.4.6 Natural Calamity :

Though Keonjhar WL Division is not coming under flood zone of Odisha, but every year in monsoon there is flash flood due to river Baitarani and its tributaries and Ghasipura, Anandapur & Hatadihi Blocks are badly affected by this. During the month of Spetember'2011, due to continuous rain flood occurred in river Baitarani affecting mainly Anandapur Sub-Division. Anandapur, Ghasipura and Hatadihi Blocks area had been heavily damaged.

The entire Keonjhar WL Division is vulnerable to cyclone as per Odisha Disaster Management Report'2016.All the blocks of Keonjhar (W.L) Division have been affected by severe cyclonic storm in Phailin & floods.During the year 2013-14, the cyclonic storm 'Hudhud' heavily affectedin Anandpur, Ghasipura and Hatadihi Blocks.

1.4.7 Agro Climatic Zone :

Odisha is divided into 10 agro-climatic zones basing on the amount and distribution of rainfall pattern, irrigation,soil characteristics and cropping pattern. Keonjhar (Wildlife) Division comes under two Agro-climatic zones which is given in the Table No. 1.16.

Table No. 1.16: Agro climatic zone of Keonjhar W.L. Division.

Name of Plateau	Area	Climate	Normal rainfall	Max Temp.	Min Temp.	Lateritic Reds
1.North Central Plateau	Harichandanpur block	Hot & moist sub humid	1534	36.6	11.1	Yellow & mixed red
2.North-Eastern coastal plain	Anandapur, Ghasipura & Hatadihi block	Moist & sub-humid	1568	36	14.8	Red, lateritic, deltaic, alluvial coastal alluvial.
Sources : OUAT, Bhubaneswar						

CHAPTER – II

MAINTENANCE/INCREASE IN EXTENT OF FORESTAND TREE COVER

2.1 AREA OF FORESTS UNDER DIFFERENT LEGAL CLASSES :

2.1.1 There are 19 no. of Reserve Forests in Keonjhar (WL) Division. This Working Plan covers 17 No. of Reserve Forests, 3 No. of P.R.F.s, 10No. of D.P.F.s,8No. PFs (Compensatory afforestation area notified U/s-33 of Odisha Forest Act, 1972) and 56 No. of Village Forests. The two RFs which have been excluded from the purview of this working plan are Salapada RF & Boula RF. Out of total notified area of 1553.84 Ha of Salapada R.F, 757.41 ha.have been de-reserved for variousnon-forestry purposes, the balance area of 796.43 Ha. situated in the heart of Anandapur town is completely devoid of forest growth and fully encroached. The Baula Reserve Forest of area 10,422.4 Ha., which comes under Hadagarh Sanctuary is under the management of separate wildlife management plan. Hence, both have been excluded from the purview of this Working Plan. The forest of this Division includes other forest growth on revenue land which has been excluded from the purview of Working Plan because of its occurrence in small patches and sporadic form.However, some of the revenue forests managed by V.S.S. under JFM mode are included in this Working Plan.Distribution of Recorded Forest Area of Keonjhar(Wildlife)Division is given in TableNo.2.1.

Table No.2.1 : Distribution of Recorded Forest Area of Keonjhar (WL) Division

Sl.No.	Classification of Forest	Nos.	Area covered(In Ha.)
1.	Reserve Forest	19	72327.34
2.	Proposed Reserve Forest	3	214.070
3.	Protected Forest	8	216.83
4.	Village Forest	56	411.540
5.	D.P.F	10	1420.470
6.	Un-classed Forest	33	8.452
7.	D.L.C. (Revenue)		1530.33
	Source: DFO, Keonjhar(WL)		

2.1.2 This Plan covers 17 Nos. of Reserve Forest Blocks over an notified area of 60,351.10 Ha, 3 Nos. of Proposed Reserve Forest over an area of 214.07 Ha. and 10 Nos. of Demarcated Protected Forest having area of 1420.47 Ha. Furthermore 8 PFs i.e. Compensatory Afforestation sites of 216.83 Ha. notified U/s-33 of OFA'1972, 56 Social Forestry Plantations of an area 411.54 Ha. declared as Village Forest under Section 30 of Odisha Forest Act, 1972 have been included in this plan. In to-to this division have 76129.032 Ha of recorded forest area which is of 37.50% of geographical area of Keonjhar (W.L) Division. The detailed list of RFs, PRFs, DPFs, PFs & VFs along with notification of the division are furnished in Table No. 2.2, 2.3, 2.4, 2.5, 2.6.

2.1.3 **Legal position :**

Out of 17 RFs included under this plan, 09 numbers of Forest Blocks of Keonjhar (WL)Division were declared as Reserve Forest by Executive Orders during 1910-15 settlement operation. Before merger of Ex-State, some of the Forest Blocks were reserved

as 'B' class forest. After merger of Ex-States, these Forest Blocks were deemed to be Reserve Forest within the meaning of Section 20 of the Indian Forest Act, 1927. The notification certificates were issued by the ruling Chief vide Govt. of Orissa in their defunct Development Department Notification No. 10721-12F-42(M)/2/28-Dated 26/27th March, 1958. The said notification is enclosed as **Appendix – II.**

Consequent upon coming in to force of the Orissa Forest Act, 1972, all these Forest Blocks are deemed to be Reserved Forest as per provision of section 21 of the said Act.

The Reserve Forests namely Baranga, Hatibandha, Nuniapatna, Ostapura, Palaspal, Santoshpur, Rebana, Atei (P), and Salapada were notified during the year 1958. The Reserve Forests namely Gayalmunda, Koldiha and Panasdiha were notified in the year 1979. Thereafter, RF namely Mahulpanga was notified during the year 1980. During 1982, two numbers of Forest Blocks namely Baigundi and Meghanadpoi were notified as RF. Kadagotha and Patilo Forest Blocks were declared as Reserve Forests during 1983. The Forest Block namely Turkipada was notified as RF in 1985. The Forest Blocks namely; Brahmanipal, Sapanposi and Tangiriapal were notified as PRF during the year 1978, which are given in Table No. 2.2.

Table No.2.2: The list of RFs

S.N.	Range	Name of R.F.	Notification No. and Date	Area(Ha.)
1	2	3	4	5
1	Anandapur	Baigundi	FS 378/81-56450/R dt. 26.08.82	42.49
2		Baranga	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Govt. Gazette of 4th April 1958 partial page-289	1329.84
3		Gayalmunda	FS 293/79-78146/R dt. 05.11.79	107.42
4		Hatibandha	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Govt. Gazette of 4th April 1958 partial page-289.	83.36
5		Koldiha	FS 290/79-63729/R dt 31.08.79	40.14
6		Meghanadpoi	FS 377/82-81831/R dt.31.12.82	328.81
7		Nuniapatna	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Government Gazette of 4th April 1958 partial page-289	66.37
8		Ostapura	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Government Gazette of 4th April 1958 partial page-289	528.38
9		Panasdiha	FS 291/79-77038/R dt.30.10.79	61.55
10		Patilo	FS 63/83/38956/R dt.13.06.83	463.38
11		Santoshpur	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Government Gazette of 4th April 1958 partial page-289.	9393.49
12		Atei(P)	10721-12F-42(M/2)58/D.26/27th March 1958 published in the State Government Gazette of 4th April 1958 Part-III-Page 289	12522.31
	Deogaon	Atei(P)	10721-12F-42(M/2)58/D.26/27th March 1958 published in the State Government Gazette of 4th April 1958 Part-III-Page 289	
13		Kadugotha	FS 73/83-52167/R dt.10.08.83	60.9
14		Rebana(P)	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Government Gazette of 4th April 1958 partial page-289.	32292.83
	Brahmanipal	Rebana(P)	10721-12-42 (M/2) S8/D26/ 27th March 1958 published in the state Government Gazette of 4th April 1958 partial page-289.	
15		Mahulapanga	FS 20/80-8340/R dt.04.02.80.	205.18

16		Turkipada	FS 69/84-34853/R dt.29.06.85.	304.99
17	Deogaon & Brahmanipal	Palaspal	10721-12F-42(M/2)58/D 26/27th March-1958 published in the state Govt. Gazette of 4th April 1958 part-III page 289.	2519.66
			Total	**60,351.10**
18	Hadagarh	Boula**	No.10721-12F(M/2)/58-D dt.26&27.3.1958	10422.40**
19		Salapada**	10721-12F(M/2)/58-D Dt.26th& 27th March'1958	1553.84**
			G.Total	**72327.34**
Source : DFO, Keonjhar WL Division				

In SalapadaRF out of total area of 1553.84 Ha., 757.41 Ha. was de-reserved vide 06 nos. of de-reservation notification giving a balance of 796.43 Ha. which is under active encroachment.Thus the RF has been excluded from the purview of this working plan along with the Boula RF as [It was also excluded from **outgoing approved working plan.].

The total area of three numbers of PRF Blocks comes to 214.07 Ha. The action to be taken for declaration of R.F U/s-21 of Orissa Forest Act, 1972 is pending since long. The list of P.R.F is given in the Table No. 2.3.

Table No. 2.3 :List of PRF with notified area.

Sl.No.	Range	P.R.F.	Notification No. & Date	Area in ha.
1.	Brahmanipal	Brahmanipal	No. FS-67/78/30529/R dt. 05.05.78	45.08
2.		Sapanaposi	No. FS-69/78/30092/R dt. 29.05.78	57.29
3.		Tangiriapal	No. FS-18/78/78/12302/R dt. 29.02.78	111.7
			Total	**214.07**
Source : DFO, Keonjhar WL Division				

The maps of eight numbers of the D.P.Fs are not available in the office of Divisional Forest Officer, Keonjhar (W.L) Division. However, the maps of two D.P.Fs are available in the Division Officewhichdoes not tally with the exact area in the ground. Meanwhile, one settlement operation has already been carried out. Hence the area of these D.P.Fs should be resurveyed with DGPS in accordance with village sheet and appropriate action should be taken for declaring such area as PRF and subsequently R.F. All D.P.F Blocks are brought under this Working Plan Management. The list of D.P.Fs is given in the Table No. 2.4.

Table No.2.4 : The list of D.P.Fs

Sl.No.	Name of the Range	Name of the D.P.F.	Recorded Area(Ha.)
1	Anandapur	Andharijodi	131.93
2		Baniajodi	80.94
3		Biragovindapur(A)	388.51
4		Biragovindapur(B)	20.23
5		Sanapurunapani	127.48
6		Talagaon(A)	213.68
7		Talagaon(B)	186.56
8	Deogaon	Alughati	48.56
9		Madhubhandar	64.75
10	Brahmanipal	Champapal	157.83
Total:			**1420.47**
Source : DFO, Keonjhar WL Division			

There are 8 Nos PF Blocks in the Division. The total area of P.F Blocks is 216.8324 Ha. These areas have been mutated in favour of Forest Department in lieu of forest land diverted for non-forestry purposes under Forest (Conservation) Act, 1980 and declared U/s-33 of Odisha Forest Act, 1972. In the outgoing plan P.Fs were not included. The list of the P.F

Blocks is given in the Table No. 2.5.

Table No. 2.5 : List of the P.F Blocks				
Sl.No.	Name of the ProtectedForests	Name of Range	Notification No.	Area (in Ha.)
1.	Arjunbania	Anandpur	10F(Div)-7/2008/3460/ F&E dtd 3.8.2017	12.08
2.	Matha	Hadagarh	10F(CON)-209/2017(PT)-19049/F&E Dt.11.09.17	32.9981
3.	Asanbahali	Deogaon	10F(CON)-209/2017(Pt.) /19056/F&E dtd 11.09.2017.	90.00
4.	Bahabaradanda	Hadagarh	10F(CON)-209/2017(PT)-19066/F&E Dt.11.09.17.	32.7630
5.	Asia	Hadagarh	10F(CON)-209/2017(PT)-19042/F&E Dt.11.09.17	12.9985
6.	Thunigaon	Hadagarh	10F(CON)-209/2017(PT)-19035/F&E Dt.11.09.17	3.9983
7.	NuaRugidi	Hadagarh	10F(CON)-209/2017(PT)-19028/F&E Dt.11.09.17	15.9973
8.	PadhiarPalli	Hadagarh	10F(CON)-209/2017(PT)-19021/F&E Dt.11.09.17	15.9972
			Total	**216.8324**
Source : DFO, Keonjhar WL Division				

There are 56 Village Forests notified by Govt. of Odisha over an area of 411.54 Ha. All VFs have been brought under purview of this plan as per the recommendation of the Standing Consultative Committee. The list of V.F is given in the Table No. 2.6.

Table No.2.6 : List of Village Forests				
Sl No.	Name of the Range	Name of Village Forest	Notification No.	Area in ha.
1	Anandapur	Salapada	No. 19852/F&E dt. 13.11.91	5
2		Hasanpur	No. 19852/F&E dt. 13.11.91	5
3		Bailo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
4		Khailo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
5		Patapal	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
6		Kalimati	AFFN(SIDA) 3756/F&E dt. 18.02.1992	11.46
7		Tampo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
8		SalapadaCol.(B)	AFFN(SIDA) 3892-24958/F&E	10.2
9		Barigaon	AFFN(SIDA) 3892-24958/F&E	4.43
10		Madanpur	AFFN(SIDA) 3892-24958/F&E	7.52
11		Panchiora	AFFN(SIDA) 3892-24958/F&E	0.57
12		Saladei	AFFN(SIDA) 3892-24958/F&E	1.45
13		Patapada	AFFN(SIDA) 3892-24958/F&E	5
14		Anjar	AFFN(SIDA) 3892-24958/F&E	3.68
15		Madanpur	AFFN(SIDA) 3892-24958/F&E	11.5
16		Suanpada	AFFN(SIDA) 3892-24958/F&E	7.6
17		Lunuhar	AFFN(SIDA) 3892-24958/F&E	7.59
18		Godipatna	AFFN(SIDA) 3892-24958/F&E	5
19		Sarei	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.04
20		Satatira	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.4
21		Haridapal	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.43

22		Kalaragadia	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.44
23		Golabandha	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.96
24		Kundibahali	Assn(SIDA)91- 1977-F&E dt.28.01.92	6
25		Anranga	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.3
26		Talagaon	Assn(SIDA)91- 1977-F&E dt.28.01.92	8.64
27		Khadibil	Assn(SIDA)91- 1977-F&E dt.28.01.92	4.93
28		Fakirpur	Assn(SIDA)91- 1977-F&E dt.28.01.92	13.19
29		Panchupali	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.7
30		Bailo	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.28
31		Khalana	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.3
32	Hadagada	Saramanga	AFFN(SIDA)3892-24958/F&E	1.4
33		Ambo	AFFN(SIDA)3892-24958/F&E	6.5
34		Tarava	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.08
35		Bancho	Assn(SIDA)91- 1977-F&E dt.28.01.92	3.496
36		Jambhara	Assn(SIDA)91- 1977-F&E dt.28.01.92	13.5
37		Jambhara (Majhisahi)	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.85
38		Ambrutpur	Assn(SIDA)91- 1977-F&E dt.28.01.92	1.85
39		Aitpur	No. 19852/F&E dt. 13.11.91	5
40		Anjara	No. 19852/F&E dt. 13.11.91	5
41		Govindapur	No. 19852/F&E dt. 13.11.91	10
42		Balipada	No. 19852/F&E dt. 13.11.91	10
43	Deogaon	Kantipada	No. 19852/F&E dt. 13.11.91	71.19
44		Chasatangar	No. 19852/F&E dt. 13.11.91	5.074
45		Pitatangar	No. 19852/F&E dt. 13.11.91	5
46		Bayapita	No. 19852/F&E dt. 13.11.91	5.5
47		Raidhiha	No. 19852/F&E dt. 13.11.91	5
48		Singibila	No. 19852/F&E dt. 13.11.91	6
49		Hatisila	AFFN(SIDA)3892-24958/F&E	5.3
50		Rekutia	AFFN(SIDA)3892-24958/F&E	10
51		Kainipura	AFFN(SIDA)3892-24958/F&E	10
52		Kainipura	Assn(SIDA)91- 1977-F&E dt.28.01.92	1.94
53		Kathapala	Assn(SIDA)91- 1977-F&E dt.28.01.92	11.25
54		Raidiha	AFFN(SIDA)38/92-3264/F&E	10
55		Aonlajodi	AFFN(SIDA)38/92-3264/F&E	5
56		Singibila	AFFN(SIDA)38/92-3264/F&E	10
			Total	**411.54**
Source : DFO, Keonjhar WL Division				

The maps of VFs could not be traced. But the survey team tried to locate these VFs and their present position with the help of local people. Theresult of such verification has been enclosed in **Appendix–III.**

2.1.4 The District Level Committee Report (DLC) jointly singed by the Divisional Forest Officer, Keonjhar Forest Division and Collector, Keonjhar in connection with Writ Petition (Civil) No. 202/1995-TN Godavarman Thirumalkpad–Vrs-Union of India and others included all Forest Blocks of the Division along with small chunk of revenue forest land. These revenue lands are not included in this plan. There is no scientific management prescription for these lands but some of the forests are managed under the control of "Vana Samrakashyan

Samiti" (VSS). The DLC report is enclosed in **Appendix - IV.**

2.1.5 The Office buildings and other construction works carried out in non-forest land categorised as un-classed forest are given in a tabular statement in **Appendix-V**. All the Forest Blocks of Keonjhar (Wildlife) Division are included in 09 Topo Sheets (Scale 1 : 50,000) prepared by Survey of India. These are open series topo sheets published during 2015 given in Table No. 2.7.

Table No.2.7: Topo Sheet details.

Sl. No.	Range	Topo Sheet No.
01.	Brahmanipal	F45N11, F45N12,F45N15, F45N16
02.	Deogaon	F4503, F4504,F45N15, F45N11,F45N12, F45N16
03.	Anandapur	F4502, F4503,F4504,F45N15
04.	Hadagarh	F4503, F4504,F4507, F4508

2.2 DISTRIBUTION OF AREA :

2.2.1 There is major difference between the topo sheet published during 1976 by S.O.I (restricted) and the open series topo sheet published during 2005. 09 Nos. of R.Fs notified during 1958 under Indian Forest Act, 1927 and afterward regarded as deemed Reserve Forest under Odisha Forest Act, 1972. Final settlement work have been completed during 1975-76 to 1978-79 in Anandpur Sub-Division and maps (Mouza Sheet) along with ROR have already been published before 25th October, 1980 when the historical Forest (Conservation) Act, 1980 came into force.

The open series topo sheets are prepared by SOI considering the settlements and change of the RF boundary line in some places. During field survey of Keonjhar (W.L) Division, the boundaries of all Forest Blocks (RF, PRF) were verified by GPS. The maps of GPS survey were superimposed on the digitized map of the village sheet in ORSAC, Bhubaneswar from which it is concluded that the areas of some Reserve Forest have already been settled during the last settlement. The notified area and the area changed after settlement have been computed at ORSAC which is given Table No.2.8.

All Recorded Forest blocks with their notifications & de-reservation notifications with their area statements is furnished in **Appendix – VI-A.** Out of which effective management area 58610.92 ha. is brought under the purview of this working plan. Range wise effective management area for allocation to different working circle is furnished below in following table.

Table No.2.8.A: Notified area and management area.

Sl. No.	Range	Name of R.F.	Notified Area in Ha.	Effective area for management in Ha.
1	2	3	4	5
1.	Anandapur	Baigundi	42.49	42.52
2.		Baranga	1329.84	1180.37
3.		Gayalmunda	107.42	120.44
4.		Hatibandha	83.36	82.93
5.	Anandapur	Koldiha	40.14	32.57
6.		Meghanadpoi	328.81	332.86
7.		Nuniapatna	66.37	67.25
8.		Ostapura	528.38	220.157
9.		Panasdiha	61.55	62.39

10.		Patilo	463.38	466.27
11.		Santoshpur	9393.49	8125.7925
12.	Deogaon	Kadogotha	60.9	62.228
13.	Brahmanipal	Mahulapanga	205.18	207.62
14.		Turkipada	304.99	306.95
15.	Deogaon &	Rebana	32292.83	31097.03117
16.	Brahmanipal	Palaspal	2519.66	2584.57
17.	Deogaon & Anandpur	Atei	12522.31	11589.6544
		Total	***60351.10***	***56581.60307***

Most of the Reserve Forest Blocks have been divided into compartments. The area of various compartments have been computed by considering Mouza sheets with the help of ORSAC. The above information is given as **Appendix –VIB.**

Table No.2.8.B Notified Area & Management area of PRFs, DPFs, PFs & VFs

Sl. No.	Range	Name of PRF	Notified Area in Ha.	Effective area for management in Ha.
1	Brahmanipal	Sapanaposi PRF	45.08	57.95
2		Tangiriapal PRF	57.29	124.16
3		Brahmanipal PRF	111.7	53.99
		Total	**214.07**	**236.10**
Sl. No.	Range	Name of DPF	Notified Area in Ha.	Effective area for management in Ha.
1	Anandapur	Talgaon (A)DPF	213.68	14.18
2		Talgaon (B)DPF	186.56	186.56
3		BiraGobindapur (A)DPF	388.51	388.51
4		BiraGobindapur (B)DPF	20.23	20.23
5		Andharajodi DPF	131.93	76.10
6		Baniajodi DPF	80.94	80.94
7		Sanapurunapani DPF	127.48	127.48
8	Deogaon	Alughati DPF	48.56	48.56
9		Madhubhandar DPF	64.75	64.75
10	Brahmanipal	Champapal DPF	157.83	157.83
		Total	**1420.47**	**1165.14**
Sl. No.	Range	Name of PF	Notified Area in Ha.	Effective area for management in Ha.
1.	Anandpur	Arjunbania	12.08	12.08
2.	Hadagarh	Matha	32.9981	32.9981
3.	Deogaon	Asanbahali	90.00	90.00
4.	Hadagarh	Bahabaradanda	32.7630	32.7630
5.	Hadagarh	Asia	12.9985	12.9985
6.	Hadagarh	Thunigaon	3.9983	3.9983
7.	Hadagarh	NuaRugidi	15.9973	15.9973
8.	Hadagarh	PadhiarPalli	15.9972	15.9972
		Total	**216.8324**	**216.8324**

Sl. No.	Range	No. of VF	Notified Area in Ha.	Effective area for management in Ha.
1	Anandapur	31	177.610	177.313
2	Hadagarh	11	72.676	72.676
3	Deogaon	14	161.254	161.254
	Total	**56**	**411.540**	**411.243**
		Grand Total	**62614.0124**	**58610.91847**

The area of RF & PRF in previous outgoing plans is furnished in **Appendix-VII.**

2.2.2 Forest Area under different Working Circle : The area of Forest Blocks allotted to different working circles in the present Working Planof Keonjhar (W.L) Division is given in Table No. 2.9.

Table No.2.9.A Forest Range wise Exclusive and Overlapping Working Circle area of Keonjhar (WL) Division

Sl. No.	Name of Working Circles	Anandapur Range	Deogaon Range	Brahmanipal Range	Hadagarh Range	Total Area of Working Circle
1	Rehabilitation W.C (Ha.)	6508.657	10278.7224	12934.61	0	**29721.9894**
2	Improvement W.C(Ha.)	5476.37	5362.50	7503.47	0	**18342.34**
3	Protection W.C (Ha.)	2268.3025	0	5045.21117	0	**7313.51367**
4	Plantation W.C (Ha.)	854.393	574.254	1617.00	187.4284	**3233.0754**
	Total	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.91847 or 58610.92**
5	JFM(O) W.C.(Ha.)	3485.313+ 47.00*	3112.254+ 112.00*	2411.00	72.676+ 477.00*	**9081.243+ 636.00***
6	NTFP(O)W.C.(Ha.)	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.92**
7	Wild Life (O)W.C.(Ha.)	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.92**

***VSS area inside Revenue Forest**

The details of area working circle Range wise & Forest block wise are furnished below.

Table No.2.9.B Block wise & Working Circle wise Area of Reserve Forest of Keonjhar (W.L) Division

1	2	3	4	5	6	7	8
SL. No.	Name of Range	Name of Forest Block	Total Area under prescription	Rehabilitation WC	Improvement WC	Plantation WC	Protection WC
1	Anandapur	Panasadiha	62.39	62.39	0	0	0
2		Santoshpur	8125.7925	1132.82	4558.92	208.00	2226.0525
3		Baranga	1180.37	963.37	0	217.00	0
4		Gayalamunda	120.44	109.44	0	11.00	0
5		Ostapura	220.157	171.157	0	49.00	0
6		Nuniapatna	67.25	0	0	25.00	42.25
7		Hatibandha	82.93	72.93	0	10.00	0
8		Meghanadpoi	332.86	314.86	0	18.00	0
9		Patilo	466.27	465.27	0	1.00	0
10		Baigundi	42.52	42.52	0	0	0
11		Koldiha	32.57	32.57	0	0	0
12		Atei	3290.78	2247.33	917.45	126.00	0
	Deogaon	Atei	8298.8744	4610.0144	3587.86	101.00	0
13		Kadagotha	62.228	62.228	0	0	0
14		Palaspal	191.11	191.11	0	0	0
15		Rebana	7298.70	5302.06	1774.64	222.00	0
	Brahmanipal	Rebana	23798.33117	9886.65	7503.47	1363.00	5045.21117
16		Mahulpanga	207.62	207.62	0	0	0
17		Turkipada	306.95	188.95	0	118.00	0
		Palaspal	2393.46	2272.46	0	121.00	0
		Total	56581.60307	28335.7494	18342.34	2590.00	7313.51367

Table No.2.9.C Range Wise & Working Circle wise Area of Proposed Reserve Forest of Keonjhar (W.L) Division

1	2	3	4	5	6	7	8
SL. No.	Name of Range	Name of Forest Block	Total Area under prescription	Rehabilitation WC	Improvement WC	Plantation WC	Protection WC
1	Brahmanipal	Sapanaposi PRF	57.95	42.95	0	15	0
2		Tangiriapal PRF	124.16	124.16	0	0	0
3		Brahmanipal PRF	53.99	53.99	0	0	0
		Total	236.10	221.10	0	15	0

Table No.2.9.D Range Wise & Working Circle wise Area of Demarcated Protected Reserve Forest of Keonjhar (W.L) Division							
1	2	3	4	5	6	7	8
SL. No.	Name of Range	Name of Forest Block	Total Area under prescription	Rehabilitation WC	Improvement WC	Plantation WC	Protection WC
1	Anandapur	Talgaon (A)DPF	14.18	14.18	0	0	0
2		Talgaon (B)DPF	186.56	186.56	0	0	0
3		BiraGobindapur (A)DPF	388.51	388.51	0	0	0
4		BiraGobindapur (B)DPF	20.23	20.23	0	0	0
5		Andharajodi DPF	76.10	76.10	0	0	0
6		Baniajodi DPF	80.94	80.94	0	0	0
7		Sanapurunapani DPF	127.48	127.48	0	0	0
8	Deogaon	Alughati DPF	48.56	48.56	0	0	0
9		Madhubhandar DPF	64.75	64.75	0	0	0
10	Brahmanipal	Champapal DPF	157.83	157.83	0	0	0
		Total	**1165.14**	**1165.14**	0	0	0

Table No.2.9.E Range Wise & Working Circle wise Area of Protected Reserve Forest of Keonjhar (W.L) Division							
1	2	3	4	5	6	7	8
SL. No.	Name of Range	Name of Forest Block	Total Area under prescription	Rehabilitation WC	Improvement WC	Plantation WC	Protection WC
1.	Anandpur	Arjunbania	12.08	0	0	12.08	0
2.	Hadagarh	Matha	32.9981	0	0	32.9981	0
3.	Deogaon	Asanbahali	90.00	0	0	90.00	0
4.	Hadagarh	Bahabaradanda	32.7630	0	0	32.7630	0
5.	Hadagarh	Asia	12.9985	0	0	12.9985	0
6.	Hadagarh	Thunigaon	3.9983	0	0	3.9983	0
7.	Hadagarh	NuaRugidi	15.9973	0	0	15.9973	0
8.	Hadagarh	PadhiarPalli	15.9972	0	0	15.9972	0
		Total	**216.8324**			**216.8324**	

Table No.2.9.F Range Wise & Working Circle wise Area of Village Forest of Keonjhar (W.L) Division							
1	2	3	4	5	6	7	8
SL. No.	Name of Range	No. of VFs	Total Area under prescription	Rehabilitation WC	Improvement WC	Plantation WC	Protection WC
1	Anandapur	31	177.610	0	0	177.313	0
2	Hadagarh	11	72.676	0	0	72.676	0
3	Deogaon	14	161.254	0	0	161.254	0
		Total	**411.243**			**411.243**	

2.3 PERCENTAGE OF FOREST WITH SECURED BOUNDARIES :

2.3.1 District Boundaries :

The length of forest boundary between Keonjhar and adjacent district i.e. Mayurbhanj, Bhadrak and line hardly carried out. Posting of pillars have been also neglected in these common boundary.

Division Boundary: The adjoining divisions of Keonjhar (W.L) Division are Keonjhar (T) Division, Karanjia(T) Division, Bhadrak (W.L) Division, Balasore (W.L) Division Cuttack (T)Division and Dhenkanal Division. These inter Divisional boundary shall be cleared to width of 15.00 mtr.

Boundary& Pillars of Reserve Forests: All the Reserve Forests have been surveyed. According to National Map Policy'2005, Survey of India prepared the map in scale 1:50,000. The boundary of Reserve Forests needs to be cleared to a width of 10.00 mtr.

2.3.2 The total length of boundary of R.Fs is 474.7716Kms.and P.R.F block is 16.821 Kms. Thelength of Boundary along with numbers of pillars have been furnished in table below.

Table No. 2.10 (A) : RF wise Length of boundary along with numbers of pillars.					
Sl. No.	Range	Name of R.F.	Length of Boundary line (In Km)	No. of Boundary Pillars as per notification	Remarks
1	2	3	4	5	6
1	Anandapur	Baigundi	4.767	47	
2		Baranga	37.00	116	
3		Gayalmunda	10.123	109	
4		Hatibandha	9.420	50	
5	Anandapur	Koldiha	4.5456	54	
6		Meghanadpoi	11.9914	79	
7		Nuniapatna	4.300	16	
8		Ostapura	15.460	126	
9		Panasdiha	3.200	45	
10		Patilo	14.700	81	
11	Deogaon	Kadogotha	3.431	37	
12	Brahmanipal	Mahulapanga	11.8136	48	
13		Palaspal	36.860	213	
14		Turkipada	11.040	109	
15	Anandapur	Santoshpur	81.860	398	

16	Deogaon & Brahmanipal	Rebana	154.100	590	
17	Deogaon & Anandpur	Atei	60.160	439	Pillar S.L. No. 215 to 653.
		Total	**474.7716**	**2557**	

Table No. 2.10 (B)PRF wise boundary length					
Sl. No.	Range	Name of P.R.F	Boundary Length (in km)	No. of Boundary Pillars	Remarks
1	Brahmanipal	Brahmanipal	5.2892	44	
2	Brahmanipal	Sapanposi	5.099	30	
3		Tangiriapal	6.4328	43	
		Total	**16.821**	**117**	

Maintenance of boundary is in great disorder in Reserve Forests like Rebana, Palaspal. Pillars have been damaged to such an extent that it becomes difficult to identify the boundary line of R.F in the field. Mainly the stone cairnsare completely damaged. In some forest blocks like Atei R.F Agave has been planted on the boundary line. It is absolutely necessary for reposting/repair of boundary pillars basing on GPS reading and as per RF Notification immediately. The DFO, Keonjhar (W.L) Division has taken steps for construction of new pillars in R.Fs like Barang R.F, Rebana R.F and Atei R.F. Theinter divisional boundary have not also been maintained properly. Maintenance of the boundary pillars arevery poor like missing of pillars, damaged pillars, erection of substandard pillars. Pillars without serial number or wrong numbers are also found in Rebana R.F. Furthermore, the boundary pillar in the field should tally with boundary in the map. This aspect should be carefully looked after in almost all blocks except Barang R.F. The boundary lines have not been cleared since long. Even in most of the Reserve Forest boundary line, trees having two or three feet girth are available. The provision of Rule,168 of OFD Code and relevant prescription of outgoing plan has not been followed in some cases.. Shifting of boundary pillars attracts legal provisions under Orissa Forest Act, 1972. It is non-bailable offence. Action should have been initiated against offenders as per Section-67 of OFA,1972. Present status of boundary pillar after field verification isgiven in Table No. 2.11.

Table No. 2.11: Status of Boundary Pillars of RFs and PRFs							
RF Name	No. of Pillars as per Notification	Existing	Types		Condition		
			Stone cairn	C.C	Intact	Partially damaged	Completely damaged
Baranga	116	90	5	85	87	2	1
Baigundi	47	17	17		11	4	2
Patilo	81	30		30	19	7	4
Meghanadpoi	79	45		45	27	5	13

Gayalmunda	109	64		64	39	17	8
Panasdiha	45	39	3	36	27	11	1
Hatibandha	50	24		24	24		
Ostapura	126	10		10	9	1	
Nuniapatna	16	4		4	4		
Kadugotha	37	11		11	8	2	1
Koldiha	54	16		16	3	6	7
Atei	439 (215 to 653)	314	104	210	201	80	33
Santoshpur (Settlement Area)	398	398	142 29	227	304 19	50 6	15 4
Palaspal	213	171	62	109	105	29	37
Turkipada	109	13	4	9		11	2
Mahulpanga	48						
Rebana	590	560	196	364	392	98	70
Sapanposi	30	1		1			1
Tangiriapal	43	-	-	-	-	-	-
Brahmanipal	44	5		5	4	1	
Total	**2674**	**1812**	**562**	**1250**	**1283**	**330**	**199**

The boundary verification of Protected Forests, Demarcated Protected Forests and Village Forests were also carried out. No pillars were found in DPFs and VFs. In case of PRF,pillar posting has been made only in common boundary area.

2.3.3 The stone cairnsare cheaper, easy to construct than masonry pillars. But these require frequent repair. At times local people shift the boundary pillars to a convenient place for encroachment. Shifting of boundaries is a common phenomenon in Rebana R.F. Steps should be taken to re-fix the boundary pillars after proper demarcation. The guidelines issued by Principal Chief Conservator of Forests, Odisha for construction of boundary pillar should be strictly adhered to which given in **Appendix-VIII(A)**.

2.3.4 As described in para 2.2.1. The Reserve Forests whose boundaries have been changed after final settlement during 1975 to 1979 should be re-demarcated by DGPS survey and boundary pillars should be posted accordingly. Re-notification is desired by competent authority.

2.3.5 There are few villages inside Rebana R.F, Santoshpur R.F, Atei R.F. and Ostapura R.F whose boundary need to be ringed out and masonry pillars are to be posted with serial numbers. The forest area settled after enactment of FRA 2006 should also be demarcated with immediate effect.

2.4 LAND USE, LAND USE CHANGE AND FORESTRY :

An area over 337.48Ha. has been diverted for non-forestry purposes U/s-2 of Forest (Conservation) Act, 1980 which are given in Table No. 2.12.

Table No.2.12: Area diverted under Forest (Conservation) Act, 1980

Sl. No.	Range	Name of Forest Block	Name of the project approved under FC Act.	Final approval order	Forest area diverted (In ha.)	Purpose of diversion
1	Brahmanipal	Rebana RF	Widening of existing ghat road in Rebana RF	8(26)1/2000-FCE dt.6.8.01	0.7925	Road
2	Brahmanipal	Rebana RF	Daitari Iron ore Mines	8-164/97-FC dt.27.1.05	59.254	Mining
3	Brahmanipal	Rebana RF	Exploratory drilling for Atomic Minerals by AIIM	ORB-036/2006-BHU dt.21.5.08	0.000012	Mining
4	Anandapur	Baranga RF	Jhinkdova Minor Irrigation Project	8-275/FCE dt.26.3.97	1.76	Irrigation
5	Deogaon &Brahmanipal	Atei&Rebana RF	Laying of slurry pipeline M/S. BRPL. Ltd.	5-ORC140/2011-BHU dt.17.8.02	1.9878	Mining
6	Deogaon &Brahmanipal	Atei&Rebana RF	Improvement of road from Sagadpata to Barigaon in Harichandanpur-Brahmanipal road project.	10F(Cons)540 /12-2306/F&E dt.4.2.13	4.961	Road
7	Deogaon	Atei RF	Slurry pipeline Tanto to Paradip, M/S ESSAR Steel	5-ORB-166/2013-BHU dt. 23.9.03	0.451	Mining
8	Anandapur	Santoshpur RF	Baitarani Power Project	5-ORC123/2011-BHU dt.26.11.14	10.2239	Energy
9	Brahmanipal	Rebana RF	DaitariExtension area Township project	8-02/2013-FC dt.27.8.14	249.968	Mining & allied
10	Anandapur	Ostapura RF&Gramya Jungle	Strengthening & widening of NH-215 from Panikoili to Rajamunda road	8-01/2014-FC dt.6.5.14	7.353	Road
11	Deogaon & Brahmanipal	Atei &Rebana RF	Slury Pipe Line (Essar Steel Ltd)		0.724	Mining
				Total	**337.47521**	

Source : DFO,Keonjhar W.L Division

Apart from that, 106.016ha. area of Rebana RF has got stage-1 Clearance for proposed Conveyor corridor of OMC Ltd. Further 413.762ha. area of Rebana RF and 53.7080ha. of Talapada Revenue Forest is pending for lease out to OMC Ltd.

Forest land up to 1 Ha. Involving felling up to 75 trees per ha. diverted for Govt. projects U/S-30(2) of Forest Right Act,2006. An area of 9.69872 Ha. has been diverted under Forest Right Act,2006, the details of which is given in Table No. 2.13.

Table No.2.13.A: Forest land diverted for Govt. Projects.

Sl. No.	Name of the Division	Name of the Govt. managed project/ User Agency	Location	Forest Area diverted in ha.	Name of Forest Block	Purpose of diversion
1	2	3	4	5	6	7
1	Keonjhar Wildlife Division, Anandpur	Construction of road from Dhakotha to Arjunabania	Dhakotha	0.15	Atei	Road
2		Construction of road from Nandabar to Nanikabahili	Nandabar	0.91	Baranga	Road
3		Construction of road from Badeikatali to Salukdahi	Badeikatali	0.98	Atei	Road
4		Construction of road from NH – 215 to Tikira	Tikira	0.287	Atei	Road
5		Supply of Electricity from Taneipal to Budhikud	Budhikud	0.3836	Santoshpur	Electricity
6		Supply of Electricity from Jhinkipita to Salukdahi	Salukdahi	0.54	Atei	Electricity
7		Construction of road from Arjunachua to Keshapada	Keshapada	0.184	Rebana	Road
8		Construction of road from Rebana to Sanajjimei	Sanajimei	0.94	Rebana	Road
9		Supply of Electricity to Panganal village	Panganal	0.981	Rebana	Electricity
10		Supply of Electricity to Rugudipanga	Regudipanga	0.39	Rebana	Electricity
11		Construction of road from Nuasahi to Express Highway	Nuasahi	0.38	Rebana	Road
12		Construction of building (Club) in Baliparbat village	Baliparbat	0.0111	Rebana	Building
13		Construction of building of Marshal Club, Daitari	Daitari	0.0145	Rebana	Building
14		Construction of road from Tinipolia of Pancham village to Khajuria (Pancham)	Pancham	0.03305	Rebana	Road
15		Construction of Water harvesting structure in Baliparbat village	Baliparbat	0.02	Rebana	WHS
16		Construction of Water harvesting structure in Panganal	Panganal	0.024	Rebana	WHS
17		Construction of road from Jhinkipita to Jhatia	Jhatia	0.70	Atei	Road
18		Construction of road from Fulbahali to Batasahi	Batasahi	0.252	Kadagotha	Road

19		Construction of road from Panchugochhia to Betanati via Kasibeda	Betanati	0.672	Atei	Road
20		Construction of road from Dantiani to Kaduadihasahi	Kaduadihasahi	0.909	Rebana	Road
21		Construction of Culvert at Barigaon village	Barigaon	0.04047	Rebana	Culvert
22		Supply of Electicity from Nalidhaba to Guhiasal	Guhiasal	0.60	Rebana	Electricity
23		Construction of 132 KV transmission line from Bhadrak to Anandpur	Panchupalli	0.297	Panchupalli VF	Electricity
			Total	**9.69872**		
Source : DFO, Keonjhar WL Division						

Details of C.A. in lieu of forest land and details of non-forest land in lieu of forest land diverted has been depicted in following Table:-

Table No.2.13.BComp. Affn. Programme during 2003-04 to 2020-21 in Keonjhar Wildlife Division, Anandapur

Year	Scheme	Name of the User Agency	Diverted Forest land	Plantation sites	Area in ha.
1	2	3	4	5	6
2004-05	Comp. Affn.	Joda East Iron Ore Mines of M/s. TISCO Ltd.	Keonjhar (T) Division	Deulahudi Rannipada Kantala Putujhari Haribeda Bhalughara Deojharana Uleikundi (Revenue land)	16.3860 40.4683 19.9065 4.8764 9.7084 22.0028 6.7178 6.9444 **127.0106**
2005-06	Do	OMC Ltd of M/s. Diatari	Rebana RF	Turkipada (RF)	100.00
2006-07	Do	OMC Ltd of M/s. Diatari	Rebanab RF	Rebana RF near Kanjiapal	91.20
		Jhilong LongLota Iron/ Manganese Mines by ESSEL	Keonjhar (T) Division	Asia (Revenue Land)	4.597
2010-11	Do	Canal System Baitarani Barrage Anandapur		Arjunabania (PF)	5.00
2015-16	Do	Khandabandha TICSO Ltd	Keonjhar (T) Divn	Rebana RF Near Baripal	4.00
		Essar Steel India Ltd. Water Pipe Line	Rebana RF	Rebana RF Bhagamunda	8.00
2016-17	Do	Daitari Extension of M/s. OMC Ltd.	Rebana RF	Asanbahali (PF) Bahabaradanda(PF) Rebana RF(PCA)	48.00 23.763 499.936 **571.699**
2017-18	Do	Daitari Extension of M/s. OMC Ltd.	Rebana RF	Bahabaradanda(PF) Asia (PF) Matha (PF) Thunigaon (PF) Padhiaripally (PF) NuaRugudi (PF) Bahabaradanda (PF)	4.00 13.00 33.00 4.00 16.00 16.00 5.00 **94.00**

2018-19	Do	Extraction of Stone Boulder for construction of NH-215 by M/s Gayatri Ltd.	Revenue Forests	Samana Village (Revenue Forest)	8.09
		Jhiling Long Lota of M/s. Essel Mining and Industries	Keonjhar (T) Divn	Atei RF near Asanabahali (PF)	30.8047
		Daitari Extension of M/s. OMC Ltd.	Rebana RF	Atei RF near Asanabahali (PF)	42.00
2020-21	Do	Pyrophyllite mines at Rampakote diversion of 3.5936 ha in Rebana RFM/s. K B Pahi	Rebana RF	Rebana RF Near Daitri	0.879
				Rebana RF Near Daitri	1.10

2.4.1 Change in Forest Cover :

Forest Survey of India, Dehra Dun conducted survey of forest cover on the basis of satellite imagery of all States and published report in the India State of Forest Report in every two years interval. The report classified forest cover into following categories on the basis of crown density.

Sl. No.	Classification of Forest Cover	Canopy Density in percentage.
1.	Very dense forest	70% and above.
2.	Moderately dense forest	40 – 70%.
3.	Open forest	10-40%.
4.	Scrub	Less than 10%

The latest 'India State of Forest Report was published in 2017' and the previous was published in the year 2015. On comparison of the forest cover of Keonjhar (W.L) Division for the year 2017 and 2015, the following change of forest cover under various categories was noticed, which is given in Table No. 2.14.

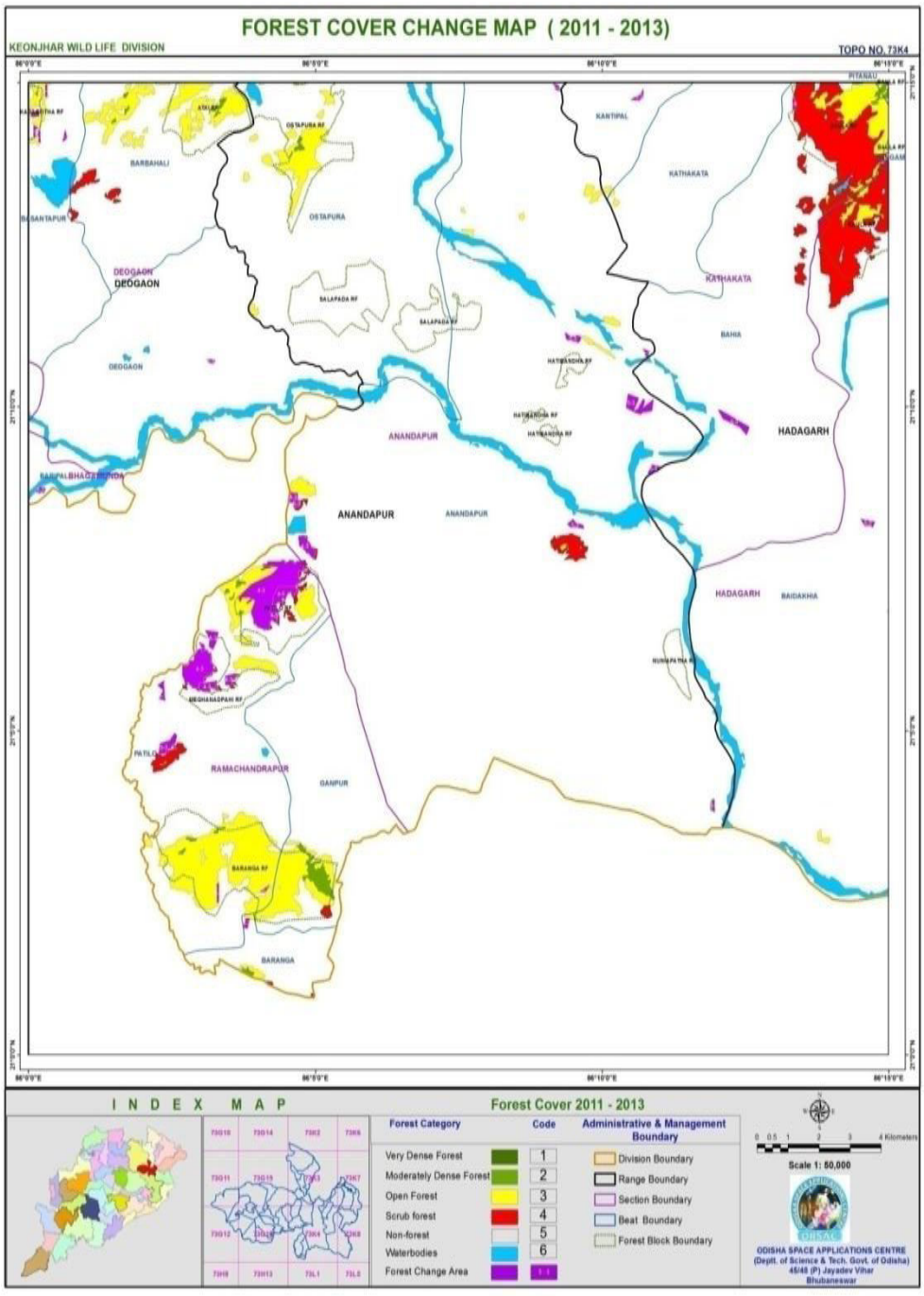
Table No.2.14: Forest cover change in Keonjhar Wildlife Division

Type of Forest Cover	FC Data-2015 Area in ha	FC Data – 2017 Area in ha	Forest Cover change between 2015 & 2017
Very dense forest	12762.67	12707.74	-54.93
Moderately dense forest	24233.62	24130.90	-102.72
Open forest	32819.68	33471.45	651.77
Scrub	1877.69	1895.01	17.32
Non-Forest.	124665.45	128676.43	4010.98
Source : FITGC, Aranya Bhawan, Bhubaneswar.			

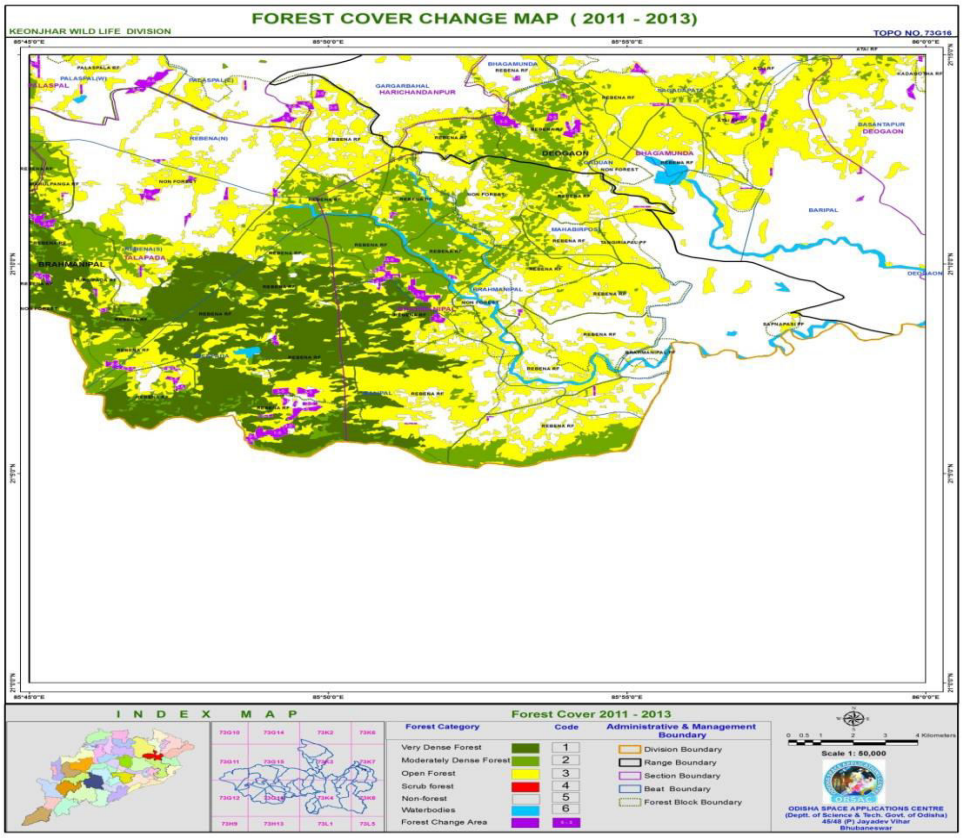
On analysis, it is observed that there is a negative trend in change in forest cover. The

areas of very dense forests and moderately dense forests have decreasedwhereasthat of open forests and scrub forests has increased. The mean overall density of forest has decreased and there is a trend in increase of non-forest area in Keonjhar (W.L) Division.
The Beat wise Forest Cover change matrix of Keonjhar(WL) Division for the year 2011 2013 is given in **Appendix-VIII-B**and that of 2017 & 19 is depicted in **Appendix- VIII-C.** The Forest cover change map (2011 to 2013) prepared by GIS Cell, Office of the PCCF, Odisha is given in Map No.2.1 to 2.5

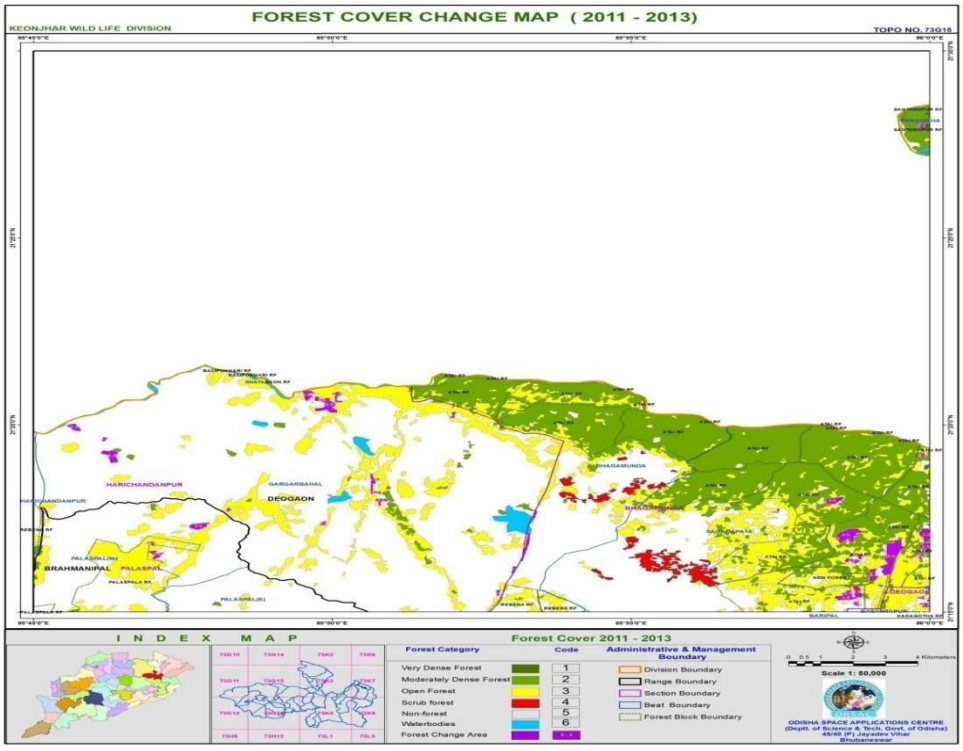
Map No. 2.1 : Maps of Ostapura R.F, Barang R.F, Kadagotha R.F (Part) Patilo RF, MeghanadpoiR.F, Nuniapatna R.F, Hatibandha R.F and Atei(Part) R.F



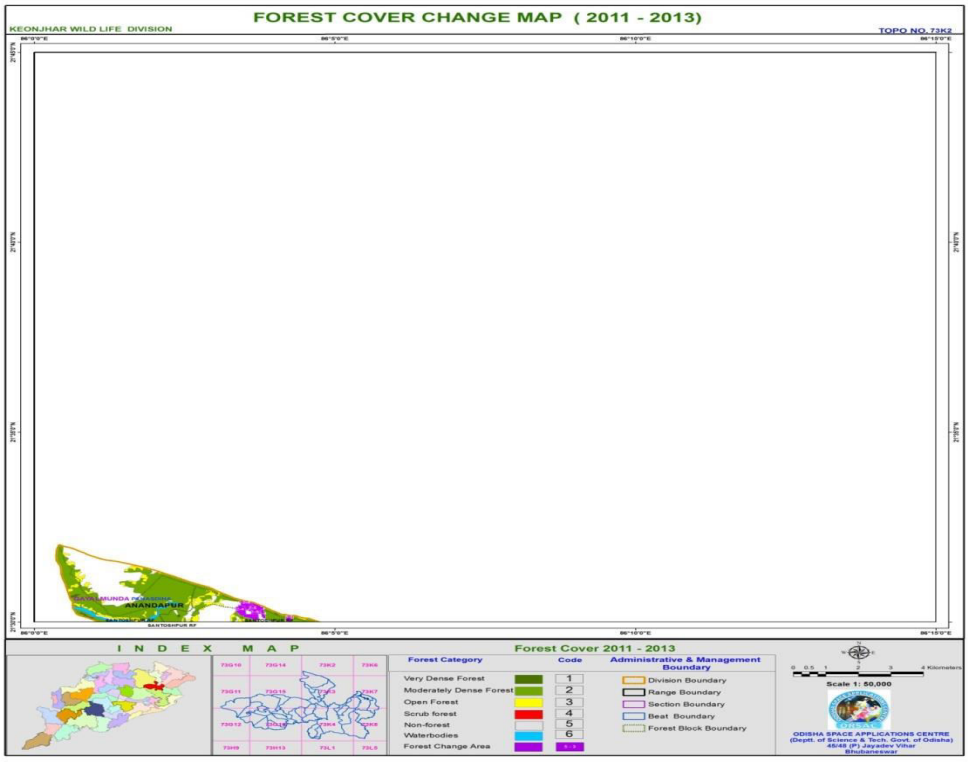
Map No. 2.2 : Maps of Rebana R.F(Part), Palaspal R.F(Part), Atei R.F(Part), Turkipada R.F, Mahulpanga R.F, Kadugotha R.F (Part), Tangiripal P.R.F, Brahmanipal P.R.F and Sapnaposi P.R.F



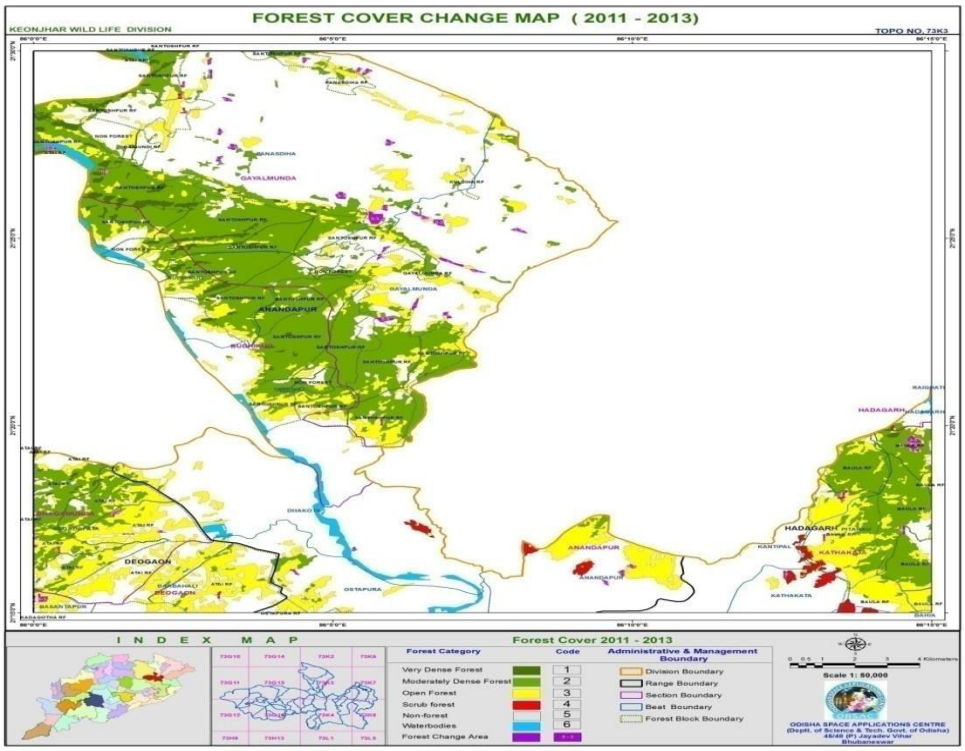
Map No. 2.3 : Maps of Palaspal R.F (Part), Rebana R.F (Part) and Atei R.F (Part)



Map No. 2.4 : Santoshpur R.F (Part)



Map No. 2.5 :Atei R.F (Part), Santoshpur R.F (Part), Panasdiha R.F, Baigundi R.F, Kolidiha R.F, Gayalmunda R.F.



This data indicatesa trend in increase of open forest and non forest in Keonjhar (W.L) Division. This negative change in forest density classes is due to tremendous biotic and abiotic pressure.

2.4.2 **Encroachments :**

Encroachment is a serious problem in this Division since a long time. Mostly encroachments are either for homestead or agriculture purposes. Many offence cases have been initiated against the encroachers and the cases are pending in the court of law. Before 1980, 1927persons haveencroached over an area of 459.75 ha. in different Reserve Forests and other Forest Blocks and cases have been booked for eviction of such encroachment. Similarly, after 1980, 1263 persons have encroached an area of 968.4641 ha. of forest land. Such encroachments have been settled under FRA.

During verification of boundary pillar, the Working Plan team noticed heavy encroachments in many Reserve Forest. Encroachments are very high in Rebana R.Fs. It is very difficult to find out the extent of areaof encroachment because the land allotted to the individuals under FRA-2006 has not been demarcated in the field. The individuals have occupied more area than the actual allotted area. These problems have been discussed in detail in para 8.8.

2.4.3 **Implementation of Forest Right Act, 2006 :**

In Keonjhar Wildlife Division consequent upon implementation of (ST & Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006, till November'2016,1878 numbers of titles have been issuedover an area of 1121.71acre to the beneficiaries for individual right in R.F Blocks. Similarly,82 Nos. of community rights have been issuedmeasuring 62.43acre to the beneficiaries under this Act.R.F wise number of individual beneficiaries and area allotted is given in Table No. 2.15.

Table No. 2.15 :FRA Data from 23.9.2009 to 22.11.2016

Name of R.F.	No. of Individuals	Area allotted (In Acre)	No. of Communities	Area allotted (Acre)	Total	Total Area	
						Acre	Ha.
Rebana	51	52.71	-		51	52.71	21.33
Atei	1267	702.91	73	54.57	1340	757.48	306.548
Santoshpur	428	255.94	9	7.86	437	263.8	106.758
Barang	40	50.84	-		40	50.84	20.574
Ostapura	65	40.85	-		65	40.85	16.531
Baigundi	26	16.78	-		26	16.78	6.790
Patilo	1	1.68	-		1	1.68	0.679
	1878	**1121.71**	**82**	**62.43**	**1960**	**1184.14**	**479.210**

2.4.4 **Land use change and Climate Change :**

Land use change can bea factor for increase in atmospheric carbon dioxideconcentration and is thus a contributor to climate change. International Panel for Climate Change estimates that land use change (e.g: conversion of forest into agricultural land) contributes a net 1.6 ± 0.8 Giga tons carbon per year to the atmosphere.

2.5 THREATS TO THE FORESTS :

There are different types of threats to the existence of forest which can be broadly categorized under two headings i.e. Biotic interference and Natural Interference.

1. Biotic Interference :
   This is one of the major causes responsible for devastation of forests. It results in irreparable loss to the forest. Biotic interference, through illicit felling, forest fire, mining activities, shifting cultivation, encroachment, sweeping of forest floor, girdling of trees , cattle grazing, lopping of branches for ripe and unripen fruits as fodder etc. are the main causes for depletion of forests.
2. Natural Interference :
   Natural calamities like cyclone, flood, drought, presence of climbers, weeds etc. played a major role for loss of forests and wildlife. All these threats have been discussed in detail in Chapter – IV.

2.6 DISTRIBUTION OF DIFFERENT FOREST TYPES :

The forest of Keonjhar (WL) Division comes under the major group Tropical Forest on the basis of "Champion and Seth'' revised classification. Two Varieties of sub-type 3C/C2e (Moist peninsular Sal) occur in different blocks and compartments. Three Types of sub-group 5B (Northern tropical dry deciduous forest) occur in different blocks and compartments. The sub type E4 lateritic Semi Evergreen Forest & $5/DS_1$ Moist Mixed Shrub Deciduous Forest are also seen in this Division. The classification of tropical forest is given in the Table No. 2.16.

Table No. 2.16 : 3C/ $C_{2e\,(ii)}$ (Moist peninsular low level Sal)	
Group3	Tropical Moist Deciduous Forest.
Sub Group	3C North Indian Tropical Moist Deciduous Forest.
Type	$3C/C_2$ Moist Sal bearing forest
Sub-Type	$3C/C_2e$ Moist Peninsular Sal
Variety	$3C/C_2e$ (ii) Moist Peninsular Low-level Sal.

The variety 3C/ $C_{2e\,(ii)}$ i.e. Moist peninsular low level Sal is fairly extensive in the Rebana, Atei and Santoshpur Forest Blocks. In this area, Sal ascends to an elevation of 400 mt above mean sea level and occurs as almost pure crop. The quality of the Sal varies from Q-III to Q-IV. The area is free from frost and regeneration is adequate. The common associates of Sal are *Pterocarpus marsupium, Terminalia alata, Emblica officinalis, Bridelia retusa, Gmelina arborea, Cleistanthus collinus, Careya arborea, Diospyros melanoxylon, Woodfordia fruticosa*. Common climbers are *Bauhinia superba, Combretum decandrum*etc. The classification is given in Table No.2.17

Table No. 2.17:3C/ $C_{2e\,(iii)}$ (Moist peninsular Valley Sal)	
Group3	Tropical Moist Deciduous Forest.
Sub Group	3C North Indian Tropical Moist Deciduous Forest.
Type	$3C/C_2$ Moist Sal bearing forest
Sub-Type	$3C/C_2e$ Moist Peninsular Sal
Variety	$3C/C_2e$ (iii) Moist Peninsular Valley Sal.

The variety 3C / $C_{2e\,(iii)}$ i.e. Moist peninsular valley Sal is confined to moist sheltered valley of Rebana and Santoshpur forest blocks either in small or extensive patches providing better soil and moisture regime and at favourable location consists of good quality Sal

forest. The average quality is IV though it improves to quality III at favorable location. The regeneration is satisfactory. The canopy is dense. The area adjoining to both side of the perennial and semi-perennial nala flowing in the division comes under this variety. The alluvial deposits have been formed of good well drained soil of sufficient depth with adequate supply of sub-soil water. The best Sal forest of this tract is found in this variety. The common associates of Sal are *Terminalia alata, Lagerstroemia parviflora, Anogeissus latifolia, Madhuca indica, Pterocarpus marsupium, Bridelia retusa*. The common under growth are *Indigofera pulchella, Flemengia chapper, Helicteris isora, Clerodendron viscosum* etc. The classification is given in Table No.2.18

Table No. 2.18:5B/C1c (Dry Peninsular Sal Forest)	
Group5	Tropical Dry Deciduous Forest
Sub Group	5B Northern Tropical Dry Deciduous Forest.
Type	C1 Dry Sal Bearing Forest
Sub-Type	C1c Dry Peninsular Sal Forest.

The sub-type 5B / C_{1c} i.e. Dry peninsular Sal forests is found on shallow soil overlying crystalline or metamorphic rocks, where moisture condition is unfavorable for good growth. Sal does not grow well; generally attaining quality IV. Regeneration of Sal inadequate & high percentage of unsoundness of trees of all girth classes in higher slopes. This is due to poor soil, continuous annual ground fire, uncontrolled selective felling and leaving unsound stem. Sal forms almost a pure corp. The growth is poor stunted and many are found malformed. This may be due to frequent annual fire and drought varying proportion of miscellaneous species and also found with Sal as principal species. The Forest Block of Atei (part), Barang (part), Gayalmunda, Mahulpanga, Palaspal, Rebena (part) comes under this category. The common associates are *Terminalia alata, Anogeissus latifolia, Pterocarpus marsupium, Diospyros melanoxylon, Buchnania lanzan, Emblica officinalis, Cassia fistula, Morinda tinctoria, Hollarhena antidysenterica. The common climbers are Bauhinnia vahlii, Smilax species, Helicteris isora, Combretum decandrum* etc. The classification is given in Table No.2.19

Table No. 2.19:5B/C2 (Northern Dry Mixed deciduous Forest)	
Group5	Tropical Dry Deciduous Forest.
Sub Group	5B Northern Tropical Dry Deciduous Forest.
Type	C2 Northern Dry Mixed Deciduous Forest.

The type 5B / C_2 i.e. Northern Dry Mixed Deciduous Forest is scattered throughout the hill tracts having poor humus contain soil. This Type of forest occurs in all most all blocks which exist towards the southern part of the division. The culmination stage of plant succession is noticed in this locality, where the existing Sal crop has been replaced by miscellaneous species owing to excess illicit felling, fire and over grazing. The crop is less open and trees are stunted. The trees remain leafless for a longer period and the forests give a desolate look in summer season. The forest block of Atei (part), Baigundi, Ostapura, Patilo, Rebana (part), Santoshpur (part), Panasdiha comes under this category. The main associates of this forest are *Lagerstroemia parviflora, Terminalia alata, Anogeissus latifolia ,Albizia species, Boswellia serrata, Dalbergia paniculata, Cleistanthus collinus, Gardenia latifolia, Ougeinia oogenensis, Phoenix species* etc. The classification is given in Table No.2.20

Table No.2.20:E4 (Lateritic Semi Ever green forest).	
Group2	Tropical Semi Ever Green Forest.
Sub Group	2B Northern Tropical Semi Ever Green Forest.
Type	General Edaphic and Seral types of Semi-ever Green Forest.
Sub-type	E4 Lateritic Semi Ever Green Forest.

The Sub- Type E_4 i.e. Lateritic Semi-ever Green Forest has the general appearance of the group but the predominance of *Xylia xylocarpa*, which is nearly evergreen, and of different habits from its associates gives it a character of its own. This is an edaphic variation and classified as E_4 Lateritic Semi-ever Green Forest. The rainfall in these areas is comparatively high and the forests have a moist tendency because of proximity to the sea. The average height of *Xylia xylocarpa* in these forests is around 12 meter and girth is around 90 cm. The main associates in this type of forests are *Pterocarpus marsupium, Careya arborea, Strychnos nux-vomica, Anogeissus latifolia, Lagerstroemia parviflora, Lannea coromandelica, Diospyros melanoxylon, Buchnania lanzan, Bridelia retusa, Mangifera indica, Trewia nudiflora, Macaranga peltata, Terminalia tometosa spp. The common undergrowths found in this type of forests are Adhatodavasica, Holarrhena antidysenterica, Murraya paniculata, Clerodendron spp., Broom grass and stray bamboo clumps (Bambusa arundinacea). Butea superba and Combretum decandrum* are the common climbers found in these areas. The density varies from 0.4 to 0.6. The typical site quality of these types of forests is Q III to Q IV. The regeneration of all species is profuse. Because of biotic interference the intensity of *Shorea robusta* is decreasing which promoting the intensity of *Xylia xylocarpa*. The Forest Block of Rebana (part) comes under this category.

Table No.2.21:5/DS1 (Moist Mixed shrub Deciduous Forest).	
Group5	Tropical Dry Deciduous Forest.
Sub Type	5/DS1 Dry Deciduous Shrub Forest.

The Sub- Type 5/DS1 i.e. Moist Mixed Shrub Deciduous Forest is the degradation stage of $5BC_{1c}$ Dry Peninsular Sal forests. This stage came into existence not due to adverse climatic condition but due to maltreatment such as (a) Situation of these forests blocks are in scattered fashion in the outskirts of forest area and are surrounded by villages, (b) Heavy demand for biomass by local public and cattle population from these blocks, (c) Illicit removal of commercially important species, (d) Annual forest fire two to three times in summer, (e) Repeated coppicing and (f) Soil erosion. The soil is generally open to sky, shallow to very shallow depth. Moderate depth is also found in some areas. The soil is mixed with morrum, grits having no fiber and humus content. The canopy is having irregular openings of different sizes with soil and rocks exposed. These areas are eroded having large numbers of gullies further extending to ravines. Some areas are also in gully formation stage. Grasses are found but overgrazed. Unbrowsable thorny grasses are also there. The species of coppice origin occur with top browsed. The trees are normally many stemmed from the thick base. High stumps left after felling is also common. The height of vegetation varies from 6 to 7 meter.

This degradation stage is seen in many forest blocks of the divisions. It is remarkable in the forest blocks like Atei, Baranga, Meghanadpoi, Patilo etc. Proper steps should be taken to control the adverse effects on the vegetation. The main species found in this type of forests are *Shorea robusta, Terminalia alata, Cleistanthus collinus, Madhuca indica, Diospyros montana, Diospyros melanoxylon, Soyamida febrifuga, Chloroxylon swietenia, Emblica officinalis, Woodfordia fruticosa. Many of the shrubs found in this type of forests are either distasteful to the cattle or thorny and these are usually Holarrhena antidysenterica, Randia dumetorum, Carissa spinarum, Diospyros ferrea.*Climbers are not

common in these Forest Blocks but heavy growth of *Combretum decandrum* is found in Atei blocks in comparatively moist area. Sal is the predominant species in these degraded shrubby forests and exists in rooted waste form. It needs special protection and proper tending operations by which, ultimately it can develop in to a beautiful Sal forest and can be brought back to $5B/C_1c$ category. The Forest Block Atei (Part), Barang (part), Hatibindha, Kadagotha, Meghanadpoi, Nuniapatna, Turkipada comes under this category.

2.7 TREE OUTSIDE FOREST :

The Geographical area of Keonjhar (WL) Division is 2030.10 Sq. Kms., out of which 745.89 Sq. Kms.is notified forest area, and 15.3033 Sq. Kms. DLC land, & rest area outside forest controlled by Revenue department. These revenue land area comprises of premises of Govt. offices, college, school, road, agricultural land, agro forestry, farm forestry, industrial plantation, avenue plantation, other urban area, other institutions, temple and private sector etc. and the tree growths existing in these area are addressed as "Tree Outside Forest(**TOF**)".

Apart from the natural growths, during the period2012-13 to 2020-21 the departments like Soil conservation (Watershed), Horticulture has raised plantations and Keonjhar (WL) Division has also raised plantations over the lands outside forests. During this period, Soil conservation department has taken over 165.54 ha. of block plantation and 5rkm of avenue plantation. Horticulture department has raised plantations over 1262.85 ha. of cashew and mango. The Forest department has raised plantation over 140 ha. of block plantation, 100ha. of ANR plantation and 7000no. of trees in small patches amounting a total seedling of 2,51,000 under Green Mahanadi Mission. Besides 295.275 ha.of block plantation amounting to the plants of 5,84,040 in urban areas under various scheme. Further the Keonjhar (WL) Division has distributed seedlings of 33,42,700 to public and institutions on a target of massive plantation in the areas outside forest to augment the tree coverage area.The detail of plantations of different wings has been furnished in the chapter XIII of Part-II.

2.8 SHIFTING CULTIVATION:

Keonjhar has been the strong holds of Bhuyans and Juangas-the people of very primitive tribe groups. Shifting cultivation is an immemorial custom of these tribes and had been officially recognized in the past. Practice of shifting cultivation in this tract is as old as 100 years or more. Although the tribes are practicing shifting cultivation at present but has considerably come down during the last 30 years. In Keonjhar Wildlife Division practice of shifting cultivation is only restricted to Rebana, R.F.

CHAPTER – III

MAINTENANCE, CONSERVATION AND ENHANCEMENT OF BIODIVERSITY

3.1. Introduction :

The tract dealt in this plan is associated with characteristics of variation of temperature from 11.81° C to 43.6ºC and mean annual temperature of 24.67°C with short winter and prolonged summer. The average annual rainfall is 153.45 cm. The tract dealt comes well within 21°32'04" N to 21° 01'27" N latitude and 85°36'18" E to 86°22'13" E longitude of the sub-tropical zone, which is characterized by having an average mean temperature of 12°C during December. Most of the precipitation is concentrated to the monsoon months only and the average rainy day in a year is 70 days. The moisture content of the upper soil remains low due to the hilly and undulating topography and quick drainage of rainwater. Excessive transpiration due to prolonged summer further reduces the moisture content of the inner soil. Because of these factors, the habitat of this tract is dry and uncontrolled forest fire in summer makes it further drier. Due to the prolonged dry season and insufficient moisture content of the soil, the vegetation of this tract is mostly of deciduous type. Both moist and dry deciduous zones of vegetation are seen.

3.1.1 FOREST COMPOSITION AND DISTRIBUTION :

The general characteristics of the vegetation are tropophilous with distinct tendency to attain xerophytic status in many of its species.

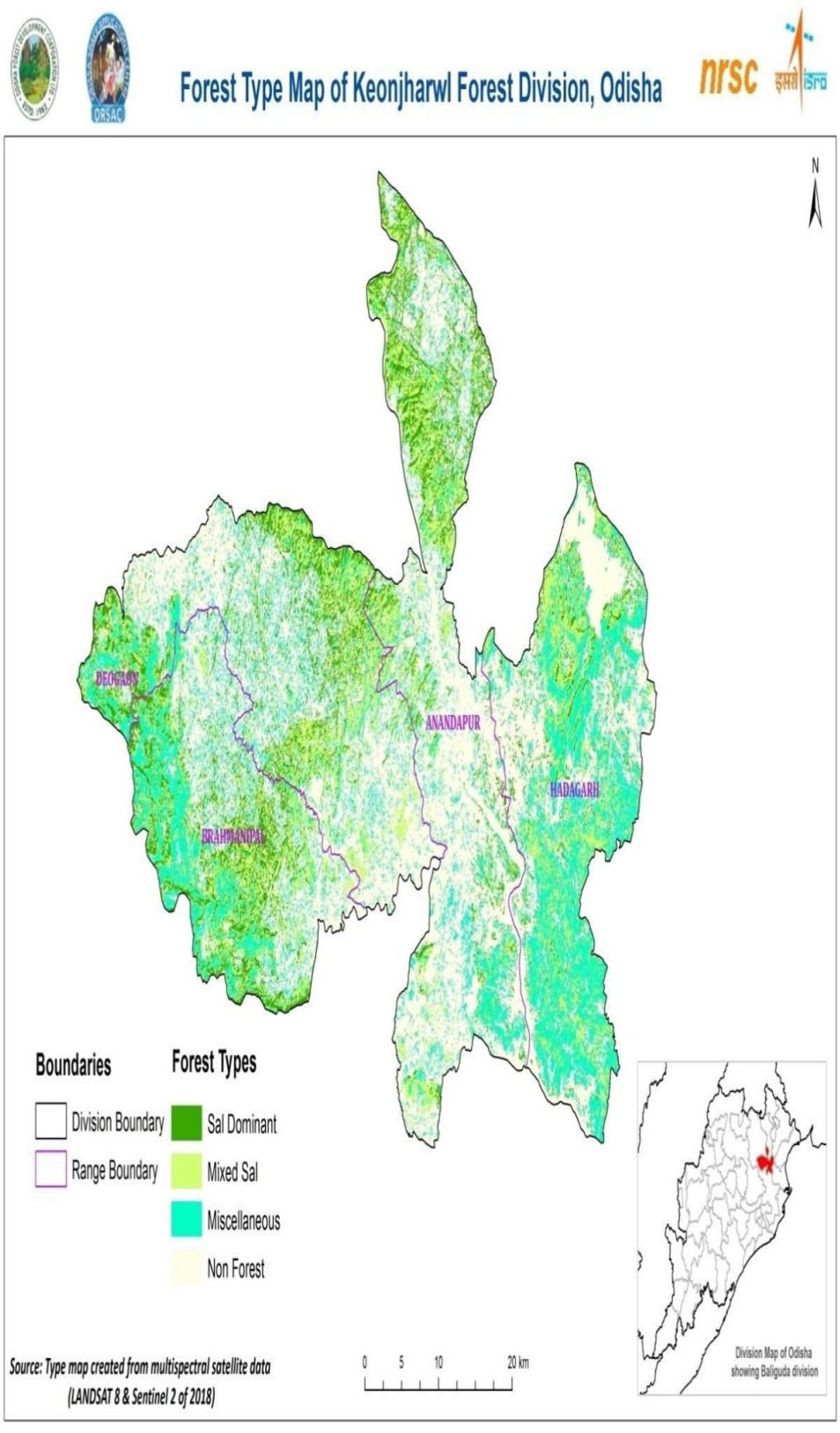
Sal is the principal species in all forest blocks of Keonjhar (W.L) Division. The geological formation in Rebana RF is quite suitable for the growth of the Sal. So in part of Rebana RF, Sal is the dominant species which constitute 60 to 70% of the top canopy. Here the middle storey is hardly seen. The quality of Sal is III & IV. The quality III Sal is seen on the hill slope & quality IV Sal is seen in the ridges. The principal associates of Sal are *Asana, Bahada, Harida, Sidha, Dhaura, Jamu & Kusuma* etc. Presence of *Milletia auriculata, Combretum decandrum i*s the striking features of this locality with profuse regeneration of Sal, both coppice and seedling origin. The prevalence of pole to middle age Sal in the area indicates the incidence of shifting cultivation in the past and the crop can be considered as the second origin. The density of the crop varies from 0.2 to 0.8, the average being 0.4. The canopy is to some extent regular and closed. It is seen in the small patches of Rebana RF in Compartment No. 5,6,10,12, 13, 19, 20(part), 21(part), 24, 26, 27, 28,29,30, 46 (part) & 47 (part).

Similarly, Sal is predominant in certain RF where the quality of Sal is poor. It is mostly seen in Atei (part), Rebana (Part), Santoshpur (Part), Gayalmunda, Mahulpanga & Palaspal. The associate of Sal in this forest are *Asana, Harida, Bahada, Sidha, Chara, Mai, Sissoo, Amla, Sunari, Acchu, Randia species, Antidesma species, Karada and Lodha.* The common undergrowths in these forests are *Flemengia chapper, Indigofera pulchela, Woodfordia fruticosa, Desmodium species, Strobilanthus species and Phoenix species. The common climbers are Bauhinia vahlii, Smilax species, Combretum decandrum* etc. Although Sal is predominant in this type of forest, the quality varies from quality IV to quality V. The average height of tree is about 10 to 12 mtrs & the crop density varies from 0.2 to 0.4. The canopy is irregular and open. The Sal trees are badly shaped and hollowness occurs. The hill slope generally support a dry type of vegetational growth. The ground regeneration of Sal is fair but establishment is rare due to various factors like repeated forest fire, biotic

interference, heavy grazing, browsing and illegal removal of pole crops. The water retention capacity of these forests has not been improved and further degraded and tending towards xerophytic condition. Due to increasing dryness of tract, decreasing moisture retention capacity and increasing biotic interference, Sal crop is noticed to be disappearing from the drier tract of the region. As a result, the forest blocks like Hatibandha, Meghanadpoi, Nuniapatna, have become barren having few Sal regeneration so also of the other species.

In Forest Blocks of Rebana(part) i.e. compartment No. 9,7,11,12, 16,18, 23, 25, 30, 31, 38,Santoshpur(part), Atei(part), Baigundi(part), Ostapura, Patilo and Panasadiha, the composition of crop is mixed than in other forest blocks. Here Sal crop is scanty. These forests usually have poorer vegetation with upper canopy often broken and irregular. The trees have relatively short boles and height rarely over15 to 20 mtrs. The main reason attributed to such type of vegetation is topography, aspect and shallow depth of soil. The associates of Sal in the top canopy are *Dhaura, Sidha, Asana, Sissoo, Piasal, Pahadi Sissoo, Kuruma, Harida, Bahada, Dhoben* etc. The middle storey consists of *Karada, Amla, Sunari, Gardenia* species. The undergrowth is usually rare and consist of species like *Pheonix, KureiandCymbopogan martini* and climbers like*Butea superba, Combretum decandrum, Smilax tetraphylla*. The typical side quality of this forest is III to IV. Regeneration of Sal and other important species is poor. The crop density is 0.2 to 0.4. The most characteristic features of the cropis throny, unbrowsable and xerophytic. On the drier hills species like*Gardenia latifolia, Gardenia gumifera, Gardenia turgida, Sterculia urens* and *Cochlospermum gossypium* are found. In eroded and calcarious soil, *Soyamida febrifuga, Chloroxylon swetenia* and *Acacia catechu* are found. In such case *Sal* is stunted and defective and height is around 10 mtrs. Bamboo is noticed to be disappearing from the Rebena Block which was found in very small scattered locality in the past.

Map No. 3.1 : Forest type map of Keonjhar (W.L) Division.



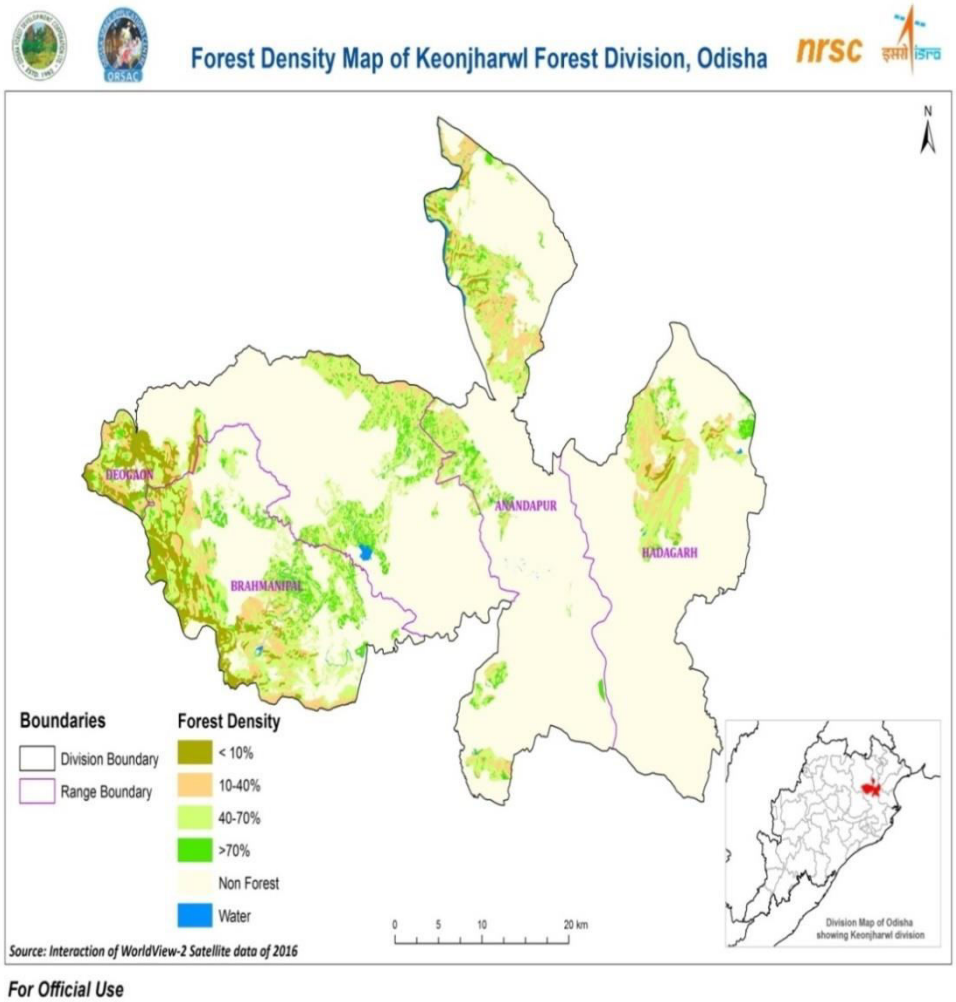
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Forest Type

Sl.N	Category	Forest Blocks with major part
1	Sal Dominant	Rebana[5(P),6(P),10(P),12(P),13(P),19(P),20(P), 21(P),25(P),46(P),47(P)]
2	Sal dominant+ Mix Sal	Santoshpur, Atei, Rebana(24,26,27,28,29,30)
3	Miscellaneous	Rebana(3,7,8,9,11,12,16,18,21,23,25(p),30), Mahulpanga, Turkipada

Some portion of southwest of Rebana block i.e. compartment No. 21, 22, 25 & 30 where rainfall is comparatively high and the soil is lateritic support nearly evergreen vegetation, which is an edaphic variation. *Xylia xylocarpa* is a predominant species and comprises of a sizeable proportion in the crop composition. The important associates are *Pterocarpus marsupium, Bridelia retusa, Emblica officinalis, Trewia nudiflora, Bursera serrata, Macranga peltata, Alstonia scholrais, Oroxylon indicum, Diospyrous montana, Anogeissus latifolia, Terminalia species, Careya arborea, Strychnos nux-vomica , Largestroemia parviflora* etc. The common undergrowth found in the forest are *Adhatoda vasica ,Hollarhena antidysenterica, Clerondendron* species. Common climbers are *Butea superba, Combratum decandrum* etc. The crop density varies from 0.4 to 0.6. Site quality is quality III and quality IV. Regeneration is profuse. Intensity of Sal is decreasing which promotes the intensity of *Xylia xylocarpa*.

Map No. 3.2 : Forest density map of Keonjhar (W.L) Division.



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In part of Atei, Baranga, Hatibandha, Kadagotha, Meghanadpoi, Nuniapatna, Ostapura, the original dry peninsular Sal forest is degraded due to repeated fire, grazing, irregular and unauthorised removal of timber by fringe villagers and unscrupulous smugglers. This type of degraded forest is marked by soil mixed with morrum. Soil is of shallow depth and humus content is very less. The canopy is having irregular opening of different sizes in proportion to soil and rock exposer. These areas are eroded with large number of gullies. Grasses are found with over grazed and species of coppice origin occurred with top browsed. The height of vegetation varies from 6 to 7 mtrs. The main species found in this scrubby forest is Sal, existing in rooted waste form. The other associates are *Terminalia alata, Cleistanthus collinus, Mangifera indica, Diospyrous montana, Diospyrous melanoxylon, Soyamida febrifuga, Chloroxylon swetenia, Emblica officinalis, Woodfordia fruticosa* etc. The shrubs like *Hollarhena antidysenterica, Randia dumetorum* etc. Climbers are not common in this forest but *Combretumdecandrum* is found in abundant in Baranga, Ostapura and Atei in comparative moist areas. The density of crop is 0.2 and the site quality is quality V. Regeneration from seed origin is very poor and needs special protection and proper tending to develop into a good Sal forest. In the eroded and calcareous soil, *Rohini, Veru* and *Khaira* are seen where *Sal* is of stunted growth.

3.1.2. Sal is the main species in almost all of the forest blocks. It occurs in Sal dominant and mixed Sal patch in this tract and previously the forest blocks i.e. Santoshpur, Atei and Rebana which were under the selection working circle are now degraded to such an extent that Sal is restricted to 46% in Rebana and 58% in Atei R.F. Mixed forest of miscellaneous species containing no Sal hardly occur in this division except in small pockets of Forest Blocks like Atei, Rabana and Santoshpur. The extent of such area is quite negligible and comparatively of no importance. The Sal forests of this tract vary in quality depending on the edaphic conditions and elevation of hills. The forests of the division are mostly present on steep hills and narrow winding valleys. Thequality and growth of Sal in plains like Atei, Santoshpur is comparatively low.

3.1.3 It is further observed that the Sal forestvaries conspicuously in quality depending on edaphic condition in comparison to the Forest Blocks of neighbouring Division.

3.1.4 In general the presence of high percentage of pole crop of Sal is observed in Atei & Rebana Blocks.

3.1.5 This pole stage of the crop has not improved during last 5 decades of management. Rather, the condition of the forest of this tract has further degraded and is tending towards xerophytic conditions. The reason for such unusual condition is mainly due to cleaning of forest floor for collection of Sal seed and dry Sal leaves and repeated forest fire. Moreover, these areas are completely devoid of undergrowth and the topsoil is very compact. The water retention capacity of the soil is very low.

3.1.6 The Forest Blocks like Gayalamunda, Baigundi, Baranga, Mahulpanga, Palaspal area are having pole crops of Sal with some undergrowth. Such a stage of degradation of Sal crop is mainly due to Podu cultivation in the past.

3.1.7 Due to increasing dryness of the tract and decreasing moisture retention capacity of soil, supported by increasing biotic interference, Sal crop is noticed to be disappearing from the drier tracts of this region. As a result, the forest blocks like Hatibandha, Nuniapatna, Meghanadpoi etc. have become barren having scanty Sal regeneration so as the other species.

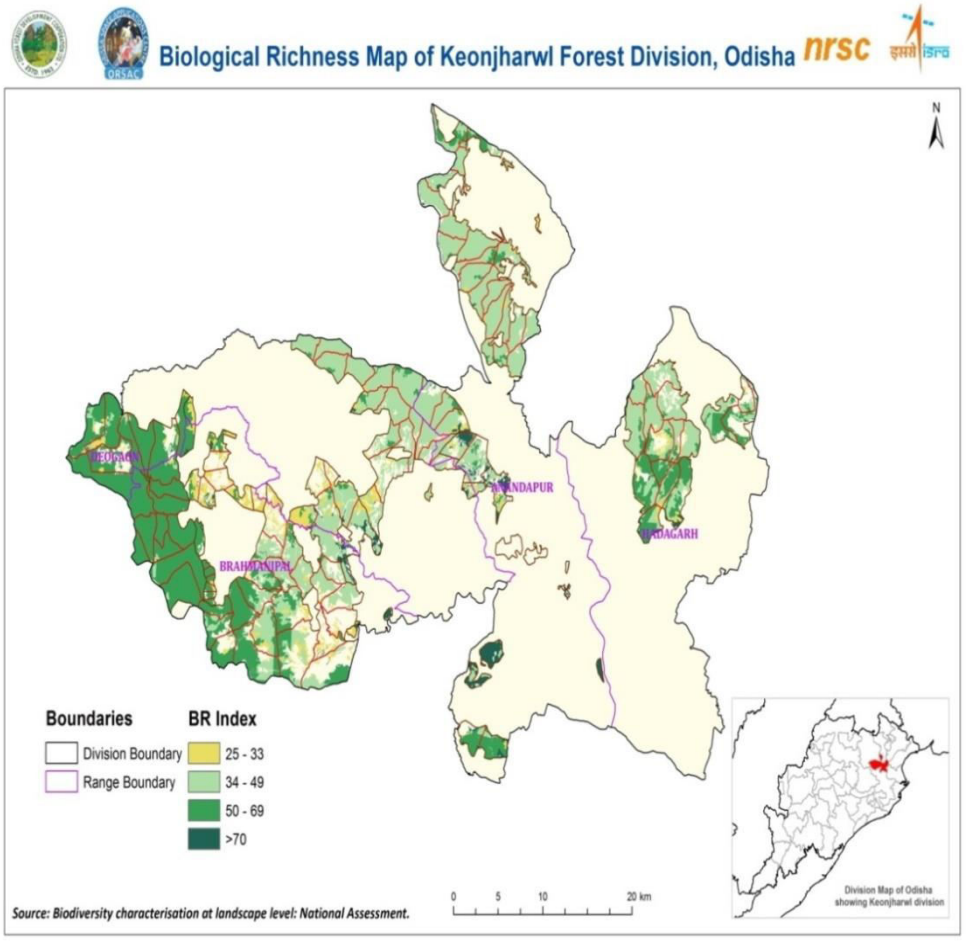
3.1.8 Bamboo occurs in very small-scattered locality of Rebana R.F in compartment No. 20,26,27 Reserved Forests. The quality of Bamboo is also very poor. So to say, this tract is devoid of appearance of natural good quality Bamboos and hardly warrants any management prescriptions. The main Sal associates of this tract are *Terminalia tomentosa (alata), Terminalia chebula, Terminalia belerica, Terminalia arjuna along streams, Diospyros melanoxylon, Anogeissus latifolia, Madhuca indica, Syzygium cumini, Pterocarpus marsupium, Schleichera oleosa, Careya arborea, Bridelia retusa, Emblica officinalis, Elaeodendron glaucum, Dillenia pentagyna, Bombax ceiba, Kydia calycina, Adina cordifolia.*

3.1.9 On the drier hills, species like *Gardenia latifolia, Gardenia turgida, Gardenia gummifera, Sterculia urens and Cochlospermum gossypium* are found. While in the eroded and calcarious soil *Soyamida febrifuga, Chloroxylon swietenia* and *Accacia catechu* are found. In such type of area Sal is stunted and defective and the height is around 05 metres. Phasi occurs in sporadic manner on the banks of Baitarani, and Musala river. Special attention is to be given for the regeneration of *Anogeissus acuminate* species because it comes under Car Timber categories.

3.1.10 In south west of the district around Daitari, Rebana and Talapada areas of Rebana R.F. *Xylia xylocarpa*occurs plentily.

3.2 PLANT SPECIES DIVERSITY :

Map No. 3.3 : Biological richness map of Keonjhar (W.L) Division.



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Biological Richness

Sl.No.	Category	Forest Blocks with Comp.
1	>70	Rebana[9(Part),38,39], Palaspal(Part), Ostapura(Part), Tangiriapal PRF (Part)
2	50-69	Rebana[20,21,24,25,26(P),28(P),29(P),30,33(P),45,46(P),47(P)], Baranga, Mahulpanga, Turkipada
3	34-49	Santoshpur, Atei, Tangiriapal(P)
4	25-33	Rebana09,36,37,45), Atei(69), Ostapura, Palaspal

However, from the biological richness map prepared by NRSC gives idea about species richness.

More will be the species richness; stable will be the eco-system. More species richness will contribute to increase in biodiversity which is an important aspect of biodiversity conservation.

$D=\frac{N(N-1)}{\varepsilon n(n-1)}$

D=Species diversity index.

N=Total number of organism of all species.

n=Total number of organism of each species.

E-sum of animal together.

Bigger the value of D, then more is the species diversity.

From the field enumeration data,the DBH of each tree is utilised to derive secondary data attributed like basal area (BA, m2/Ha), density (3, trees per Ha.) & frequency C.F, number of quarters where trees are present) in relation to total plots observed). Relative values of BA, D&F are then calculated. The important value index (IVI) is calculated by adding up relative dominance (RBAP), relative density (RD) & relative frequency (RF).

Species diversity is an expression of community structure. The number of species in a community is referred to as species richness. The relative abundance of all species is called evenness.

A community demonstrates high species diversity if many equally or nearby equally abundant species are present. Communities with a large number of species those are evenly distributed are the most diverse. Species diversity indices like Shannon-Winner index are calculated separately for trees, shrubs and herbs.

Sal, Dhaura & Kangada are three important tree species of Keonjhar(WL) Division.

Table No.3.1.A. IVI_s of Tree species of Keonjhar (WL) Division

Species Name	Density	Frequency	Dominance	Relative Density	Relative Frequency	Relative Dominance	IVI
Shorea robusta	2781	131.4884	243	31.4663	8.9568	31.5034	71.9267
Anogeissus latifolia	614	35.6010	164	6.9472	6.0449	8.5296	21.5219
Xylia xylocarpa	734	33.5834	137	8.3050	5.0497	8.0463	21.4011

Terminalia tomentosa	451	24.4766	160	5.1029	5.8975	5.8643	16.8648
Buchanania lanzan	522	12.2878	158	5.9063	5.8238	2.9440	14.6741
Madhuca indica	234	16.8581	115	2.6476	4.2388	4.0390	10.9255
Scheichera oleosa	209	17.7969	115	2.3647	4.2388	4.2639	10.8676
Syzigium cumini	253	16.2495	87	2.8626	3.2067	3.8932	9.9626
Cleistanthus collinus	341	7.4054	99	3.8583	3.6490	1.7742	9.2817
Diospyros melanoxylon	161	9.9766	86	1.8216	3.1699	2.3903	7.3819
Bridelia retusa	169	7.3547	81	1.9121	2.9856	1.7621	6.6599
Lannea coromandelica	137	7.16026	72	1.5501	2.6538	1.7155	5.9195
Diospyros montana	158	5.8095	71	1.7877	2.6170	1.3919	5.7966
Dillenia pentagyna	97	9.0028	54	1.0975	1.9904	2.1570	5.2449
Diospyros sylvatica	129	3.5919	61	1.4596	2.2484	0.8606	4.5686
Terminalia tomentosa	93	4.9584	50	1.0522	1.8429	1.1879	4.0832
Careya arborea	93	3.7439	51	1.0522	1.8798	0.8970	3.8291
Terminalia chebula	73	2.8173	48	0.8259	1.7692	0.6750	3.2702
Ougeinia oojeinensis	75	5.1089	28	0.8486	1.0320	1.2240	3.1047
Semecarpus anacardium	72	1.9303	49	0.8146	1.8061	0.4624	3.0832
Cassia fistula	66	1.4193	50	0.7467	1.8429	0.3400	2.9298
Pterocarpus marsupium	66	2.5135	32	0.7467	1.1795	0.6022	2.5285
Lagerstroemia parviflora	60	2.5722	33	0.6788	1.2163	0.6162	2.5115
Trewia nudiflora	90	3.2999	19	1.0183	0.7003	0.7906	2.5092
Casearia elliptica	61	1.0864	41	0.6902	1.5112	0.2602	2.4617
Bursera serrata	64	2.9663	27	0.7241	0.9952	0.7107	2.4300
Gardenia latifolia	46	1.9004	27	0.5204	0.9952	0.4553	1.9710
Aegle marmelos	42	1.8592	25	0.4752	0.9214	0.4454	1.8421
Terminalia belerica	32	1.5318	28	0.3620	1.0320	0.3670	1.7611
Dalbergia latifolia	38	1.5546	26	0.4299	0.9583	0.3724	1.7608
Mitragyna parviflora	31	2.3767	20	0.3507	0.7371	0.5694	1.6573
Miliusa velutina	29	0.8236	24	0.3281	0.8846	0.1973	1.4101
Bombax ceiba	28	1.2101	20	0.3168	0.7371	0.2899	1.3439
Mangifera indica	29	2.7999	9	0.3281	0.3317	0.6708	1.3307
Acacia auriculiformis	77	1.5770	2	0.8712	0.0737	0.3778	1.3227
Strychnos potatorum	28	1.0438	17	0.3168	0.6266	0.2501	1.1935
Gmelina arborea	26	1.1796	16	0.2941	0.5897	0.2826	1.1665

Emblica officinalis	26	0.4229	19	0.2941	0.7003	0.1013	1.0958
Grewia tiliaefolia	32	1.2895	11	0.3620	0.4054	0.3089	1.0764
Tectona grandis	48	1.4034	4	0.5431	0.1474	0.3362	1.0267
Mallotus philipinensis	28	1.7272	8	0.3168	0.2948	0.4138	1.0255
Symplocos racemosa	21	1.2507	13	0.2376	0.4791	0.2996	1.0164
Polyathia cerasoides	24	0.6056	16	0.2715	0.5897	0.1451	1.0064
Adina cordifolia	19	0.8215	14	0.2149	0.5160	0.1968	0.9278
Diospyros embryopteris	15	0.8365	10	0.1697	0.3685	0.2004	0.7387
Elaeodendron glaucum	14	0.6526	11	0.1584	0.4054	0.1563	0.7202
Kydia calycina	17	0.5515	10	0.1923	0.3685	0.1321	0.6930
Terminalia arjuna	10	1.4920	6	0.1131	0.2211	0.3574	0.6917
Morinda tinctoria	17	0.3864	11	0.1923	0.4054	0.0925	0.6903
Cordia macleodii	20	0.5456	9	0.2262	0.3317	0.1307	0.6887
Lagerstroemia speciosa	12	0.3346	10	0.1357	0.3685	0.0801	0.5845
Chloroxylon swietenia	13	0.4060	9	0.1470	0.3317	0.0972	0.5761
Terminalia bellirica	9	0.7288	8	0.1018	0.2948	0.1746	0.5713
Pongamia pinnata	11	0.7591	6	0.1244	0.2211	0.1818	0.5275
Dalbergia latifolia	12	0.4039	8	0.1357	0.2948	0.0967	0.5274
Ficus bengalensis	6	0.9408	6	0.0678	0.2211	0.2254	0.5144
Canthium didymum	12	0.5727	6	0.1357	0.2211	0.1372	0.4941
Bauhinia variegata	9	0.5642	6	0.1018	0.2211	0.1351	0.4581
Litsaea sebifere	12	0.5432	5	0.1357	0.1842	0.1301	0.4502
Albizzia lebbek	9	0.4736	6	0.1018	0.2211	0.1134	0.4364
Soymida febrifuga	9	0.2771	7	0.1018	0.2580	0.0664	0.4262
Nyctanthes arbortristis	9	0.1341	7	0.1018	0.2580	0.0321	0.3919
Ixora arborea	8	0.1384	7	0.0905	0.2580	0.0331	0.3816
Alstonia scholaris	8	0.4294	5	0.0905	0.1842	0.1028	0.3777
Catunaregam spinosa	8	0.2429	6	0.0905	0.2211	0.0581	0.3698
Syzygium caryophyllifolium	10	0.2543	5	0.1131	0.1842	0.0603	0.3583
Ficus glomerata	8	0.4644	4	0.0905	0.1474	0.1112	0.3492
Alangium lamarckii	8	0.4463	4	0.0905	0.1474	0.1069	0.3448
Pterospermum canescens	9	0.2291	5	0.1018	0.1842	0.0548	0.3410
Oroxylon indicum	9	0.2134	5	0.1018	0.1842	0.0511	0.3372
Tamarindus indica	4	0.5717	4	0.0452	0.1474	0.1369	0.3296

Dalbergia sissoo	8	0.1739	5	0.0905	0.1842	0.0416	0.3165
Ficus religiosa	4	0.4877	4	0.0452	0.1474	0.1168	0.3095
Anthocephalus cadamba	6	0.5392	3	0.0678	0.1105	0.1292	0.3076
Boswellia serrata	9	0.4837	2	0.1018	0.0737	0.1159	0.2914
Wendlandia tinctoria	5	0.3216	4	0.0565	0.1474	0.0770	0.2810
Strychnos nuxvomica	5	0.1158	5	0.0565	0.1842	0.0277	0.2686
Ochna obusata	5	0.2641	4	0.0565	0.1474	0.0632	0.2672
Anacardimum occidentale	8	0.3288	2	0.0905	0.0737	0.0787	0.2430
Sterculia urens	4	0.3362	3	0.0452	0.1105	0.0805	0.2363
Bauhinia malabarica	8	0.2652	2	0.0905	0.0737	0.0635	0.2277
Ziziphus xylocarpus	4	0.1155	4	0.0452	0.1474	0.0276	0.2203
Ficus retusa	3	0.3978	2	0.0339	0.0737	0.0953	0.2029
Hymenodictyon excellsum	4	0.1811	3	0.0452	0.1105	0.0434	0.1992
Albizzia stipulata	3	0.1891	3	0.0339	0.1105	0.0453	0.1898
Butea monosperma	4	0.1404	3	0.0452	0.1105	0.0336	0.1894
Xylia dolabriformis	3	0.1643	3	0.0339	0.1105	0.0393	0.1839
Azadirachta indica	2	0.3604	2	0.0226	0.0737	0.0863	0.1827
Antidesma diandrum	4	0.0888	3	0.0452	0.1105	0.0212	0.1771
Syzygium operculata	3	0.2005	2	0.0339	0.0737	0.0480	0.1557
Ficus retusa	2	0.2444	2	0.0226	0.0737	0.0585	0.1549
Cochlospermum religiosum	4	0.1498	2	0.0452	0.0737	0.0359	0.1548
Bauhinia purpurea	2	0.2282	2	0.0226	0.0737	0.0546	0.1510
Pterospermum heyneanum	5	0.0552	2	0.0565	0.0737	0.0132	0.1435
Albizia procera	2	0.1346	2	0.0226	0.0737	0.0322	0.1286
Vitex peduncularis	2	0.0999	2	0.0226	0.0737	0.0239	0.1202
Acacia catechu	3	0.0345	2	0.0339	0.0737	0.0082	0.1159
Mimusops elengi	4	0.1150	1	0.0452	0.0368	0.0275	0.1096
Artocarpus intigrifolia	3	0.1493	1	0.0339	0.0368	0.0357	0.1065
Sesbania grandiflora	2	0.0279	2	0.0226	0.0737	0.0066	0.1030
Dalbergia paniculata	2	0.0217	2	0.0226	0.0737	0.0052	0.1015
Monilkra hexandra	3	0.1074	1	0.0339	0.0368	0.0257	0.0965
Eugenia heyneana	1	0.1661	1	0.0113	0.0368	0.0398	0.0879
Pithecolobium dulce	1	0.1590	1	0.0113	0.0368	0.0381	0.0862

Erythrina indica	1	0.0754	1	0.0113	0.0368	0.0180	0.0662
Elaeocarpus robusta	1	0.0530	1	0.0113	0.0368	0.0127	0.0608
Moringa oleifera	1	0.0530	1	0.0113	0.0368	0.0127	0.0608
Naringi crenulata	1	0.0452	1	0.0113	0.0368	0.0108	0.0590
Areca catechu	1	0.0415	1	0.0113	0.0368	0.0099	0.0581
Avicennia officinalis	1	0.0415	1	0.0113	0.0368	0.0099	0.0581
Crataeva religiosa	1	0.0380	1	0.0113	0.0368	0.0091	0.0572
Ziziphus mauritiana	1	0.0380	1	0.0113	0.0368	0.0091	0.0572
Zizyphus xylopyra	1	0.0283	1	0.0113	0.0368	0.0067	0.0549
Stereospermum colais	1	0.025	1	0.0113	0.0368	0.0060	0.0542
Michelia champaca	1	0.0201	1	0.0113	0.0368	0.0048	0.0529
Messua ferrea	1	0.0132	1	0.0113	0.0368	0.0031	0.0513
Annona squamosa	1	0.0078	1	0.0113	0.0368	0.0018	0.0500
Holoptelia integrifolia	1	0.0078	1	0.0113	0.0368	0.0018	0.0500
Randia uliginosa	1	0.0078	1	0.0113	0.0368	0.0018	0.0500
	8838	417.3779	2713	100	100	100	100

IVI_s of Shrubs of important RF of Keonjhar (WL) Division

Table No.3.1.B.Rebana RF (Shrub)

Sl No	Species Name	D_s	RD_s	f_s	RF_s	BA_s	$RBAF_s$	IVI_s
1	*Helicteres isora*	4.5222	18.3320	17.83	28.0341	541.3285	48.49129	94.8573
2	*Eupatorium odoratum*	7.07	28.6599	5.73	9.0092	234.5462	21.01026	58.6793
3	*Randia dumetorum*	1.4649	5.9385	6.36	9.9998	73.5773	6.59093	22.5292
4	*Jasminum sambac*	1.8471	7.4876	1.27	1.9968	128.863	11.5433	21.0277
5	*Zizyphus oenoplia*	1.5286	6.1967	6.36	9.9998	36.2518	2.4411	18.6376
6	*Clerodendron viscosum*	2.4203	9.8115	3.82	6.0061	4.1251	0.3695	16.1871
7	*Entada scandens*	1.3375	5.4221	3.18	4.9999	25.4032	2.2755	12.6975
8	*Phoenix acaulis*	2.48407	10.0697	1.27	1.9968	3.4887	0.31251	12.3790
10	*Indigofera pulchela*	0.6369	2.5819	5.09	8.0030	8.1167	0.7270	11.3119
11	*Flemingia chappar*	0.9554	3.8729	2.54	3.9936	23.8632	2.1376	10.0041
12	*Woodfordia fruticosa*	0.70063	2.8401	2.54	3.9936	15.9601	1.4296	8.2633
13	*Flacourtia indica*	0.8280	3.3564	2.54	3.9936	0.9016	0.0807	7.4307
14	*Guruva*	0.191	0.7745	1.91	3.0030	12.8234	1.1487	4.9262
15	*Jataphala*	0.191	0.7745	1.27	1.9968	0.3771	0.0337	2.8050

16	*Ixora parviflora*	0.191	0.7745	0.63	0.9905	6.280	0.5630	2.3280
17	*Veronia aspera*	0.191	0.7745	0.63	0.9905	6.286	0.56308	2.32808
18	*Strobilanthus auriculatus*	0.0636	0.2578	0.63	0.9905	3.143	0.2815	1.5298

Table No.3.1.C.Santoshpur RF(Shrub)

l No	Species Name	D_s	RD_s	f_s	RF_s	BA_s	$RBAF_s$	IVI_s
1	*Indigofera pulchela*	2.88	27.6805	24.07	47.6928	49.9394	13.7682	89.1415
2	*Helicteres isora*	0.3703	4.255	3.70	6.1321	141.435	38.9936	49.3807
3	*Nectanthes arbor tris tris*	0.2962	6.3825	5.55	4.9050	77.0035	21.2298	32.5173
4	*Eupatorium odoratum*	0.351	6.3825	5.55	5.8125	30.6128	8.4399	20.6349
5	*Desmodium indicum*	0.629	6.3825	5.55	10.4162	6.6708	1.8391	18.6378
6	*Cycas circinalis*	0.1851	8.51	7.4	3.0652	8.9967	2.4803	14.0555
7	*Zizyphus oenoplia*	0.129	8.51	7.4	2.1362	12.2418	3.3750	14.0212
8	*Flacourtia indica*	0.259	8.51	7.4	4.2890	3.6143	0.9964	13.7154
9	*Flemengia chapper*	0.333	6.3825	5.55	5.5144	4.194	1.1632	13.0601
10	*Guruva*	0.277	6.3825	5.85	4.5871	3.4022	0.9379	11.9075
11	*Phoenix acaulis*	0.0740	6.3825	5.55	1.2254	3.6458	0.1559	7.7638
12	*Entada scandens*	0.0740	4.255	3.7	1.2254	0.3928	0.1082	5.6363
13	*Randia dumetorum*	0.0740	2.1275	1.85	1.2254	1.5715	0.8665	4.2194
14	*Woodfordia fruticosa*	0.018	2.1275	1.85	0.2980	3.143	0.4332	2.8587

Table No.3.1.D.-RF-Atei=Item-Shrub

Sl No	Species Name	D_s	RD_s	f_s	RF_s	BA_s	RBA F_s	IVI_s
1	*Helicteres isora*	10.37	22.84	22.64	13.26	21.39	55.09	91.19
2	*Indigofera pulchela*	8.11	17.25	37.73	18.95	37.72	7.19	43.39
3	*Flemingia chappar*	5.47	11.63	13.20	6.63	31.88	6.07	24.33
4	*Randia dumetorum*	2.83	6.02	26.41	6.63	25.89	4.93	17.58
5	*Nictanthes arbor tris tris*	0.94	2.0	11.32	5.68	19.32	3.68	11.36
6	*Ocimum bacilicum*	2.26	4.8	5.66	2.84	15.14	2.88	10.52
7	*Woodfordia fruticosa*	1.69	3.59	7.54	3.78	11.15	2.12	9.49
8	*Abutilon indicum*	1.32	2.80	7.54	3.78	9.63	1.83	8.41
9	*Phoenix acaulis*	0.94	2.0	7.54	3.78	10.96	2.09	7.87
10	*Eupatorium odoratum*	0.56	1.19	11.32	5.68	4.2	0.80	7.67
11	*Zizyphus oenoplia*	0.94	2.00	7.54	3.78	7.03	1.34	7.12
12	*Lantana camara*	0.94	2.0	5.66	2.84	1.73	0.32	5.16

13	*Wrightia tinctoria*	1.32	2.8	3.77	1.89	0.26	0.04	4.73
14	*Zizyphus jujuba*	0.37	0.78	3.77	1.89	6.93	1.32	3.19
15	*Flacourtia indica*	0.75	1.59	3.77	1.89	4.86	0.92	4.4
16	*Strobilanthes auriculatus*	0.37	0.78	3.77	0.94	9.90	1.88	3.6
17	*Calotropis procera*	0.18	0.38	3.77	1.89	3.46	0.65	2.92
18	*Rauwolfia tetraphyla*	0.56	1.19	1.88	0.94	3.46	0.65	2.78
19	*Clerodendron viscosum*	0.37	0.78	1.88	0.94	3.53	0.67	2.39
20	*Clausena excavata*	0.37	0.78	1.88	0.94	3.46	0.65	2.37
21	*Kydia calycina*	0.37	0.78	1.88	0.94	2.54	0.48	2.2
22	*Emblica ribes*	0.37	0.78	1.88	0.94	0.37	0.07	1.79
23	*Entada scandens*	0.37	0.78	1.88	0.94	0.35	0.06	1.78
24	*Cycas circinalis*	0.18	0.18	1.88	0.94	1.13	0.21	1.33

Simpson's Index :

Simpson's index is based on the probability of any two individuals drawn at random from an infinitely large community belonging to the same species.

$$D=\sum \frac{ni(n-1)}{N(N-1)}$$

D-Dominance

Simpson's Index = 1 – D

Simpson's index is a measure of diversity that is much loss sensitive to species richness.

The Shannon Index value as well as Simpson Index value for Herbs and Shrubs is calculated for the entire Keonjhar (W.L)Division which is given below forest block wise.

Shannon Index value and Simpson Index value for the Shrubs of Keonjhar (W.L) Division

Shannon Diversity Index : Shannon Diversity index provides more information about species composition than simply richness

$$H = -\sum Piln(Pi)$$

H = Shannon index

Pi = the proportion of individuals found in the sp.

In = the natural logarithm.

S = the number of species in the community.

Interpretation: The value of this index generally lies between 1.5 to 3.5 and rarely it is greater than 4. The Shannon index increases as both the richness and evenness of the community increase.

Table No.3.2.A Shannon & Simpson Index for Herb

Sl No	Forest block	Shannon Index	Simpson Index
01	Santoshpur	1.235794295	0.941928214
02	Kadugotha	0.104054232	0.877627337
03	Gayalamunda	0.109673608	0.910376688
04	Baigundi	0.042479767	0.909330849
05	Patilo	0.06115102	0.828706337
06	Hatibandha	0.096124983	0.823095916
07	Ostapura	0.063000523	0.832647829
08	Baranga	0.113049383	0.843448396
09	Mahulpanga	0.131611078	0.92906012
10	Turkipada	0.14785405	0.93943719
11	Panasadiha	0.013061413	0.806818182
12	Palaspal	0.148991561	0.889563186
13	Rebana	1.781362602	0.960859573
14	Atei	1.089380725	0.953115674
15	Meghanadpoi	0.047265601	0.770637985
16	koldiha	0.026339018	0.142857143

Table No.3.2.B. Shannon & Simpson Index forShrub

Sl No	Forest block	Shannon Index	Simpson Index
01	Santoshpur	1.041975502	0.873768244
02	Kadugotha	0.04083659	0.999784529
03	Gayalamunda	0.014585481	0.825123153
04	Baigundi	0.046499282	0.720061022
05	Patilo	0.055990831	0.999998528
06	Hatibandha	0.056813752	0.999685633
07	Ostapura	0.027273619	0.492941176
08	Baranga	0.057603071	0.813576494
09	Mahulpanga	0.059190662	0.688411633
10	Turkipada	0.118774714	0.874759505
11	Panasadiha	0.021129922	0.998272884
12	Palaspal	0.713024455	0.881463234
13	Rebana	1.798232401	0.999977587
14	Atei	1.231725509	0.898850845
15	Meghanadpoi	0.014965103	0.996621622
16	koldiha	0.016034798	0.998569385

3.3. STATUS OF BIODIVERSITY CONSERVATION IN FORESTS :

Biodiversity conservation is a process of optimizing the process of conservation as many species are protected with fewer efforts. An area with higher species abundance has a more stable environment as compared to an area with lower species abundance.

For conservation of bio-diversity, Biodiversity Act 2002 has been enacted with an aim to provide conservation of biological diversity and sustainable use of its components & equitable sharing of benefits arising there form. This Act creates a three-tier structure of authorities to manage the biodiversity of the country. This includes National Biodiversity Authority (NBA), the State Biodiversity Board of State level and the Bio-diversity Management Committees of Regional Level.

Odisha Biodiversity Board is authorized to implement the legal provisions of Biological Diversity Act 2002 in the State. To conserve the biological resources of the State, Odisha Biological Diversity Rules were made by the State Government in 2012. As per Section 41 of the Act, the local bodies shall constitute a Biodiversity Management Committee at GP, Block, District, Urban areas like Municipal Corporation and District Level.

As per Rules 21 of the OBD Rules 2012 BMCs shall prepare People's Biodiversity Registers at all the local bodies level. The BMCs have the power and responsibilities to protect and conserve the native biodiversity in their respective jurisdiction and they can levy charges on any companies, traders and manufactures against the commercial collection of bio resources under Access and Benefit Sharing Agreement (ABS) fees which is 3 to 5% of the ex-factory grass sale of the total value of the bio-resources. This ABS fees shall be utilized for protection conservation and restoration of native biodiversity and the money shall be kept in a joint account named Local Biodiversity Fund (LBF).

The PBRs shall consists of detailed information on local biological resources and it's associated traditional knowledge including flora fauna and agricultural diversity of the local areas for monitoring and evaluation. Maintenance of PBR at Block/ Gram Panchayat Level is under Progress. In the present context the forest block of Keonjhar (WL) Division shows wide range of diversity as different forest types are seen in these areas i.e. Northern Tropical, Moist Deciduous, Northern Tropical Dry Deciduous, Northern Tropical, Semi Evergreen and Dry Deciduous Scrub Forest.

Sal is a dominant species in these forests having its principal associates like *Terminalia tomentosa, Terminalia belerica, Terminalia chebula, Anogeissus latifolia, Pterocarpus marsupium, Diospyros melanoxylon, Emblica officinalis, Cleistanthus collinus, Lanea coromandelica, Dalbergia latifolia, Schlechera oleosa, Syzizium cuminii, Madhuca indica. Similarly in some portion the species of semi -evergreen nature* i.e*Xylia xylocarpa, Bridelia retusa, Madhuca indica, Trewia nudiflora, Boswelia serata, Soyamida febrifuga, Gardenia latifolia , Ixora parviflora* etc. are found.

For in-situ conservation many such species have already been tried in different plantation programmes .But due to forest fire, grazing, illicit felling, smuggling, encroachment, shifting cultivation and various mining activities, the biodiversity is in depletion stage.

a) Forest Fire –
It arrest plant succession and normal regeneration of principal species as a result, thorny and fire hardy species occupies their position.

b) Grazing–
Heavy trampling by cattle leads compactions of soil, thus reduces percolation of water. It also reduces seed germination and allows obnoxious weed invasion i.e. *Eupatorium odoratum, Parthenium histerophorus, Ageratum conyzoides, Lantana camara* etc.

c) Illicit felling and smuggling : –
As many villages are located in the close vicinity of the Reserve Forest, the villagers illegally removed the valuable trees for their local consumption and other needs.

d) Encroachment : –
Tribal people often encroach upon the forest land and many villages have been settledinside the forest area .They cut the valuable tree species and convert the forest land to agricultural land as a result of which many established valuable species are sacrificed.

e) Shifting cultivation: –
Due to this, the productivity of the area decreases and affect the species diversity.

f) Mining activity : –
It is the worst agent for affecting the forest cover and species diversity.

Due to the above factors important economic viable species have been felled and they now exist as pole crops. Important species like *Sal, Piasal, Kuruma, Kasi, Asana Sissoo, Dhaura*etc.though exist in the locality but in the form of pole and unsound crop. The plantations inside the forest are illicitly felled for local consumption and illegal transportation. All such areas which are affected by the aforesaid causes are either covered with stunted pole size growth of coppice origin or are heavily infested with weeds and grasses.

3.3.1 Rare, Endangered and threatened species :

Species recorded were screened for their uniqueness with references in the literature. The different plant species recorded by Biswal, A.K and Reddy, C.S.2007. Prioripizing taxa for conservation in Odisha (Proceedings of National Seminar on Conservation of Eastern Ghats, EPTRI, Hyderabad is mentioned in the Table No. 3.3

Table No. 3.3 : List of threatened species

SI. No	Name of Species	Local Name	Habit	Status
1	2	3	5	6
1	*Tylophora fasciculata*	Antamula	Climbing shrub	Rare
2	*Alchornea Mollis*	Tabhari	Shrub	Rare
3	*Aeschyanthus parasiticus*	Sola	Shrub	Rare
4	*Habenaria diphylla*	Orchid	Climbing shrub	Rare
5	*Habenaria gibsoni*	Orchid	Climbing shrub	Rare
6	*Habenaria gibsoni-foetida*	Orchid	Climbing shrub	Rare
7	*Habenaria longicorniculata*	Orchid	Climbing shrub	Rare
8	*Luisia brachystychys*	Orchid	Climbing shrub	Rare
9	*Luisia zeylanica*	Orchid	Climbing shrub	Rare
10	*Smitinandia micranthe*	Orchid	Climbing shrub	Rare

11	*Zeuxine gracilis*	Orchid	Climbing shrub	Rare
12	*Trychospermum grandiflorum*	-	Herb	Rare
13	*Balanophora polyandra*	-	Herb	Endangered
14	*Liparis espevijii*	Orchid	Herb	Endangered
15	*Ceropegia hirsuta*	-	Climber	Endangered
16	*Nothopegia heyneana*		Tree	Critically Endangered
17	*Saraca asoca*	Asoca	Tree	Critically Endangered
18	*Symplocos racemosa*	Lodha	Tree	Critically Endangered

The list of medicinal plants having threatened status is discussed in Table No. 3.4

Table No. 3.4 : Rare, endangered and threatened medicinal plants

1	*Cordia macleodii*	Sambarsingha, Ghanti	Tree	Endangered
2	*Gloriosa superba*	Panchaangulia	Climber	Endangered
3	*Oroxylum indicum*	Phanaphania	Tree	Endangered
4	*Pterocarpus marsupium*	Piasal	Tree	Endangered
5	*Rauwolfia serpentiana*	Patal Garuda	Herb	Endangered
6	*Urariapicta*	Iswarjata	Herb	Endangered
7	*Embelia ribes*	Bidanga	Climber	Endangered
8	*Cycas circinalis*	Arguna	Shrub	Vulnerable
9	*Gnetum ula*	Lolari	Woody Climber	Vulnerable
10	*Mastigionappendiculatum*	Epiphyte	Climbing shrub	Vulnerable
11	*Gardenia gummifera*	Kurudu/Gurudu	Shrub	Vulnerable
12	*Litsea glutinosa*	Jaisanda	Tree	Vulnerable
13	*Operculinaturpethum*	Tiudi	Climber	Vulnerable
14	*Pueraria tuberosa*	Bhuinkakharu	Climber	Vulnerable
15	*Embelia tsjeriamcottam*	Baibidanga	Shrub	Vulnerable
16	*Paederia foetida*	Prasaruni	Climber	Vulnerable

Source: **CAMP**- Conservation assessment and management prioritization'2007

The habitat, Range, distribution frequency and flowering period of various types of orchids of Rebana RF is given below.

Table No.3.5. Orchids of Rebana RF

Terrestrials				
Taxon and Habit		Habitat (Forest type)	Range In metres)	Frequency
1.	*Geodorumdensiflorum*	Tropical Moist Deciduous	500-600	Occasional
2.	*Goodyeraprocera*	Tropical Semi Evergreen-Tropical Evergreen	500-1000	Scarce

3.	*Habenariafurcifera*	Tropical Moist Deciduous-Tropical Semi Evergreen	300-800	Occasional
4.	*Habenariagrandiflorifomis*	Tropical Moist Deciduous	1000-1600	Scarce
5.	*Habenariaplantaginea*	Tropical Moist Deciduous	200-700	Occasional
Epiphytes				
1.	*Acampepraemorsa*	Tropical Dry Deciduous-Tropical Moist Deciduous	50-800	Common
2.	*Acamperigida*	Tropical Moist Deciduous-Tropical Semi Evergreen	600-800	Rare
3.	*Aeridesmultiflora*	-do-	200-800	Occasional
4.	*Aeridesodorata*	Tropical Dry Deciduous-Tropical Moist Deciduous	100-900	Occasional
5.	*Bulbophyllumguttulatum*	Tropical Semi Evergreen	1100	Endangered
6.	*Cymbidium aloifolium*	Tropical Moist Deciduous	100-800	Occasional
7.	*Dendrobiumaphyllum*	Tropical Moist Deciduous	200-1000	Occasional
8.	*Dendrobiumcrepidatum*	Tropical Semi Evergreen	500-1100	Scarce
9.	*Dendrobiumfimbriatum*	Tropical Moist Deciduous	500	Unknown
10.	*Dendrobiumherbaceum*	Tropical Moist Deciduous-Tropical Semi Evergreen	600-1000	Occasional
11.	*Luisiatrichorhiza*	Tropical Moist Deciduous	250-1600	Occasional
12.	*Pholidotaimbricata*	Tropical Moist Deciduous-Tropical Semi Evergreen	100-1200	Occasional
13.	*Rhynchostylisretusa*	Tropical Moist Deciduous	100-1100	Occasional

14.	*Vanda tessellata*	Tropical Dry Deciduous-Tropical Moist Deciduous	15-600	Common
15	*Vanda testacea*	Tropical Dry Deciduous-Tropical Moist Deciduous	100-1000	Common

Source: Orchids of Odisha by Sri Sarat Ch. Mishra, Retd. Er.

3.4. Status of Species prone to over exploitation :

Peoples demand for the last 10 years have changed the picture of forest of Keonjhar (WL) Division. Due to the mining activity, a lot of human habitations have come up inside the Reserve Forest and at the fringe areas. As revealed from outgoing plans of Keonjhar Division, the beautiful patches of forest have been continuously subjected to shifting cultivation, illicit felling and smuggling. Due to the heavy biotic interference two storied vegetation is seen prominently instead of three storied vegetation as was seen earlier.

Due to the heavy demand of furniture ,door and window frame ,shutters ,sound trees of *Tectona grandis(Teak),Shorearobusta(Sal),Pterocarpusmarsupium (Piasal), Mytragyna parviflora(Mundi), Bridelia retusa(Kasi), Anogeissuslatifolia(Dhaura), Albizialebbeck(Kala Sirisa)* are indiscriminately cut down by the local people and smuggler to fulfil their growing need of the local people. So all the above species are found as pole crop as mostly sound trees of the above species are rare now a day.

Similarly, for construction of houses,household article and agricultural implements, species like *Ougeniaoojeinensis, Brideliaretusa, Anogeissuslatifolia, Diospyrosmelanoxylon ,Syziziumcuminii, Madhucaindica ,Schleicheraoleosa, Mangiferaindica ,Lagerstroemia parviflora, Terminaliaarjuna, Cleistanthuscollinus* are profusely cut down so that the sound matured trees of the above species are hardly found. Solitary sound trees of the above species are rarely seen in the Forest Blocks.

Apart from timber yielding species the following species are over exploited by cutting the stem and branches for collection of seeds for use in confectionary and pharmaceutical industry. These species are *Madhucaindica, Schleicheraoleosa, Pongamiapinnata, Strychnusnux-vomica*etc.

Similarly many fibre yielding species like *Ficusbenghalensis,Ficusreligiosa, Careyaarborea , Buteamonospema* are cut indiscriminately for preparation of rope .Grass species and climber like *Ichno-carpus frutescens* are over exploited by the tribals for thatching purpose.

Similarly some gum yielding species are lopped off for collection of gum in a crude method thus losing their existence gradually in the forest today.The species in this category includes *Sterculiaurens, Acacia catechu, Boswelliaserrata ,Anogeissuslatifolia*, *Acacia nilotica* and *Oroxylon indicum*.

The species *Shorearobusta* is worst affected for collection of resin by old crude method in some blocks of Rebana RF.

Similarly the branches of some tannin yielding species are cut down by the tribals in unscientific way, thus losing their existence gradually in the forest. Those species include *EmblicaOfficinalis, Terminaliabelerica,Terminaliachebula, Terminaliaarjuna, Acacia nilotica,Anogeissus latifolia, Cassia fistula and Shorearobusta.*

The dye yielding species like *Wodfordiafruticosa,Mallotusphillipinensis* are over exploited by collecting the flowers and fruits along with the branches for use in dye industry.

Due to severe biotic interference vulnerable species like *Sissoo, Piasal, Kendu, Mundi* are depleting day by day. Podu cultivation (shifting cultivation) is also a reason of over exploitation of forest in Rebana Forest Blocks. The regeneration of *Sal, Kendu*& other species are adversely affected by forest fire. Making of Sal leaves plates is a cottage industry in many of the tribal villages adjoining to Santoshpur & Rebana Forest Block. Uncontrolled collection of *Sal* leaves and saplings by tribals are also the reason of degradation of Sal forest. The industrial hub of Kalinga Nagar, Daitari, Jajpur Road are dependent on the forests of this division which is also main cause of degradation of forest.

3.4.1 List of Medicinal Plants (Over exploited) :

The list of medicinal plants are given in the Table No. 3.6.

Table No. 3.6: List of medicinal plants and their uses.

Sl No.	Local name	Botanical name	Usable Part	Diseases
1	Amla	*EmblicaOfficinalis*	Fruit	Cough, Diabetes, Cold, Hyper Acedity, Laxative
2	Bela	*Aeglemarmellous*	Fruit, Bark	Diarrhoea, Dysentry, Constipation
3	BhuinAmla	*Phyllanthusamarus*	Whole plant	Aenimic, jaundice, dropsy
4	Guluchi	*Tinosporacordifolia*	Stem	Gout, Pile, Fever, Jaundice
5	BhuinNeem	*Andrographispaniculata*	Whole plant	Fever, Acidity, weakness
6	Panchangulia	*Gloriosa superb*	Seed, Tuber	Skin diseases, Abortion
7	Sarpagandha	*Rauwolfiatetraphylla*	Root	Hyper Tension, Insomnia,
8	Patalgaruda	*Rauwolfiaserpentiana*	Root	Snake bite
9	Satabari	*Asparagusracemosus*	Tuber, Root	Fatigue, Cough, Weakness, enhance lactation
10	Tulsi	*Ocimum sanctum*	Leaves, seed	Cough, Cold, Expectorant
11	Kochila	*Strychnosnux-vomica*	Seed	Nervous paralysis, healing wounds
12	Harida	*Terminaliachebula*	Seed	Trifola, leprosy, wound ulcer, Cough, inflammation
13	Bahada	*Terminaliabellerica*	Seed	Trifola, Cough, insomnia, dropsy, vomitting

14	Neem	*Azadirachtaindica*	Rhizome	Sedative, Analgesic, Epilepsy, Hypertension
15	Anantamul	*Hemidesmusindicus*	Root, Leaf	Appetiser, Carminative, Aphrodisiac,
16	Vasa	*Adhatodavasica*	Whole Plant	Antispasmodic, Respiratory stimulant
17	KhusKhus	*Vetiveriaziziinoides*	Root	Burning, ulcer, vomiting
18	Kurei	*Holarrhenaantidysenterica*	Bark, Seed	Scabies, Antipyretic, Amoebic dysentery
19	Akrantivejaibaigan	*Solanumxanthocarpun*	Fruit, Seed, Whole Plant	Diuretic, Antiinflamatory, Appetizer
20	Kaincha	*Abruspricatorius*	Leaf, Seed	Rheumapic Pain, Abortion
21	Apamaranga	*Achyranthusaspera*	Leaf, Stem	Easy delivery, tooth ache, fever
22	Bicho	*Acoruscalamus*	Rhizome	Boil, Asthma, Appetizer, Dysentery
23	Siali	*Bauhinia vahlii*	Leaf, Seed	Diarrhoea, Diabetes, Pimples,
24	Semul	*Bombaxceiba*	Root	Pain Reliver,Fertility
25	Bara	*Ficusbenghalensis*	Root	Vigour,Strengh
26	Gudumari	*Gymnemasylvestra*	Leaf	Diabetes
27	Karanja	*Pongamiapinnata*	Stem, Seed	Pyorrhoea, skin disease
28	Muturi	*Smilax zeylanica*	Root	Rheumaticpain,ulcer
29	Jaamu	*Syzygiumcuminii*	Fruit, Seed	Dysentery, Piles,
30	Kumbhi	*Careaarborea*	Bark	Diarrhoea
31	Mai	*Laneacoromandelica*	Bark	Diarrhoea
32	Kanteikoli	*Zizyphusnimularis*	Root	Diarrhoea
33	Aswagandha	*Wythaniasomnifera*	Root ,Leaf	Restorative tonic ,Nervous disorder, Aphrodisiac
34	Brahmi	*Bacopamonnnieri*	Whole plant	Nervous ,memoryenhancer ,mental disorder .
35	Chiraita	*Swertiachiraita*	Whole plant	Skin diseases ,fever

				,burning sensation
36	Gudamari	*Gymnemasylvestre*	Leaf	Diabetes ,Asthma
37	Guluchi	*Tinosporacordifolia*	Stem	Gout ,Pile ,fever ,Jaundice
38	Panchaangulia	*Gloriosasuperba*	Seed ,Tuber	Skin disease ,labour pain ,abortion .
39	Patalagaruda	*Rauwolfiasarpentina*	Root	Snake bite
40	Sarpagandha	*Rauwolfiatetraphylla*	Root	Hypertension ,Insomnia
41	Baividanka	*Embeliaribes*	Root ,Fruit ,Leaf	Skin diseases ,Snake bite
42	Bhrugaraj	*Eclipta alba*	Seed , whole plant	Anti-inflammatory, digestive ,hair tonic
43	Raktachitrak	*Plumbagoindica*	Root ,root bar	Colic ,inflammation ,cough ,indyspeipsia
44	Swetachitrak	*Plumbagozeylanica*	Root ,root bar	Appetiser ,Antibacterial ,anti cancer .
45	Bacha	*Acoruscalamus*	Rhyzome	Sedative ,Analgesic ,hypertensive .
46	Arakha	*Calotropisprocera*	Leaf,Stem	Toothache
47	Piasal	*Pterocarpusmarsupium*	Bark	Hypertension
48	Char	*Buchananialanzan*	Bark ,Seed	Cut & wound ,Skin diseases ,rheumatism
49	Palasa	*Buteamonosperma*	Flower ,seed	Scorpion bite
50	Duba	*Cynodondacteylon*	Leaf	Arthritis
51	Sisso	*Dalbergiasisso*	Leaves ,Bark ,Root	Eye disease ,Scabies ,leprosy, diarrhoea& dysentery
52	Dudhaghasa	*Euphobiahirta*	Leaves	Arthritis
53	Aswatha	*Ficusreligiosa*	Whole plant	Scabies ,Snake bite, Toothache
54	Mahula	*Madhucaindica*	Fruit	Gout ,Rheumatism
55	Nirgundi	*Vitexnegundo*	Leaves	Rheumatism
56	Hadabhanga	*Vitisquadrangularis*	Whole plant	Joint of bones
57	Barakoli	*Zizyphusmauritiana*	Fruit	Cold & Cough

58	Ghont	*Zizyphusxylopyrus*	Fruit ,Leaves .	Skin eruptions
59	Sidha	*Largestroemiaparviflora*	Stem, Bark	Leucorrhoea
60	Pedipedica	*Abutilon indicum*	Leaf	Jaundice
61	Kumuti	*Cleodendronviscosum*	Leaf	Diabetes ,blood pressure .

However, the detail list of medicinal plants available is given in **Appendix-IX**.

3.4.2 NTFP (Over exploited) :

The NTFP species over exploited in Keonjhar (Wildlife) Division is given in Table No. 3.7.

Table No. 3.7 : List of N.T.F.P

Sl. No.	Local Name	Botanical Name	Usable Part	Uses
1.	Babool	*Acacia nilotica*	Bark	Dying
2.	Genduli	*Sterculiaurens*	Bark	Confectionary
3.	Jamun	*Syzygiumcuminii*	Fruit & Seed	Medicinal
4.	Bhalia	*Semicarpusanacardium*	Seed	Medicinal
5	Chara	*Buchnanialanzan*	Seed & Fruit	Edible
6	Arjun	*Terminaliaarjuna*	Barik	Leather industry
7	Sunari	*Cassia fistula*	Seed , Bark	Medicinal
8	Kendu	*Diospyrosmelanoxylon*	Fruit	Edible
9	Kusuma	*Schleicheraoleosa*	Seed	Medicinal
10	Mahula	*Madhuca latifolia*	Flower	Edible & Breweries
11	Mango	*Mangiferaindica*	Fruit, Kernel	Edible, confectionary
12	Palasa	*Buteamonosperma*	Bark	Medicinal
13	Chakunda	*Cassia tora*	Seed	Medicinal
14	Pita alu	*Dioscoreawallichii*	Root	Edible
15	Sal	*Shorearobusta*	Leaves, seed	Plate & oil yielding
16	Tentuli	*Tamarindusindica*	Fruit, seed	Edible & gum
17	Mushrooms	*Mucunapruriens*	Total part	Decorative andmedicinal

The detail list of NTFP species is given in **Appendix –X**.

3.5 CONSERVATION OF GENETIC RESOURCES :

There is no preservation plot, sample plot, medicinal plants conservation area and community conservation area within the Division. However, proposals have been given in the Chapter Science and Research for this purpose. Research organisations may be contacted for genetic diversity in near future. Research should be made on species particularly NTFPs and MAPs with the help of these organisations.

3.6 FAUNA AND THEIR HABITATS :

Forest and Wildlife are both sides of the coin. A healthy forest is the habitat of good number of wildlife. The common species seen in the forest in Keonjhar (WL) Division are given in the Table Below.

List of Mammals of Keonjhar (W.L) Division

Table No. 3.8. : List of important Mammals.

S.I No	Local Name	English Name	Zoological name	IUCN Status	Schedule (As per WPA 1972
1	Sambar	Sambar	*Cervus unicolor*	Vulnerable	III
2	Cheetal	Spotted deer	*Axis axis*	Least concern	III
3	Kutura	Barking deer	*Muntiacusmuntijack*	Least concern	III
4	Bilua	Jackel	*Canisaureus*	Least concern	II
5	Heta	Striped hyaena	*Hyaenahyaena*	Near threatened	III
6	Hati	Elephant	*Elephasmaximus*	Endangered	I
7	Bhalu	Sloth bear	*Melursusursinus*	Vulnerable	I
8	Kalara patria bhaga	Leopard	*Pantherapardus*	Endangered	I
9	Bajrakapta	Pangolin	*Maniscrassicaudata*	Endangered	I
10	Barah	Wild boar	*Sus scrofacristatus*	Least concern	III
11	Neula	Mongoose	*Herteseduardsii*		IV
12	Jhinka	Purcupine	*Hystrixindicaindica*	Least concern	IV
13	Mankada(Hanu)	Monkey	*Presbyeis entellus*	Least concern	II
14	Mankada(Pati)	Rhesus macaque	*Macacamulatta*	Least concern	II
15	Kokisiali	Fox	*Vulpesbengalensis*	Least concern	II
16	Saliapatani	Todi cat	*Paradoxurus hermaphrodites*	Least concern	IV
17	BanaBilei(Katasa)	Jungle cat	*Felischausaffinis*	Least concern	II
18	Gadabhalu	Rattle	*Mellivoracapensis*	Least concern	I
19	Thekua	Hare	*Lepusnigricollisruficaudatus*	Least concern	IV
20	Gurandi	Mouse deer	*Tragulusmeminna*	Least concern	I

List of Important Birds

Table No. 3.9 : List of important Birds					
01	Mayur	Peafowl	*Pavocristatus*	Least concern	I
02	Koili	Indian Cuckoo	*Cuculusmicropterus*	Least concern	IV
03	BanaKukuda	Grey Jungle fowl	*Gallus gallus*	Least concern	IV
04	BhadaBhadalia	Blue Jay	*Coracasbengalensis*	Least concern	IV
05	Pecha	Owl	*Anthenebrama*	Least concern	IV
06	Sua	Large Indian parakeet	*Psittaculaeupatria*	Near threatened	IV
07	Gunduri	Quail	*TurnaxSuscitator*	Least concern	IV
08	Kathahana	Golden Beaked Wood Pecker	*Picoidesnanus*	Least concern	IV
09	Bani	Indian Myna	*Acridopherestristis*	Least concern	IV
10	Sari	HilMyna	*Gracularеligiosa*	Least concern	I
11	Kochilakhai	Grey Hornbill	*AnthracocerosCoronatus*	Near threatened	I
12	Kajalpati	CommunDrongo	*Dicrususmacrocerus*	Least concern	IV
13	Gharachatia	Sparrow	*Passer domesticus*	Least concern	IV
14	Gendalia	Open billed stork	*Anastomusoseitans*	Least concern	IV
15	Kumbhatua	Greater coucal	*Centropussinensis*	Least concern	IV
16	Kochilakhai	Indian Pied Hornbill	*Anthracocerosmalbaricus*		III

List of important Reptiles.

Table No. 3.10 : List of important Reptiles					
Sl. No	Local Name	English Name	Zoological Name	IUCN Status	Schedule
01	Ahiraj	King Cobra	*Naja Hannah*	Vulnerable	II
02	Naga	Cobra	*Najanaja*	Least concern	II
03	Ajagara	Python	*Python molurus*	Near threatened	I
04	Rana	Branded Krait	*Bungarusfasciatus*	Endangered	IV
05	Chiti	Common Krait	*Bungaruscarcruleus*	Least concern	II
06	Dhaman	Rat Snake	*Ptyasmucosus*	Least concern	II
07	Russels Viper	Russels Viper	*Viper russelli*		II
08	Godhi	Monitor Lizard	*Varanusbengalensis*	Least concern	II
09	PohalaEndua	Chamelion	*Chammalionzeylanicus*	Least concern	II

10	Boda	Common Boa	*Boa constrica*	Near threatened	II

List of important Pisces are given in the Table No. 3.11

Table No. 3.11 : List of important Pisces.

S.I No.	Local Name	Zoological name
1	Balia	*Wallgoaniaattu*
2	Bhakura	*Catlacatla*
3	Chital	*Notopterus chital*
4	Magura	*Clariasbatrachus*
5	Pohala	*Cirrhinareba*
6	Mirkali	*Cirrhinamrigala*
7	Rohi	*Labeorohita*
8	Seula	Ophiocephalusstriatus

Important Mammals & their habit and habitat of Keonjhar Wildlife Division are given in the Table No. 3.12.

Table No. 3.12 : Important Mammals and their habit..

SI No.	Local Name	Zoological name	Distribution	Habit and Habitat.
1.	Sambar	*Cervus unicolor*	Rarely seen in Rebana forest.	The food consist of grasses, leaves, various wild fruit and aquatic plants. They are water dependant and found near the water source but can be found in a broad range of forest habitat ranging from dry deciduous to mixed forest.
2.	Cheetal	*Axis axis*	Large scale in Baranga RF , also found at Atei ,Panasadiha & Santoshpur RF .	The food consist of grasses and foliage of different species . They found in open deciduous forest and grass lands close proximity to a permanent water source .
3.	Kutura	*Muntiacusmuntijack*	Common in all RFs .	They feed on grass, wild fruits ,shoots ,seeds ,birds egg etc. They are mostly wide spread in thick forest as well as in hilly areas & grass lands.
4.	Bilua	*Canisaureus*	Common in all RFs .	It is omnivores and feeds on reptiles insects,ground dwelling birds ,fruits ,berries etc.They live in holes in the groundof open forest ,grass land etc.
5.	Gadhia	*Cannis lupus*	Common in all RFs .	They prey on small mammals, Hares,birdsetc.They live in forest more commonly on open regions in holes & cavities inside rocks.
6.	Heta	*Hyaenahyaena*	Plain areas of Atei, Rebana, Santoshpur, Panasadiha &Gayalamunda .	They act as scavengers and feeds on dead animals.They lives especially in caves of the soil near grassy forest and in borrows of hillside near the forest area .
7.	Hati	*Elephosmaximus*	Northwest part of Rebana& Southwest part of Atei RF.	They eat mostly grasses,leaves ,Flowers ,wild fruits twigs and bamboo culms . They live in cool forest area where there is sufficient tall tree growth

				with hilly and undulating nature and where bamboo grows in profuse.
8.	Bhalu	*Melursusursinus*	Rebana, Atei, Panasdiha, Santoshpur, Palaspal, Gayalamunda, Ostapura, Mahulpanga RFs etc.	The food consist of various fruits like mango,jamu,bela, jack fruit etc insects like ants, termites , Honeycumb&Mohua flowers . They live in forest areas where there is sufficient forest growth and places where outcropping of rocks and tumbled boulders offer shelter during summer & rain.
9.	Kalara patria bhaga	*Pantherapardus*	RebenaRF,Santoshpur RF .	They prey upon small herbivores like Deer,Monkeys etc and large rodents like Purcupines etc.
10	Bajrakapta	*Maniscrassicaudata*	Mostly Rebana RFs , rarely in Atei &Other RFs .	They feed on ants,termites,various wild vegetables,fruits and grains etc They lives in borrows dug by themselves on the ground and crevices in rock beds.
11.	Baraha	*Sus scrofacristatus*	Common in all RFs .	They feeds on crops,tubers ,insects and carrion . They live in grassy,bush jungle ,scrub forest.
12.	Neula	*Herpestesedu ardsii*	Common in all RFs &PRFs .	They prey on Rats ,Mice ,Snakes ,Lizards ,frogs ,insects,Scropions ,Fruits ,roots and birds egg .
13.	Jhinka	*Hystrixindicaindica*	Hilly areas of Rebana RF .	They feeds on vegetables, grains ,fruits , roots etc. It lives in rocky hillsides and take shelters amongst rock during daytime .
14	Mankada(Hanu)	*Presbytis entellus*	Common in all RFs .	It feeds on fruits,flowers,buds ,leaves of plant species . They live in forest on the top of the trees and grooves of rock. They may stay in close proximity to human habitation.
15.	Mankada(Pati)	*Rhesus macaque*	Common in all RFs .	It feeds on fruits ,seeds ,herbs ,variety of crops and insects .They live in forest with variety of habitats like foot hills ,plains and may stay close proximity to human habitation
16	Kokisiali	*Vulpesbengalensis*	Common in all RFs .	They feed on small mammals ,reptiles ,insects ,rats and land crabs etc .Sometimes they take various fruits ,shoot and pods of different plants . They live in borrows dug by itself in open forest nearby cultivated landand rocky hillside.
17.	Salia patani	*Paradoxurus hermaphroditus*	Common in all RFs.	They feed on berries,pulpy food, insects andsmall mammals. They live in crevices on top of the trees in forest.
18.	Katash	*Felischausaffinis*	Common in all RFs.	They prey on small mammals, birds in Scrub forest and poultry when lives nearby human habitation They lives in drier open forest, grass

				land and scrub jungle.
19.	Gada bhalu	Mellivoracapensis	Common in all RFs.	They feed on infects, frogs, turtles, lizards, rodents, birds eggs and honey. They live in plain bushy scrub jungles.
20	Thekua	Lepusnigricollisruficaudatus	Common in all RFs.	They feed on grasses, tubers,fruits of different species .They live in large tract of bushy jungle near cultivated land.

3.6.1 Unique Habitat of Fauna

Unique habitats provide special functions. They are geomorphic in origin .These habitats include caves, over hangs, den, large bouldy aggregates, sheet rocks, sandy banks and pit cliffs, talus, ledges, earth cuttings etc.

Caves: Caves are used by varieties of large mammals like leopard, bear and hyena as shelter and rearing cubs. Several species of bats live in colonies inside caves. Caves need complete protection even while being inside a walked area.

Dens: These are much smaller and distinct caves usually dug in soft rock or earth cuttings by animals such as hyena, wolfs,foxes, porcupine for the purpose of shelter and breeding. When not occupied, they can be used by some small mammals and reptiles. Hence, they need to be protected.

Over hangs – These are earth shaped structure formed, when soft rock underlying hard rock weather away. These serves as a shelter for bee heaps, nesting colonies for Swallows.

Large Boulders Aggregates: Aggregates normally found in drainages. These are excellent habitats for beers and reptiles. Hence these areas should not be disturbed.

Sheet Rocks: Provide shelter to several species small vertebrates. Lithophitic plants also grow on them. These should be protected.

Sandy banks and Sands Spits: These are important for fresh water turtle and otter. Hence, sand mining needs to be strongly controlled. Especially along the nallahs and rivers.

Cliffs- Cliffs have crevices which are colonized by several species of bats . Several bats like swallows , martins establish their nesting colonies along cliff faces . Hence they need to be protected .

Talus – Talus is an aggregates of loose rocks dislodged from time to time from cliff faces which provides microhabitats to several species of small mammals and reptiles . These features need to be strongly protected.

Ledges – These are located high of serving as nesting places for Eagles and Vulture colony and need to be strongly protected.

Earth cutting – These are important for species which dig dense near streams,Kingfishers bore burrows in to the banks for nesting. So the earth cutting need to be protected at the time of road alignment

Special Habitat of Fauna

These are biological in origin and provides habitat for small wild animal. These are to be found out and protected. These includes snags ,snag recruits , down wood ,large old trees , trees with fluting boles , buttresses and holes at the base .Lianas and tangle climbers , fruit bearing shrub and trees , roosting / nesting trees etc .

Snags-These are dead trees, which as a rule of thumb at-least five tallest and largest diameter snags per hectare is to be retained. These are vital for a variety of primary hole nesting birds like Woodpeckers and Barbets, which are colonized by secondary hole nesting birds like Mynas,Rollers, Owlats etc during subsequent years.

Snag recruits – These are dying trees mostly affected by heart rot fungus which should be retained five snags recruit per hectare. They provide good substrate for epiphytic orchids.

Down woods – These are large size hollow lob or rejects for any reason need to be maintained at the rate of at least three logs per hectare and evenly distributed .

Large old trees – These are to be retained at the 2 to 4 per hectare which serve as daytime rosting /nesting sites for large Owls.

Lianas and tangled climbers – lianas are and tangled climbers provide significant habitat for arboreal, small carnivore and lizards. These are to be retained at the rate 2 nos. per hectare in a evenly manner

Roosting and nesting trees- Trees which are known to support to nesting colonies of water birds or roosting congregation of reptiles and other birds need to be retained. They are important nesting places of vultures,fishing Eagles etc .

The census data of Mid-Winter Water Fowl and Wild Animal from 2015 to 2017 is given in the Table Below.

Table No. 3.13 : MidWinter Water fowl Census 2015

Sl. No.	Name of the waterfowl	Scientific Name	Nos. of Water Fowl census counted			
			Hadagarh Range	Deogaon Range	Brahmanipal Range	Total
1	Little grebes	*Tachybaptua ruflcollis*	0	152	0	152
2	Indian pond Heron	*Ardeola grayil*	0	10	42	52
3	Kingfisher	*Alcedo atthis*	20	40	0	60
4	Great Cormorants	*Phalacrocorax carbo*	0	30	22	52
5	Large whistling Duck	*Dendrocygna bicolour*	60	0	0	60
6	White Breasted Water Hen	*Amourornis phoenicurs*	0	0	21	21
7	Storks		50	0	30	80
		TOTAL	**130**	**232**	**115**	**477**
Source: Keonjhar (WL) Division						

Table No. 3.14 : Mid Winter Waterfowl Census 2016

Sl. No.	Name of the waterfowl	Scientific Name	Nos. of Water Fowl census counted			
			Hadagarh Range	Deogaon Range	Brahmanipal Range	Total

1	Little grebes	*Tachybaptua ruflcollis*	0	115	0	115
2	Indian pond Heron	*Ardeola grayil*	0	15	10	25
3	White Breasted Water Hen	*Amourornis phoenicurs*	0	0	10	10
4	Storks		50	40	0	90
5	Indian shag	*Phalacrocorax fuscicollis*	0	60	0	60
6	Cattle Egret	*Bubulcus ibis*	0	0	50	50
7	Little Cormorant P. Nagar	*Phalacrocorax niger*	0	0	20	20
8	White Breasted Kingfisher		25	50	10	85
9	Cool gouse		70	0	0	70
10	Pani dubuki		0	0	30	30
11	Tattler Bird		0	0	05	5
		TOTAL	**145**	**280**	**135**	**560**
Source: Keonjhar (WL) Division						

Table No. 3.15 : Mid Winter Waterfowl Census 2017

Sl. No.	Name of the waterfowl	Scientific Name	Nos. of Water Fowl				
			Hadagarh Range	Deogaon Range	Brahmanipal Range	Anandpur Range	Total
1	Little grebes	*Tachybaptua ruflcollis*	0	1328	101	34	1463
2	Black Naked Grebe	*Podiceps nigricollis*	0	38	0	0	38
3	Indian Cormorant	*Phalacrocorax fuscicollis*	11	63	0	12	86
4	Great Cormorant	*Phalacrocorax carbo*	0	02	0	18	20
5	Little Cormorant	*Phalacrocorax niger*	140	124	23	53	340
6	Little Egret	*Egretta garzetta*	70	49	02	133	254
7	Great Egret	*Egretta alba*	0	14	0	0	14
8	Cattle Egret	*Bubulcus ibis*	16	0	07	27	50
9	Intermediate Egret	*Egretta intermidia*	0	0	0	96	96
10	Yellow-Wattled Lapwing	*Venellus malabaricus*	0	23	0	0	23
11	Red-Wattled Lapwing	*Venellus indicus*	17	06	0	28	51
12	Lesser Whistling Duck	*Dendrocygna javanica*	165	576	0	23	764
13	Brahminy shelduck	*Tadorna ferruginea*	11	275	0	0	286
14	Asian	*Anastomus*	19	19	0	19	57

	Openbill-Stork	*oscitans*					
15	Indian pond Heren	*Ardeola grayii*	37	29	18	47	131
16	Kingfisher	*Alcedo atthis*	07	40	04	0	51
17	White Breasted Water Hen	*Amourornis phoenicurus*	01	0	31	0	32
18	Streaked weaver	*Ploceous manyar*	0	0	0	12	12
19	Grey Plover	*Pluvialis squatarola*	08	0	0	0	8
20	Common Sandpiper	*Actitis hypoleucos*	16	0	0	0	16
		TOTAL	**518**	**2586**	**186**	**502**	**3792**
Source: Keonjhar (WL) Division							

Table No. 3.16 : Mid winter water fowl Census (2018)

Sl. No.	Name of the Waterfowl	Scientific Name	Nos. of Water Fowl Census counted				
			Hadagarh Range	Deogaon Range	Brahmanipal Range	Anandapur Range	Total
1	*Little grebes*	*Tachybaptua ruflcollis*	383	1023	65	47	**1518**
2	*Indian shag*	*Phalacrocorax fuscicollis*	6	70	0	4	**80**
3	*Indian pond Heren*	*Ardeola grayil*	7	50	28	51	**136**
4	*Little Egret*	*E. garzetta*	23	54	8	103	**188**
5	*Kingfisher*	*Alcdo atthis*	23	43	5	13	**84**
6	*Great Cormorants*	*Phalacrocorax carbo*	5	0	0	2	**7**
7	*Little Cromorant*	*Phalacrocorax niger*	85	22	15	48	**170**
8	*White-breasted water hen*	*Amaurornis phoenicurs*	0	0	26	0	**26**
9	*Asian Openbill*	*Anastomus ascitans*	3	9	3	30	**45**
10	*Black-Necked grebe*	*P. nigricollis*	0	0	0	0	**0**
11	*Great Egret*	*E. alba*	50	5	0	0	**55**
12	*Lesser Whistling Duck(Lesser Tree Duck)*	*D. Javanica*	0	379	0	25	**404**
13	*Brahminy Ruddy Shelduck*	*Tadorna ferrugineas*	0	72	0	0	**72**
14	*Yellow-wattled lapwing*	*V. malabaricus*	30	0	0	0	**30**
15	*Red-wattled lapwing*	*V. indicus*	0	6	0	0	**6**
16	*Cattle Egret*	*Bubuleus ibis*	0	0	9	44	**53**
17	*Common Sandpiper*	*Aclitis hypoleucos*	17	0	0	0	**17**
18	*Intermediate*	*E. intermedia*	34	0	0	52	**86**

	Egret						
19	*Grey-headed Lapwing*	*V. cinereus*	6	0	0	0	**6**
20	*Great Crested Grebe*	*Piva cristatus*	18	0	0	0	**18**
21	*Pointed stork*	*Mycteria Leucocephala*	1	0	0	0	**1**
22	*Baillons Crake*	*P. pusilia*	1	0	0	0	**1**
G. Total:-			**692**	**1733**	**159**	**419**	**3003**
Source: Keonjhar (WL) Division							

Table No. 3.17 : Mid winter water fowl Census (2019)

Sl No	Name of the Water fowl	Scientific Name	Nos. of Water Fowl Census Counted				
			Anandapur Range	Deogaon Range	Hadagarh Range	Brahmanipal Range	Total
1	*Little grebes*	*Tachybaptua ruflcollis*	140	1120	0	57	**1317**
2	*Indian shag*	*Phalacrocorax fuscicollis*	0	55	0	0	**55**
3	*Indian pond Heren*	*Ardeola grayil*	93	51	50	51	**245**
4	*Little Egret*	*E. garzetta*	119	30	26	0	**175**
5	*Kingfisher*	*Alcdo atthis*	12	36	52	13	**113**
6	*Great Cormorants*	*Phalacrocorax carbo*	2	0	0	0	**2**
7	*Little Cromorant*	*Phalacrocorax niger*	157	9	68	89	**323**
8	*White-breasted water hen*	*Amaurornis phoenicurs*	0	0	0	48	**48**
9	*Asian Openbill*	*Anastomus ascitans*	12	7	0	0	**19**
11	*Great Egret*	*E. alba*	0	5	0	0	**5**
12	*Lesser Whistling Duck (Lesser Tree Duck)*	*D. Javanica*	0	380	89	0	**469**
13	*Brahminy Ruddy Shelduck*	*Tadorna ferrugineas*	0	75	0	0	**75**
15	*Black headed (white) ibis*	*Threskiomis melanocaphalus*	0	0	2	0	**2**
17	*Bar-headed Goose*	*A.indicus*	0	0	6	0	**6**
18	*Cattle Egret*	*Bubuleus ibis*	55	0	46	27	**128**
19	*Common Sandpiper*	*Aclitis hypoleucos*	0	0	15	0	**15**
20	*Intermediate Egret*	*E. intermedia*	8	0	0	0	**8**
23	*Glossy ibis*	*Plegadis falcinallus*	0	0	3	0	**3**
24	*Wood sandpiper*	T. glareola	0	0	2	0	**2**

Total :-	**598**	**1768**	**359**	**285**	***3010***
Source: Keonjhar(WL)					

Table No. 3.18 : Mid winter water fowl Census (2020)

Sl. No.	Name of the Waterfowl	Scientific Name	Nos. of Water Fowl Census counted				
			Hadagarh Range	Deogaon Range	Brahmanipal Range	Anandapur Range	Total
1	Little grebes	*Tachybaptua ruflcollis*	0	310	45	110	465
2	Indian shag	*Phalacrocorax fuscicollis*	9	12	0	0	21
3	Black Bitten	*Ixobrychus flavicollis*	0	65	0	0	65
4	Indian pond Heren	*Ardeola grayil*	11	627	37	89	764
5	Little Egret	*E. garzetta*	129	17	2	133	281
6	Kingfisher	*Alcedo atthis*	3	60	15	19	97
7	Great Cormorants	*Phalacrocorax carbo*	4	70	0	1	75
8	Little Cromorant	*Phalacrocorax niger*	51	335	35	167	588
9	White-breasted water hen	*Amaurornis phoenicurs*	0	0	38	0	38
10	Asian Openbill	*Anastomus ascitans*	50	3	10	10	73
11	Great Egret	*E. alba*	187	0	12	0	199
12	Lesser Whistling Duck (Lesser Tree Duck)	*D. Javanica*	0	120	0	0	120
13	Brahminy Ruddy Shelduck	*Tadorna ferrugineas*	0	15	0	0	15
14	Yellow-wattled lapwing	*V. malabaricus*	11	0	0	0	11
15	Red-wattled lapwing	*V. indicus*	0	10	0	0	10
16	Cattle Egret	*Bubuleus ibis*	39	1060	40	137	1276
17	Common Pochard	*Aythya ferina*	0	465	0	0	465
18	Intermediate Egret	*E. intermedia*	3	0	0	0	3
19	Brahminy Kite	*Haliastur indus*	0	0	0	1	1
20	Jungle Babbler	*Turdoides striata*	0	0	0	6	6
21	Kentish Plover	*C. alexandriles*	0	0	0	5	5
22	Water Hen	Amaurornis	0	0	0	83	83

		phoenicurus					
23	Blue Tailed Bes Eater	*Merops philippinus*	0	0	0	4	4
24	Oriental Darter	*Anhinga malamogastor*	6	0	0	0	6
25	Terek Sandpiper	*Xenus cinereus*	7	0	0	0	7
26	Black-tailed Godwit	*Limosa limosa*	0	0	0	8	8
27	Black Drongo	Dicrurus macrocercus	8	0	0	35	43
28	Spotted Dove	*Spilopelia chinensis*	5	0	0	45	50
29	Brone-winged Jacana	*Metopidcus indicus*	0	0	0	2	2
Total :-			**523**	**3169**	**234**	**855**	**4781**
Source-Keonjhar(WL)							

The census report of Wild Animals (Elephant, Tiger and Leopard) in Keonjhar (W.L) Division, Anandpur is given below in Table No. 3.19.

Table No. 3.19 : Census report of Wild Animals (up-to 2020.)

Census report of Wild animals in Keonjhar (WL) Division, Anandapur.

Sl. No.	Name of the Wild animal	Year of census	Total
1	Elephant	2006	19
		2008	27
		2010	35
		2012	40
		2015	51
		2017	49
2	Tiger	2015	3
		2016	3
3	Leopard	2015	5
		2016	5

Sources - DFO, Keonjhar (WL) Division, Anandapur.

The census report of Tiger and Leopard is given in the Table No.3.20

Table No. 3.20 : Census report of Tiger and Leopard

Year	Tiger				Leopard			
	Adult Male	Adult Female	Others	Total	Adult Male	Adult Female	Others	Total
2007-08 to 2014-15	--	--	--	--	--	--	--	--
2015-16	1	2	0	3	2	3	0	5
2016-17	1	2	0	3	2	3	0	5
2017-18 to	--	--	--	--	--	--	--	--

2020-21								
Sources - DFO, Keonjhar (WL) Division, Anandapur.								

The census report of Elephant in Keonjhar Division is given in the Table No. 3.21

Table No. 3.21 : Census report of Elephant

Year	Adult Male	Adult Female	Others	Total
2007-08 to 2011-12	--	--	--	--
2012-13	8	21	11	40
2013-14 to 2014-15	--	--	--	--
2015-16	13	27	11	51
2016-17	11	26	12	49
2017-18	11	26	12	49
2018-19 to2020-21	--	--	--	--
Sources - DFO, Keonjhar (WL) Division, Anandapur.				

3.7. THREAT AND CHALLENGES TO WILDLIFE :

3.7.1. Habitat Fragmentation :

Animals ultimately depend upon habitat for their survival. Habitat requirement of each species is different from other which is an equally important pre-requisite for all forms of life. Habitat degradation results from over grazing by wild & domestic animals, excess openings due to illicit felling, forest fire and scarcity of water holes. Apart from this, opening of remote areas by developing infrastructure, construction of projects, mining activities, clearance of forests for cultivation and new settlement are also causes of habitat degradation. Jakhapura - Bansapani railway track is going through Atei R.F & Rebana R.F which causes the major disturbance to the existing wildlife. The express highway from Keonjhar to Chandikhole is passing through Rebana Reserve Forest which is also a major cause of threat to wildlife. The National Highway from Keonjhar to Jajpur – Keonjhar road passes through Atei Reserved Forest also causes threat to existing fauna. The Daitari mining area where mining activity is going on throughout day and night disturbs the movement of Wildlife. A primitive tribal group known as Juang are staying in many hamlets in and around Rebana Reserved Forest and adjoining to Daitari area. Their profession is shifting cultivation and hunting which is a major threat to existing fauna.

3.7.2. Poaching of Animals:

In this division hunting of herbivores like *Chittal, Barking deer, Wild boar, Squirrels, Birds* have been noticed. Elephant hunting has been noticed in the [past for ivory purpose. There are incidences of killing of wild animals by organised Sikar Groups. Akhand Sikar is practised by the Tribals and mis-use of crop protection guns in various villages & tribal hamlets in close proximity of forest occur. In the name of Crop protection it is seen that farmers used to electrocute animals. People use nets of various types of traps & trenching techniques to catch different fauna. During summer the herds of Spotted deer in Barang RF are forced to come to the nearby villages for water & easily poached by the human beings. Direct involvements of human beings in large numbers for poaching in Rebana, Atei, Santoshpur areas for Sikar are a common occurrence. Illicit trafficking of elephant tusk, smuggling of Tiger & Leopard skins and trophies of various wild animals are occasionally detected. The wild animals are killed by poisoning or shooting & valuable tusks are transported outside the division by the help of local tribals. Data on poaching reflects tip of the iceberg as detections are low compared to animals

killed & incredibly low conviction rates.

The data on Poaching of Wildlife of Keonjhar W.L Division is given in the Table No. 3.22.

Table No. 3.22.:Wildlife Cases booked in Keonjhar Wildlife Division, Anandapur.

SL. No.	Year	Name of the Range	OR Case No.	Place of Seizure	No. of persons arrested	Details of wildlife articles seized	Brief details of crime
1	2015-16	Anandapur	1A of 2015-16	Near Sarei village	3	Bengal Monitor Lizard - 1no Squirrel- 6nos Parakeet- 1no	Illicit Poaching
2	2016-17	Anandapur wildlife Range	OR case No. 146 A of 2016-17	Near Tolankapada village of Ghasipura Block	1	one indian python	snake charmer
3			OR case No. 147 A of 2016-17	Near Badapada Market	1	one indian python	snake charmer
4	2016-17		UD case No.-04 A of 2016-817	inside Baranga RF	0	one Dead spotted deer	–
5			UD case No.-17 A of 2016-17	inside Baranga RF near Nandabara	0	one Dead male spotted deer	–
6			UD case No.-18 A of 2016-17	inside Baranga RF near Purunabandhogada	0	one Dead male Barking deer	–
7			UD case No.-19 A of 2016-17	inside Baranga RF	0	one Dead male spotted deer	–
8	2017-18		UD case No.-01 A of 2017-18	inside Baranga RF near Nandabara	0	one Dead male spotted deer	–
9			UD case No.-03 A of 2017-18	Near Gohirabani village on NH-53	0	one Dead male rattle Beer	–
10			UD case No.-09 A of 2017-18	inside Baranga RF near Nandabara	0	one Dead male spotted deer	–
11			UD case No.-11 A	inside Baranga RF near	0	one Dead male	–

			of 2017-18	Nandabara		spotted deer	
12			UD case No.-12 A of 2017-18	inside Baranga RF near Kirtanapatia	0	one Dead female deer	–
13			UD case No.-15 A of 2017-18	inside 12 no.word of fakirpur village near Ramamanir	0	male adult monky injured in his left thigh	Rescu/Release
14			UD case No.-18 A of 2017-18	At Anandapur near the Bank of river Baitarani	0	indian softshell turtle	Rescu/Release
15			UD case No.-20 A of 2017-18	near Anandapur Bridge	0	one barn owl adult	Rescu/Release
16			UD case No.-21 A of 2017-18	inside Baranga RF near Ganpur high school	0	dead female chettal	–
17			UD case No.-22 A of 2017-18	inside Baranga RF near Kusumai	0	one Dead male spotted deer	–
18			UD case No.-23 A of 2017-18	Near Nandabara vilage	0	one dead calf chittal	–
19		Anandapur	UD case No.-25 A of 2017-18	Near Nuhamalia vilage	0	one dead male chittal	–
20			UD case No.-26 A of 2017-18	Near Anandapur vilage	0	one barn owl	–
21			OR case No. 170A of 2017-18	Inside Baranga RF Near Nuhamalia	2	two nos. Of fruit bat(dead)	Poacher
22	2018-19		UD case No.-06 A of 2018-19	inside Baranga RF near Purunabandhogada	0	one dead male chittal	–
23			UD case No.-14 A of 2018-19	inside Baranga RF near Kaadapal	0	one dead male chittal	–
24			UD case No.-15 A of 2018-19	inside Baranga RF near Ganpur village	0	one dead female chittal	–
25			UD case No.-21 A	near village Kaadapal	0	one dead male	–

			of 2018-19			chittal	
26			UD case No.-24 A of 2018-19	inside patilo RF,piller No.-05	0	dead female mellivora capersis	–
27			UD case No.-30 A of 2018-19	near road side Purunabandhogada	0	one dead male chittal	–
28			UD case No.-31 A of 2018-19	near village Nuagaon	0	male Barking Deer (injured)	Rescu/Release
29			UD case No.-32 A of 2018-19	near village Purunabandhogada	0	one dead male chittal	–
30			UD case No.-34 A of 2018-19	inside Baranga RF near Nanikabahali village	0	one dead male spotted deer	–
31			UD case No.-37 A of 2018-19	near village Purunabandhogada	0	one dead female spotted deer	–
32			UD case No.-38 A of 2018-19	near village Purunabandhogada near Baranga RF	0	one dead female deer	–
33	2019-20		UD case No.-01 A of 2019-20	inside Baranga RF near Nandabara	0	one dead male Barking deer	–
34			UD case No.-08 A of 2019-20	near Baranga village	0	one dead monky	–
35			UD case No.-12 A of 2019-20	inside Baranga RF near Banadurga Thakurani of Ganpur	0	one dead male chittal	–
36			UD case No.-14 A of 2019-20	inside Baranga RF near Karadapal village	0	one dead male chittal	–
37			UD case No.-23 A of 2019-20	out side Baranga RF near Ganpur village	0	one dead female spotted deer	–
38			UD case No.-28 A of 2019-20	on NH-20 near Barigaon village	0	one dead jungle cat	–
39			OR case No. 78 A of 2019-20	Inside Taneipal Village	2	3 kg meet of spotted Deer & Hair of	Poacher

						spotted Deer	

Sl. No.	Year	Name of the Range	OR Case No.	Place of Seizure	No. of persons arrested	Details of wildlife articles seized	Brief details of crime
40		Anandapur	UD case No.-29 A of 2019-20	On the road of Purunabandhogada & Nandabara	0	one dead kitten common palm	_
41			UD case No.-32 A of 2019-20	inside Talgaon village	0	one dead male monky	_
42			UD case No.-33 A of 2019-20	On the road of Purunabandhogada & Nandabara	0	one dead male palm civet	_
43			UD case No.-35 A of 2019-20	inside Baranga RF near Nandabara village	0	one dead female Barking deer	_
44			UD case No.-36 A of 2019-20	inside the premises of Range office,Anandapur	0	carcase of one male adult monky	_
45			UD case No.-38 A of 2019-20	near village Purunabandhogada of perifhery of Baranga RF	0	one dead male spotted deer	_
46			UD case No.-51 A of 2019-20	inside periphery area of Baranga RF near Ganpur Gramyapanchayat	0	one dead male chittal	_
47	2020-21		UD case No.-04 A of 2020-21	on NH-20 near Dhakotha petrol Bunk	0	one Dead male Barking deer	_
48			OR case No. 04 A of 2020-21	inside Bagun Gagrai house's premises	0	one Dead spotted deer & Horn	Poacher

1	2016-17	Brahmanipal	UDC No. 3B of 2016 - 2017	Inside Rebana R.F Near Daitari Dam Site	0	Dead - Body of Wild Elephant (Female)	Natural Death
2			OR Case No. 26B of 2016 - 2017	Inside Rebana RF, near Village Budhipada	1	Barking Dear - 1 no. Seized - Flesh (5 Kg)	Illegal Poaching
	2017-18		UDC No. 2Bof 2017 - 2018	Inside Rebana R.F Near Vill - Talapada	0	Barking Dear - 1 no.	Natural Death
3	2018-19		UDC No. 9B of 2018 - 2019	Inside TATA Colony Near Brahmanipal	0	Barking Dear - 1 no. (Female)	Dog Bite
4			UDC No. 22Bof 2018 - 2019	Inside Rebana R.F Near Vill - Patharagoda	0	Wild Boar (Female)	Natural Death
5			UDC No. 56B of 2018 - 2019	Inside Rebana R.F Near Vill - Khajuria (Pancham)	0	Bear Skin - 1 no. Size : L - 120 cm. x w - 55 cm.	Natural Death
6			UDC No. 76Bof 2018 - 19	Inside Rebana R.F Near Rebana Ghat Road	0	Wild Elephant Male - 1 no. Seized : Tusk - 2 nos. (16.01 Kg. & small pieces - 5 nos. (340 grm.)	Natural Death
7	2019-20		UDC No. 13Bof 2019 - 20	Inside Rebana R.F Near Rebana Tarini Ghat Road	0	Male Elephant Calf - 1 no. Seized : Tusk - 2 nos. (160 grm.)	Natural Death
8			UDC No. 55B of 2019 - 20	Inside Rebana R.F Near Hati Khunti	0	Male Elephant Carcass - 1 no.	Anthrax Doubt (Burnt)
9	2020-21		Nil				
1	2013-14	Deogaon	22D of 2013-14	Inside Harichandan pur Police Station	3	Chameleon - 2nos	Illicit transport ation
2	2014-15		21D of 2014-15	Near village Pitanagar road side	2	Barking Deer - 1 no.	Illicit Poaching
			22D of 2014-15	Near village Ostiaposi	2	Wild Boar - 1 no.	Illicit Poaching
			75Aof 2014-15	Nanikabahali village near Baranga RF	1	Horn of spotted Deer - 1 no.	Illicit Poaching
3	2016-17	De og	UDC No.16D	Inside Rebana R.F.	0	1. Dead Male Bariking Deer-	Body Recover

				near village Gargadabahal		1no. 2. Body Length - 24" 3. Neck Girth - 12'-5" 4. Front Leg - 17" 5. Back Leg Length - 19" 6. Chesk Girth - 23" 7. Weight - 12.5Kg.	
4	2017-18		UDC No.15D	Inside Rebana R.F. near village Ostiaposi	0	1. Dead Male Barking Deer - 1no. (Length - 24" Neck - 14" Chest Girth - 25" Hight - 21" Fore limb - 16" Hind Limb - 20" Weight - 16Kg.)	Body Recover
5			UDC No.61D	Near Village Ranipada , Dehurisahi	0	1. 4.5 Kg of Flesh of wild pig with some far 2. Trap made of clutch wire- 1 No. 3. Axe-1 No	Meat Recover
6	2018-19		Nil				
7	2019-20						
8	2020-21		UDC No. 10D	Near Daradipal Matha	0	1. Dead Male spotted Deer - 1no. (Length - 103cm Girth - 85cm Height - 78cm Horn Length - 40cm)	Body Recover
9			OR Case No. 43D	Near Bayapita village	3	1. Elephant Tusk - 14nos. (19.510Kg.) 2. Hundai X-cent Car - 1no. (OD22-N-8524) 3. Mobile - 4nos.	Poaching
Source: D.F.O., Keonjhar Wild Life Division, Anandapur							

3.7.3 Man- Animal Conflict :

Man Animal conflict is one of the major threats to the continued survival of many species. Opening of roads to the forests, increased speedy vehicular traffic causes the animal's easy break to the poacher equipped with fast moving vehicles, powerful search light and deadly accurate weapons. In the mining activity, day and night extraction of ores, functioning of crusher units, movement of truck and other vehicles, movement of human populations and clearance area, the wildlife population is greatly disturbed especially the elephant. Its movement outside forest is causing havoc in the nearby areas.

Elephant menace is very much noticed in this division. The elephants, come out in herds particularly in harvesting season and cause havoc in villages. They damage crops and houses and it is observed that elephants are very fond of Mahua flowers fermented in preparation of country liquor. The elephants very often invade houses of such liquors. Incidences of the grazing, wilful setting of forest fire and clearance of forest for cultivation in the new settlements have also depleted the wildlife habitat forcing them to come out from their hide outs.

Other instances of Man – Animal conflict between Bear and human beings are also common in this Division. Due to habitat fragmentation and degradation, the Bears come out of the forests and attack the human beings. During summer, the Bears come out of their hide out to eat the ripe jack fruits and remain in the vicinity of the villages where the fruits are plentily available and thus thevillagers get attacked by the Bears which is very common.Conflict occur mostly during dawn and let afternoon or dust. Wild pigs in large groups enter into crop field and cause extensive damaged.

It is the high time to address the root causes behind the man - animal conflict as it is a conservation concern.In the above context, following points should be taken into consideration for mitigating the above issue.

1. *Conservation & Protection of viable population of Elephant and Bear in their natural habitat.*

2. *Restoration of natural habitats and corridors in case of elephant through eco-restoration, and habitat improvement.*

3. *Formation and patrolling of anti-depredation squad in the transition area of wildlife habitat and human population.*

4. *Conflict prevention and mitigation strategies to be adopted like putting some honey bee boxes in the areas usually raided by elephants. Humming sound of bees act as deterrent to elephants to take that route. However, flower plants ought to be cultivated to keep the bee surviving. Extra income from honey collection may come.*

Human Killed :The compensation paid for human killed are given in the Table No. 3.23.

Table No. 3.23. : Compensation paid for human killed

Year	Name of Place	No. of Person Death	Compensation Paid in Rs.
2012	Guhiasala	1	2,00,000/-
2013	-	0	0
2014	-	0	0

2015	-	0	0
2016	Kushatikiri	1	3,00,000/-
2017	-	0	0
2018	-	0	0
2019	Nuarugudi	1	4,00,000/-
	Kanapur	1	4,00,000/-
	Kushatikiri	1	4,00,000/-
2020	Aturakana	1	4,00,000/-
	Panasakatha	1	4,00,000/-
	Total	**07**	**25,00,000/-**

Human Injury :

The compensation paid for human injury are given in the Table No. 3.24

Table No. 3.24 : compensation paid for human injury

Year	Name of Place	No. of Person Injury	Compensation Paid in Rs.
2012	-	0	0
2013	Hadagarh	1	75,000/-
2014 to 2016	-	0	0
2017	Bangurusuni	1	5,000/-
	Baniapanka	1	5,000/-
	Kanheigola	1	5,000/-
	Rebana	1	1,00,000/-
2018	Santoshpur	2	10,000/-
	Mahulagoda	1	5,000/-
	Golabandha	1	1,00,000/-
	Andharajodi	1	1,00,000/-
	Kantajhari	1	1,00,000/-
	Manoharpur	1	5,000/-
	Maliposi	1	1,00,000/-
2019	Rebana Palaspal	1	5,000/-
	KateniKantol	1	5,000/-
	Gopinathpur	1	5,000/-
2020	Panasjharan	1	1,00,000/-
	Badasiadimal	1	5,000/-
	Total	**18**	**7,30,000/-**

Crop Damage : The compensation paid for crop damage are given in the Table No. 3.25.

Table No. 3.25 : Compensation paid for Crop Damage.				
Year	Name of Place	No. of Case	Area Affected in Acre	Compensation Paid in Rs.
2012	Kanjiapal	3	1.39	6950
	Budhipada	1	0.66	3300
2013	Arjunchua	1	3.0	15000
	Kathaughati	21	9.03	45150
	Hayerpur	5	3.0	15000
2014	Hayerpur	6	7.2	36000
	Bhagamunda	3	1.9	9500
	Karadapal	2	1.7	8500
	Hatikucha	1	1.0	5000
	Arjunchua	7	7.45	37250
	Kathaughati	19	10.4	52000
	Ranipada	13	13.58	67900
	Ostiapasi	1	1	5000
	Kuntala	1	0.8	4000
2015	Bhalughara	17	2.02	10100
	Kantala	4	0.62	3100
	Budhipada	5	3.6	18000
	Kuntala	1	1	5000
2016	Nuarugudi	17	4.19	41900
	Binapatia	1	0.8	8000
	Madhubana	17	7.38	73400
	Hadagarh	11	2.34	23400
	Soso	2	0.85	10100
	Nuabaripala	1	0.03	300
	Baniapanka	6	1.04	10400
	Balibarel	1	0.8	8000
	Siadimalia	9	1.78	17800
2017	Soso, Balibarei, Daneipur, Nuagaon, Kanpur, Nimadani, Siadimalia, Bhagamunda, Sagadapata	113	58.83	588300
2018	Soso, Nimadani, Nuarugudi, Madhuban, Rangamatia Marchaipada, Palaspal, Bhagamunda	187	90.85	908500
2019	Kanpur, Madhuban, Rangamatia, Bangor,	535	174.95	174950

	Daneipur, Balibarei, Kusatikiri, Sankatapalia, Siadimalia			
2020	Soso, Nimadani, Bangor, Siadimalia, Balibarei, Madhubana, Nuagaon, Baghua, Morchaipada, Budhikud, Nanikabahali, Baranga, Santoshpur, Panasadiha, Gayalmunda	370	87.52	977620
Total		**1381**	**500.71**	**3189420**

The table above shows the crop damage is increasing with passing years and also it is a matter of great concern that man animal conflict is spreading to more villages with passing years.

House Damage :The compensation paid for House Damage are given in the Table No. 3.26.

Table No. 3.26 : Compensation paid for House Damage

Year	No. of Case	Nature of damage and compensation paid			
		Partly	Amount paid	Fully	Amount paid
2012	12	11	Rs. 22,000/-	1	Rs. 10,000/-
2013	10	3	Rs. 6,000/-	7	Rs. 70,000/-
2014	20	12	Rs. 24,000/-	8	Rs. 80,000/-
2015			NIL		
2016	2	1	Rs. 2,000/-	1	Rs. 10,000/-
2017	1	1	Rs.2,000/-	-	-
2018	-	-	-	-	-
2019	46	36	Rs.72,000/-	10	Rs.1,00,000/-
2020	5	-	-	5	Rs.50,000/-
Total	96	64	Rs.1,28,000/-	32	Rs.3,20,000/-

MAN BEAR CONFLICT : The compassionate amount paid are given in the Table No. 3.27.

Table No. 3.27 : Compassionate amount paid for Bear attack

Year	Temporary	Permanent	Killed	Compassionate amount paid
1	2	3	4	5
2016-17	4	2	1	Rs. 5,10,000/-
2017-18	2	1	0	Rs. 1,05,000/-
2018-19	1	2	0	Rs.2,05,000/-
2019-20	7	1	0	Rs.1,35,000/-
2020-21	1	1	0	Rs.1,05,000/-
Total	17	10	5	Rs.10,60,000/-
Sources : DFO, Keonjhar W.L. Division, Anandapur				

3.8 PROTECTION AND MANAGEMENT OF FAUNA :

Wildlife population and their habitat are two sides of the coin. Learning habitat requirement of each species of animal is considered as the most important factor of wildlife management. Uncontrolled grazing by cattle in the forest causes trampling of natural regeneration which interfere the habit and habitat of the wild animals. Though rights and concessions have already been ceased by the Govt. of Odisha in the RFs but in practical there is rampant grazing of domestic cattle inside the forests which has not been stopped altogether. Awareness among the VSS members has been created to encourage stall feeding and discourage their entry into the forest area.

Some of the important management plans for protection of fauna is given below.

Creation of Water Hole : Sufficient numbers of water holes should be there to meet the heavy demand during summer season.

Creation of Salt Lick: Artificial salt licks should be created to cater the salt demand of herbivores.

Anti-poaching camp/squad: People with strong physique should be engaged in Anti-Poaching Squad. They should cover the interior pockets of forests and camp nearby the vulnerable area, so that prompt action can be made whenever they get information. Particularly the squad should keep vigilant eyes on snaring, trapping including electrocution.

Information Network:Information about poachers, smugglers etc should be collected, so that crime can be avoided. Frequently elephant affected villages may be given mobile phones to promptly alert squads about movement of herds and herd size.

Clearing of Fire line:It should be carried out without any compromise to minimize the fire hazard as well as restoration of habitat. Fire protection measures to prevent fire engulfing flora and fauna should be given utmost priority.

Incentive & Rewards:Incentives and rewards should be given to the informers as well as to the VSS those are working for protection of fauna.

As per codal provision rewards fully given to informers & staff. The reward money received by Divisional Forest Officer, Keonjhar (WL) Division from Orissa Forest Development Corporation Ltd. is as follows: -

3.28. Reward money

Year	Reward money received in Rs.
2015-16	8,375.00
2016-17	22,292.00
2017-18	6,886.00
2018-19	11,067.00
2019-20	5,108.00

Source: DFO, Keonjhar (WL) Division.

The reward money has been rewarded to all the persons involved in seizure of the forest produce under the provision made in the Orissa Rewards for detection of Forest Offence Rules, 2004 annexed during 2016.

There is a provision of "Secret Fund" under Rule-5 of Orissa Rewards for Detection of Forest Offences Rules, 2004. This is maintained by the Divisional Forest Officer. The payment from the 'Secret Fund' is not subject to Audit.

Weed eradication:Uprooting of weeds should be carried out in R.F and also within 1 km of boundary of the nearby villages, so that seed dispersal to the R.F can be checked.

Provision of Check Gate : To control the illegal trade of forest produce, following check gates are being operated in this division.

Table No.3.29 : List of Check Gates

Sl. No.	Name of Check Gate	Location	Range	Beat	Status	Remark
1	Chitijhari	Chitijhari	Anandapur	Gayalmunda	Functional	Anti smuggling
2	Patharpada	Patharpada	Anandapur	Patilo	Non functional	
5	Bareigoda	Bareigoda	Brahmanipal	Rebana(N)	Functional	Anti smuggling
Source-Keonjhar (WL) Division						

121 Nos. of V.S.S have been formed which keep vigil on the movement of poachers and intimate to the forest staff. Anti Depredation Squad have been formed to combat the illegal traders and poachers. 70No. of water bodies have been excavated in different Reserve Forest area to provide drinking water to the Wildlife. Motorized boats have been provided to patrol along Baitarani river to guard the anti socials and poachers.Watch Towers have been constructed at vulnerable points to check the poaching & smuggling. It should be ensured that during summer dug out tanks retain sufficient water to cater to the needs of wildlife population. Number of water holes may be created on dry nallah beds/rivers so that animals can meet their water requirement from oozing out water from such holes during summer months in every Forest Block.

The list of Creation of Water Body/ WHS is given in the Table No. 3.29.

Table No. 3.30 : Creation of Water Body/WHS

Year	Sl. No.	Item of Work	Location	Name of Range	Physical Achievement
01	02	03	04	05	06
2007-08	1.	Creation of Game Tank	Ostipashi	Deogaon	1 No.
2008-09	2.	Creation of Game Tank	Gayalmunda R.F Rebana R.F	Anandpur and Bramanipal	2 Nos.
	3.	Renovation of Game Tank	Gayalmunda.	Anandpur.	1 No.
2009-10	4.	-	-	-	-
2010-11	5.	Creation of Water Body	Turkipada	Bramanipal	1 No.

	6.	Water harvesting structure.	Baranga.	Anandpur	1 No.
2011-12	7.	Creation of Water Body	Talapada	Bramanipal	1No.
	8.	Creation of Water Body	Gutung and Baranga		2 Nos.
	9.	Water harvesting structure.	Baranga.	Anandpur	1 No.
2012-13	10.	Maintenance of Water Body		-	4 Nos.
	11.	Creation of Water Body	Rebana R.F	Bramanipal	1 No.
	12.	Creation of Water Body	Rebana R.F	Bramanipal	1 No.
	13.	Water harvesting structure	Rebana R.F	Bramanipal	1 No.
	14.	Creation of Water Body		-	4 Nos.
	15.	Maintenance of Water Harvesting Structure.	Rebana R.F	Bramanipal	1 No.
2013-14	16.	Creation of water body	Rebana R.F	Bramanipal	1 No.
	17.	Water Harvesting structure	Rebana R.F and Bhoka	Bramanipal	2 Nos.
	18.	Creation of water body	Santoshpur R.F near Budhikud and Boula R.F near Hadagarh	Anandapur	2 Nos.
	19.	Creation of water body	Talapada	Bramanipal	1 No.
	20.	Water Harvesting structure	Baranga and Pitanau	Anandpur	1 Nos.
2014-15	21.	Creation of Water Body	Santoshpur R.F Near Kantala	Anandapur	1 No.
	22.	Water Harvesting	Digging of WHS in Atei R.F and	Anandapur and	2 Nos.

		structure	Rebena R.F near Talapada	Deogaon	
	23.	Maintenance of Water body	Rebana R.F	Bramanipal	1 No.
	24.	Maintenance of water body	Baranga R.F	Anandapur	1 No.
2015-16	25.	Maintenance and Renovation of check dam WHS	Baranga	Anandapur	1 No.
2016-17	26.	Creation of water body	Nardangipentha of Rebena RF	Bramanipal	1 No.
	27.	Renovation of water body	Turkipada of Rebana R.F	Bramanipal	1 No.
CAMPA-APO 2011-12	28.	Digging of Game Tank	Gumundu	Bramanipal	1 No.
CAMPA-APO 2012-13	29.	Creation of Water body	Jhinkipita, MatiHudi, Kantala, Putujhari	Anandapur, Deogaon, and Bramanipal	4 Nos.
CAMPA-APO 2013-14	30.	Creation of Water body	Sikabeda, Panasdiha, Madyapur, Dhurudi Ambo, KathauGhati and Talapada	Anandapur, Deogaon, and Bramanipal	6 Nos.
CAMPA-APO 2014-15	31.	Creation of Water body	Jugalkishorepur, Hatikucha, Bhaliapada and Kusumjodi	Anandapur, Deogaon, and Bramanipal	4 Nos.
	32.	Maintenance of Water body	Rebana and Baranga.	Anandapur, and Bramanipal	2 Nos.
2017-18	33	Digging of Water body	Gopinath Pur (Rebana RF)	Brahmanipal	1 nos
			Dhanabani (Rebana RF)	Deogaon	1 nos
			HaridaBahali	Anandapur	1 nos

			(Atei RF)		
			Debihudi (Rebana RF)	Brahmanipal	1 nos
2018-19	34	Digging of Water body	Dihapal (Rebana RF)	Brahmanipal	1 nos
			Kaliahudi (Atei RF)	Deogaon	1 nos
			Nuamalia (Baranga RF)	Anandapur	1 nos
			Chandikhamana (Santoshpur RF)	Anandapur	1 nos
			Rebana (Rebana RF)	Brahmanipal	1 nos
			Kainya pathara (Rebana RF)	Deogaon	1 nos
2019-20	35	Digging of Water body	Kalamatia (Atei RF)	Deogaon	1 nos
			Rebana (Rebana RF)	Brahmanipal	1 nos
			Hatichapal(Santoshpur RF)	Anandapur	1 nos
			Ranipada (Rebana RF)	Deogaon	1 nos
			Nipania (Rebana RF)	Brahmanipal	1 nos
2020-21	36	Digging of Water body	Kanheigola (Rebana RF)	Deogaon	1 nos
				Total	70No.

CHAPTER- IV

MAINTENANCE & ENHANCEMENT OF FOREST HEALTH AND VITALITY

4.1 STATUS OF REGENERATION :

Tree species up to 10 cm diameter are taken into consideration for assessment of regeneration status of a particular species as prescribed in National Forest Inventory by FSI. Data collected from the square plots of 3mx3m for saplings (2 cm to 10 cm collar diameter) and from the square plots of 1mx1m for seedlings will be generally used to assess the regeneration status of species in the management unit (compartment, village or any other unit). Based on the phyto-sociological data from plot level enumeration, the regeneration status of the sampled species may be assessed in the following categories.

a. Good regeneration- If seedlings are more in numbers than the saplings and likewise saplings are more than that of adults.
b. Fair regeneration -If seedlings are more in numbers than that of the saplings but the saplings are equal or less than that of adults.
c. Poor regeneration- If a species survives in only sapling stage, but not as seedlings (though sapling may be less, more or equal to adults).
d. No regeneration - If a species is absent both in sapling and seedling stage, but present as adult.
e. New regeneration- If a species has no adults but only sapling and/or seedlings.

The regeneration survey has been done in almost all Forest Blocks and the detailed result is presented in **Appendix – XI.**

4.1.1 In Atei R.F,there is good regeneration in Compartment No. 50, 51, 52, 54, 55, 56, 63, 66, 67, 68 and 69 and fair in Compartment No. 53, 57, 58, 59, 60, 61, 62. Sal is the dominant species in Atei R.F. the overall regeneration status and regeneration status of Sal is depicted in Table No. 4.1.

Table No. 4.1 : Regeneration status of Sal

Name of R.F	Compartment No.	Regeneration Status	**Regeneration Status of Sal**
Atei	50	Good	New
	51	Good	New
	52	Good	Good
	53	Fair	Fair
	54	Good	Fair
	55	Good	Good
	56	Good	Fair
	57	Fair	New
	58	Fair	Fair
	59	Fair	Fair
	60	Fair	Fair
	61	Fair	Good
	62	Fair	Fair
	63	Good	New
	64	Fair	-

	65	New	-
	66	Good	Fair
	67	Good	Fair
	68	Good	Good
	69	Good	Good

4.1.2 Sal is also dominant species in Rebana R.F. The compartment wise overall regeneration status and regeneration status of Sal is given in Table No. 4.2.

Table No. 4.2 : Compartment-wise regeneration status

Name of the R.F	Compartment No.	Total Regeneration Status	Regeneration Status of Sal
Rebana	1	Good	Good
	2	Good	Good
	3	Fair	Fair
	4	NA	NA
	5	Good	Fair
	6	Good	Good
	7	Good	Good
	8	Good	Good
	9	Good	Fair
	10	Good	Good
	11	Good	Good
	12	Good	Good
	13	Good	Fair
	14	Fair	Fair
	15	Fair	Fair
	16	Good	Fair
	17	Good	Fair
	18	Fair	Fair
	19	Good	Good
	20	Good	Good
	21	Good	Good
	22	Fair	New
	23	New	New
	24	Good	Good
	25	Good	Fair
	26	Good	Fair
	27	Good	Fair
	28	Good	Good
	29	Fair	Fair
	30	Good	New
	31	Good	New
	32	Fair	Fair
	33	Good	Fair
	34	Good	Fair
	35	Good	Good
	36	NIL	Nil
	37	Good	New

	38	Good	Fair
	39	Good	Fair
	40	Good	New
	41	Good	Fair
	42	Good	Fair
	43	Good	New
	44	Good	Fair
	45	Fair	Fair
	46	Good	Fair
	47	Good	Fair

4.1.3 Sal is also the dominant species in Santoshpur R.F. The compartment wise overall regeneration status and regeneration status of Sal is given in Table No. 4.3.

Table No. 4.3 : Compartment wise regeneration status

Name of R.F	Compartment No.	Overall Regeneration Status	Regeneration Status of Sal
Santoshpur	1	Good	Good
	2	Poor	poor
	3	Fair	Fair
	4	Good	Good
	5	Good	Fair
	6	Good	Good
	7	Good	Fair
	8	Good	Good
	9	Good	Good
	10	Good	Fair
	11	Good	Good
	12	Good	Good
	13	Good	Good
	14	Good	Good
	15	Good	Fair
	16	Fair	Good
	17	Good	Good
	18	Fair	Poor
	19	Good	Poor
	20	Good	Good

From the above data, it is found that the overall regeneration status of Santoshpur R.F is good.

4.1.4 The regeneration status of other RFs like Turkipada, Kadagotha, Hatibandha, Baigundi, Baranga, Gayalmunda, Mahulpanga, Meghanadpoi, Ostapura, Palaspal and Patilo are given in the Table No.4.4.

Table No. 4.4 : Regeneration status of other RFs

Name of Forest Block	Regeneration Status	Regeneration Status of Sal
Baranga	Fair	Poor
Patilo	Fair	Poor
Meghanadpoi	New	Poor
Ostapura	Fair	Poor

Palaspal	Good	Poor
Gayalmunda	Poor	Poor
Hatibandha	Fair	Poor
Kadagotha	Fair	New
Panasdiha	Fair	Not available
Baigundi	Fair	Poor
Turkipada	Good	Fair
Mahulpanga	Good	New
Tangiriapal	Fair	Fair
Koldiha	Not available	Not available

4.2. AREA AFFECTED BY FOREST FIRE :

As most of the forests of this Division are dry and moist deciduous forest, leaf shedding starts from mid February and the dried leaves cover the forest floor. Prolonged hot weather with scanty rains between Februarys to May accounts for high fire risk. The dry leaves and grasses provide the inflammable materials for spreading of fire. Once started during the hot weather, it becomes difficult to control. There is no single block in this Division which is spared from ravages of fire. Repeated fire in the same Forest Block is common.

The causes of fire are well known. It spreads from village lands to the neighbouring forests. Graziers also put fire for bringing up new grasses. Persons moving in the forest sometimes throw un-extinguished bidi or cigarette which causes forest fire. The burnt wood left in the forest camp by the labourers or villagers who sometimes take shelter in the forest with their cattle and carts spreads fire inside the forest. Collectors of Mahua flower&sal seeds often set fire to clear the ground in the mid of February for easy Mahua collection.Forest fire always start by one of two ways i.e. naturally caused or human caused. The later contribute about 99% of Forest fire. Thus, there are various causes which contributes to the forest fire in the Division. Considerable parts of forests are burnt annually although the whole area is taken specifically for fire protection under the provision of law. Basing on the information collected from MODIS satellite, the forest blocks are divided into three categories on the basis of intensity of fire (Area affected) as high, moderate and low. The details are given in the table No. 4.5.

Table No.4.5 : Fire Occurrence percentage

Name of Forest Block	No. of Occurrence during 2006-07 to 2017-18	%age of Occurrence	Intensity of Fire
Rebana	259	70.38	High
Santoshpur	27	7.33	Moderate
Patilo	2	0.54	Low
Turkipada	2	0.54	Low
Mahulpanga	1	0.27	Low
Atei	30	8.15	Moderate
Non Forest	27	7.33	Moderate
Total	348		

Source : GIS Cell, PCCF Office, Bhubaneswar.

The year wise occurrence of forest fire in different forest blocks is given in Table No.4.6.A

Table No.4.6.A: Year-wise Occurrence of Forest Fire in different Forest Block

Year/ Forest Block	Rebena	Santoshpur	Boula	Atei	Patilo	Turkipada	Mahulpanga	Non Forest	Total
2006	7	0	0	0	0	0	0	1	8
2007	5	0	0	0	0	0	0	0	5
2008	7	3	0	2	0	0	0	4	16
2009	6	3	3	8	0	0	0	1	21
2010	0	0	0	0	0	0	0	0	0
2011	7	0	0	0	0	1	0	0	8
2012	8	0	0	1	0	0	0	0	9
2013	9	2	2	2	0	0	0	2	17
2014	6	1	0	0	0	0	0	2	9
2015	11	3	0	1	0	0	1	0	16
2016	12	1	0	1	0	0	0	3	17
2017	181	14	15	15	2	1	0	14	242
Total	259	27	20	30	2	2	1	27	368

Source : GIS Cell, PCCF Office, Bhubaneswar.

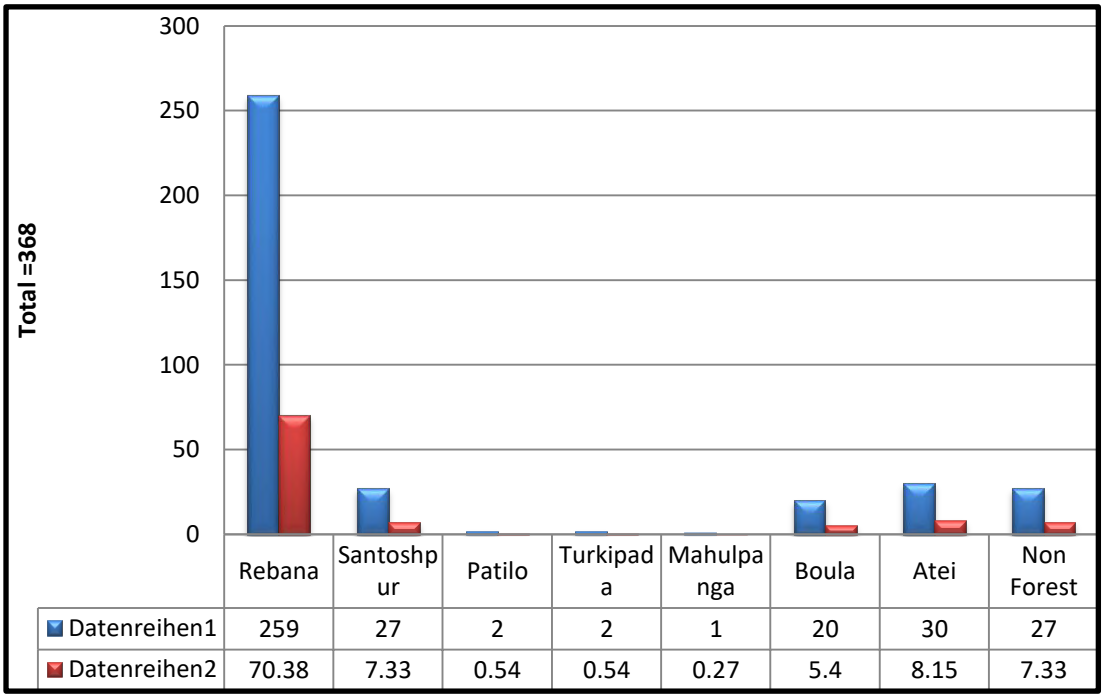
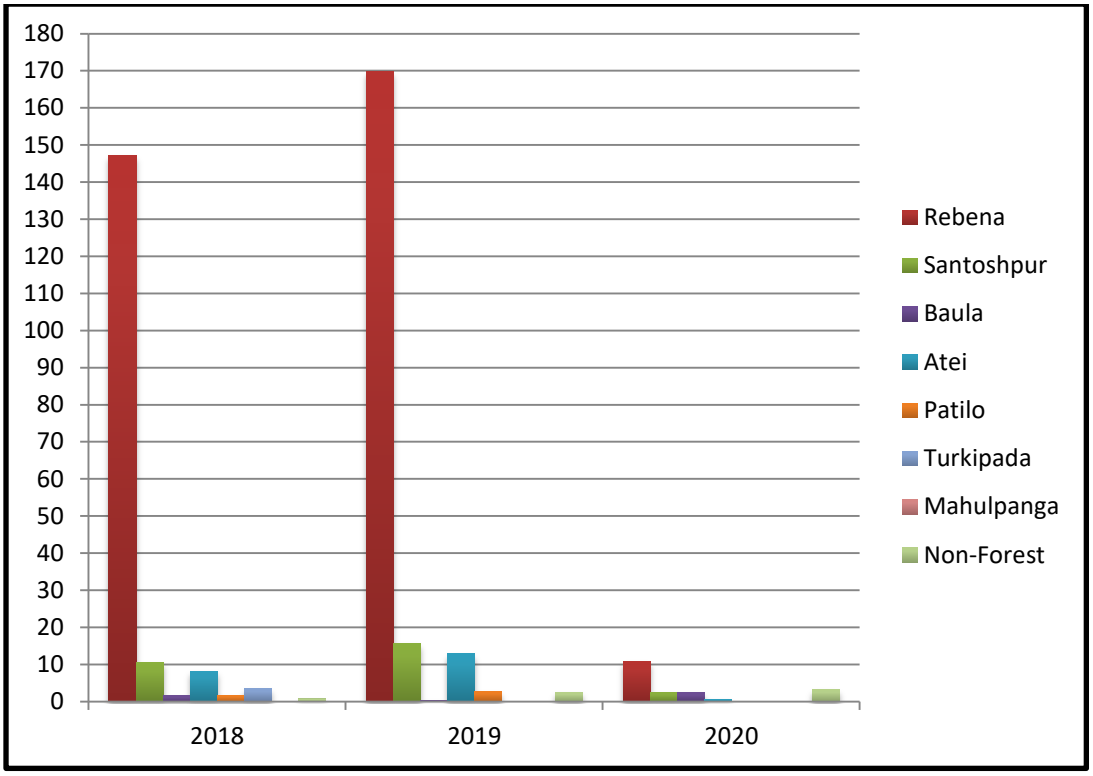


Table No.4.6.B.Year wise area(ha.) affected by forest fire : (from 2018 to 2021) :

Year	Rebena	Santos hpur	Baula	Atei	Patilo	Turki pada	Mahul panga	Non-Forest	Total
2018	147.2514	10.46	1.5	8.227	1.75	3.5	-	0.7	173.3884
2019	169.857	15.62	0.30	12.888	2.75	-	-	2.5482	203.9632
2020	10.662	2.37	2.316	0.685	-	-	-	3.245	19.278
Total	327.7704	28.45	4.116	21.800	4.50	3.5		6.4932	396.6296



Above data shows area wise as well as no. of occurrence wise Rebana RF stands highest after that lies Santoshpur RF.

Adverse Effects of Forest Fire :

1) Effect on regeneration :

   With the outbreak of fire, regeneration is affected most. It destroys or dies back, thereby delaying the establishment of a new crop and extending the rotation.

2) Effect on productivity :

   Loss of annual increment results from the defoliation that accompanies fires and consequent check the tree growth.

3) Effect on species composition :

   Fire tolerant species to some extent survive the fire and other species succumb giving rise to invasion of weeds.

4) Effect on forest soil :

   It has impact on important physical characteristics of soil like soil colour, texture, PH, bulk density and water holding capacity. Soil organic matter becomes lost, increased PH & reduced porosity and permeability.

5) Smokes/ Smog increases air pollution level and give rise to temperature in the locality.

6) Legal provision under prevalent laws :

   a) Section 27 (1) &(3) under Orissa Forest Act,1972.
   b) Orissa Forest(Fire Protection) Rules,1979 envisages under Rule-3(1).
   c) Section 27(2)(d) under Wildlife(Protection) Act,1972.
   d) Section 51(1) under Wildlife(Protection) Act,1972.

   All these above legal provisions prohibit any person to set fire in any type of forests.

Prevention and Mitigation Strategy :

Occurrence of Forest fire can be effected by vigorously controlling the causes which contribute and enforcing combative measures.

1. Preventive Measures :

   Forest fire usually starts in the dry season and can be prevented by adequate precautions. For this purpose fire line should be created and maintained in the fire prone areas.

2. Mitigation Measures :

   The mobile phone numbers of all the D.F.O.s have been registered to get quick alert of FSI. TheFITGC,of the office of the Principal Chief Conservator of Forests, Odisha is facilitating the details of KMZ file relating to different Divisions received from FSI to Forest Divisions with geo-coordinates up to Forest Block Level for field inspection by ground staff. The field officials then take adequate measures for controlling the forest fire and report back to the higher authority.

3. Inter Departmental Co-ordination:

   The involvement of other department is very much essential for controlling the forest fire. Co-ordination among Panchayatiraj, Revenue, Police, Fire Department and Health Department is required so that they will also be alert during forest fire. The details on co-ordination with other Departments and calendar plan for the activities are spelt out in standard operating procedure adopted by the State.

4. Role of Response Team : NGO & VSS – There is three tier mechanism in operation for control of Forest Fire. The first information received from State Control Room is transmitted to field units and Division control room regularly in daily basis. Then the action taken by the fire fighting squads including other supporting staff and the extent of damage collected from Divisions being reported regularly for effective monitoring.

   The VSS members are also helping in controlling of the Forest Fire. Now a days few voluntary organisations and NGOs come forward to assist the field officials for prevention of Forest Fire. Apart from the fighting through mechanical means the involvement of VSS through proper motivation need to be implemented to control fire. The Present System on Forest Fire Control is given below:

On Receiving Warning	Response Time	Loss Analysis
• Disseminate the alert to all concerned as per reports received from Forest Survey of India by State Control Room • At District level transmission of information to different Ranges through telephone/VHF networks/SMS alert by Division control Room • Transmission of message to different field units for immediate action to extinguish the fire by Range Officer/fire fighting squad.	• Within an hour of occurrence through satellite data and communicated to mobile telephones • Within one hour of transmission of message to different field units by different Ranges. • Immediate action by field units to extinguish forest fire.	• Assessment of damages on regeneration . • Assessment of damages onwildlife. • Assessment of damages on regeneration on timber & other MFP. • Investigation on the offences resulting to forest fire.

Though several steps have been taken by the State Government for minimising the fire incidence but till date fire has been the main cause of forest degradation. Allotment under Fire Protection has been increased in many fold and the Divisions have been equipped with vehicle and fire fighting squad with fire equipments to act upon the fire incidence as quick as possible. A control room is being operated during fire prone season to co-ordinate the staff from the Division office. Incentives to the villagers and VSS members are being given where the forest fire has been controlled.

Identification of vulnerable areas on maps, creation of data bank on forest fires, evolving fire dangers, fire forecast system, provision for a crisis management group, involvement of JFM committees and efficient enforcement of legal provision are the main aspects to combat fire instances. The details of expenditure incurred for prevention of fire during 2007-08 to2014-15 is given in the Table No. 4.7.

Table No. 4.7: Expenditure for prevention of fire

Year	Expenditure Incurred in Rs.	Year	Expenditure Incurred in Rs.	Year	Expenditure Incurred in Rs.
2007-08	112000	2012-13	479500	2017-18	1400000
2008-09	386000	2013-14	2016800	2018-19	7449000
2009-10	455000	2014-15	3567500	2019-20	10893510
2010-11	578500	2015-16	3550000	2020-21	2709200
2011-12	323000	2016-17	2502000		
Sources - DFO, Keonjhar (WL) Division, Anandapur.					

4.2.1 Appropriate measures taken to check Forest Fire :

E.D.C/V.S.S. keep an eye on the people who causes forest fire and inform the Forest Department stationed locally about fire incidence. Fire watchers have been stationed in vulnerable points to extinguish the forest fire whenever it occurs. Fire lines have been created and maintained by the Divisional staff in different area. Blowers and fire fighting equipments have been purchased for the purpose. The details of measures taken in last eight years are given in the Table No. 4.8.

Table No. 4.8 : The details of Fire Fighting Squad.

Sl. No.	Year	Scheme	Range	No. of Squad Engaged
1	2008-09	Integrated Forest Protection Scheme	Anandapur, Deogaon, Brahmanipal	3
2	2010-11	Deployment of fire fighting squad.	Anandapur, Brahmanipal	2
		Intensification of Forest Management.	Anandapur, Deogaon, Brahmanipal	3
3	2011-12	Deployment of fire fighting squad	Anandpur	1
4	2012-13	Deployment of fire fighting squad	Deogaon & Brahmanipal	2
		Deployment of fire fighting squad	Anandpur, Deogaon, Brahmanipal	3
5	2013-14	Deployment of Fire fighting squad	Anandapur Deogaon Brahmanipal	3
		Deployment of fire fighting squad	Hadagarh & Brahmanipal	1
6	2014-15	Fire fighting squad	Brahmanipal	1
		Fire fighting squad (including vehicle)	Anandapur & Brahmanipal	2
7	2016-17	Deployment of fire fighting squad	Deogaon	1
8	2017-18	Fire fighting squad	Deogaon	1
		Deployment of fire fighting squad	Anandpur	1
9	2018-19	CAMPA Wildlife Management (APO-2017-18)	Anandapur	5
			Deogaon	4
			Brahmanipal	4

10	2019-20	22-2406-02-789-3173-20002 OC	Hadagarh	2
		22-2406-02-110-0361-20002- OC (EMP)	Anandapur	1
			Deogaon	1
			Brahmanipal	1
		CAMPA Wildlife Management (APO-2019-20)	Anandapur	5
			Hadagarh	1
			Deogaon	4
			Brahmanipal	4
11	2020-21 (Up to October' 2020)	22-2406-02-110-0361-20002- OC (EMP)	Anandapur	1
			Deogaon	1
			Brahmanipal	1
		CAMPA Wildlife Management (APO-2019-20)	Anandapur	5
			Deogaon	4
			Brahmanipal	4

Creation and maintenance of fire line is given in the Table No. 4.9. A

Table No.4.9.A: Fire Line creation & maintenance 2007-08 to 2014-15(General Budget)

Sl. No.	Year	Range	Location	Creation (In Kms.)	Maintenance (In Kms.)
1	2007-08	Brahmanipal, Deogaon	Rebana & Atei	20	0
2	2008-09	Brahmanipal	Rebana	0	30
3	2009-10	Anandapur, Hadagarh, Deogaon & Brahmanipal	S.Pur, Boula & Rebana	24	0
		Anandapur, Hadagarh, Deogaon & Brahmanipal	Atei, H.Boula& Rebana	20	0
		Anandapur, Hadagarh, Deogaon & Brahmanipal	Rebana, S.Pur, Baula, Atei	8	30
4	2010-11	Deogaon & Hadagarh	Atei & Boula	20	20
5	2011-12	Anandpur, Hadagarh, Deogaon & Brahmanipal	Rebana, S.Pur, Baula, Atei.	10	35
6	2012-13	Anandapur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Boula, Rebana &Ostiaposi	65	0
7		Deogaon & Brahmanipal	Atei & Rebana	6.8	0
8	2013-14	Anandpur, Hadagarh, Deogaon & Brahmanipal	Patilo, Boula & Rebana	15	0
9	2014-15	Anandapur, Deogaon & Brahmanipal	Patilo & Rebana	19.93	12
10	2015-16	Hadagarh	Gadachandi (Baula RF)	0	10
			Pitanau(Baula RF)	0	10
11	2016-17		Gadachandi (Baula RF)	0	13.5
12	2017-18		Gadachandi (Baula RF)	0	15
			Pitanau(Baula RF)	0	10
			Bahia(Baula RF)	0	10
13	2018-19		Hadagarh(Baula RF)	0	10
			Gadachandi (Baula RF)	0	10
			Rangamatia(Baula RF)	0	10
14	2019-		Pitanau(Baula RF)	0	3.5

	20		Kantpal(Baula RF)	0	3.5
			Kathakata(Baula RF)	0	3.5
			Bahia(Baula RF)	0	3.5
			Baidakhia(Baula RF)	0	3.5
			Purunapani(Baula RF)	0	3.5
			Hadagarh(Baula RF)	0	3.5
			Raighati(Baula RF)	0	3.5
			Total	209	**253.5**

Table No. 4.9.B: Creation and maintenance of fire line under [CAMPA up-to 2020-21{APO : 2009-10 to 2019-20}]

Sl. No.	Year	Range	Location	Creation in KM	Maintenance in KM
1	2009-10	Anandapur, Hadagarh & Brahmanipal	Patilo, Boula & Palaspal	25	0
2	2010-11	Hadagarh & Brahmanipal	Boula & Rebana	25	0
3	2012-13	Anandapur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Boula, Gayalamunda, Rebana & Atei	82.36	0
4	2013-14	Anandpur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Boula, Gayalamunda, Rebana, & Atei.	112.2	0
5	2014-15	Anandapur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Boula, Rebana & Atei	25	60
6	2015-16	Anandapur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Atei, Rebana & Boula	35	60
7	2016-17	Anandapur, Hadagarh, Deogaon & Brahmanipal	Baranga, Atei, Rebana	51.17	125.7
8	2017-18		NIL		
8	2018-19	Anandapur, Hadagarh, Deogaon & Brahmanipal	Baranga, Santoshpur, Atei, Boula & Rebana	38.344	533
9	2019-20	Anandapur, Hadagarh, Deogaon & Brahmanipal	Santoshpur, Atei, Baranga, Boula & Rebana	50.07	461.5
			Total	88.414	994.5
Source : DFO, Keonjhar W.L Division, Anandapur					

4.3 AREA DAMAGED BY NATURAL CALAMITY :

The forest of Keonjhar (WL) Division is usually affected by the natural calamities like cyclone, flood, frost, drought giving rise to erosion and devastation to some extent.

1. Cyclone: -
   The velocity of wind flow is normal in this area. But storms are of local occurrence during the month of April to June and September to October. But the damage is of small magnitude like sporadic uprooting of trees, breaking of branches etc. However Wind fans to forest fire thereby increasing fire damage during the summer.
   During the year 2013 cyclone Phailin severely affected to this Division & damaged the natural forests, road side plantation, forest related infrastructures. Large number of trees were uprooted and subsequently salvaged departmentally. There had been considerable disturbance to wildlife habitats. It also severely damaged forest roads, culverts/cause ways, VHF communication & network etc.During Phailin in 2013, the range wise affected trees are given in the Table No. 4.10.

Table No. 4.10 : Range wise affected trees during Phailin.				
Range	Area	No. of trees affected	Out turn from the affected trees	
			Timber (In cum)	Firewood (In Stack)
Brahmanipal	-	99	171.7909	91
Anandapur	-	62	12.2961	7
Deogaon	-	54	1.836	72
Total	**-**	**215**	**185.923**	**170**

2. Flood : Flood usually occurs in Baitarani river as well as its tributaries. They hardly cause any serious damage to the forest vegetation. However,it causes soil erosion and leaching out of top soil. The forest areas severely affected by flash flood are Atei, Santoshpur and Rebana etc.
3. Frost: -Frost is of very negligible occurrence. It occurs near upper reaches of Daitari hills. Its occurrence is occasional mainly in winter season. Very small patch of Sal regeneration is affected by this and never in alarming magnitude.
4. Drought: -Drought plays a vital role in damaging the forests. The forests on the higher hill slopes are usually subjected to drought during summer months. Its effect is more visible on the South-Eastern aspects. The forest blocks affected by drought are Ostapura, Meghanadpoi, Patilo, Baranga, Atei.It is mainly due to low moisture contents in the areas which makes Sal trees stag-headedness and stunted. Continuity of this process is susceptible to fungal attack in the long run.

4.4 Area Protected from Grazing :

There are huge numbers of tribal hamlets located in and around Reserve Forests of this Division. Goat keeping & farming is their profession for which a huge number of cattle population are dependent on forest of this Division. The grazing should be regulated by the provision of Orissa Forests (Grazing of Cattle) Rules, 1980.

Though grazing is prohibited inside the RF areas, but it could not be implemented in the ground. Pasture lands are diminishing day by day in the villages, hence the cattle of forest fringe villages are totally dependent on the forest areas for grazing. Round the year the grazing pressure has increased due to increase in the number of cattle. From socio – economic survey data of 30 villages, it is found that the total livestock is 17984 out of which cow and bullock represent 46%, buffalo 2% while goats accounted for 52% only.

During Forest Resource assessment (Vegetation Survey) Plot approach form and plot description form have been maintained meticulously as per National Working Plan Code, 2014.From these data following areas are suggested to be closed.

1. The areas to be taken up under block plantation and ANR Gap Plantation should be closed for 5 years.
2. Areas having poor and new regeneration should be closed (Tables 4.1, 4.2, 4.3 of this Chapter.
3. In case of Palaspal, Gayalmunda, Hatibandha &Baigundi RFs where the regeneration status is poor, rotational grazing should be allowed.

4.4.1 Number of Live Stock Grazing in the Forest :

Name of the C.D Block and Cattle population is given in the Table No.4.11.

Table No. 4.11: Name of the C.D Block and Cattle population					
		Cattle	Buffalo	Sheep	Goat
1.	Hatadihi	72,651	30	738	31,548
2.	Ghasipura	67,154	316	2,466	21,445
3.	Anandapur	48,906	742	2,794	34,216
4.	Harichandanpur	66,177	2,861	6,583	67,401
5.	Ghatagaon	49,409	1,237	9,592	50,860
Source : S.D.V.O., Anandapur					

4.4.2 Availability of Palatable Species :

The Socio-Economic survey indicates that the cattle of approximately 90% households depend on forest for grazing. It further, shows that the stall feeding is not common but being practised by the people occasionally. Stall feeding should be encouraged by fodder cultivation though incentives to forest fringe villagers so as to discourage them from age old practice of cattle grazing inside forest. To start with one or two forest blocks and fringe villages may be taken as model so that benefits can accrue to the farmers/ cattle grazers. Some of the palatable species cherished by the cattle is given in the Table No.4.12.

Table No. 4.12 : List of palatable species

Sl. No.	Local Name	Botanical Name
1.	Bara	*Ficus benghalensis*
2.	Dimiri	*Ficusracemosa*
3.	Amara	*Ficushispida*
4.	Tentuli	*Tamarindusindica*
5.	Kalasirisa	*Albizzialebbeck*
6.	Dhalasirisa	*Albizziaprocera*
7.	Mahala	*Ailanthus excelsa*
8.	Simil	*Bombaxceiba*
9.	Kasi	*Brideliaretusa*
10.	Damaguruda	*Gardenia gummifera*
11.	Amba	*Mangiferaindica*
12.	Neem	*Azadirachtaindica.*
13.	Barada	*Bauhinia purpurea*
14.	Sissoo	*Dalbergiasissoo*
15.	Pahadisissoo	*Dalbergialatifolia*
16.	Dhobi	*Dalbergiapaniculata*
17.	Barkoli	*Ziziphusmauritiana*
18.	Mahula	*Madhuca latifolia*
19.	Babool	*Acacia nilotica*
20.	Gohira	*Acacia leucophloea*
21.	Chara	*Buchnanialanzan*
22.	Gambhari	*Gmelinaarborea*
23.	Dhaura	*Amogeissuslatifolia*
24.	Asan	*Terminaliatomentosa*
25.	Piasal	*Pterocarpusmarsupium*
26.	Sal	*Shorearobusta*
27.	Dhamana	*Grewialatelifolia*

4.4.3 Pasture Land :

Pasture Land is available on the bank of the Baitarani(Santoshpur Reserve Forest), on the bank of the Musala River (Atei Reserve Forest) and in swampy areas near the perennial water sources of many other Reserve forest like Barang. Common grazing species like *Chrysopogeonfulvus, Cymbopogon martini, Cynodondactylon, Imperata cylindrical, Cenchrusciliaris, Digoteriasanguinalis.* The pasture lands have been degraded due to pressure of huge cattle population.

4.5 Lopping Practices :

Generally during summer season lopping of fodder trees are done by tribals to feed their cattle causing damage to existing forest crop. The trees among the above palatable species shown in table are *Gambhar, Amla, Sissoo, Khair, Sal, Bija.* In order to get quick money, the villagers in the nearby forest collect Sal leaves for leaf plate making indiscriminately by lopping and pollarding of Sal shoots which cause destruction of young crop. In vast areas of Rebana and Atei R.Fs, people practised lopping and pollarding of Sal poles to get new flush of bigger leaves for preparation of khali(plate) and dana(saucer).

4.6 Area infested by invasive weed species in forests :

In almost all Forest Blocks of Keonjhar (Wildlife) Division invasive weeds are seen which pose a great threat to the natural regeneration of flagship species and other species. Eupatorium is the main weed causing damage to the young plantation. It is rampant in almost all Forest Blocks. Another type of weed i.e. Lantana is very much found in comparatively dry and open forest like Patilo, Baranga, Meghanadpoi, Rebana and Atei Reserve Forest. These weeds have posed problem for eradication and it needs regular weed eradication programmes in almost all Reserve Forests. Other weeds found in the RFs are *Ageratum conyzoides, Cassia tora, Cassiaoccidentalis.*

4.7 Incidence of pest &disease :

Insects are an integral part of the environment of forest. However, a large number of insects cause damage to the valuable tree crop in the Forest Blocks. Sal Borer (*Hoplocerambyxspinicornis*) is one of the harmful insects which make tunnel in the timber causing damage to the crop. About 20% of the Sal trees in almost all Forest Blocks are affected due to these Sal borers. Similarly, Teak defoliator (*Hyblaeapuera*) and skeletenizer (*Eutectonamachaeralis*) are damaging Teak leaves in the plantation sites causing damage to the standing crop. This defoliation is usually noticed during the summer. Similarly, the Sal seeds are often attacked by beetles. The fungi *Ganodermalucidum*, Polyporus species and *Fomestricolour*speciescausemortality to the forest crop in almost all Forest Blocks though the situation is not alarming.

4.8 FOREST DEGRADATION AND ITS DRIVERS :

4.8.1 Encroachment :

One of the main factors of forest degradation is encroachment and shifting cultivation. The main tribes which practices shifting cultivation by encroaching forest land in R.F & P.R.F of this Division are Juango, Santala&Munda.

Huge patch of forest land have been encroached upon by the tribals for cultivation & their habitation purposes. Under Forest Right Act, they have been provided with patta (Titles), but the extent of encroachment is more than the area allotted. The reasons of encroachment are population explosion, increased demand of forest produce, political interference, inadequacy of staff etc. The resettlement of displaced persons due to various development projects also instigate the poor landless tribals of the Division to encroach upon the wooded areas.

4.8.2 N.T.F.P Collection :

The unregulated removal of forest produce such as *Sal leaves, Bamboo, Harida, Bahada, Amla* unscientifically by the people also one of the causes of degradation.

4.8.4 Mining Activities :

In this Division, mineral deposits are significant for commercial exploitation. Local people are digging stone and collecting boulders for construction of houses, roads and bridges in different pockets of almost all Forest Blocks of this Division. In industrial and mining belt of Brahmanipal and Daitari, the mining activities cause severe damage to the standing forest crop. Large scale mining of ores inside the Reserve Forest destroys the forest growth. For transporting the ore, large number of trucks are moving in the forest area for which extraction path have been constructed after clearing the forest growth. Large numbers of labourers are engaged for such mining activities and their requirement of camp shed and fuel wood further damage the forest growth.Steps need to be taken to curve the new hutting, encroachment and delimit the mining project area as per law.

4.8.5 Illicit felling:

Illicit felling (unauthorized and arbitrary felling) is a major cause of depletion of forest growth. Four major reasons play a vital role for causing illicit felling in the forests.

(a) Thickly populated villages are around the forest and the villagers are fully dependenton the forest for their livelihood. They usually cut the trees for small timber and firewood for their own consumption. They collect their fencing materials and materials for agricultural implements. It sometimes tempts the local people to earn quick and easy money by supplying timbers to the nearby big towns. Because of such regular removal of timber, poles, fire wood unauthorisedly, many patches of forest areas e.g. Rebana, Atei, Patilo, Santoshpur etc. aremerely affected.

(b) At present, the carpentry units and sawmills have been shut down without providing any alternative means for sawing. Unemployment is a common phenomenon everywhere. On the contrary, such unemployment supplements the establishment of illegal sawmills and carpentry units in the small and big towns as well as in rural areas. This has reached its maximum at Keshadurapal, Baripal, Balipal, Champapal etc. These villages are infamous for illegal timber housing. Repeated raids to such units with APR force may bring a change in attitude of earning easy money from timber smuggling. For this reason, the valuable species like *Sal, Bija, Sisoo, Kurum, Gambharetc* are gradually vanishing from the forests.

(c) Further, the neighbouring thickly populated areas i.e. Bhadrak, Jajpur and Cuttack district are fully dependant for their timber requirements on the forests of Keonjhar District.

(d) The major forest of Rebana, Baranga, Patilo R.Fs which are close to the vicinity of the industrial and mining belt of Kalinga Nagar and Brahmanipal areas have become open forests. Hardly 10 to 15% of the forest contains pole crops. This is mainly due to huge resident population. The floating populations of these areas are also dependant on these forests for their fuel wood and preparation of huts etc.

The compartment wise intensity of illicit felling of Forests Blocks is given in the Table No.4.13.

Table No 4.13 : Intensity of illicit Felling

Sl. No.	Range	RF/PRF	Compartment	Intensity of Illicit felling
1	2	3	4	5
1	Deogaon	Rebana	1	Low
			2	Low
			3	Low
			4	Low

			5	Low
			6	Low
			7	Low
			8	Low
	Brahmanipal/ Deogaon		9	Moderate
	Brahmanipal		10	Moderate
			11	Moderate
			12	High
			13	Low
			14	Moderate
			15	Moderate
			16	Low
			17	Moderate
			18	High
			19	High
			20	High
			21	Moderate
			22	Moderate
			23	Moderate
			24	Low
			25	High
			26	High
			27	Moderate
			28	Moderate
			29	High
			30	High
			31	Moderate
	Brahmanipal/ Deogaon		32	Moderate
	Brahmanipal		33	Moderate
	Deogaon		34	Moderate
			35	Moderate
			36	Moderate
			37	High
			38	High
	Brahmanipal		39	High
			40	High
			41	High
			42	High
			43	High
			44	High

			45	High
			46	High
			47	Moderate
2	Deogaon	Atei	50	Low
			51	Low
			52	Low
			53	Low
			54	Low
			55	Moderate
			56	Moderate
			57	Low
			58	Low
			59	Moderate
			60	Moderate
			61	Moderate
			62	Moderate
			63	Moderate
			64	Moderate
			65	Moderate
			66	Moderate
			67	High
			68	High
			69	Moderate
3	Anandapur	Santoshpur	1	Low
			2	High
			3	Low
			4	Moderate
			5	Low
			6	Low
			7	Low
			8	High
			9	Low
			10	Low
			11	Low
			12	Moderate
			13	Low
			14	Low
			15	Moderate
			16	Moderate
			17	Moderate

			18	Moderate
			19	Low
			20	Low
4	Brahmanipal	Palaspal		Moderate
5		Turkipada		Moderate
6		Mahulpanga		Moderate
7	Anandapur	Baranga		Low
8		Patilo		Moderate
9		Meghanadpoi		Low
10		Hatibandha		Low
11		Nuniapatna		Low
12		Ostapura		Low
13	Deogaon	Kadugotha		Low
14	Anandapur	Panasdiha		Low
15		Koldiha		Low
16		Gayalamunda		Low
17		Baigundi		Low
18	Brahamanipal	Brahmanipal PRF		Low
19		Tangiriapal PRF		Moderate
20		Sapanaposi PRF		Low

4.8.5.1 Offences Cases: -

Several offence cases have been booked and many vehicles have been seized. But the rate of smuggling has not been checked. Maximum emphasis should be given to combat smuggling in an organized way. The numbers of offence cases booked are given in Table No.4.14.

Table No. 4.14.A : Status of offence cases booked in Keonjhar (WL) Division, Anandapur.

Year	No. of OR Cases	No. of UD Cases	Total	Timber Seized	Person arrested
2007-08	880	155	1035	100.8085 cum	0
2008-09	787	196	983	153.7332cum	0
2009-10	527	191	718	210.4137cum	7
2010-11	368	193	561	223.3735cum	17
2011-12	237	113	350	108.7029cum	3
2012-13	427	183	610	102.4608 Cum	6
2013-14	502	230	732	72.9723 Cum	5
2014-15	410	196	606	151.7975 cum	8
2015-16	418	173	591	72.0096 cum	35

2016-17	48	28	76	6.1037cum	13
2017-18	446	103	549	81.3070cum	18
2018-19	482	157	639	58.2670cum	26
2019-20	536	193	729	131.7628cum	34
2020-21	203	100	303	33.9885cum	23
Sources - DFO, Keonjhar (WL) Division, Anandapur					

4.8.5.2 Offence cases and seized produce during plan period: - All attempts have been made to control illicit felling by the field staffs with the help of local people in detecting forest cases and confidentially intimating about the illegal transportation of forest produces.

4.8.5.3 Forest cases have been booked under section 56 0f Odisha Forest Act 1972: - The no of cases booked and vehicle seized under Section 56 of Odisha Forest Act 1972 during 2006-07 to 2020-21 are given in Table No.4.14.B

Table No.4.14.B. Vehicle & Forest Produce Seized under Section 56

Sl. No	Year	Vehicles seized			Forest produce seized
		Name	Nos.	Total	
1	2006-07	Truck	03	09	Timber = 122.13 cft.
		Mini Truck (407)	01		Fire wood = Q 16.00
		Trecker	01		Metal = 200cft.
		Ambasader Car	01		
		Motor cycle	01		
		Tractor with trolly	01		
2	2007-08	Tractor with trolly	02	07	Timber = 230.62 cft.
		Tata 207 Pickup van	02		
		Bolero	01		
		Mahindra Marshal	01		
		Motor cycle	01		
3	2008-09	Truck	03	20	Timber = 343.88 cft.
		Mini Truck 407	02		
		Tata 207 DI	01		
		Mahindra Bolero	02		
		Ambasader Car	02		
		Mahindra Safari	01		
		Auto rickshaw	02		
		Motor cycle	05		
		Tata paggio	01		

		Commander Jeep	01		
4	2009-10	Truck	01	17	Timber = 362.17cft.
		Tata 207 DI	07		L. stone = 55 Nos.
		Mahindra Bolero	01		
		Tractor with trolly	02		
		Scooter	02		
		Motor cycle	03		
		Tata Magic	01		
5	2010-11	Pick up van	05	23	Timber = 607.99cft.
		Bolero	04		Planks = 96 pcs.
		Motor cycle	06		Sizes = 102 pcs.
		Maruti van	01		
		Mahindra Marshal	01		
		Truck	02		
		Tata Magic	01		
		Ambasadar	02		
		Tractor with trolly	01		
6	2011-12	Tractor	05	27	Timber = 674.98cft.
		Bolero	05		Panasa planks = 96 Nos.
		Pick up van	03		L. Stone = 45 pcs.
		Tata ACE	01		Sal & non-sal = 679 pcs.
		Motor cycle	12		
		Scooter	01		
7	2012-13	Truck	06	36	Timber = 491.407cft.
		Tractor	04		Charcoal = 27Qntl.
		Pick up van	06		Fire wood = 16 Qntl
		Bolero	07		Sal sizes = 74 pcs.
		Tata ACE	02		Dhaura &Kolita =11nos.
		Motor cycle	10		R.R. stone = 180cft.
		Scooter	01		
8	2013-14	Motor Cycle	27		Timber = 202.143 cft.
		Tata Tipper	1		Sal Sleeper =49 pcs.
		Car	3		Sal sawn sizes = 150 pcs.
		Scooter	1		Green spitted wood =20 Qntls.
		Bolero	4		Chameleon – 2 Pcs.
		Mahendra Maxima Mini	2		Other sleeper-3 pcs.

		Ashok Leyland Truck	1		Misc. Poles=17 Nos.
					Green fire wood=60 Qntls.
9.	2014-15	Motor Cycle	13		Timber=29.56 cft.
		Truck	1		Sal Sleeper =21 Nos.
		Tata Sumo	1		Other Sleeper=20 Nos.
		Bolero	1		Charcoal=20 Qntl.
		Tata Magic	1		Tosser Cocoon=2 Qntl.
					Tosser Cocoon=3500 Nos
10.	2015-16	Tata ACE	3		Timber = 82.32 cft.
		Mini Truck	1		Sal Sleeper = 72 Nos.
		Motor Cycle	10		Other Sleeper =37 Nos.
		Pick Up Van	1		Fire wood = 5 Qntl.
		Bolero	1		Pea hen = 1 No.
11.	2016-17	Tata ACE	3		Fire wood – 30 Qntl.
		Tata Pick Up Van	3		Sal Sleeper = 27 Pcs.
		Marshal	1		Other Sleeper=34 Nos.
		Auto rickshaw & trolley	1		Charcoal=65 bags.
		Motor Cycle	5		Wooden haft – 131 Nos.
		Bolero	1		Unfinished Sofa set – 1 No.
		Tata Dumper	1		
12.	2017-18	Motor Cycle	6		Iron dust = 12 tons.
		Truck	1		Charcoal=936 Kgs.
		Car	1		Fruit bats = 2 Nos.
		Tata ACE	1		Fire wood=5 Qntls.
		MahendraInvador	1		Timber = 37.507 cft.
13.	2018-19	Motor cycle	8		Timber = 67.039 cft.
		Truck	2		Sal Sleeper=30 Nos.
		Ashok Leyland	1		Other Sleeper=11 Nos.
		Bolero XL	1		Charcoal=72 Bags & 1600 Kgs.
		Power Tiller	1		Lime Stone=11 pcs.
		Scorpio	1		
14.	2019-20	Bolero	2		Sal Sleeper = 115 pcs.
		Tractor	3		Other Sleeper = 44 Nos.
		Motor Cycle	10		Fire wood= 155 Kgs.

		Auto Rickshaw	1		Timber = 2.45 cft.
		Old bicycle	27		Charcoal= 2400 Kgs.
		Tata 407	1		
		Tata 207 DI	1		
		Truck	2		
		Tata ACE	1		
		Mahendra Super Mini Truck	1		
		Diesel motor	2		
15.	2020-21	Old bicycle	10		Fire wood = 400 Kgs.
		Motor Cycle	23		Sal sleeper= 185 Nos.
		Auto Rickshaw	1		Other Sleeper = 15 Pcs.
		Tata ACE	1		Elephant Tusk = 14 pcs
		Mahendra Max Pick Up Van	1		
		Hyundai Xcent Car	1		
		Tractor with Trolley	1		
		Tata Xenon Pick	1		

4.9 POLLUTION CONTROL AND PROTECTION OF ENVIRONMENT :

4.9.1 The Charge Chrome Factory at Brahmanipal and Iron Ore Mines in Daitari area in this Division are the main cause of pollution of this area. This plant & mineshave beenaccorded NOCfrom State Pollution Control Board and environmental clearance from MoEF, Govt. of India, New Delhi. The water samples from Baitarani and Salandi rivers are tested by the Pollution Control Board and found that though there is pollutant in the water but its effect on forest is not remarkable. Conditions stipulated by SPCB and MoEF should be rigidly enforced and any violation noticed be recorded and project proponent taken to task.

4.9.2 Water Pollution :

There is no major industry to pollute the rivers flowing through this division i.e. Baitarani, Kusei. But huge number of Sponge Iron Industries are on the uphill side of the stream in Keonjhar Division which allow their waste product to Baitarani river, causing the river water pollution to some extent.

4.9.3 Air Pollution :

Air pollution is caused by Brahmanipal Charge Chrome Plant and number of stone crushers situated in different area. The diesel locomotives used by Indian Railways for transportation of Iron Ore day & night add to air pollution in some extent.

CHAPTER – V

CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES

5.1 AREA TREATED UNDER SOIL AND WATER CONSERVATION MEASURES :

Soil is a natural resource and water is the most limiting factor, both of which are the deciding factors for the condition, type and existence of forest types. Presence of water regime in the soil regulates the growth and vitality of forest vegetation.

All types of soil erosion such as rill erosion, sheet erosion, gully erosion, stream bank and river bank erosion are observed in this Division. Factors contributing to erosion are removal of trees, excess grazing, podu cultivation, formation of extraction paths, roads and forest fire. The soil erosion is observed to be very rapid in the degraded forest areas. The extent of soil erosion in Rebana Reserve Forests, is high. Most of the compartments have assumed alarming position. As a result of which, the top soil has been washed out exposing the underlying rocks. Rill erosion and sheet erosion is observed in plain forest blocks ofSantoshpur R.F (Part) and Atei R.F (part). Stream bank and river bank erosion are seen in Nuniapatna RF, Atei R.F and some parts of Rebana RF. There is some urgent need for taking action to control soil erosion.

Due to excess biotic pressure, the forest of Keonjhar (Wildlife) Division has been degraded and the top soil has been washed out thereby decreasing the water regime in the soil. With proper water and soil conservation method, soil erosion can be checked enhancing the water retention in the soil. The most common soil and water conservation methods are :

a) Management Practices (Vegetative Method) such as :	b) Mechanical practices such as :
1. Strip cropping. 2. Mulching. 3. Crop rotation. 4. Contour cultivation 5. Planting of grasses for stabilization ofsoil, planting of trees and afforestation.	1) Bunding 2) Terracing 3) Gully or nallah plugging. 4) Control of stream and river bank.

5.1.1 Soil Erosion Vulnerability Assessment :

The top soil is the lifeline for the very existence of living beings on earth. There are different causes of soil erosion. Encroachment for cultivation, un-control fire, un-control grazing and illicit felling are the main causes of heavy soil erosion. It has been estimated that sheet and rill erosion takes place @ 4-0 ton/Ha/year in red soil, 17– 43 ton/Ha/Year in black soil and 4-14 ton/Ha/Year in alluvial soil. Gully erosion can lead to loss of 33 ton/Ha/Year soil in ravine areas. During last plan period, the entire rehabilitation working circle has been treated for soil and moisture conservation measures like loose boulder check dam and stone check dam, percolation tank as per necessity given in the Table No. 5.1.

Table No. 5.1 : Construction of Check Dam/SMC

Year	Sl.No.	Item of Work	Location	Range	PhysicalAchievement
01	02	04	05	06	07
2011-12	1	SMC small check dam and gully plugging.	Rebana R.F	Bramanipal	1 No.

2012-13	2	SMC, Nallah, Check Dam and Gully plugging.	Gayalamunda, Ostapura, Atei and Rebena R.F	Anandpur, Deogaon Bramanipal	4 Nos.
2013-14	3	Construction of check dam	Talapada	Bramanipal	1 Nos.
2014-15	4	Construction of Check Dam	Basukinala		1 No.
2016-17	5	Loose boulder structure check dam	Rebana RF near Gadua	Deogaon	1 No.
	6		Rebana RF near Gumundu	Bramanipal	1 No.
	7	Loose boulder structure	Rebana RF near Naradingipentha	Bramanipal	1 No.
	8	Construction of check dam	Bramanipal	Bramanipal	1 No.
2017-18	9	SMC	Baidakhia Nala(Atei RF)	Anandapur	LBCD
	10		Kathakata Nala (Boula RF)	Hadagarh	LBCD
	11		Talanatia (Kadagotha RF)	Deogaon	Chain link wire mesh 300 feet
	12		Rebana (Rebana RF)	Brahmanipal	LBCD 5 nos
2018-19	13		Gumuda&Talapada (Rebana Rf)	Brahmanipal	Sub surface dyke
	14	Checkdam	Baranga RF	Anandapur	Sub surface dyke
2019-20	15	Nil			
CAMPA					
2014-15	1	SMC	Tumbinala.	Anandapur	2 Nos.
	2	SMC	Asitaposhi	Deogaon	1 No.
	3	SMC	Turkipada	Bramanipal	43 Nos.
	4	SMC	Talapada	Bramanipal	5 Nos.
	5	SMC	Rebana	Bramanipal	7 Nos.
	6	SMC	Bramanipal	Bramanipal	12 Nos.
2015-16	7	SMC	Gayalmunda (TumbiNahall 20 mtr.)	Anandapur	1 No.
2016-17	8	Sub-dyke	Badajhari Nala	Anandapur	Sub surface dyke
	9		Pitanau	Hadagarh	Sub surface dyke
	10		Paniamba	Hadagarh	Sub surface dyke
	11		Baliparbata	Brahmanipal	Sub surface dyke
2017-18	12	Check dam	Arjunbania (Atei)	Anandapur	Check dam
	13	LBCD	Paitapani (Boula)	Hadagarh	LBCD 15nos
	14	LBCD	JosandaHodi Rebana RF	Deogaon	LBCD 10nos
	15	LBCD	Dhurudiamba (Atei RF)	Deogaon	LBCD 20nos
	16	LBCD	Talapada (Rebana RF)	Brahmanipal	LBCD 8nos
2018-19	17	LBCD	Ashok jharana Nala	Anandapur	LBCD 2nos
	18		Arjunbania (Atei)	Anandapur	Sub surface dyke
2019-20	19	Sub-dyke	Santoshpur RF	Anandapur	Sub surface dyke
	20	Graded bund	Baranga RF	Anandapur	Graded bund 267 mtr
	21	Check dam	Kendhugotha Nala	Deogaon	Check dam 1nos
	22		Talapada (Rebana RF)	Brahmanipal	Check dam 1nos
	23		Pitanau	Hadagarh	Check dam work done 1nos
2020-21		NIL			
Source: DFO, Keonjhar(WL) division					

Table No.5.2.ASMC Works undertaken under OMBADC *(adhoc-CAMPA)* during 2017-18 in Keonjhar Wildlife Division, Anandapur.

Name of Range/ Forest Block	Treatment area (in ha.)	Item of works undertaken													
		LBCD (in cum.)		Percolation Pit (in nos.)		Earthen Graded Bund (in RMT.)		Sub-surface Dyke (in nos.)		Staggered trench (in nos.)		Wire Mesh LBCD (in nos.)		Trench on both side of LBCD (in nos.)	
		Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
Brahmanipal WL Range/ Rebana RF	2819	2000	2000	707	707	4000	4000	17	17	5630	5630	49	49	22	22
Source: DFO, Keonjhar(WL) division															

Table No.5.2.BSMC WORKS CARRIED OUT UNDER OMBADC (COMPENSATION MONEY) DURING FINANCIAL YEAR 2019-20

Sl. No.	Range	Beat	Forest Block	SMC Works carried out during 2019-20			
				No. of site/ stretches	Earthen Graded Bund	Sub-surface Dyke	Wire Mesh LBCD
1	2	3	4	5	6	8	10
1	Brahmanipal WL Range	Balipar bat Beat	Rebana RF	4	20650 RMT.	40 nos. (257.531 cum.)	150 nos. (1773.0061 cum.)
2	Deogaon WL Range	Garagad abahal Beat	Rebana RF	3	15000 RMT.	15 nos. (68 cum.)	120 nos. (1119.9624 cum.)
Source: DFO, Keonjhar(WL) division							

The extent of soil erosion depend upon the land use pattern. There has been decrease in canopy density in almost all Forest Block in Keonjhar (Wildlife) Division and there is trend in increase of scrub and open forest due to heavy biotic pressure which has already been discussed in Para No.2.4. Considering above facts, the status of gully and nallah erosion in various block of Keonjhar (Wildlife) Division has been assessed and given in the Table No. 5.3.

Table No. 5.3 : Soil Erosion : Area affected by Stream/Nala

Stage of soil erosion	Forest block & compartment
Susceptible to High erosion	Rebana RF(24,26,30,44,45,46,47), Brahmanipal PRF, Panasadiha, Nuniapatna
Medium erosion area	Rebana (P), Atei, Baigundi, Hatibandha, Kadugotha, Meghanadpoi, Ostapura, Palaspal,
Low erosion area	Rebana RF(1,2,3,27), Santoshpur(15,16,17), Atei(55,56,66,67,68,69), Mahulpanga, Turkipada

5.2 DURATION OF WATER FLOW IN THE SELECTED SEASONAL STREAMS :

Baitarani, Musala, Salandi, Kusei are the major rivers of Keonjhar (Wildlife) Division. Apart from this, many steams and nallahs carry considerable volume of water during the rainy season, but in most cases water flow is much reduced after winter. In summer, most of the nallahs dry up. The duration of water flow in the selected seasonal steams of the Division found in different Forest Blocks is given in the Table No. 5.4.

Table No. 5.4: List of Stream/Nala inside RF/PRF				
SL No.	Name of Block	Name of stream/ Nala	Passes through	Duration of water flow
1	Sapanaposhi PRF	Bali Nala	RF	Perennial
2	Brahmanipal PRF	KuseiNadi	PRF	Perennial
3	Turkipada RF	SendheiNadi	RF	Perennial
4	Mahulpanga	Kanjiapalnala	RF	Perennial
5	Palaspal	BagiraNala	RF	Perennial
6	Baranga	Bhimaanthua Nala	RF	Perennial
		GondaNala	RF	Perennial
7	Patilo	Baghamahurakhali Nala	RF	Rainy Season
8	Hatibandha RF	Badanala	RF	Perennial
9	Nuniapatna RF	Baitarani River	RF	Perennial
10	Ostapura	Badajhari Nala	RF	Perennial
		BarabankiNala	RF	Rainy Season
		TungakhiaNala	RF	Rainy Season
		BetanatiNala	RF	Rainy Season
11	Santoshpur RF	Kantamila Nala	Comp-01,02,03	Perennial
		KathupakaNala	Comp-06	June, December
		Tambei Nala	Comp-09,10,11	Perennial
		ChampeiNala	Comp-8, 9	June, January
		JatraNala	Comp-10,11	June, December
		AinsaNala	Comp-13,14	June, January
		PateisuniNala	Comp-15	June, November
		DodhuaNala	Comp-16,18,19	June-February
		Bhalughora Nala	Comp-17	Perennial
		Bautia Nala	Comp-18	Perennial
		Baitarani River	Comp-1,3,4,5, 6,7,9,10	Perennial
12	Atei RF	ChemraNala	Comp-50	June-October
		BankiNala	Comp-51	June-November
		Bamuri Nala	Comp-51	Perennial
		Manisijharan Nala	Comp-52,53	Perennial
		Kanjia Nala	Comp-54,55, 56,57	Perennial
		Sendhei Nala	Comp-68,69	Perennial
		Sauntia Nala	Comp-56,57, 58,65, 66,67,68	Perennial
		Musala Nala	Comp-50,51, 53,54, 57,58	Perennial
13	Rebena RF	Kuladera Nala	Comp-1	Perennial
		Dhobadhobani Nala	Comp-2,4	Perennial
		Musala Nala	Comp-2,4,5	Perennial
		SuneiNoli Nala	Comp-7	Perennial
		Santigodia Nala	Comp-7,8	Perennial
		Meghanada Nala	Comp-5	Perennial
		Bhaliapada Nala	Comp-4	Perennial
		Bagira Nala	Comp-7,10	Perennial
		Banklula Nala	Comp-12,13,14,16	Perennial
		Kusei Nala	Comp-18,19	Perennial
		Raisuana Nala	Comp-20	Rainy Season
		NipaniaNala	Comp-15	Rainy Season

		Kukurangi Nala	Comp-27,26, 29,46, 24,30	Perennial
		Kuleinadi	Comp-45,26,27,31	Perennial
		Bali Nala	Comp-44,45	Rainy Season
		Sendhei Nala	Comp-21	Perennial
		Bhakbhaki Nala	Comp-23	Perennial
		Sapnath Nala	Comp-23	Perennial
		NireigodiNadi	Comp-28	Perennial
		BagiraNadi	Comp-32,33,42,41	Perennial
		AmbadharaNadi	Comp-39	Rainy season
Source : DFO, Keonjhar W.L. Division				

5.3 WETLANDS IN FOREST AREAS :

5.3.1 Watersheds:

The river systems of the Division constitutes number of watersheds. The detailed of watersheds covering different forest blocks in furnished in Table No.5.5.

Table No.5.5.A: List of Mini Watersheds covering forest areas of Keonjhar Wildlife Division

MWS Code	Type	Area in Ha.	District	Block Name
0408020103130103	Forest	340.9643052	Keonjhar	Anandapur
0408020103130201	-do-	874.8997318	-do-	-do-
0408020103140102	-do-	374.9256503	-do-	-do-
0408020103140102	-do-	100.5357697	-do-	-do-

5.3.2 **Wetlands of Forest Area** :

Wetland is a distinct eco-system inundated by water either permanently or seasonally, where oxygen free processes prevail. Presence of vegetation of aquatic plants adopted to the unique hydric soil distinguishes wetlands from other water bodies. The list of wetlands of Keonjhar WL Division is given in the Table No.5.6.

Table No. 5.5.B : List of Wetlands of Keonjhar W.L. Division

Name of the Division	Name of Range	Name of Wetlands	Area in ha. (Approximate)
Keonjhar WL Division, Anandapur	Anandapur	1. Gada Dam, Salukdahi	38.20 ha.
		2. Dhaneipitha	1.50 ha.
		3. Madanpur Dam	13.80 ha.
		4. River Baitarani	3827.00 ha. (Area under Division Boundary)
	Deogaon	1. Remal Dam	185.00 ha.
		2. Gobara Dam	9.90 ha.
		3. Sendhei Dam	56.60 ha.
	Brahmanipal	1. Talapada Dam	27.70 ha.
		2. Sunapentha Dam	5.50 ha.
		3. Baneitangar Dam	2.27 ha.

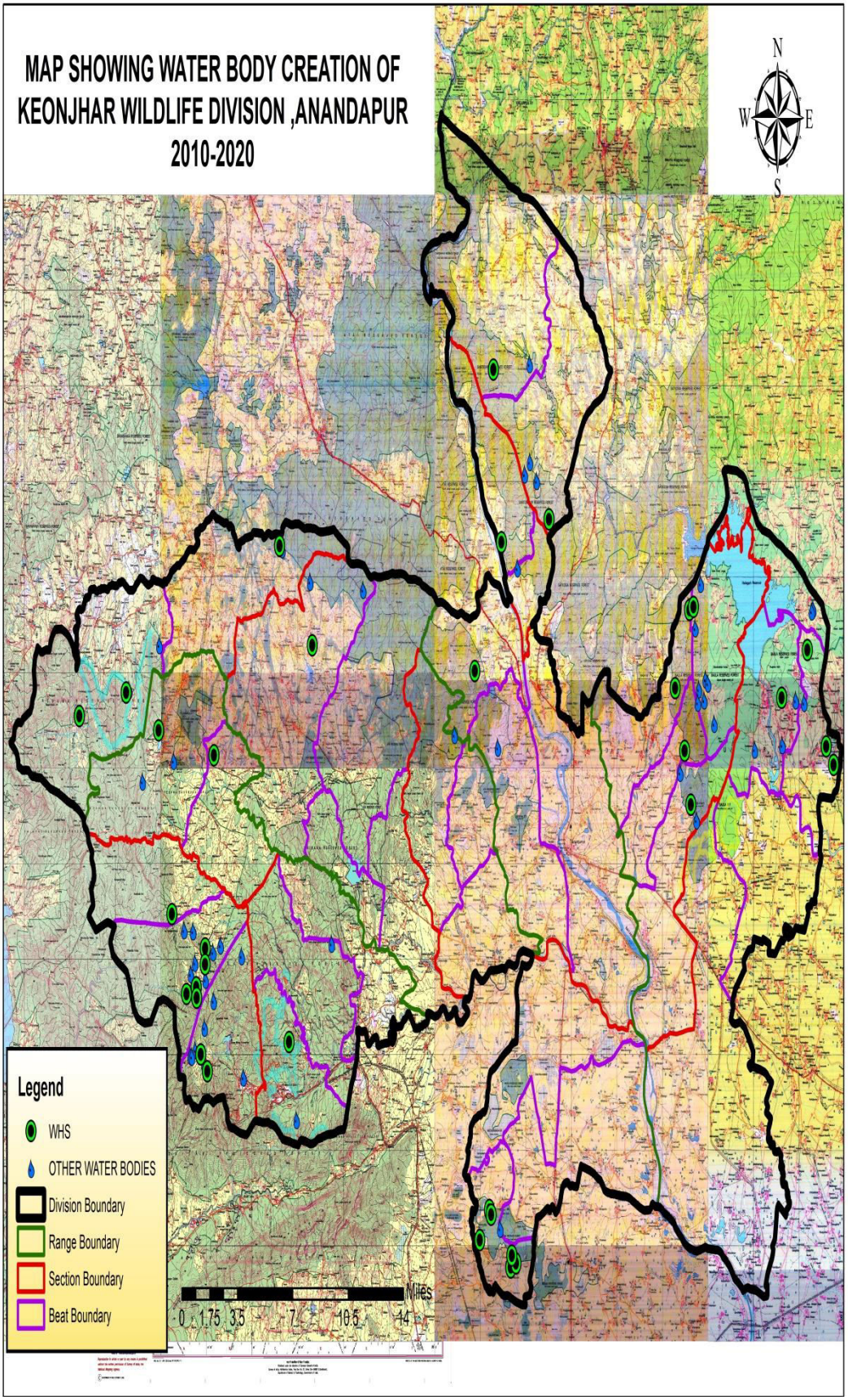
5.3.3 **Creation of Water Bodies/Water Harvesting Structure:**

Besides natural water sources there are several Game tanks/WHS has been created by the division during the last working plan periods basing on the water requirements for wild lives in different Reserve Forests and PRFs. These water bodies meet the water requirement of wild lives in pick period and as well as act as water rechargers. The detailed list is furnished below.

Table No. 5.6 : Creation of Water Body/WHS

Year	Sl. No.	Creation of Water bodies	Location	Name of Range	Physical Achievement
01	02	04	05	06	07
2016-17	1	Pond	Nardangipentha of Rebena RF	Bramanipal	1 No.
	2	Pond	Turkipada of Rebana R.F	Bramanipal	1 No.
2015-16	3	WHS	Baranga	Anandapur	1 No.
2014-15	4	Pond	Santoshpur R.F Near Kantala	Anandapur	1 No.
	5	WHS	Digging of WHS in Atei R.F and Rebena R.F near Talapada	Anandapur and Deogaon	2 Nos.
	6	Pond	Rebana R.F	Bramanipal	1 No.
	7	Pond	Baranga R.F	Anandapur	1 No.
2013-14	8	Pond	Rebana R.F	Bramanipal	1 No.
	9	WHS	Rebana R.F and Bhoka	Bramanipal	2 Nos.
	10	Pond	Santoshpur R.F near Budhikud and Boula R.F near Hadagarh	Anandapur	2 Nos.
	11	Pond	Talapada	Bramanipal	1 No.
	12	WHS	Baranga and Pitanau	Anandpur	1 Nos.
2012-13	13	Pond	Baranga and Pitanau	Anandpur	4 Nos.
	14	Pond	Rebana R.F	Bramanipal	1 No.
	15	Pond	Rebana R.F	Bramanipal	1 No.
	16	WHS	Rebana R.F	Bramanipal	1 No.
	17	Pond	Rebana R.F	Bramanipal	4 Nos.
	18	WHS	Rebana R.F	Bramanipal	1 No.
2011-12	19	Pond	Talapada	Bramanipal	1No.
	20	Pond	Gutung and Baranga	Anandapur	2 Nos.
2010-11	21	Pond	Turkipada	Bramanipal	1 No.
	22	WHS	Baranga.	Anandpur	1 No.
2008-09	23	Game Tank	Gayalmunda R.F Rebana R.F	Anandpur Bramanipal	2 Nos.
	25	Game Tank	Gayalmunda.	Anandpur.	1 No.
2007-08	26	Pond	Ostipashi	Deogaon	1 No.
APO 2014-15	27	Pond	Jugalkishorepur, Hatikucha, Bhaliapada and Kusumjodi	Anandapur, Deogaon,Bramanipal	4 Nos.
	28	Pond	Rebana and Baranga.	Anandapur, Bramanipal	2 Nos.
APO 2013-14	29	Pond	Sikabeda, Panasdiha, Madyapur, Dhurudi Ambo, KathauGhati and Talapada	Anandapur, Deogaon, Bramanipal	6 Nos.
APO 2012-13	30	Pond	Jhinkipita, MatiHudi, Kantala, Putujhari	Anandapur, Deogaon, Bramanipal	4 Nos.
APO 2011-12	31	Game Tank	Gumundu	Bramanipal	1Nos
				Total	**53Nos.**
Source : DFO, Keonjhar W.L. Division					

Map No.5.1. Water body location of Keonjhar (WL) Division



5.4 WATER LEVEL IN THE WELLS IN THE VICINITY (UP TO 5 KMS OF FOREST AREAS) :

In this Division no periodic monitoring of water level with respect to annual rainfall has been conducted in past. However, the up to date ground water level data from the Central Ground Water Board, Bhubaneswar and the meteorological data of annual rainfall of the district has been collected from which status of ground water has been assessed. The ground water level increases in rainy season and depth of water goes down to the maximum in pre-monsoon. The ground water level is recorded in five different places in the Division *viz*; Anandpur, Ghasipura, Ghatagaon, Harichandanpur and Hatadihi. The information collected from Central Ground Water Board, Bhubaneswar and depth of water (In mtr.) during winter pre-monsoon, mid monsoon, post monsoon is furnished in the **Appendix–XII.**
Year wise pre-monsoon data on ground water level in Anandapur Sub-Division given in the Table No. 5.7.

Table No. 5.7: Ground water level in Anandapur Sub-Division (Avg. Pre-monsoon Data).(In mtr.)

Year	Anandapur	Ghasipura	Harichandanpur	Hatadihi
2007	6.58	4.73	7.46	6.34
2008	7.08	5.05	7.74	6.64
2009	6.76	4.90	7.59	6.70
2010	7.01	5.05	7.74	7.00
2011	6.76	4.91	7.49	6.88
2012	6.73	5.26	7.62	7.10
2013	6.93	5.60	7.64	7.11

Source : Central Ground Water Board, Bhubaneswar

If we compare the data received from Central Ground Water Board, Bhubaneswar, the ground water level of Harichandanpur Block lies 7.6 mtr (average) in summer which is the highest among all the four Blocks from 2007 to 2013. The climate of Harichandanpur Block is hot, moist and sub-humid. Its normal rainfall is 1534 mm. Soil is lateritic red and yellow mixed, maximum temperature is 36.6 degree Celsius. But the most striking fact is its topography which is consisting of hilly areas.

Except Ghasipura block in which the ground water level lies 5 mtr (average) in summer. The ground water level of other two blocks is also very alarming. The ground water level in Anandapur and Hatadihi block is 7 (average), if we compare the data from 2007-2012. These two blocks are lying in north eastern coastal plain the average annual rainfall of which is 1568 mm, average temperature is 36^0Celsius and soil is red lateritic and alluvial soil. Topography of these blocks are mostly plain.

Total water potential of Anandapur Sub-Division (Block wise) is given in the Table No. 5.8.

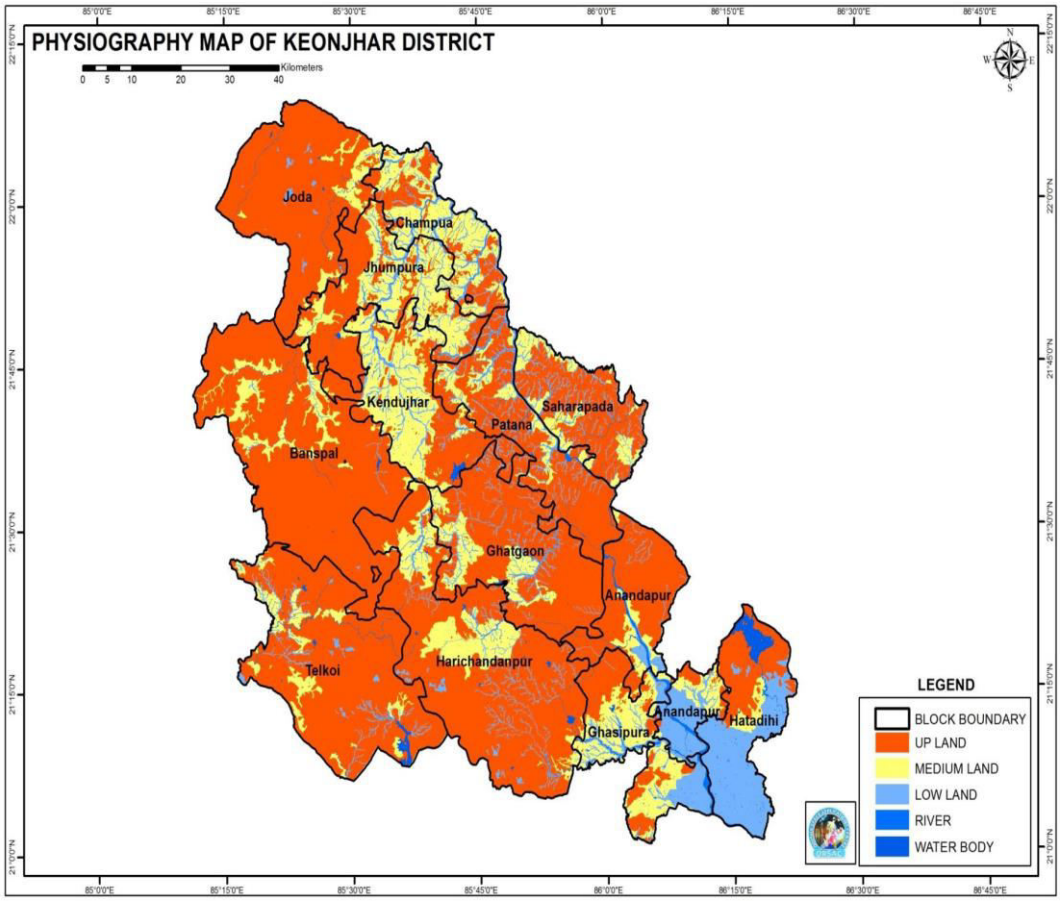
Table No. 5.8 : Water potential of Anandapur Sub-Division (Block wise)

Sl.No.	Name of the Block	SurfaceWater	Ground Water	Total (BCM)
1.	Anandapur	0.302	0.092	0.394
2.	Hatadihi	0.207	0.063	0.270
3.	Harichandanpur	0.431	0.131	0.562
4	Major part of Ghasipura	0.193	0.059	0.252

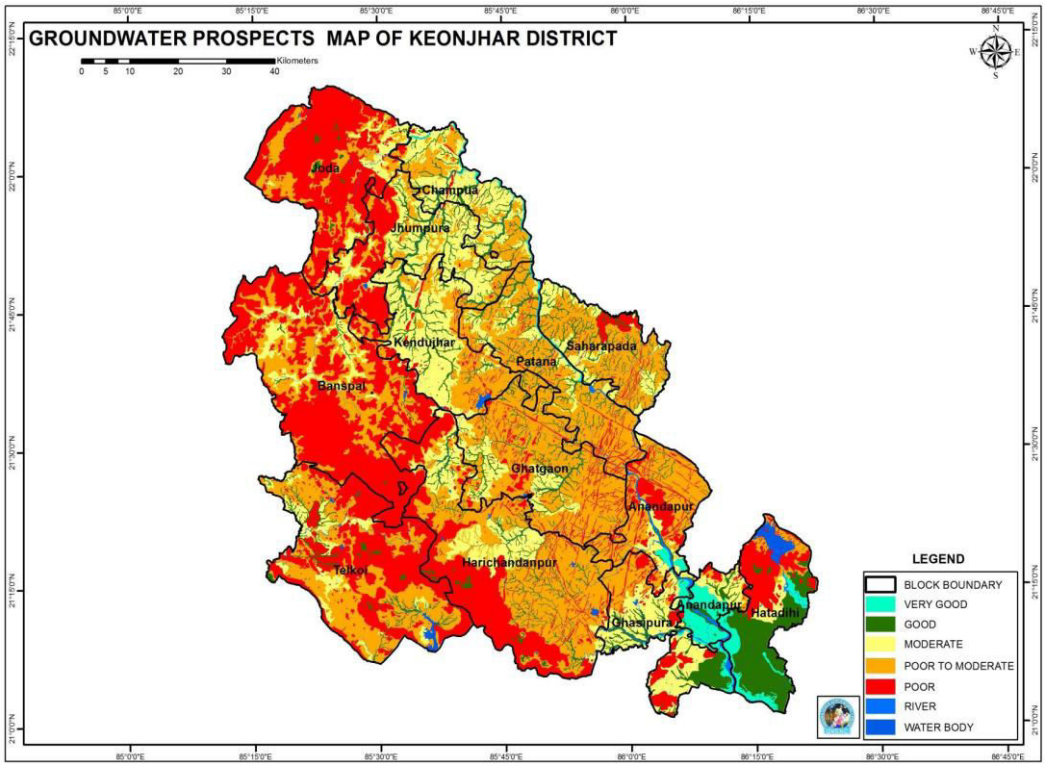
Source : District Irrigation Plan, Keonjhar

N.B : BCM stands for – Billion Cubic Mtr**.**

Map No. 5.2 : Physiography map of Keonjhar district.



Map No. 5.3 : Ground Watermap of Keonjhar district.



5.5. Status of Aquifer :

Ground water is the most valuable resource on the earth, if the ground is permeable to hold water then it is saturated in water. The upper surface of this zone of saturation is called water table. The saturated zone below the water table is called an aquifer.
An aquifer is an underground layer of rock, rock fractures or unconsolidated material (gravel, sand or silt). An aquifer gets water from pacification. In some cases water passes through the soil on top of the aquifer, in other it enters through joint and cracks in rocks. The water moves downward until it meets less permeable rock. Aquifers actas reservoir for ground water.

Forests maintain high water quality by minimising soil erosion and reducing sedimentation. Deforestation generally increases erosion resulting in higher sedimental concentration in runoff and siltation of water course.

5.5.1 Water bearing formation:

The water bearing area of Keonjhar Wildlife Division can be divided into two types.

1) Areas underlain by fracture, fissured and consolidated basement rock formation.
2) Areas underlain by recent unconsolidated alluvial formation.

Table No. 5.9: The Lithology, Hydrological condition, Ground Water potential of all Blocks

Name of Block	Geological formation	Lithology	Hydrological condition	Ground water potential
Anandapur	Consolidated formation	Granite and granite gneiss	Ground water restricted weather residuum & fracture zone.	Low to moderate yield 3-10 Lps
Hatadihi	-do-	-do-	-do-	-do-
Harichandanpur	-do-	-do-	-do-	-do-
Major part of Ghasipura	-do-	-do-	-do-	-do-
Source : Geological survey of India, Bhubaneswar				

The geological formation and lithology of Keonjhar (WL) Division is such that the ground water potential except small portion of Ghasipura Block, all other parts are low to moderate yield.

5.5.2 The details of Aquifers are given below:

Different perennial and seasonal streams are found in the Forest Blocks of Keonjhar (Wildlife) Division. The name of the stream and their source are given in the Table No. 5.10.

Table No. 5. 10 : Feeders to the Aquifers

Sl. No.	Name of Block	Name of Stream	Origin
1	Santoshpur	KantamuliNala	Rugurubera RF of Karanjia Division toSuninda Tank
		TambeiNala	Stream from Ridge of Santoshpur RF, Gayalamunda RF, Koldiha RF, Andharajodi DPF
		BhalughoraNala	Laxmiposi Forest, Gajapathar Forest, Santoshpur RF
		BartiaNala	Ridge of Santoshpur RF 2 &Satkosia RF

2	Atei	BamuriaNala	Ridge of Atei RF, compt. 51
		ManisijharanNala	Ridge of Atei RF compt. 51, 52
		KanliaNala	Ridge of Dholpita Forest 2 Singhabahali of Atei RF
		SauntiaNala	Ridge of Badabahali 2 Jaunria Dam
		MusalaNadi	Ridge of BarhaghataHudi, mathanahadi, Sol parbat, Ranga Parbat
3	Rebana	KuladeraNala	Ridge of KajalaPaharh
		DhobadhobaniNala	Ridge of KajalaPaharh
		Musala Nala	Ridge of Ranga Parbat, Sol Parbat, Mathanahudi
		SuneinoliNala	Ridge of Brahmanideihurhi
		SantigodiaNala	Ridge of BrahmanideihurhiRaighatihurhi
		MeghanadaNala	Ridge of Chandangiripaharah 2, Meghanada Parbat
		BhaliapadaNala	Ridge of Sol Parbat
		BagiraNala	Ridge of Meghanada Parbat, Raighatihurei
		BankulaNala	Ridge of Sitaentudi Parbat
		Kusei Nala	Ridge of Kusumaghati, Meghanada Parbat, Sitaentudi Parbat, Hatikhuntihudi
		KukurangiNala	OMC Dam
		KuseiNadi	
		SerndheiNala	Ridge of Lembuahuri 2, Dholamundi Parbat
		BhakabhariNala	Ridge of Sindurimundi Parbat
		Sapanathanala	Ridge of jhiagherahudi, Siarimundi Parbat
		NimeigudiNala	Ridge of Lembuahuri 2, Dholamundi Parbat
		AmbadharaNadi	Ridge of DopettaHurhi
4	Ostapura	BadajhariNala	Ridge of ChandamundaPaharh
5	Hatibandha	BadaNala	Baitarani Nadi
6	Baranga	GondaNala	JhurjhuriNala
		BhimanathuaNala	Gengutia Pond (Small reservoir)
7	Palasapal	BagiraNadi	Kusumadiha Pond (Small reservoir)
8	Mahulapanga	KanjiapalNala	Ridge of Kalighati Parbat
9	Turkipada	SendheiNala	Ridge of Dolmundi Parbat
10	Brahmanipal PRF	KuseiNadi	Ridge of sitaentudi Parbat, Kusumaghati, Meghanadaparbat, hatikhuntihudi
11	Sapanaposi PRF	Bali Nala	KhalpalRadhikadeipur Reservoir

To increase the rate of recharge into the aquifers, flow & storage along these streams may be recharged. Water is the source and support system of life. If water would not be conserved and managed at present, then the human civilization would face the turbulent future of water scarcity. Artificial recharge structures like infiltration tank, contour bonding, gully plugging will be helpful in recharge of aquifers.

CHAPTER – VI

MAINTENANCE AND ENHANCEMENT OF FOREST RESOURCE PRODUCTIVITY

6.1 GROWING STOCK OF WOOD:

Analysis of growing stock is necessary to know the capacity and potential of the forest and also to calculate harvestable yield in the Working Plan as also for future management to maintain the forest in the similar condition as a selection forest. The objectiveof forest management has gradually been shifted towards regular flow of income and eco-system services to local community keeping conservation and ecological security as the larger objective. Hence the harvestable yield should be in accordance with sustainable development of forest.

6.1.1. Estimation of total growing Stock:

Forest resource assessment methodology as prescribed in "National Working Plan Code, 2014" has been used to assess total growing stock of trees and biomass. In each compartment numbers of sample plots were laid to ensure representation of all site qualities, type and structure of forest. The location of sample plots in the Division has been given by ORSAC. The details of sample plots, their geographical co-ordinates and compartments are given in **Appendix-XIII**.While approaching the sample plots, observations and assessment of site quality, tree species, composition, its health, density and crop age etc were recorded in Plot Approach Form-I. Presences of special features such as blanks, scattered trees, plantations raised etc wererecorded. Information on NTFP yielding species, intensity of invasive speciespresence of faunal species, special wildlife habitats and drivers of deforestation were recorded.

After reaching the sample plots, a square plot of 0.1 Ha. was laid out measuring 22.36 mtr horizontal distance i.e. half of the diagonal in all four directions. After checking the dimensions of the plot, latitude longitude and altitude co-ordinates were recorded. The main plot was used for recording trees. The enumeration of trees was done by measuring the diameter or girth of each tree found in the sample plot.

The data on shrubs, climbers and re-generation status from quadrates of 3 mtr x 3 mtr laid out at a distance of 30 mtrs from the centre of the main plot of 0.1 ha. was collected and recorded in plot enumeration form. The data of herbs from all nested quadrates of 1 mtr x 1 mtr lay within each quadrates of 3 mtr x 3 mtr were collected and recorded in plot enumeration form.

6.1.2 Increment in Volume Of Identified Timber species :

Working Plan Inventory work is a collaborative effort between Forest Department, Odisha & NRSC. Sample design & Sample plot allocation for the Forest inventory was developed on the basis of the spatial information on forest type(derived from multispectral satellite data classification) & forest canopy density (derived from visual interpretation of WV2 data at 1:25000 scale). Considering the canopy density, type of forest etc. NRSC has designed stratified random sampling & has given 294 sample points for enumeration with following sampling intensity given in the Table No. 6.1.

Table No. 6.1	
Enumeration: Sampling intensity	
>70	0.0694%
40−70	0.0898%
10−40	0.0432%
<10	0.0168%

Out of 294 sample points enumerated data pertaining to 26 sample points differ widely from sample point data. Hence those points were excluded from the analysis. Therefore, enumeration data of 26 points were taken for interpretation. The range-wise distribution status of these 268 points aregiven in the Table No. 6.2.

Table No. 6.2				
Range wise Sample point distribution				
RANGE	D1	D2	D3	D4
ANANDAPUR	4	42	32	1
BRAHMANIPAL	23	36	52	8
DEOGAON	16	17	34	3
Source : NRSC				

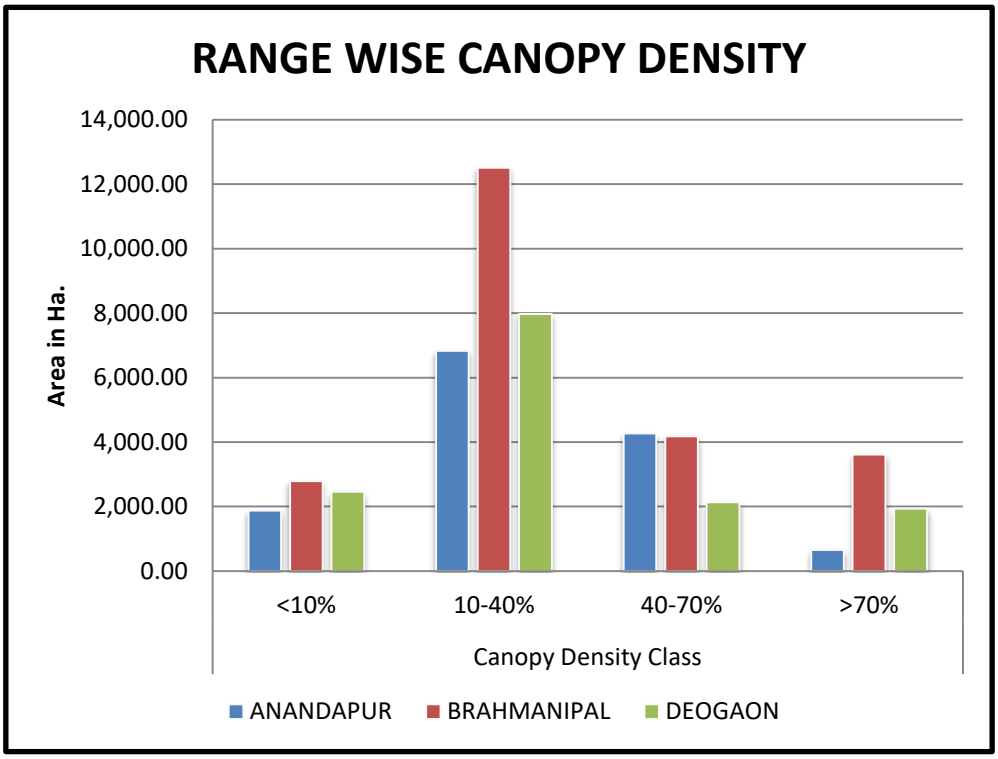
Table No. 6.3			
Enumeration: Basal Area, Volume, Area			
Status	Plot		Totals
No Large Trees	85	Trees	12.701
1 Tree	53	B.Area	0.54
2-5 Trees	129	Volume	4.162
>5 Trees	1	Area	0.044
Source : NRSC			

Enumerated plot volume by type of forest and density strata as extrapolated by NRSC is given in the Table No. 6.4.

Table No. 6.4.		
Density strata		
Stratum	Numpt	Mean Per Ha.
SALDOM(>70)	10	139.75
SALDOM(40-70)	25	103.87
SALDOM(10-40)	10	102.11
MXSAL(>70)	12	106.97
MXSAL(40-70)	55	102.50
MXSAL(10-40)	79	74.28
MMISC(>70)	21	113.83
MMISC(40-70)	14	95.53
MMISC(10-40)	29	86.21
SCRUB	12	66.27
Source : NRSC.		

The enumerated data was uploaded and NRSC prepared the result report. Like canopy density strata, stock & stand table which is annexed as **Appendix–XIV.**

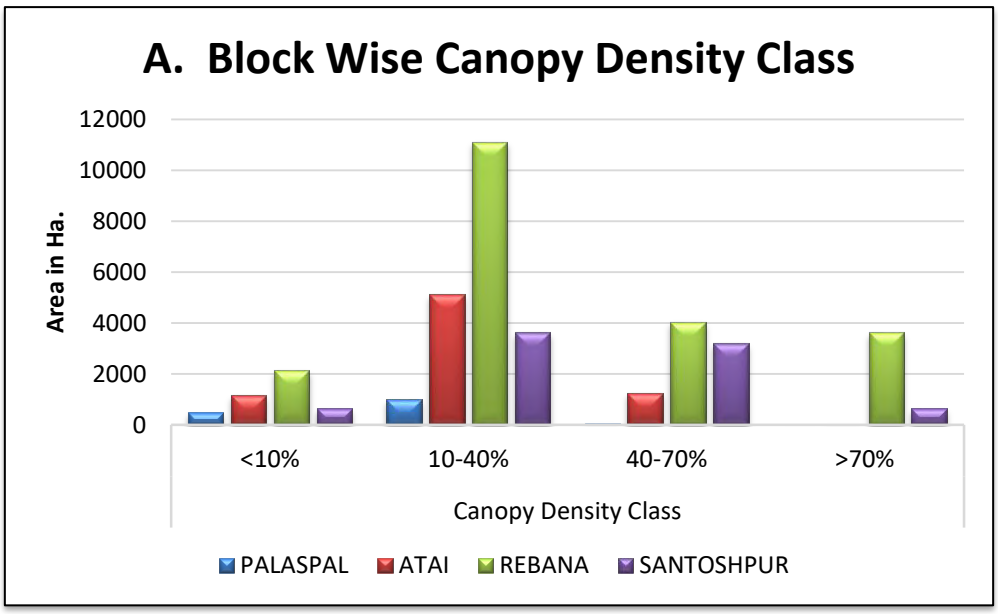
The report prepared by NRSC has been analysed in terms of Canopy density, number of stems & forest type for Ranges& Forest blocks.

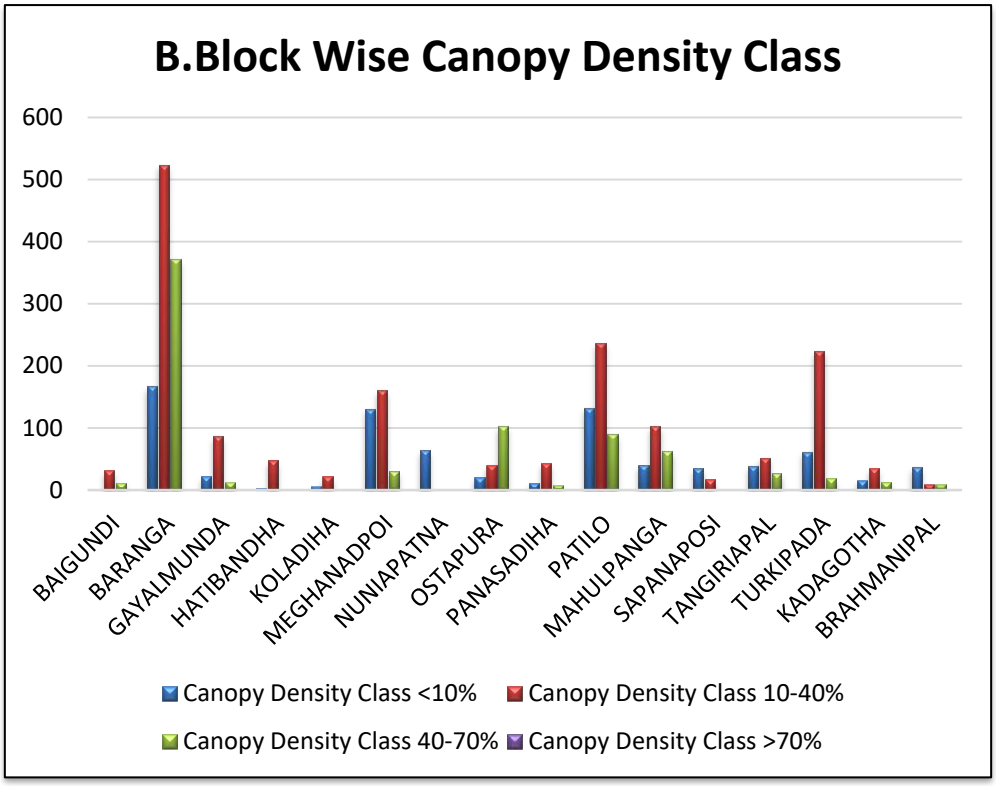


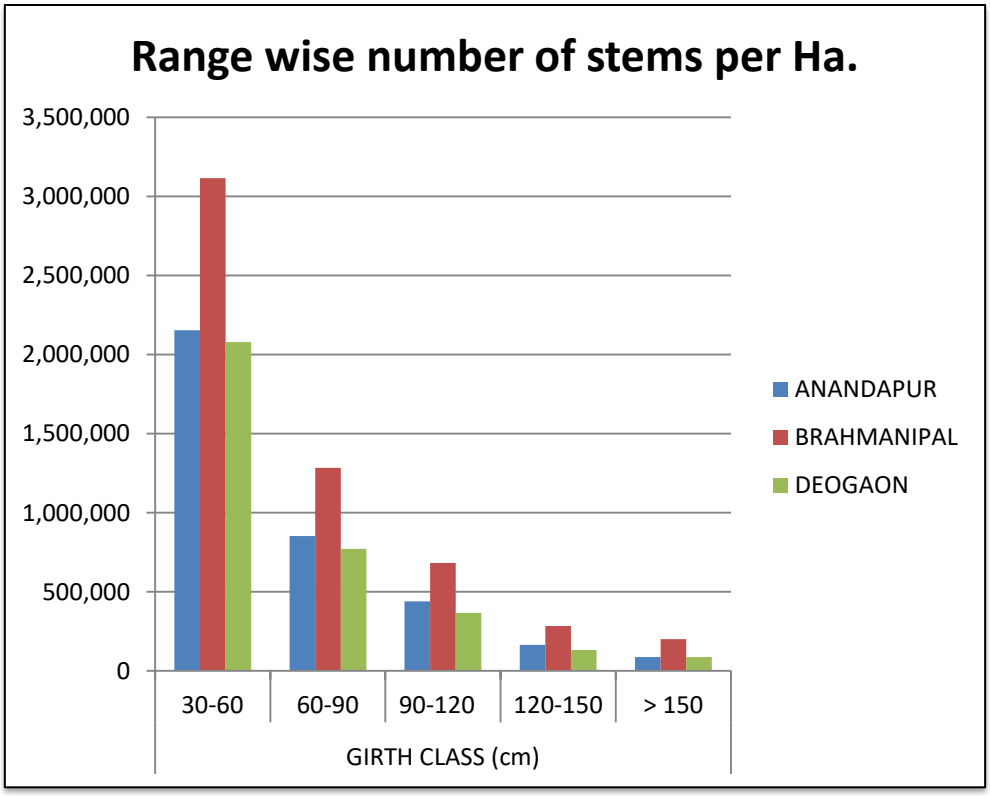
Canopy density

NRSC data shows maximum area of Keonjhar (WL) Division lies within 10-40% canopy cover that means open forest. Hence, protection of forest along with massive plantation is required which have been prescribed in respective working circles.

The forest block wise canopy density is depicted in graphical form as below.

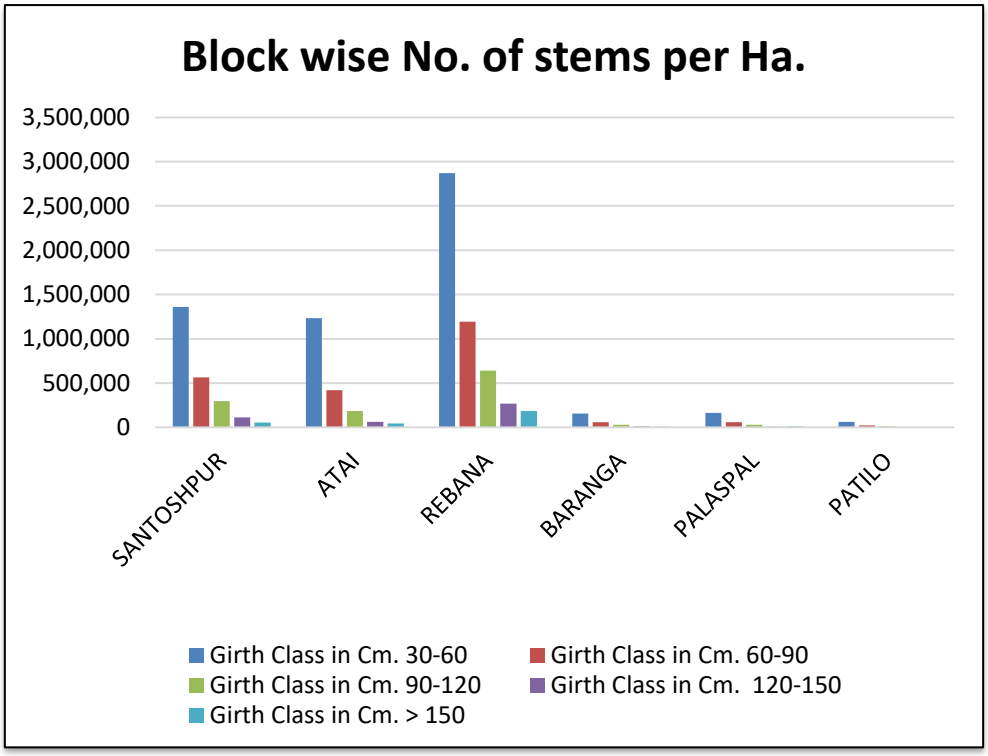


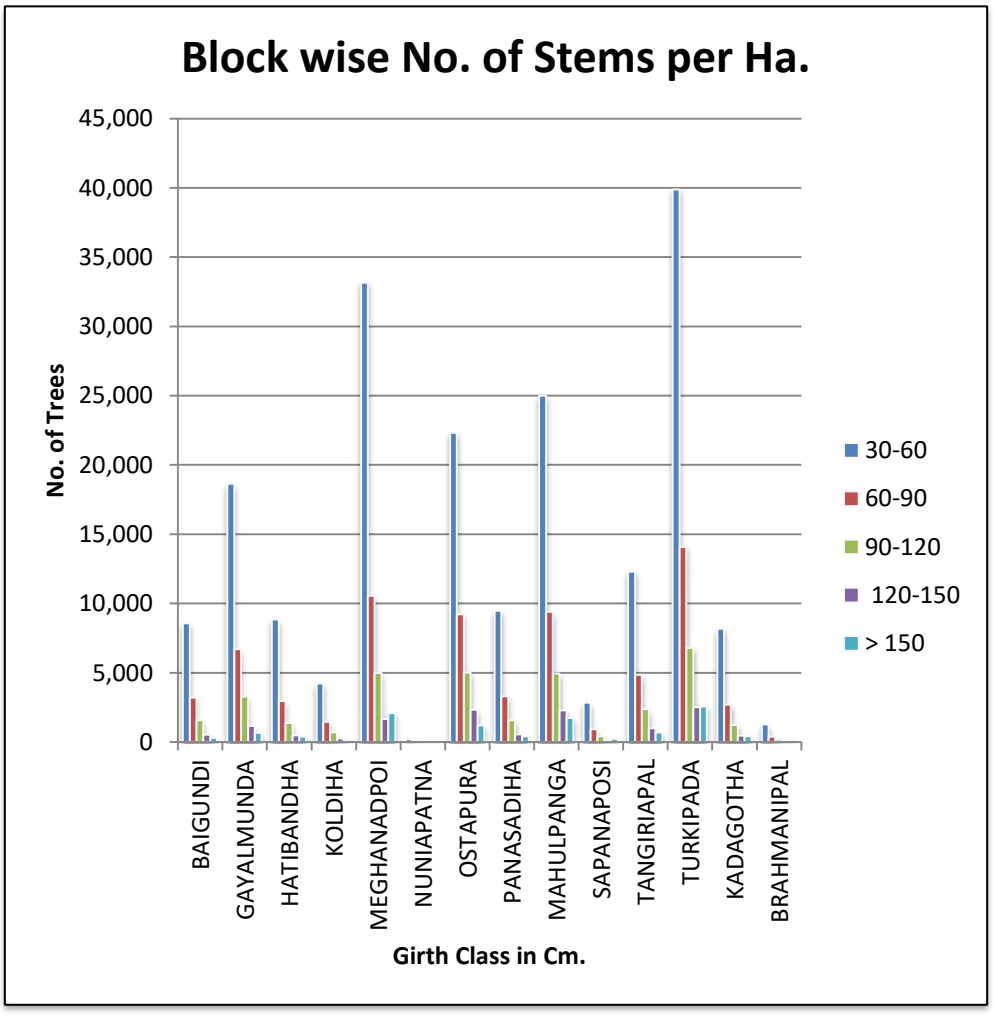


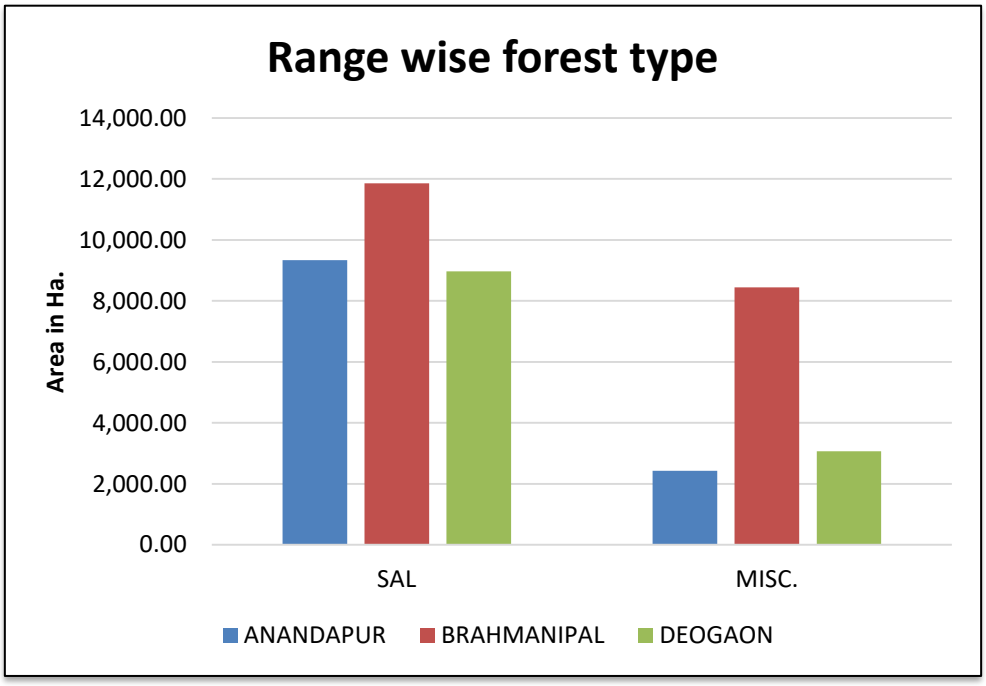


Number of stems per hectare

The graphical representation of NRSC data for number of stems per Ha. in girth class of 30-60 Cm. is maximum in each forest block for which improvement Working Circle is prescribed. The trees having girth class between 90-120cm and more than 120cm are to be retained for natural regeneration as their number are very few per Ha.

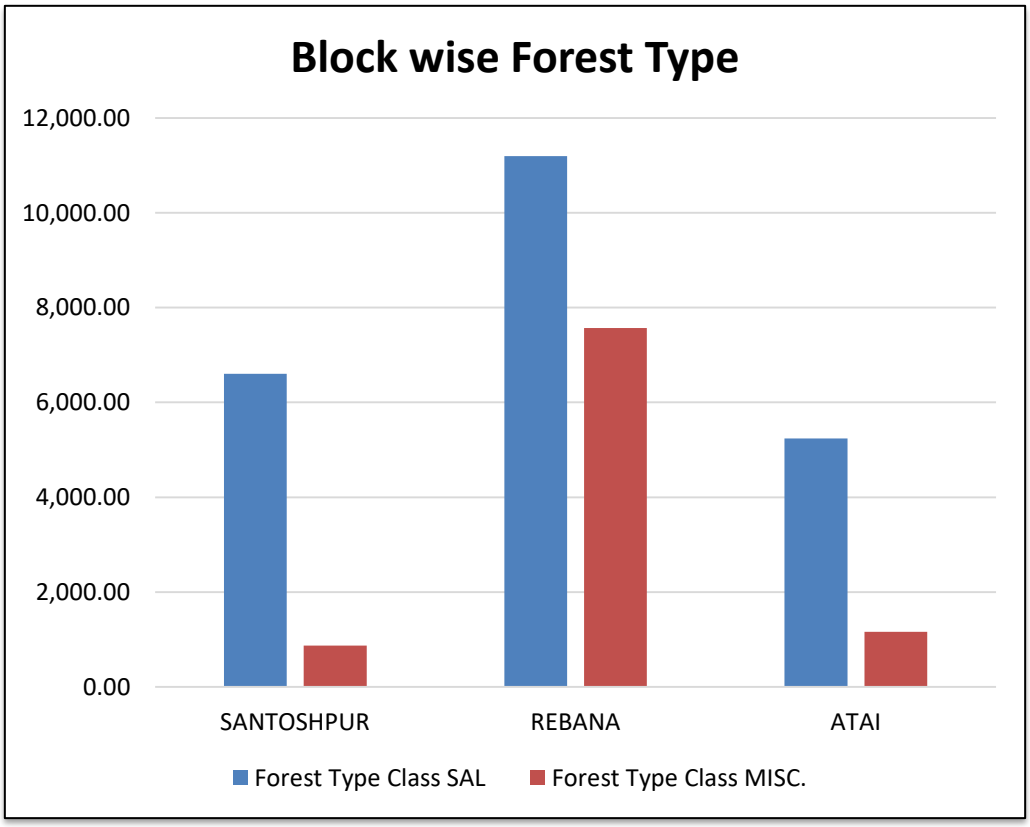

Block wise No. of stems per Ha.
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
SANTOSHPUR
ATAI
REBANA
BARANGA
PALASPAL
PATILO
Girth Class in Cm. 30-60
Girth Class in Cm. 60-90
Girth Class in Cm. 90-120
Girth Class in Cm. 120-150
Girth Class in Cm. > 150

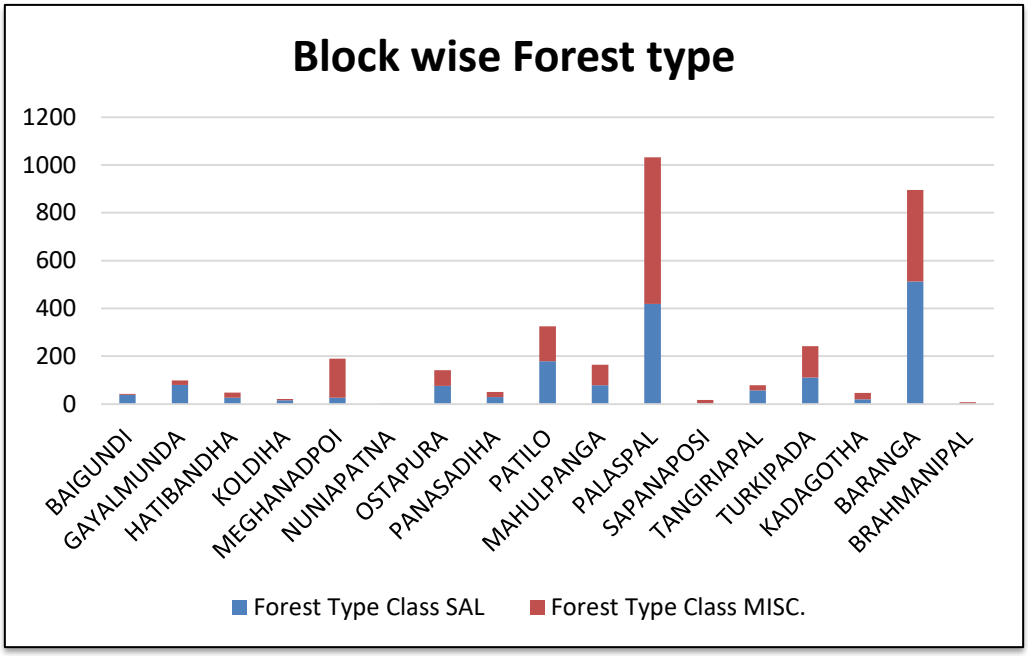

Block wise No. of Stems per Ha.
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
No. of Trees
BAIGUNDI
GAYALMUNDA
HATIBANDHA
KOLDIHA
MEGHANADPOI
NUNIAPATNA
OSTAPURA
PANASADIHA
MAHULPANGA
SAPANAPOSI
TANGIRIAPAL
TURKIPADA
KADAGOTHA
BRAHMANIPAL
Girth Class in Cm.
30-60
60-90
90-120
120-150
> 150



Forest Type

Sal is predominant in almost on all forest blocks. From Field supervision along with previous stock map, it is learnt that Sal population is declining due to factors like uprooting of mature Sal trees, poor regeneration and frequent forest fire. Therefore, now miscellaneous species are taking the place of Sal crop.





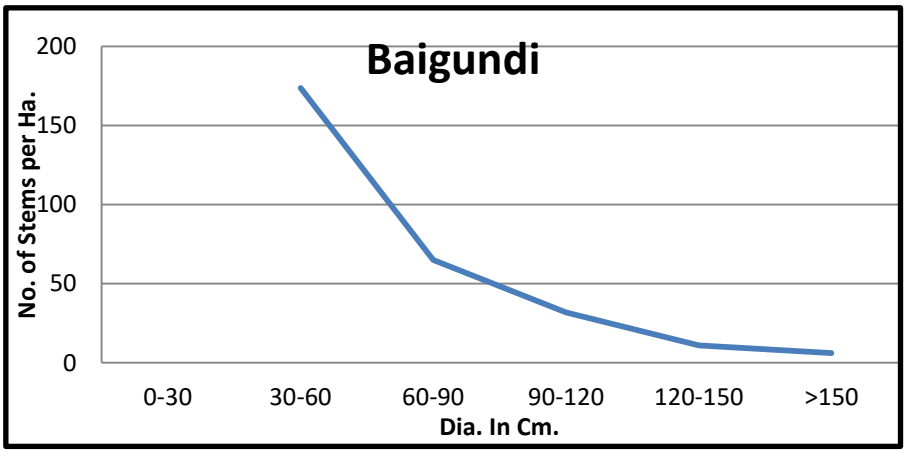
The report prepared by NRSC has been analysed RF wise and the result is as follows :

As per DeLiquort's Law the number of trees in successive diameter classes should be in a geometric series. The law states that if the number of trees is plotted against diameter classes or girth classes, the resultant curve will be literally inverted J shape. In a balanced forests, the number of stems by diameter class decreases in a constant geometric progression. The smooth J inverted shaped curve will indicate the balanced stand structure of the forest block. The curves of every forest block are presented below.

6.1.3. **Baigundi R.F** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.67, 2.04, 2-93, 1.79. This means the stand structure of the forest block can be termed as balanced except for >150cm. The presence of mature trees is comparatively less. Average number of trees is 287 per Ha. Sal constitutes 78.6% of the total area. The data shows 63% of the area is having 10 - 40% canopy density.

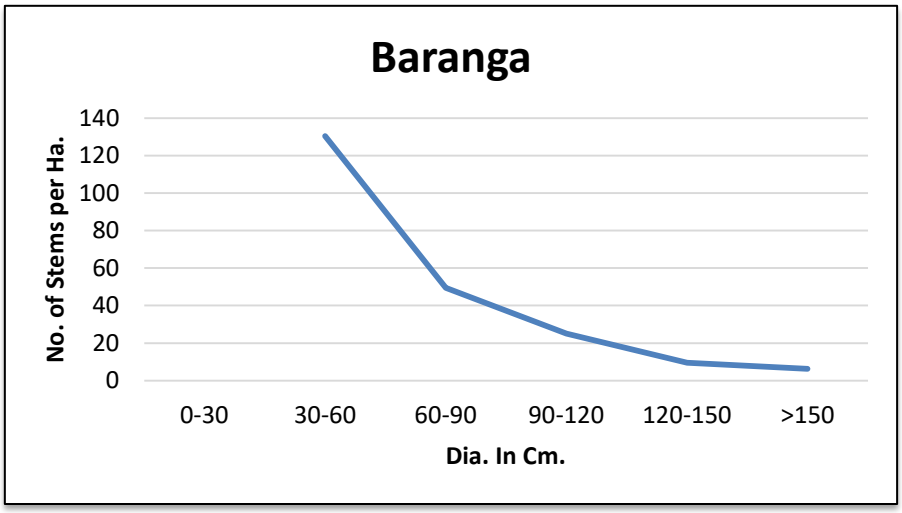
	0-30	30-60	60-90	90-120	120-150	>150
Baigundi		173.71	65.01	31.77	10.82	6.03



6.1.4 **BarangaRF** : The Deliquort's quotient for successive girth classes from 30-60 cm to >150 cm is 2.63, 1.97, 2.65, 1.49. This curve shows that there is dearth of trees both in 60-90 cm

and >150 cm category. Overall the stand structuresis balanced. Average number of trees 221 per Ha. Sal constitutes 42% of the area. 43.5% of the area lies is 10-40% canopy density and 31% lies 40-70% canopy density

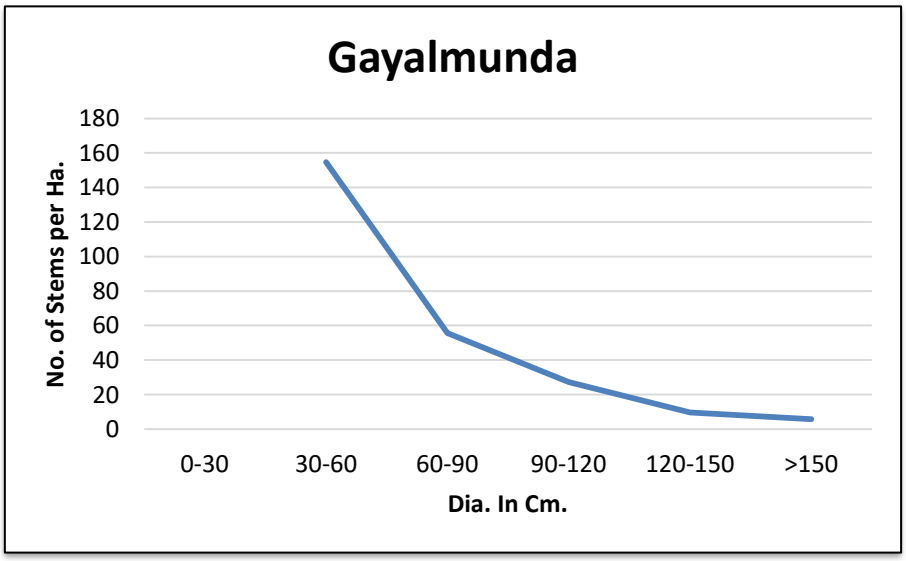
	0-30	30-60	60-90	90-120	120-150	>150
Baranga		130.41	49.44	25.07	9.44	6.31



6.1.5 **GayalamundaRF** :

The Deliquort's quotient for successive girth classes from 30-60 cm is 2.78, 2.04, 2.84, 1.70. This means the stand structure of the forest block can be termed as balanced except for >150 cm. The presence of mature tree is comparatively less. Average number of trees is 253 per ha. Sal constitutes 66.8% of total area. The data shows 71.6% of area lies in 10-40% canopy density.

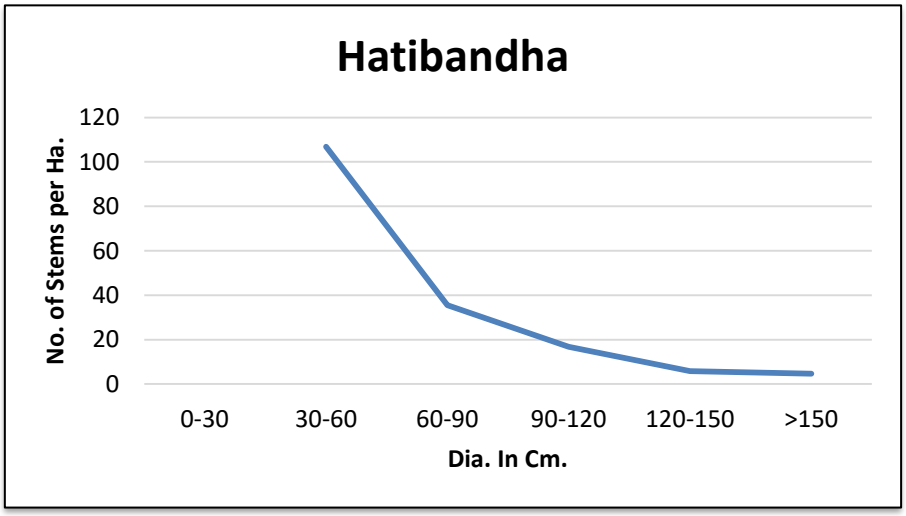
	0-30	30-60	60-90	90-120	120-150	>150
Gayalamunda		154.76	55.65	27.22	9.57	5.62



6.1.6. **HatibandhaRF** :

The Deliquort's quotient for successive girth classes from 30-60 cm is 3, 2.11, 2.87, 1.23. This means there is more number of trees in 30-60 cm girth class and there is less number of mature trees. Average number of trees is 170 per ha. Sal constitutes 32% of total area. 57% of total area lies in 10-40% canopy density.

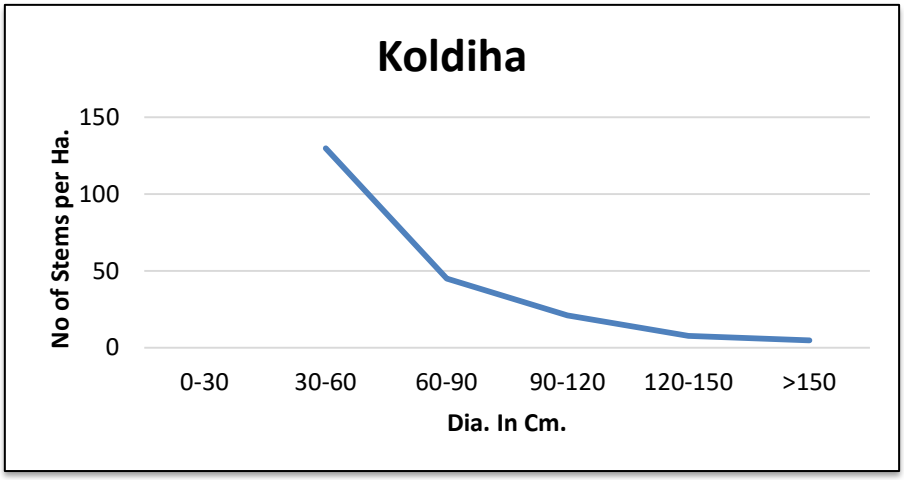
	0-30	30-60	60-90	90-120	120-150	>150
Hatibandha		106.8	35.52	16.76	5.82	4.7



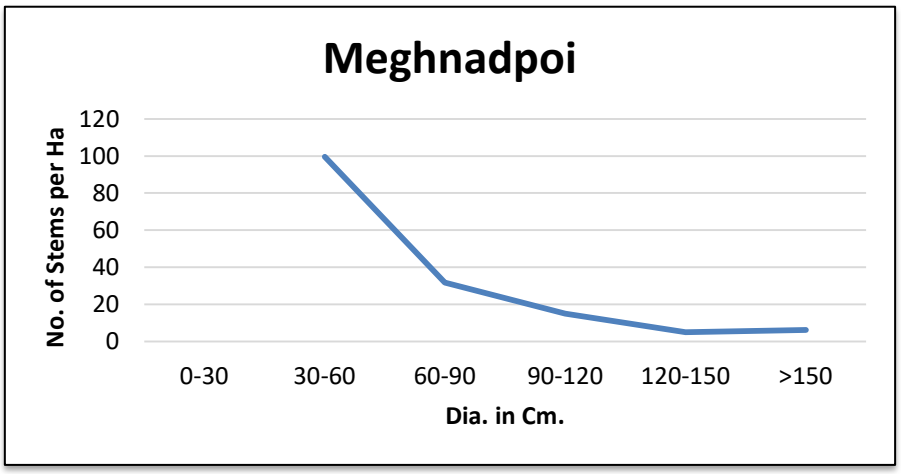
6.1.7. **Koldiha & Meghanadpoi R.F** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.88, 2.13, 2.77, 1.63 in Koldiha RF and 3.14, 2.11, 3.01, 0.79 in case of Meghanadpoi. This means the stand structure of the forest block can be termed as balanced except for >150cm in case of Koldiha R.F. But in case of Meghanadpoi R.F there is presence of very less mature trees. Also there is less number of trees 60-90 cm girth class. Average number of trees is 208 per ha. in case of Koldiha 157 in case of Meghanadpoi Sal constitutes 49.24% in case of whereas Meghanadpoi is mixed forest having 49% miscellaneous crop. 66% of total area lies in 10-40% canopy density.

	0-30	30-60	60-90	90-120	120-150	>150
Koldiha		129.72	44.94	21.09	7.61	4.66



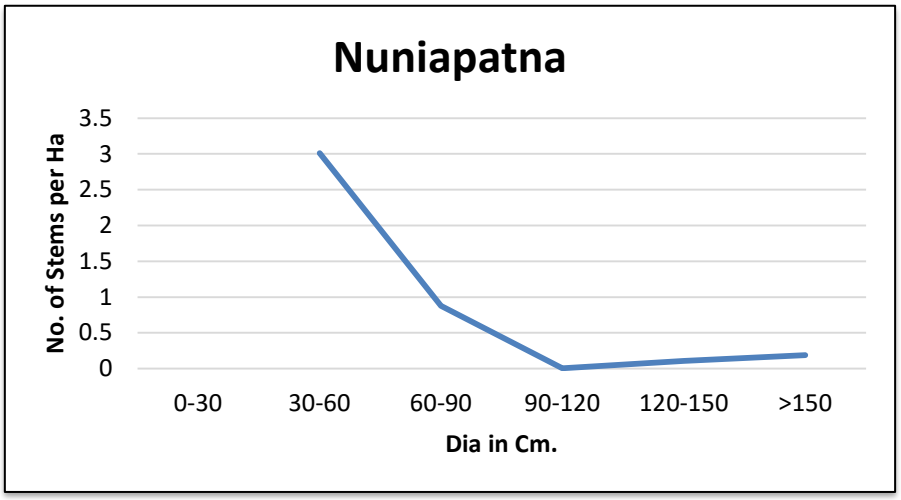
	0-30	30-60	60-90	90-120	120-150	>150
Meghanadpoi		99.63	31.69	14.99	4.98	6.25



6.1.8 **NuniapatnaRF** :

It needs special mention because major part of the RF lies inside Baitarani river & rest part is the river bank of Baitarani river. The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 3.43, 175, 0.04, 0.57. It denotes the stand structure is highly irregular. Average number of trees is 4.6 per ha. and 94% of this RF is of scrub forest.

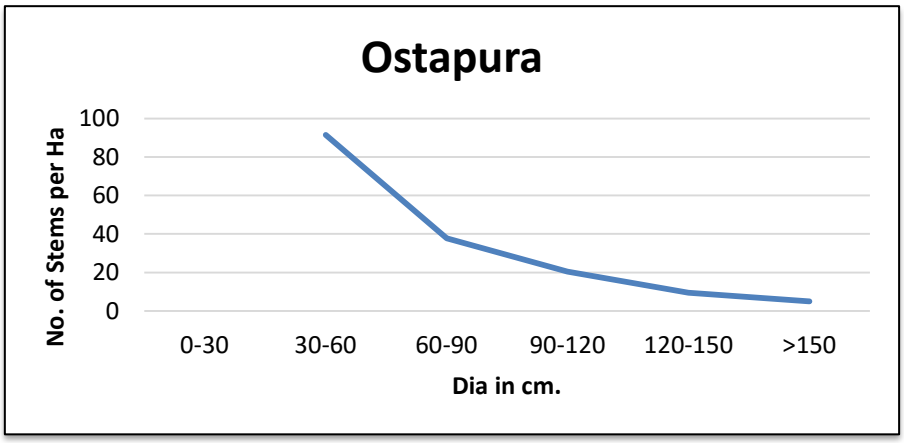
	0-30	30-60	60-90	90-120	120-150	>150
Nuniapatna		3.01	0.88	0.005	0.11	0.19



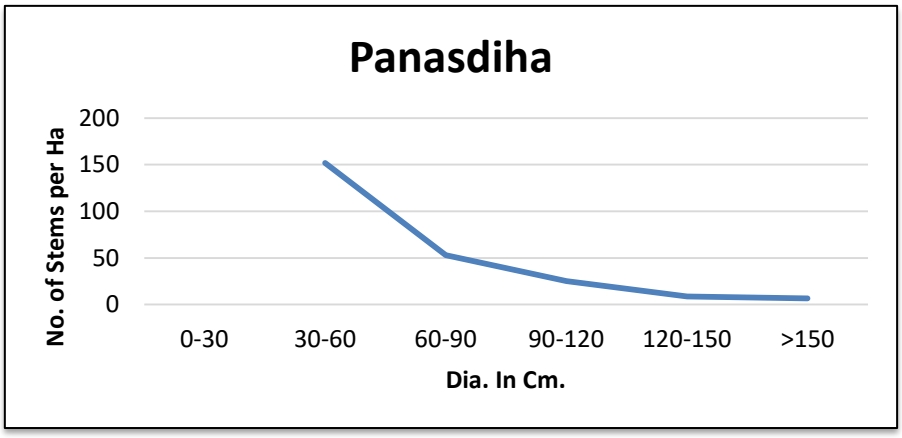
6.1.9. **Ostapura, Panasadiha, PatiloRF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.42, 1.83, 2.15, 1.93 in case of Ostapura. 2.86, 2.10 in Panasadiha. Average number of trees 164, 245.6 and 214.6 per ha. in Ostapura, Panasadiha and Patilo RF respectively. Sal constitutes 40%, 47% and 38% of total area of Ostapura, Panasadiha and Patilo RF respectively.

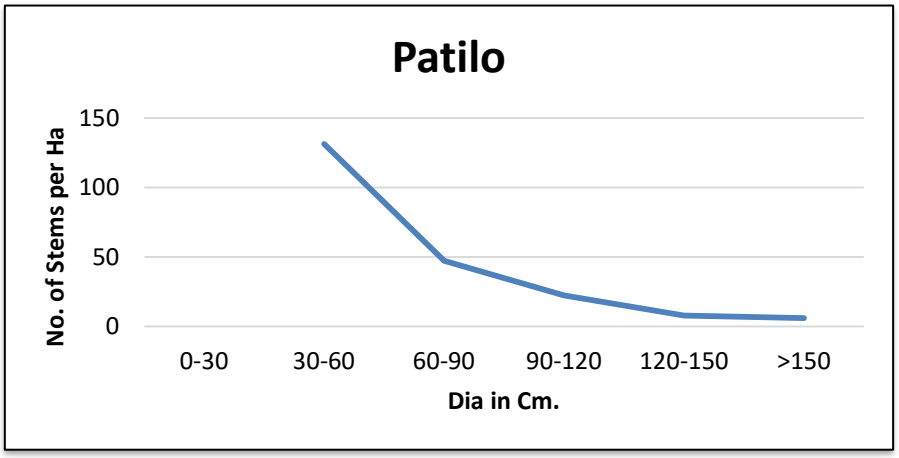
	0-30	30-60	60-90	90-120	120-150	>150
Ostapura		91.44	37.76	20.54	9.55	4.93



	0-30	30-60	60-90	90-120	120-150	>150
Panasadiha		151.77	53.02	25.16	8.83	6.61



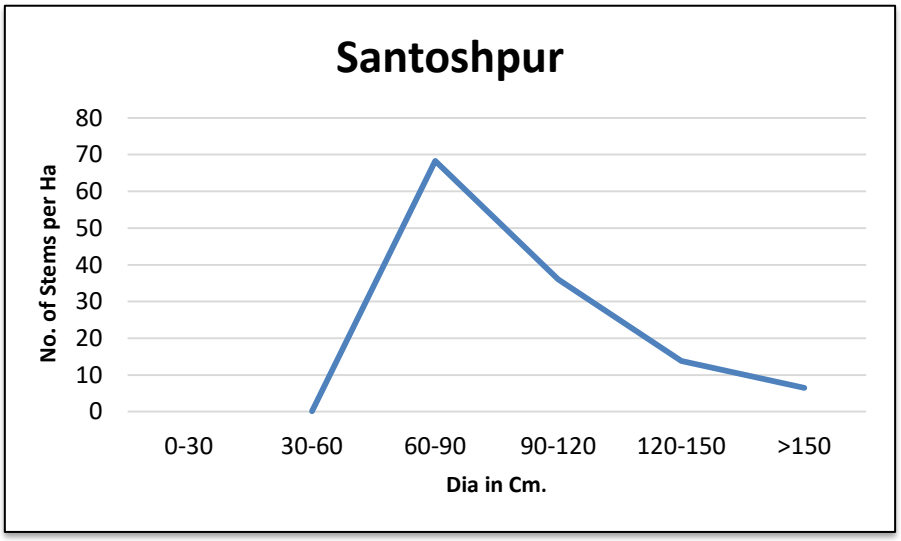
	0-30	30-60	60-90	90-120	120-150	>150
Patilo		131.23	47.16	22.43	7.82	6.02



6.1.10 **SantoshpurRF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 0.00 to 0.17, 2.75, 2.12. This means that the stand structure of the forest block is highly unbalanced. Trees in 30-60 cm girth class and 60-90 girth class are very less. Average number of trees is 289.5 per ha. and 80% of this RF is of Sal forest.

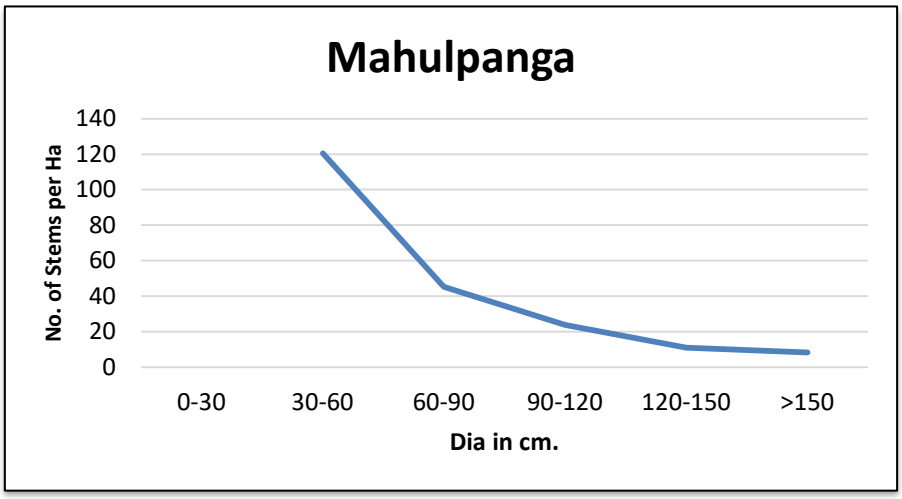
	0-30	30-60	60-90	90-120	120-150	>150
Santoshpur		0.164	68.27	36.08	13.8	6.5



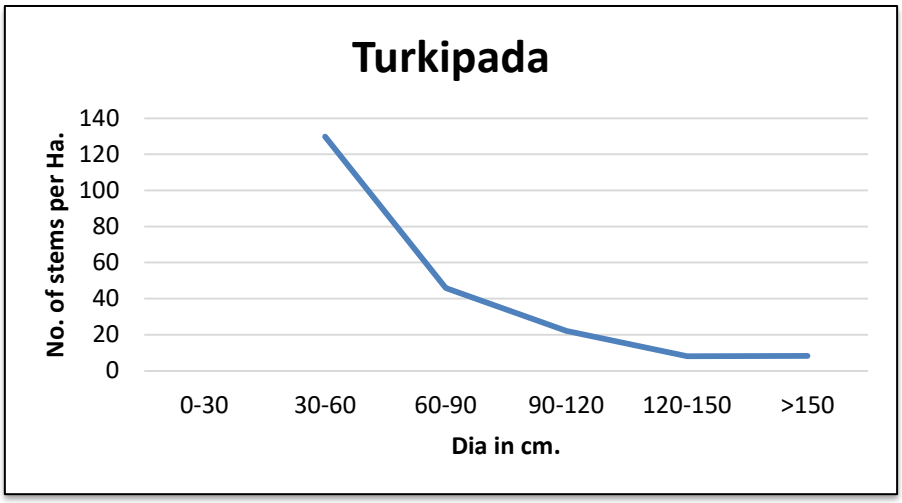
6.1.11 **Mahulpanga, Turkipada, KadagothaRF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.65, 1.90, 2.15, 1.32 in case of Mahulpanga R.F. And that of Turkipada is 2.83, 2.06, 2.71, 0.97. In case of Kadagotha R.F the above said Quotient is 3.02, 2.19, 2.74, 1.07. The data shows the number of trees in higher girth class i.e. >150 cm is very less and so also in 60-90 cm girth class. The stand structure of Turkipada R.F and Kadagotha R.F are balance except >150 cm.

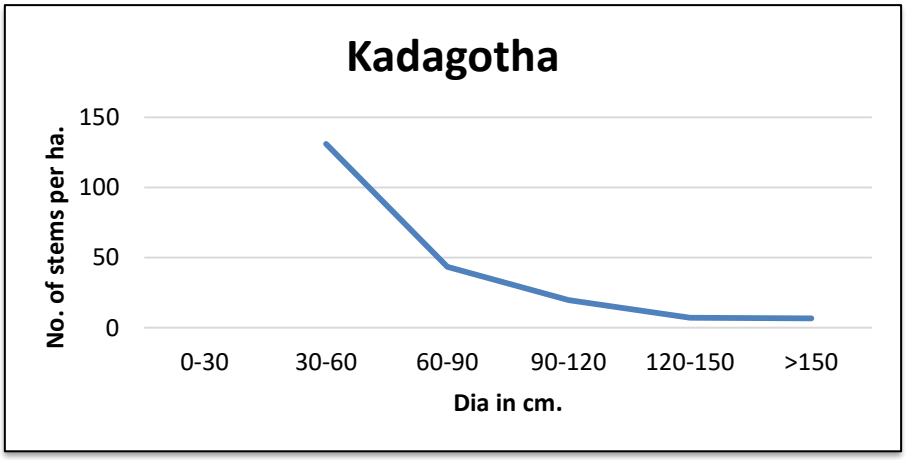
	0-30	30-60	60-90	90-120	120-150	>150
Mahulpanga		120.4	45.27	23.77	11.02	8.32



	0-30	30-60	60-90	90-120	120-150	>150
Turkipada		129.91	45.87	22.16	8.16	8.33



	0-30	30-60	60-90	90-120	120-150	>150
Kadagotha		131.01	43.32	19.73	7.18	6.67

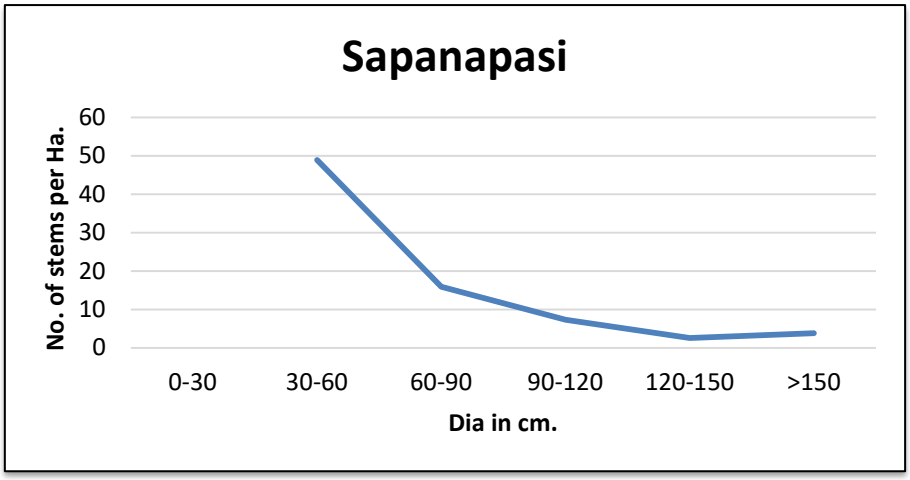


Average number of trees is 208.8 in Mahulpanga R.F, 214.4 in Turkipada R.F and 207.9 in Kadagotha R.F per ha. and Sal constitute 37.7% and 41.7% is of mixed forest in Mahulpanga RF, 36% of Sal in Turkipada R.F, in case of Kadagotha R.F 43% is mixed forest and Sal constitutes 32%.

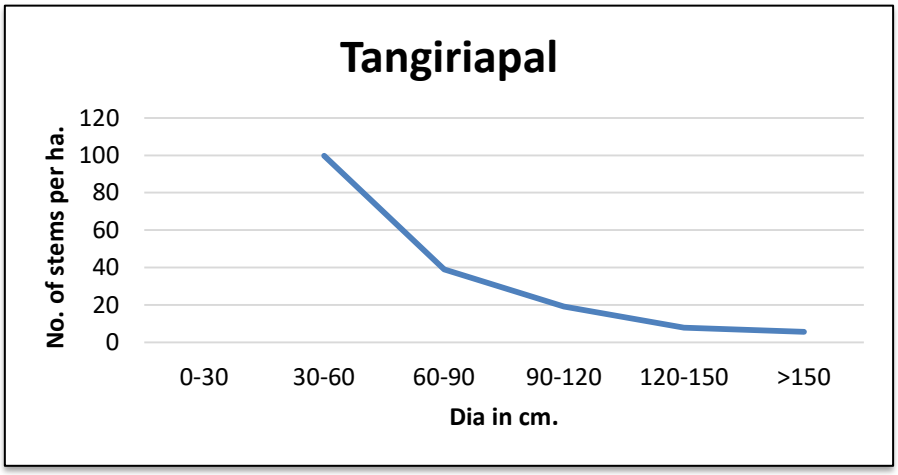
6.1.12 **Sapanposi, Tangiriapal, Brahmanipal PRF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 3.08, 2.17, 2.83, 0.65. This means there is more number of trees 30-60 girth class which may be due to its plain topography and the stands structure of Forest Block is balanced except for >150 cm. The quotient in case of Tangiriapal is 2.4, 2.03, 2.42, 2,40. This means the stand structure is balanced except in mature trees.

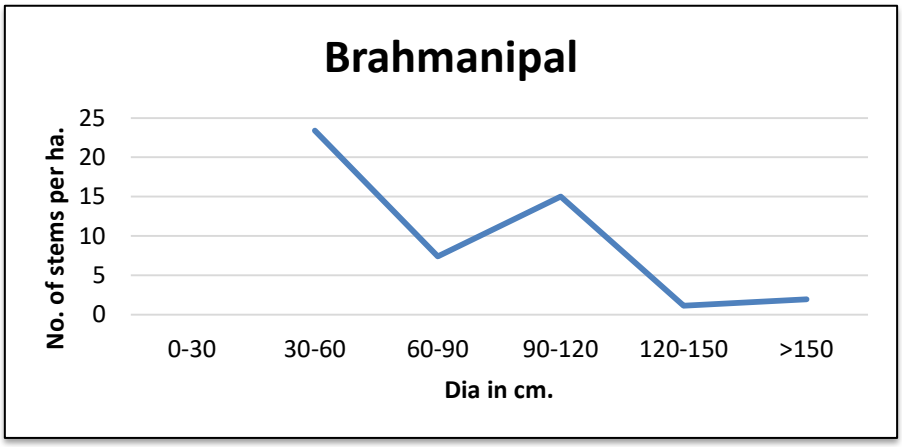
	0-30	30-60	60-90	90-120	120-150	>150
Sapanapasi		48.93	15.87	7.29	2.57	3.83



	0-30	30-60	60-90	90-120	120-150	>150
Tangiriapal		99.7	38.99	19.17	7.9	5.64



	0-30	30-60	60-90	90-120	120-150	>150
Brahmanipal		23.41	7.4	15	1.14	1.92

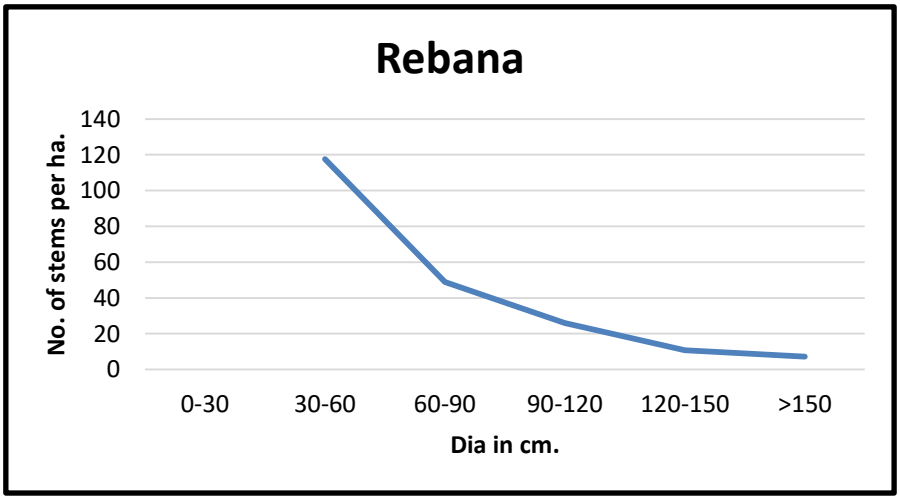


In Brahmanipal the above said quotient is 3.16, 22.42, 0.28, 0.59. The data shows the stand structure is highly irregular. In Sapanposi average number of trees per Ha. is 78 Nos., in Tangiriapal 170.7 Nos per Ha and that of Brahmanipal is 37 nos per Ha. In Sapanposi the forest is scrub type. Constitutes only 3%sal, in case of Tangiriapal Sal constitutes 45% and that of Brahmanipal PRF is a miscellaneous scrub forest.

6.1.13 **Rebana RF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.40, 1.87, 2.41, 1.50. This means the stand structure is not balanced having less number of trees in 60-90 cm and more than 150 cm girth class. Average number of tree is 210 per ha. and 46% of this RF is of Sal forest.

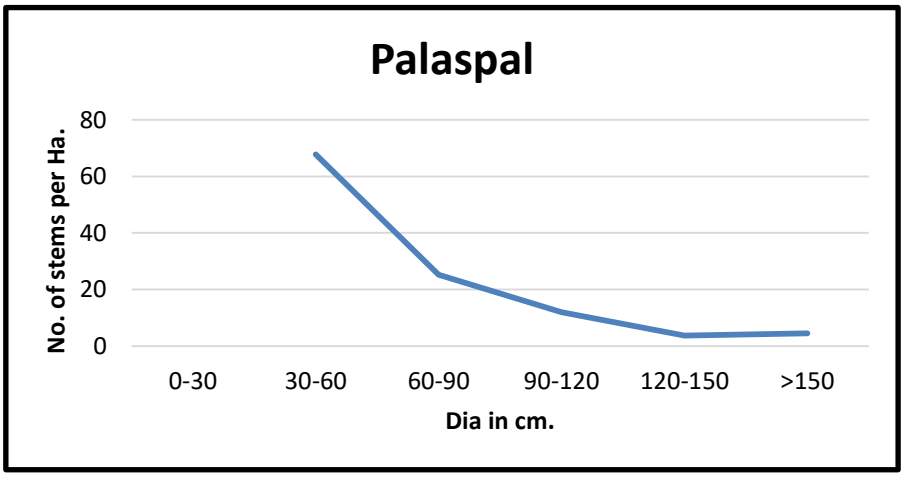
	0-30	30-60	60-90	90-120	120-150	>150
Rebana		117.603	48.84	26.07	10.79	7.17



6.1.14 **PalaspalRF** :

The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.68, 2.10, 3.22, 0.81. This means the stand structure of the forest block is balanced except more than 150 cm girth class. The presences of mature trees are comparatively less. Average number stem per Ha is 113. In this forest block, the predominant crop is miscellaneous crop with only 16.5% Sal.

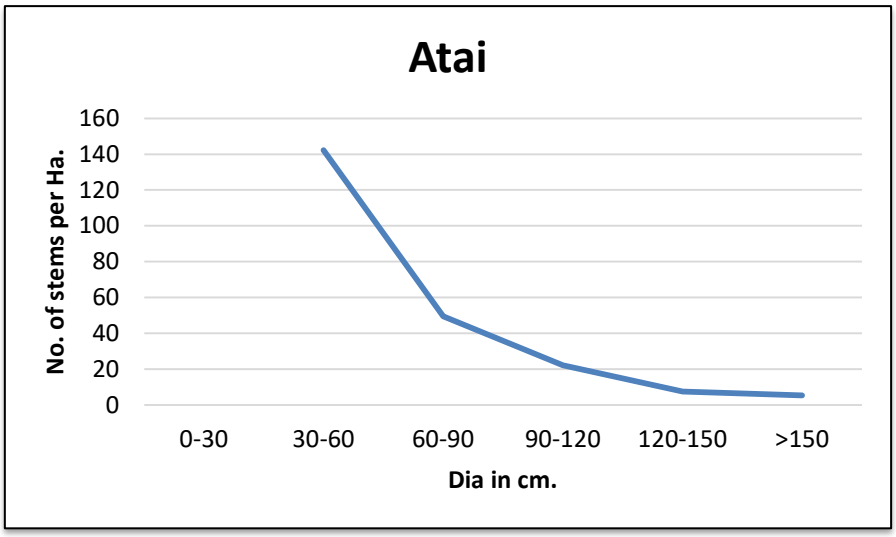
	0-30	30-60	60-90	90-120	120-150	>150
Palaspal		67.76	25.19	11.98	3.71	4.53



6.1.15 **Atei RF**:

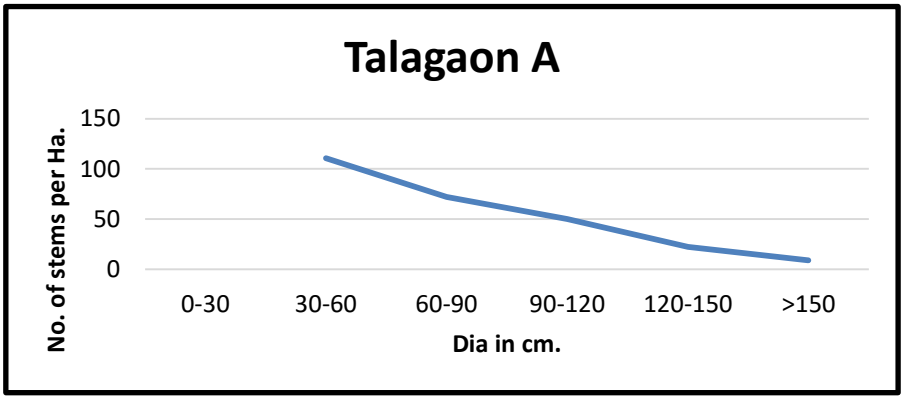
The Deliquort's Quotient for successive girth classes from 30-60 cm to >150 cm is 2.87, 2.23, 2.94, 1.40. This means the stand structure of the forest block is balanced except for more than 150 cm girth class. The average 226.7 plant per Ha. Sal constitutes 58% of the total forest area

	0-30	30-60	60-90	90-120	120-150	>150
Atai		142.295	49.429	22.15	7.52	5.35



6.1.16 **Talagaon DPF :**

	0-30	30-60	60-90	90-120	120-150	>150
Talagaon A		110.71	72.14	50	22.21	9.02



6.1.17 LOCAL VOLUME EQUATION :

The Forest Survey of India has developed local volume equation for different principal and secondary species taking the forest of Phulbani, Sambalpur and Koraput District as per their sampling for Odisha state. The 'Report on Resources Survey of Phulbani Forest Catchments (Odisha) prepared by Forest Survey of India, Dehradun, 1982 has been referred for relevant local volume equation for determination of volume and yield in this Plan. In these equation 'V' denotes under bark round timber volume in cum and "D" denotes over bark diameters in meters at breast height, where D = 7g / 22 and "g" denotes over bark girth in meter at breast height. All other species including fruit bearing species like Mahul, Kendu, Mango, Siris and Kusum etc. have been categorized as other miscellaneous species. The local volume equations for different species are shown in the table below.The NRSC has also used these equations to estimate the volume of Keonjhar (W.L) Division. The detail Forest Block wise volume in Cum estimated in different girth classes as provided by NRSC is depicted in the table below :

Table No.6.5.Forest Block wise Stock Table Estimated Volume of Trees

(Volume in Cum)

Girth Class (cm)

Block	Major Species All Trees	30-60	60-90	90-120	120-150	>150	Total
Atei	All	143010	171240	176977	106033	151484	748744
Baigundi	All	694	937	1048	627	698	4003
Baranga	All	13434	16761	19842	13428	18160	81625
Gayalmunda	All	1535	1978	2185	1336	1649	8683
Hatibandha	All	788	834	929	553	993	4096
Koldiha	All	351	425	454	282	382	1894
Meghanadpoi	All	3333	2699	3358	1934	5330	16654
Nuniapatana	All	21	15	18	9	35	99
Ostapura	All	1851	2754	3338	2950	2593	13485
Panasdiha	All	823	922	1037	629	1034	4446
Patilo	All	5370	6008	6927	4241	6920	29464
Santoshpur	All	106982	163970	197452	134214	123142	725760
Mahulpanga	All	2506	2922	3404	2879	4124	15834
Palaspal	All	17236	18487	20968	10855	28421	95968
Rebana	All	357362	467891	567665	417540	559318	2369778
Turkipada	All	4148	4129	4626	2834	6629	22366
Kadagotha	All	753	751	824	544	1015	3887
Brahmanipal PRF	All	142	101	128	69	279	719
SapanaposiPRF	All	316	239	293	162	596	1606
TangiriapalPRF	All	1219	1519	1607	1138	1754	7237
Total		662668	865677	1014432	703172	915579	4161529

Source : NRSC

6.2 GROWING STOCK OF BAMBOO :

The forest of Keonjhar (W.L) Division has no natural bamboo forest. Therefore, estimation of growing stock bamboo has not been carried out.

6.3 MEAN ANNUAL INCREMENT: -

Owing to the absence of any research activities for assessment of rate of growth of different species, it would be very difficult to assess the mean annual increment as the past enumeration data, year wise for last 20 years are not available. Illicit felling is a regular feature in most forest blocks. As such illicit removal of timber from the forest would make the calculation of M.A.I. even more difficult task.

6.4 EFFORTS TOWARDS ENHANCEMENT OF FOREST PRODUCTIVITY THROUGH QUALITY PLANTATION ACTIVITY:

To enhance the productivity of forest, it is essential to stock the blank areas by planting with Quality planting stock. The planting stock should be healthy and should be healthy (18 months seedling) height above 150cm. Seeds from plus trees are to be collected by the division. Also quality seedlings are to be collected from State Silviculturist, Bhubaneswar. The planted species should be site specific and indigenous. As the success of plantation is dependent on weed eradication, it should be carried out meticulously. Furthermore, to increase the ground water regime of the site, suitable soil and moisture conservation structures should be made in the locality where plantation will be carried out. The detailed prescription has been described in rehabilitation working circle and plantation working circle. As the productivity of the forest is also dependent on protection measures against grazing and fire, strict measures against the grazing and fire should be ensured.

6.5 BIOMASS CARBON STOCK ASSESSMENT:

Forest biomass is organic matter resulting from primary production through photosynthesis minus consumption through respiration and harvest. Assessment of biomass provides information on the structure and functional attributes of a forest and is used to estimate the quantity of timber, fuel and fodder components (Brown S.1997). With approximately 50% of dry forest biomass comprised of carbon (Westlake, 1966), biomass assessments also illustrate the amount of carbon that may be lost or sequestered under different forest management regimes. Carbon is lost to the atmosphere as CO.. To convert carbon in biomass to CO., the tonnes of carbon are multiplied by the ratio of the molecular weight of carbon dioxide to the atomic weight of carbon (44/12). Estimating the biomass density of forest components is, therefore, the first step in forest carbon accounting.

(Chapter-2 : FSI Report)

A) Tree biomass :

Forest Block wise growing stock estimated by NRSC has been taken into consideration for the estimation of tree biomass .The estimated volume per multiplied by its wood density to derive the bole biomass. The standard wood density is taken as 0.57 as per the standard fixed by IPCC'2006 for tropical dry forest. Further the bole biomass was multiplied by the biomass expansion factor i.e. 1.5 to derive per ha tree biomass above the ground (Haripriya 2000). Aboveground biomass was used to calculate the Belowground Biomass by multiplying the value of aboveground biomass with the constant factor 0.26 (IPCC 2006). Aboveground biomass and belowground biomass were added to get the total tree biomass per ha. The carbon content for a particular Forest Block was calculated by multiplying the total biomass per ha with the conversion factor 0.47 (IPCC 2006). The assessment of whole carbon stock for all the tree biomass is calculated as follows—

- The **growing stock density (GSVD- The growing stock as estimated by NRSC is taken for calculation of carbon stock.**
- The estimated **GSVD** is then converted into **above ground biomass density (AGBD)** of tree components, which was calculated by multiplying GSVD of the tree species by appropriate **biomass expansion factors** (**BEF**) (Brown et al., 1999): **AGBD = GSVD * WOOD DENSITY * BEF**
- BGBD (below ground biomass density) is estimated for different tree species as follows:
- **BGBD = AGBD * 0.26 (IPCC Default value)**
- **AGBD** (above ground biomass density) and **BGBD** are added to get the **total biomass density (TBD):AGBD + BGBD = TBD**

- The total C density (TCD) was computed using the following formula (IPCC 2006): **TCD = TBD x (0.47)** .

Table No.6.6.A.Average Biomass of Tree >10cm dia

BIOMASS AND CARBON STOCK OF TREES

Name of the Forest Block	Total Growing stock in Cu.mtr.	Growing Stock per Ha. in Cu.mtr	Above Ground Biomass	Below Ground Biomass	Total Biomass in tons per Ha.	Total Carbon density in tons per Ha.
Baigundi	4003	81.18028797	69.40914622	18.04637802	87.45552423	41.1040964
Baranga	81625	67.81681774	57.98337917	15.07567858	73.05905775	34.3377571
Gayalamunda	8683	72.09398871	61.64036035	16.02649369	77.66685404	36.5034214
Hatibandha	4096	49.3910527	42.22935005	10.97963101	53.20898107	25.0082211
Koldiha	1894	58.15167332	49.71968069	12.92711698	62.64679767	29.4439949
Meghanadpoi	16654	50.03304693	42.77825512	11.12234633	53.90060145	25.3332827
Nuniapatna	99	1.472118959	1.25866171	0.327252045	1.585913755	0.74537946
Ostapura	13485	55.25733486	47.24502131	12.28370554	59.52872685	27.9785016
Panasadiha	4446	71.2614201	60.92851418	15.84141369	76.76992787	36.0818661
Patilo	29464	63.09883285	53.94950209	14.02687054	67.97637263	31.9488951
Santoshpur	725760	88.04358507	75.27726523	19.57208896	94.84935419	44.5791965
Kadugotha	3887	62.21190781	53.19118118	13.82970711	67.02088828	31.4998175
Mahulpanga	15834	76.26432906	65.20600135	16.95356035	82.1595617	38.614994
Turkipada	22366	72.86528751	62.29982082	16.19795341	78.49777423	36.8939539
Rebana	2910577	92.58066917	79.15647214	20.58068276	99.7371549	46.8764628
Palaspal	95968	37.1311282	31.74711461	8.254249798	40.0013644	18.8006413
Atei	748744	62.90776954	53.78614296	13.98439717	67.77054012	31.8521539
						537.602636

The forest block wise carbon stock for all trees calculated basing on the total growing stock.

B) Herb, Shrub and Leaf litter biomass :

The collected herb samples (1m * 1m quadrats) shrub samples (5m * 5m quadrats) and

leaf litter samples (1m * 1m quadrats) from each of the corners of 4 sample plots and their fresh weights were recorded. For each of the three types of biomasses the composite samples were prepared by taking sub samples from each corner and they were taken for the air dried completely. The dried weights of the composite samples were taken after confirming the three consecutive dried weight readings for each of the samples.

The carbon stock analysis for herb, shrub and leaf litter biomass is calculated by following formula –

Step 1: Weight the oven dry sample.
If sub sample was collected, the moisture content is determined by Dry weight =
Dry weight of sub sample X Fresh weight of whole sample *Fresh weight of sub sample.*

Step 2: The biomass is calculated by multiplying the dry weight with an expansion factor calculated from plot size.

Expansion factor = 10,000 m2 / Area of the plot and Carbon stock = Biomass * 0.47

(D) Soil biomass :

The soil samples are collected from the prefixed sample plots according to the procedure provided in the National Working Plan Code, 2014

In this working plan it has been tried for estimation of bio mass and carbon stock as per the field of data. It can be taken as base year data. Forest Block wise carbon content of trees is given in the Table No. 6.6.B. Range wise carbon content of trees, herbs & shrubs is given in the Table No.6.5.D.

Table No.6.6.B Carbon Content

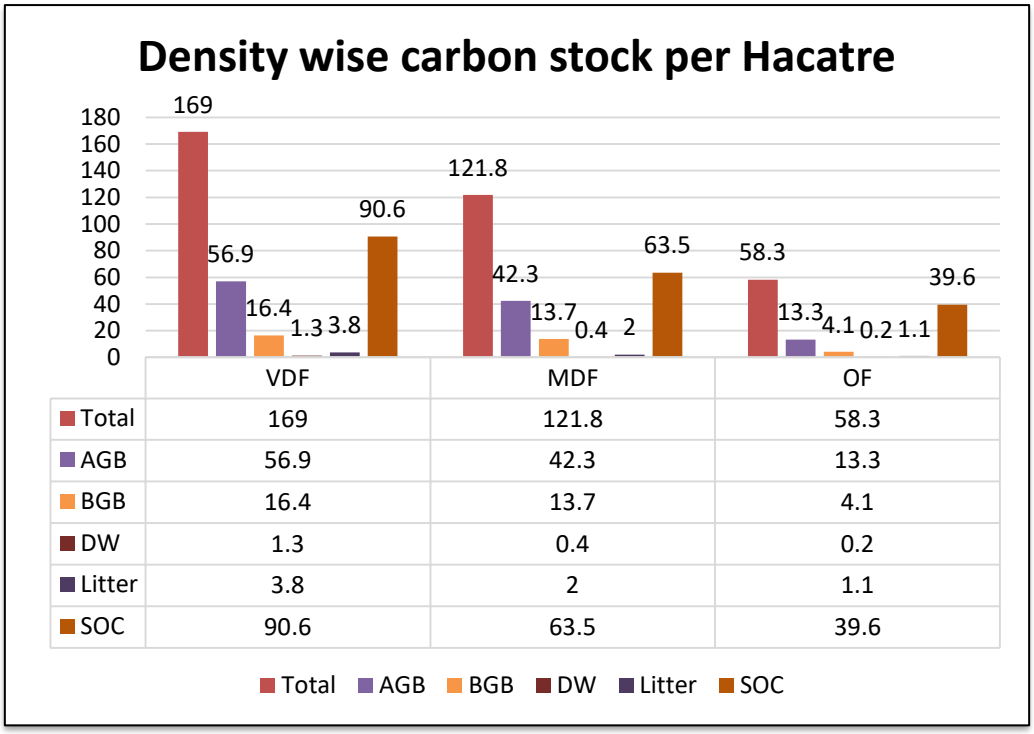
Sl. No.	Range	Average Carbon content per Ha.				
		Tree Biomass in Tons Per Ha.	Average carbon tons /Ha (Trees)	Herb	Shrub	Woody Litter
1	Anandapur	64.66	30.388	4.10	15.49	7.19
2.	Deogaon	59.43	27.922	4.2	13.62	3.35
3.	Brahmanipal	71.34	33.531	4.5	8.28	3.57

The carbon content of Keonjhar (W.L) Division for different component

In tropical dry deciduous forest				Per Ha Tonnes/Ha	
Tree	Herb	Shrub	Leaf Litter	Soil carbon	Dead wood
30.613	4.26	12.46	4.70	-	-

FSI has been one of the major contributors on forest biomass estimation and carbon stock change. In 2010 FSI has completed estimation of forest carbon stock in national level as well as State level.

As per FSI data, density wise carbon stock per ha has been depicted in the following histogram. The data shows the density of the forest is directly proportional to the carbon stock of the forest that means the total carbon content of a very dense forest is more than that of moderately dense forest similarly the carbon content of moderately dense forest is more than the open forest. It is pertinent to mention here that soil carbon content of a very dense forest is more than that of moderately dense forest and the soil carbon content in moderately dense forest is more than that of open forest. This means the soil of very dense forest is healthier and more fertile than that of moderately dense forest. Therefore, soil health and soil carbon content is directly proportional to the density of forest.



The forest of Keonjhar WL Division is categorised under tropical dry deciduous forest. As per FSI 2010 data the per ha carbon stock is as follows.

Table No.6.6.C.Carbon stock

In Tropical dry deciduous forest Per Ha Tonnes/Ha.

AGB	BGB	DEAD WOOD	LITTER	SOIL CARBON	TOTAL
37.52	14.73	0.16	0.77	42.49	95.67

6.6 CARBON SEQUESTRATION AND MITIGATION:

Efforts should be taken to enhance of the carbon sequestration of these forest taking into calculated carbon stock as the base line. A balance crop having representation of diameter and height classes is ideal for maximum carbon sequestration. A growing forest with healthy and vigorous crop is the sign of maximum carbon sequestration. The growing stock of trees must be so constituted that it provides regularly the greatest possible quantity of the desired products including intangible benefit. All these points can be achieved by growing indigenous species and increasing density class.

Due to severe biotic pressure, the forest of Keonjhar W.L. Division has already been degraded as per land use, land use change in forestry data. For this reason inthis Working Plan suitable prescriptions have been made in rehabilitation and plantation overlapping working circle to increase the growth and viability of the forest thereby increasing carbon sequestration.

Forest soil must be kept as healthy and fertile as possible. It can only be achieved by increasing the density classes i.e. the optimum vigour of forest. The factors like sweeping of forest floor, occurrence of fire, grazing, and illicit felling which are the main causes of forest degradation need to be checked. Suitable fire protection measures have been prescribed in the current plan.

CHAPTER – VII

OPTIMISATION OF FOREST RESOURCE UTILIZATION

7.1 RECORDED REMOVAL OF TIMBER:

There was no selection coupe duringpast working plan period. Only felling of dead, diseased uprooted trees had been prescribed under improvement working circle. In the year 2010-11 improvement felling had been carried out in the coupes STP-V (Santoshpur) and BPT-V (Baliparbata) and 10.5816 cum of timbers was harvested.

During Phailin (Cyclone) in the year 2012, some uprooted trees were salvaged and 185.923 cum of timber was realized.

7.2 RECORDED REMOVAL OF FUEL-WOOD.

Forest fringe villagersuse different types of fuelslike fire wood, cow dung cakes, electricity and LPG for cooking. As per socio-economic study, the per capita consumption of fuel wood of Keonjhar (Wildlife) Division is 470 Kg. per annum. The number of house-holds in 30 fringe villages is estimated to be 4307. The total consumption in 30 fringe villages comes to 10646.23 tonnes per year. The socio economic study shows that fuel wood is the major source of energy for forest fringe households for cooking. Fuel wood provides approximately 98% of total energy requirement which clearly reflects very high dependency.

Forest is the major source of fuel wood where as negligible quantity is obtained from farm land etc. The forest fringe villagers depend mostly on the species like *Sal, Piasal, Gohira, Kusuma, Karada* etc for their fuel wood requirement.

Firewood requirement of the Division :

As per India State of Forest Report'2011, out of 33.029 million persons using fuel wood, 11.110 million persons are using fuel wood from forest & they are using 2.97 million tonnes of fuel wood from forests. That means per capita consumption of fuel wood comes to 267 Kg.

The data from Socio – Economic study carried out in 30 fringe villages of this working plan shows 21,952 people consume 103310.7 qtls.of fuel wood that means per capita consumption of fuel wood is 470 Kgs. **Annual Consumption of Fire Wood**.

Table No.7.1 : Annual Consumption of Fire Wood

Sl. No.	Block	Population	As per FSI, 2011 report@267Kg/ Person/Annum	As per PRA exercise @ 470 Kg/Person/Annum
1.	Anandpur	109669	29281.623 M.T	51544.43M.T
2.	Ghasipura	148554	39663.918 M.T	69820.38 M.T
3.	Harichandanpur	138085	36868.695 M.T	64899.95 M.T
4.	Hatadihi	164629	43955.943 M.T	77375.63 M.T
5.	AnandapurMunicipality	39585	10569.195 M.T	18604.95 M.T
6.	Daitari City	4065	1085.355 M.T	1910.55 M.T
	Total		**161424.729 M.T**	**284155.89 M.T**
Source: DFO, Keonjhar(WL)				

The above table shows the demand of fuel wood is **161424.729 M.T** (as per FSI, Survey'2011)and**284155.89 M.T**(as per Socio-Economic Survey) of this working plan area. Against this, the documented fuel wood obtained from forest during last 10 years is 3295.46 M.T (U.D + O.R + Salvage), from project area 634 M.T and from RH (Record Holding) plot 132.45 M.T. The pressure of forest in illegal removal is imaginable.

Hence, the total production of fire wood from 2007-08 to 2016-17 comes to 4061.91 M.T, which is negligible so far demand is concerned. Therefore, the gap between demand of fire wood and supply is very high. In order to minimize wood based fuel wood, efforts need to be made to subscribe to the 'Ujala' scheme of the Govt. of India amongst the villagers of fringe villages. The age old practise of sole dependence on fire wood should be stopped forthwith. Information on removal of trees from R.H Plot in Keonjhar (Wildlife) Division, Anandapur is given in the Table No.7.2.

Table No. 7.2 : Information on removal of trees from R.H Plot in Keonjhar (Wildlife) Division, Anandapur.

Sl.No.	Year	No. of trees	Quantity Recovered
1	2	3	4
1.	2009-10	2	Timber – 0.51 cum.F.W. – 2 stack
2.	2010-11	1	Timber – 0.35 cum.F.W. – 0.5 stack
3.	2011-12	23	Timber – 14.56 cum.F.W. – 3 stack
4.		11	Timber – 23.79 cum.F.W. – 3 stack
5.		1	Timber – 0.79 cum.F.W. – 3 stack
6.	2012-13	--	--
7.	2013-14	210	Timber – 11.38 cum.F.W. – 23.5 stack
8.		145	Timber – 6.87 cum.F.W. – 23 stack
9.	2014-15	21	Timber – 27.76 cum.F.W. – 22 stack
10.		20	Timber – 19.97 cum.F.W. – 15 stack
11.		14	Timber – 12.39 cum.F.W. – 7 stack
12.		1	Timber – 7.53 cum.F.W. – 1 stack
13.	2015-16	6	Timber – 0.67 cumF.W. – 0.2 stack
14.	2016-17	43	Timber – 7.41 cum.F.W. – 5.5 stack
15.		9	Timber – 17.86 cum.F.W. – 1 stack
16.		37	Timber – 32.81 cum.F.W. – 15.5 stack
17.		16	Timber – 18.98 cum.F.W. – 7 stack
18.		1	Timber – 1.13 cum.F.W. – 0.25 stack
19	2017-18	5	Timber - 976.94 cft Firewood – 13 stack
20	2018-19	41	Timber – 1968.66 cftFirewood – 5 stack
21	2019-20	26	Timber – 1343.86 cftFirewood – 4 stack
22	2020-21	6	Timber – 336.37 cft

Source-Keonjhar (Wild life)Division , Anandapur .

7.3 RECORDED REMOVAL OF BAMBOO :

The forest of Keonjhar(WL) Division is devoid of naturally occurring bamboo.

7.4 RECORDED REMOVAL OF LOCALLY IMPORTANT NTFPS INCLUDING MAPS:

There is wide scope of augmentation of planting, harvest and marketing of NTFPs in these forests.

The forest of this Division is rich in variety of non-timber forest produces. The NTFPs contribute sizeable proportion to livelihood of not only tribals but also non tribals particularly rural population.

7.5 DEMAND AND SUPPLY OF TIMBER AND IMPORTANT NON-TIMBER FOREST PRODUCE:

The economy of Anandpur Sub-Division is agrarian in nature. The fertile land of Baitarani basin help in this purpose. Nearly 37% of the total population of the Sub-division (229721) comprises the work force, out of which 22%, constitutes the main workers. Nearly 25.84% main workers of the sub-Division depend upon agriculture and allied activities for their livelihood.

Timber: Timber is required for housing, furniture & agricultural implements etc. The requirement of timber in the study area has been calculated as detailed below.

i) In 2011, Forest Survey of India came at with fresh estimates of requirement of timber for housing, furniture and agricultural implements along with some other estimation. Taking into account of the population of Odisha in 2011, the per capita requirement comes to 0.167 cum, 0.031 cum and 0.010 cum respectively for housing, furniture & agricultural implements. As per these estimates, the demand of timber for the Keonjhar (Wildlife) Division (Block wise as below) is given in Table No. 7.3.

Table No. 7.3 : Demand of Timber for Keonjhar (W.L) Division (Block wise)

Name of Block	Population	Housing & allied uses (0.167 cum/person/ annum)	Furniture (0.031 cum /person /annum)	Agriculture improvement(0.010 cum/person/annum)	Total
RURAL					
1.Anandpur	109669	18314.723	3399.739	1096.69	22811.152
2.Ghasipura	148554	24808.518	4605.174	1485.54	30899.232
3.Harichandanpur	138085	23060.195	4280.635	1380.85	28721.68
4.Hatadihi	164629	27493.043	5103.499	1646.29	34242.832
URBAN					
5.A.Municipality	39585	6610.695	1227.135	395.85	8233.68
6.Daitari City	4065	678.855	126.015	40.65	845.52
Total	**604587**	**100966.029**	**18742.197**	**6045.87**	**125754.096**

ii). PRA exercise has been carried out in 30 forest fringe villages. The study area was concentrated only in rural areas. From these PRA exercise attempt has been made to find out the per capita requirement of housing & allied uses and requirement for agricultural implements. No data is available for requirement of furniture. The result is depicted in the Table No. 7.4.

Table No. 7.4 : Requirement of housing and allied uses				
Name of Block	Population	Housing & allied (0.029 cum/ person/annum	Agriculture (0.020 cum/person/annum)	Total
Anandpur	109669	3180.401	2193.38	5373.781
Ghasipura	148554	4308.066	2971.08	7279.146
Harichandanpur	138085	4004.465	2761.7	6766.165
Hatadihi	164629	4774.241	3292.58	8066.821
URBAN				0
A. Municipality	39585	1147.965	791.7	1939.665
Daitari City	4065	117.885	81.3	199.185
Total	**604587**	**17533.023**	**12091.74**	**29624.763**

There is requirement of 29624.763 cum of timber as per socio-economic survey by the people of Keonjhar Wildlife Division.

Timber Supply :

1. Supply of timber is made available to the people mainly from the following sources through the main disposal agency OFDC, Ltd.

   i) Harvest of silviculturally available mature trees.

   ii) Dead & uprooted trees salvaged from forests.

   iii) Timber seized from offence case (OR & UD).

   iv) Felled trees from different projects.

2. From Record Holdings of Private People :
   Trees grown in private plots seek permission from Divisional Forest Officer for its removal from stump site. Timber they get from these trees is used for bonafide use & disposal otherwise. The table below shows the supply of timber from different sources from last 10 years.

Procurement of salvaged timber, poles and fire wood by O.F.D.C within 2007-08 to 2020-21 is furnished in the Table No.7.5.

Table No. 7.5 : Procur-ement of salvaged timber, poles and fire wood by O.F.D.C															
Year	UD Case					OR Case					Salvaged		Project		
	Item					Item					Item		Item		
	RT(Cft)	ST (Cft)	Pole (No.)	FW Qtl	Char coal (Qtl)	RT(Cft)	ST (Cft)	Pole (No.)	FW Qtl	Char coal (Qtl)	RT(Cft)	FW St	RT (Cft)	FW St	Pole(No.)
2007-08	1831.76	98	2	0	0	0	0	0	0	0	9069.6	256	0	0	0
2008-09	3513.01	465.43	1	6.9	0	62.62	108.86	0	0	0	8144.8	749	0	0	0

2009-10	6358.72	114.05	0	0	0	837.7	139.8	0	0	0	7417.3	521	0	0	0
2010-11	7114	626.76	0	27	0	165.8	0	0	0	0	2679.7	847	5341.18	486	0
2011-12	2427.79	369.39	2	0	0	0	45.3	0	0	0	0	665	536.86	36	12
2012-13	1282.44	1037	30	455.74	0	585.29	428.14	0	0	33	0	140	0	0	0
2013-14	1327.47	494.84	0	0	0	399.4	665.41	0	0	14	0	7	148.21	21	32
2014-15	1055	502.33	0	340	0	0	0	0	0	0	312.21	6	0	0	0
2015-16	238.16	362.67	0	0	8.25	0	151.37	0	0	0	0	0	1377.25	84	0
2016-17	0	21.92	0	0	0	368.48	725.12	47	215	0	0	0	0	7	0
2017-18	1581.32					811.05					4.5		-		
2018-19	1491.43					236.59					29		-		
2019-20	2098.57					264.06					5		-		
2020-21	565.49					-					2		-		

Supply of Timber & Fire Wood from different sources.

Table No. 7.6 : Supply of timber & fire wood from different sources			
O.F.D.C		Private Plot	
Timber (cum)	Fire Wood (Ton)	Timber (cum)	Fire wood (Ton)
1954.07	3929.56	204.76	132.45

From above tables, it is seen that there is huge gap in demand & supply of timber in Keonjhar (Wildlife) Division as against the demand of 125754.096 cum as per FSI (2011) in the Keonjhar (Wildlife) Division. The availability from known sources is only 1954.07cum. This is only a small fraction of total requirement.

7.6 IMPORT AND EXPORT OF WOOD AND WOOD PRODUCTS :

OFDC Jajpur Road (C) Division is unable to meet the heavy demand of timber of Keonjhar WL Division. Hence, the people depend on depot licence holder of Cuttack and Bhubaneswar

cities, who in turn import Teak and Acacia from Raipur of Chhattisgarh. No export of wood and wood products to outside the division takes place.

7.7. IMPORT AND EXPORT OF N.T.F.P :

Though data is not available, the primary collectors are selling their products to the middle man or trader who in turn export those products to West Bengal and neighbouring state.The socio-economic survey shows collection of more than 20 items of NTFP and some MAP by the villagers of 30 fringe villages. The main items of NTFP are Sal leaves ,Char, Lac ,Mango kernel,Myrobalons ,Tamarind, Siali leaves etc .The quantity of collection of NTFP items and their market rate are given in Table No. 7.7.

Table No.7.7 : List of NTFP and their MSP

Sl No.	Item	Quantity(In Qtl.)	Rate(In Rs./Qtl.)	Amount (In Rs.)
1	Sal Leaves	4911.48	3000.00	14734440.00
2	Char	693.50	200.00	138700.00
3	Lac	1.50	3000.00	4500.00
4	Mango	589.10	200.00	117820.00
5	Karanja	16.50	200.00	3300.00
6	Mahula	4638.10	2000.00	9276200.00
7	Tola	763.52	1000.00	763520.00
8	Myrobalon	236.22	500.00	118110.00
9	Kusuma	587.87	200.00	117574.00
10	Kendu	642.00	200.00	128400.00
11	Mushroom	754.57	500.00	377285.00
12	Tamarind	187.00	2000.00	374000.00
13	Sal Seed	1174.70	500.00	587350.00
14	Bhalia	122.62	500.00	61310.00

Though, the villagers are collecting many species of Medicinal & aromatic plants items, the main species, their quantity of collection and rate are given in the Table No.7.8.

Table No. 7.8 : List of MAP and their MSP

Sl No.	Item	Quantity (In Qtl.)	Rate (In Rs./Qtl.)	Amount (In Rs.)
1	Satabari	0.50	200.00	100.00
2	BaiBidanga	25.80	200.00	5160.00
3	BhuinNimba	0.48	200.00	96.00
4	Gangasiuli	1.74	200.00	348.00

N.B. The price of the different NTFP items is furnished as per the minimum support price(MSP) fixed during 2015 by Panchayati Raj Department, Govt. of Odisha

7.8 REMOVAL OF FODDER :

The population of domestic animals viz. cows, buffalos, sheep and goats in this Division is 537126 according to the livestock census of 2012. There is no instance of stall feeding and the usual practice is mass grazing. The annual requirement of source of fodder for these domestic animals is calculated based on result of P.R.A exercise and the report of Forest Survey of India. According to general observation, the per day food consumption of cow is

around 2% to 3% of its body weight. On an average a cow consumes 5 Kg of fodder per day. FSI Report, 2011 shows that nearly 39.61 percentage of fodder requirement is met from the forest in Odisha. As per the FSI report buffalo consumes fodder approximately twice that of a cow and a sheep or goat consumes half that of a cow. Based on the above observations, a tentative assessment of annual fodder requirement and the quantity of fodder in MT that are removed from the forests and the result there of is furnished below in Table No. 7.9.

ANNUAL REQUIREMENT OF FODDER

P.R.A EXERCISE

Table No. 7.9 : Annual requirement of fodder

Sl. No.	Livestock	Total Population	Adult Cattle Unit (in Nos.)	Fodder requirement in M.T per day	Fodder Requirement per Year (M.T)	Fodder obtained from forests
1.	Cattle	8,271	8271	41.355	15094.575	15094.575
2.	Buffalo	282	564	2.820	1029.30	1029.30
3.	Goat	949	474.5	2.3725	865.9625	865.9625
4.	Sheep	412	206	1.03	375.950	375.950
	Total			47.5775	17365.7875	17365.7875

As per P.R.A exercise, 17365.7875M.T of fodder being consumed by the livestock 30 forest fringe villages and it is found that the total livestock population of forest fringe villages are fully dependant on forest for their fodder requirement.

TOTAL FODDER REQUIREMENT OF DIVISION (As per FSI Report 2011)

Table No. 7.10 : Total fodder requirement as per FSI Report, 2011

Sl. No.	Livestock	Total Population	Adult Cattle Unit (in Nos.)	Fodder Requirement per Day (M.T)	Fodder Requirement per Year (M.T)
1.	Cattle	3,04,297	3,04,297	1521.485	555342.025
2.	Buffalo	5186	10,372	51.860	18928.9
3.	Goat	2,05,470	102735	513.6750	187491.375
4.	Sheep	22,173	11086.5	55.4325	20232.68
	Total	37,131	128,493.5	2142.4525	781994.98

As per FSI'2011 Report, 781994.98M.T of fodder is required for livestock population of Keonjhar (Wildlife) Division. Out of which, 309748.21M.T (39.61%) as India State Forest Report'2011) is being met from Forests. That means, the forests is under heavy pressure to meet the fodder demand of the cattle population of Forest fringe village. Fodder cultivation should be encouraged to tenants with cent percent subsidy by Forest and Animal Resources Department to ease out pressure on forest due to heavy grazing.

7.9 VALUATION OF THE PRODUCTS :

For the scientific management of Forest of Odisha, the Orissa Forest Corporation was established in the year 1962. Similarly another parallel corporation named Similipal Forest Development Corporation was established in the year 1979 with the jurisdiction over Mayurbhanj& Upper Indrabati. Up to 12th July 1984 the Orissa Forest Corporation with itsheadquarteratBarbil took over the commercial working of Keonjhar Forest Division. On 12th July 1994,the Similipal Forest Development Corporation took over the commercial activities of Keonjhar Forest Division. So the Orissa Forest Corporation Division, Barbilmerged with the Rourkela Orissa Forest Corporation Division. However on 01.10.1990 the Similipal Forest Development Corporation merged with the Orissa Forest Corporation & Formed the Orissa Forest Development Corporation. As a result of merger of Similipal Forest Development Corporation with Orissa Forest Development Corporation,the name of the Division was changed to Keonjhar Commercial Division. Subsequently the Keonjhar (plantation) Division of erstwhile Orissa Plantation Development Corporation Ltd (OPDC Ltd.) .merged with OFDC Ltd. with effect from 01.06.2007 continued as such as one independent Division under OFDC Ltd. again Keonjhar (KL) Sub-Division under the control of Angul KL Division of OFDC Ltd merged with the Keonjhar Commercial Division on 1st January 2004 .After this merger this Division was renamed as Keonjhar (CKL) Division vide office order no. 1246 dtd 18.10.2003. The Keonjhar Wildlife Division,Anandapur deals with the Jajpur (C) Division of Odisha Forest Development Corporation.

Organisation structure : Organisation structure of Jajpur Road Commercial Division,

SL. No	Name of Sub- Division	Location	Item deal with
1	Jajpur Road (C)	Jajpur Road	Timber & Fire wood
2	Panikoili	Panikoili	Timber & Fire wood

Saw Mill & Depots-

At present there is no saw mill under Jajpur Road (C) Division. There is a timber & fire wood depot for selling of timber and fuel wood at Jajpur Road for the local people.

Working Area-

The OFDC limited mainly deals with the timber & fire wood by taking delivery of seized materials in OR, UD cases, salvage & project work from Keonjhar (Wildlife) Division. They also carry out certain commercial plantations. The gap between the demand and supply of timber is very large & OFDC is unable to meet the huge requirement of the people.

Timber-

The Jajpur Road Commercial Division gets timberfrom the Keonjhar (WL) Division & Cuttack (T) Division. Irrespective of the source of procurement, the grading and shorting is done at timber depots & lots are formed considering the market demand, quality of materials & other relevant factors. The upset price for each lot is proposed by the Divisional Manager in consultation with DFO & submitted to General Manager OFDC Limited. After approval of the upset price by General Manager, marketing can be done either through auction or tender. Ratification of the sale is solely vested with General Manager, OFDC Ltd. After ratification the lot is sold. Total quantity of timbers received from Keonjhar (WL) Division from the year 2007-08 to 2016-17 is 1954.07 cum.

The OFDC Ltd. used to pay royalty which is calculated for the timbers against the delivery in terms of quantity in cum. The details of royalty for different species and specification from 2007-08 to 2016-17 is given in Table No. 7.11.

Table No. 7.11 :Rate of Royalty of OR/UD Case Timber for the period from 2007-08 to 2016-17		
YEAR	Rate of Royalty per Cft.	
	Round Timber	Sawn Timber
2007-08	150	195
2008-09	150	195
2009-10	157	204
2010-11	167	220
2011-12	180	234
2012-13	180	234
2013-14	212	276
2014-15	220	286
2015-16	230	299
2016-17	244	317
2017-18	261	339
2018-19	274	356
2019-20	293	381
2020-21	305	397

Fire Wood- Fire wood is basically collected to meet the local demand. Local sale is done at various fire wood & timber depots. The outturn of fire wood from Keonjhar (WL) Division from 2007-08 to 2017-18 is 3955.01 Ton.

The general trend in selling rates of round timber in different years is given in the Table No. 7.12.

Table No. 7.12 : The general trend in selling rates of round timber (Rs. per cft.)for 2008

Girth Class	Length Class	Special class logs	First class logs		Second class logs		Third class & other logs	
		Teak ,Rose wood (Sisso) ,Champa	Sal, Balisisoo, haldu ,kangada ,Gambhari ,Bandhana	Kuruma ,Bija	Asana, kasi, Dhaura ,Mango ,jamu ,Sidha Mitkinia ,Tentra	Kendu ,chakunda ,Mangium	All others	All soft root
1	2	3	4	5	6	7	8	9
60-75 Cm	Below 2m	205	164	181	139	132	115	98
	2m to 4.99m	274	218	240	186	175	152	131
	5m & above	479	383	421	325	306	268	227
	2m to 4.99m	636	509	559	432	407	356	305
	5m & above	1114	890	979	757	713	623	534
76-90 Cm	Below 2m	246	197	216	167	157	138	118
	2m to 4.99m	328	262	288	222	209	184	157
	5m & above	574	458	504	390	367	320	275
91-120Cm	Below 2m	274	218	240	186	175	152	131
	2mto4.99m	364	290	319	247	233	203	174
	5m & above	636	509	559	432	407	356	305
Above 120 cm	Below 2m	478	382	420	324	305	268	227
	2m-4.99m	636	509	559	432	407	356	305
	5m & above	1114	890	979	757	713	623	534

Table No. 7.13 : Revised General Selling rate of Round Timber '2010 (Rs./cum excluding tax)										
Girth Class	Length Class	Sal, Kasi, Panas	Mehogani, Teak, Sisoo (Rose wood)	Bija, Kendu (with Black portion) Haldu/ Kurum	Sambhari, Champa	Bandhana, Bali sisoo, Accacia, Tentera, Sirisa, Kangada &Mitkinia	Asan, Jamu, Arjuna, L.Mai&Sidha	Dharua, Neem, Kendu(Without Black portion)	Harida, Bahada, Mango, Mahula, Kusuma, Veru, Sunari, Chakunda ,Mangium and other Hard wood	Eucsalyptus, Simili, Rai, Mai, Salai, Chhatian &pother soft wood
1	2	3	4	5	6	7	8	9	10	11
45 to 59 Cm	Below 2M	-	12025	-	-	-	-	-	-	-
	2M to Under 3.74m	-	16020	-	-	-	-	-	-	-
	3.75M to Under 5M	-	22030	-	-	-	-	-	-	-
	5m & above	-	28004	-	-	-	-	-	-	-
60 to 74 Cm	Below 2M	8380	16761	10895	10056	7542	5866	4190	3352	2514
	2M to Under 3.74m	10902	21804	14172	13082	9812	7631	5451	4361	3271
	3.75M to Under 5M	13621	27243	17708	16346	12259	9535	6811	5449	4086
	5m & above	16340	32680	21242	19608	14706	11438	8170	6536	4902
75 to 89cm	Below 2M	10902	21804	14172	13082	9812	7631	5451	4361	3271
	2M to Under 3.74m	13621	27243	17708	16346	12259	9535	6811	5449	4086
	3.75M to Under 5M	16340	32680	21242	19608	14706	11438	8170	6536	4902
	5m & above	18787	37575	24423	22545	16909	13151	9394	7515	5636
90 to 119Cm	Below 2M	14165	28329	18414	16997	12748	9915	7082	5666	4249
	2M to Under 3.74m	17700	35400	23010	21240	15930	12390	8850	7080	5310
	3.75M to Under 5M	21235	42470	27606	25482	19112	14865	10618	8494	6371
	5m & above	24424	48847	31751	29308	21981	17097	12212	9769	7327
120 to 149Cm	Below 2M	18414	36828	23938	22097	16573	12890	9207	7366	5524
	2M to Under 3.74m	23015	46029	29919	27618	20713	16110	11507	9206	6904
	3.75M to Under 5M	27613	55226	35897	33135	24852	19329	13806	11045	8284
	5m & above	31766	63532	41296	38119	28589	22236	15883	12706	9530
150 to 179Cm	Below 2M	23015	46029	29919	27618	20713	16110	11507	9206	6904
	2M to Under 3.74m	26475	52951	34418	31770	23828	18533	13238	10590	7943
	3.75M to Under 5M	29121	58241	37857	34945	26209	20384	14560	11648	8736
	5m & above	32038	64075	41649	38445	28834	22426	16019	12815	9611
180 & above	Below 2M	25314	50628	32908	30377	22783	17720	12657	10126	7594
	2M to	27836	55671	36186	33403	25052	19485	13918	11134	8351

	Under 3.74m									
	3.75M to Under 5M	30629	61257	39817	36754	27566	21440	15314	12251	9189
	5m & above	33694	67388	43802	40433	30324	23586	16847	13478	10108

Table No. 7.14 :Revised General Selling rate of Round Timber 2013 (Rate per cum. Excluding Taxes in Rs.)

Girth Class	Length Class	Sal, Kasi, Panas	Mehogani, Teak, Sisoo (Rose wood)	Bija, Kendu (with Black portion) Haldu/ Kurum	Gam bhari, Champa	Bandhana, Bali sisoo, Accacia, Tentera, Sirisa, Kangada &Mitkinia	Asan, Jamu, Arjuna, L.Mai&Sidha	Dharua, Neem, Kendu(Without Black portion)	Harida, Bahada, Mango, Mahula, Kusuma, Veru, Sunari, Chakunda, Mangium and other Hard wood	Eucalyptus, Simili, Rai, Mai, Salai, Chhatian &pother soft wood
60 to 74 Cm	Below 2M	10736	24156	13957	12883	9662	7515	5968	4294	3221
	2M to Under 3.74m	14303	32182	18594	17164	12873	10012	7152	5721	4291
	3.75M to Under 5M	19670	44258	25571	23604	17703	13769	9835	7868	5901
	5m & above	25003	56257	32504	30004	22503	17502	12502	10001	7501
75 to 89cm	Below 2M	12890	29003	16757	15468	11601	9023	6445	5156	3867
	2M to Under 3.74m	17092	38457	22220	20510	15383	11964	8546	6837	5128
	3.75M to Under 5M	23520	52920	30576	28224	21168	16464	11760	9408	7056
	5m & above	29947	37381	38931	35936	26952	20963	14974	11979	8984
90 to 119Cm	Below 2M	15327	34486	19925	18392	13794	10729	7664	6131	4598
	2M to Under 3.74m	20341	45767	26443	14409	18307	14239	10171	8136	6102
	3.75M to Under 5M	28005	63011	36407	33606	25205	19604	14003	11202	8402
	5m & above	35668	80253	46368	42802	32101	24968	17834	14267	10700
120 to 149Cm	Below 2M	26769	60230	34800	32123	24092	18738	13385	10708	8031
	2M to Under 3.74m	35668	80253	46368	42802	32101	24968	17834	14267	10700
	3.75M to Under 5M	49053	110369	63769	58864	44148	34667	24527	19621	14716
	5m & above	62402	140504	81123	74882	56162	43681	31201	24961	18721
150 to 179Cm	Below 2M	27157	61103	35304	32588	24441	19010	13579	10863	8147
	2M to Under 3.74m	36163	81367	47012	43396	32547	25314	18082	14465	10849
	3.75M to Under 5M	49759	111958	64687	59711	44783	34831	24880	19904	14928
	5m & above	63284	142389	82269	75941	56956	44299	31642	25314	18985
180 & above	Below 2M	28535	64204	37096	34242	25682	19975	14268	11414	8561
	2M to under 3.74m	37999	85498	49399	45599	34199	26599	19000	15200	11400
	3.75M to Under 5M	52231	117520	67900	62677	47008	36562	26116	20892	15669
	5m & above	66463	149542	86402	79756	59817	46524	33232	26585	19939

Table No. 7.15 :Revised General Selling rate of Round Timber 2017 (Rate per cum. Excluding Taxes in Rs.)

Girth Class	Length Class	Sal, Kasi, Panas	Mehogani, Teak, Sisoo (Rose wood)	Bija, Kendu (with Black portion) Haldu/ Kurum	Gambhari , Champa	Bandhana, Bali sisoo, Accacia, Tentera, Sirisa, Kangada& Mitkinia	Asan, Jamu, Arjuna, L.Mai&Sidha	Dharua, Neem, Kendu (Without Black portion)	Harida, Bahada, Mango, Mahula, Kusuma, Veru, Sunari, Chakunda, Mangium and other Hard wood	Eucsalyptus, Simili, Rai, Mai, Salai, Chhatian &pother soft wood
1	2	3	4	5	6	7	8	9	10	11
45 to 59 Cm	Below 2M	-	12025	-	-	-	-	-	-	-
	2M to Under 3.74m	-	16020	-	-	-	-	-	-	-
	3.75M to Under 5M	-	22030	-	-	-	-	-	-	-
	5m & above	-	28004	-	-	-	-	-	-	-
60 to 74 Cm	Below 2M	8380	16761	10895	10056	7542	5866	4190	3352	2514
	2M to Under 3.74m	10902	21804	14172	13082	9812	7631	5451	4361	3271
	3.75M to Under 5M	13621	27243	17708	16346	12259	9535	6811	5449	4086
	5m & above	16340	32680	21242	19608	14706	11438	8170	6536	4902
75 to 89cm	Below 2M	10902	21804	14172	13082	9812	7631	5451	4361	3271
	2M to Under 3.74m	13621	27243	17708	16346	12259	9535	6811	5449	4086
	3.75M to Under 5M	16340	32680	21242	19608	14706	11438	8170	6536	4902
	5m & above	18787	37575	24423	22545	16909	13151	9394	7515	5636
90 to 119Cm	Below 2M	14165	28329	18414	16997	12748	9915	7082	5666	4249
	2M to Under 3.74m	17700	35400	23010	21240	15930	12390	8850	7080	5310
	3.75M to Under 5M	21235	42470	27606	25482	19112	14865	10618	8494	6371
	5m & above	24424	48847	31751	29308	21981	17097	12212	9769	7327
120 to 149Cm	Below 2M	18414	36828	23938	22097	16573	12890	9207	7366	5524
	2M to Under 3.74m	23015	46029	29919	27618	20713	16110	11507	9206	6904
	3.75M to Under 5M	27613	55226	35897	33135	24852	19329	13806	11045	8284
	5m & above	31766	63532	41296	38119	28589	22236	15883	12706	9530
150 to 179Cm	Below 2M	23015	46029	29919	27618	20713	16110	11507	9206	6904
	2M to Under 3.74m	26475	52951	34418	31770	23828	18533	13238	10590	7943
	3.75M to Under 5M	29121	58241	37857	34945	26209	20384	14560	11648	8736
	5m & above	32038	64075	41649	38445	28834	22426	16019	12815	9611
180 & above	Below 2M	25314	50628	32908	30377	22783	17720	12657	10126	7594
	2M to Under 3.74m	27836	55671	36186	33403	25052	19485	13918	11134	8351
	3.75M to Under 5M	30629	61257	39817	36754	27566	21440	15314	12251	9189
	5m & above	33694	67388	43802	40433	30324	23586	16847	13478	10108
45 to 59 Cm	Below 2M	-	12025	-	-	-	-	-	-	-
	2M to Under 3.74m	-	16020	-	-	-	-	-	-	-
	3.75M to Under 5M	-	22030	-	-	-	-	-	-	-
	5m & above	-	28004	-	-	-	-	-	-	-
60 to 74 Cm	Below 2M	11972	23944	15564	14366	10775	8380	5986	4789	3592
	2M to Under 3.74m	15574	31148	20246	18689	14017	10902	7787	6230	4672

	3.75M to Under 5M	19459	38918	25297	23351	17513	13621	9730	7784	5838
	5m & above	23343	46636	30346	28012	21009	16340	11672	9337	7003
75 to 89cm	Below 2M	15574	31148	20246	18689	14017	10902	7787	6230	4672
	2M to Under 3.74m	19459	38918	25297	23351	17513	13621	9730	7784	5838
	3.75M to Under 5M	23343	46686	30346	28012	21009	16340	11672	9337	7003
	5m & above	26839	53678	34891	32207	24155	18787	13420	10736	8052
90 to 119Cm	Below 2M	20235	40470	26306	24282	18212	14165	10118	8094	6071
	2M to Under 3.74m	25286	50572	32872	30343	22757	17700	12643	10114	7586
	3.75M to Under 5M	30336	60672	39437	36403	27302	21235	15168	12134	9101
	5m & above	34891	67982	45358	41869	31402	24424	17446	13956	10467
120 to 149Cm	Below 2M	26306	52612	34198	31567	23675	18414	13153	10522	7892
	2M to Under 3.74m	32878	65756	42741	39454	29590	23015	16439	13151	9863
	3.75M to Under 5M	39447	78894	51281	47336	35502	27613	19724	15779	11834
	5m & above	45380	90760	58994	54456	40842	31766	22690	18152	13624
150 to 179Cm	Below 2M	32878	65756	42741	39454	29590	23015	16439	13151	9863
	2M to Under 3.74m	37822	75644	49169	45386	34040	26475	18911	15129	11347
	3.75M to Under 5M	41601	83202	54081	49921	37441	29121	20801	16640	12480
	5m & above	45768	91536	59498	54922	41191	32038	22884	18307	13730
180 & above	Below 2M	36163	72326	47012	43396	32547	25314	18082	14465	10849
	2M to Under 3.74m	39765	79530	51695	47718	35789	27836	19883	15906	11930
	3.75M to Under 5M	43755	87510	56882	52506	39380	30629	21878	17502	13127
	5m & above	48134	96268	62574	57761	43321	33694	24067	19254	14440

Table No. 7.16 :Revised General Selling Rate of Sawn Timber, 2009 (Rate per cum. excluding Taxes in Rs.)

Girth Class	Length Class 2008	Special class logs	First class logs		Second class logs		Third class & other logs	
		Teak ,Rose wood (Sisso) ,Champa	Sal ,Balisisoo ,haldu ,kangada ,Gambhari ,Bandhana	Kuruma ,Bija	Asana ,kasiDdhaura ,Mango,jamu ,Sidha ,Mitkinia ,Tentra	Kendu ,chakunda ,Mangium	All others	All soft root
1	2	3	4	5	6	7	8	9
In cm	In meter	In Rs. Per cft	In Rs. Per cft	In Rs. Per cft	In Rs. Per cft	In Rs. Per cft	In Rs. Per cft	In Rs. Per cft
60-75 Cm	Below 2m	205	164	181	139	132	115	98
	2m to 4.99m	274	218	240	186	175	152	131
	5m & above	479	383	421	325	306	268	227
76-90 Cm	Below 2m	246	197	216	167	157	138	118
	2m to 4.99m	328	262	288	222	209	184	157
	5m & above	574	458	504	390	367	320	275
91-120Cm	Below 2m	274	218	240	186	175	152	131
	2m to 4.99m	364	290	319	247	233	203	174
	5m & above	636	509	559	432	407	356	305
Above 120 cm	Below 2m	478	382	420	324	305	268	227
	2m to 4.99m	636	509	559	432	407	356	305
	5m & above	1114	890	979	757	713	623	534

Table No. 7.17 A :Revised General Selling Rate of Sawn Timber, 2009
(Rate per cum. excluding Taxes in Rs.)

Rate	Sawn Timber Specification 2009		Timber species grouping for sawn timber(in Rs. Per cubic meter)		
	Specification	Length Class	Teak, Rose wood	Sal, Bija,Kangada, Bandhana,gambhari,Kasi,Kuruma, Mitikinia,Tentera	Others from Orisha(except sandlewood,Redsander,Khair
1	2	3	4	5	6
Reapers	5cm x 1.3cm 5cm x2.5cm 2.5cm x 2.5cm 2.5cm x 3.8cm 2.5cm x 1.3cm	Below 1M	4700	4400	2100
		1M to u/1.5M	5800	5500	2700
		1.5M to u/2.5M	8250	7750	3750
		2.5 tou/5M	8360	8000	3750
Battens	5cm x 5cm 5cm x 3.75cm 7.5cm x 2.5cm 7.5cm x 3.5cm	Below 1M	5900	5500	2700
		1M to u/1.5M	11500	10000	5000
		1.5M to u/2.5M	12750	11000	6000
		2.5 tou/5M	14000	12500	6000
Scantling	8cm x5cm 6cm x 5cm 6cm x6cm	Below 1M	9250	8250	4250
		1M to u/1.5M	15000	13000	7000
		1.5M to u/2.5M	18000	15500	8250
		2.5 tou/5M	21000	17750	8250
Scantling	10cm x 5cm 10cm x 6xm 10cm x 8cm 10cm x 10cm	Below 1M	10500	9250	4750
		1M to u/1.5M	20500	17000	9500
		1.5M to u/2.5M	23000	19500	10500
		2.5 tou/5M	26000	21500	11000
Scantling & Beam upto 200sqcm.	12cm x 8cm 13cm x 6cm 13cm x 5cm	Below 1M	12250	10750	5500
		1M to u/1.5M	22000	18500	10000
		1.5M to u/2.5M	25000	21000	11000
		2.5 tou/5M	28000	23500	11000
Beam	Upto 200 square cm	Below 1M	14000	11500	8000
		1M to u/1.5M	23000	19000	11000
		1.5M to u/2.5M	26000	22000	12500
		2.5 tou/5M	30000	24500	14000
Beam	200 to u/330sqcm.	Below 1M	16500	15000	9000
		1M to u/1.5M	25000	22500	13500
		1.5M to u/2.5M	28500	24000	15000
		2.5 tou/5M	35000	28000	17000
Beam	330sqcm & up	Below 1M	18750	17000	10500
		1M to u/1.5M	28000	24000	14000
		1.5M to u/2.5M	32000	27500	16500
		2.5 tou/5M	37500	30000	17500

Table No. 7.17 B :Revised General Selling Rate of Sawn Timber, 2013

(Rate per cum. excluding Taxes in Rs.)

Rate	Specification	Length Class 2013	Sal, Kasi, Panasa	Mehogani, Teak, Sisoo (Rose wood)	Bija, Kendu (with Black portion) Haldu/ Kurum	Gambhari, Champa	Bandhana, Balissoo, Accacia, Tentera, Sirisa, Kangada &Mitkinia	Asan, Jamu, Arjuna, L.Mai&Sidha	Dharua, Neem, Kendu(Without Black portion)	Harida, Bahada, Mango, Mahula, Kusuma, Veru, Sunari, Chakunda, Mangium and other Hard wood	Eucalyptus, Simili, Rai, Mai, Salai, Chhatian &pother soft wood
1	2	3	4	5	6	7	8	9	10	11	12
Reapers	5cm x 1.3cm 5cm x2.5cm 2.5cm x 2.5cm 2.5cm x 3.8cm 2.5cm x 1.3cm	Below 1M	7115	16009	9250	8538	6404	4981	3558	2846	2135
		1M to u/1.5M	8894	20012	11562	10673	8005	6226	4447	3558	2668
		1.5M to u/2.5M	12533	28199	16293	15040	11280	8773	6267	5013	3760
		2.5 tou/5M	12936	29106	16817	15523	11642	9055	6468	5174	3881
		5M & above	13350	30038	17255	16020	12015	9345	6675	5340	4005
Battens	5cm x 5cm 5cm x 3.75cm 7.5cm x 2.5cm 7.5cm x 3.5cm	Below 1M	8894	20012	11562	10673	8005	6226	4447	3558	2668
		1M to u/1.5M	16170	36383	21021	19404	14553	11319	8085	6468	4851
		1.5M to u/2.5M	17787	40021	23123	21344	16008	12451	8894	7115	5336
		2.5 tou/5M	20213	45479	26277	24256	18192	14149	10107	8085	6064
		5M & above	22970	51683	29861	27564	20673	16079	11485	9188	6891
Scantling	8cm x8cm 6cm x 5cm 6cm x6cm	Below 1M	14860	33435	19318	17832	13374	10402	7430	5944	4458
		1M to u/1.5M	23414	52682	30438	28097	21073	16390	11707	9366	7024
		1.5M to u/2.5M	27918	62816	36293	33502	25126	19543	13959	11167	8375
		2.5 tou/5M	31970	71933	41561	38364	28773	22379	15985	12788	9591
		5M & above	36605	82361	47587	43926	32945	25624	18303	14642	10982
Scantling	10cm x 5cm 10cm x 6xm 10cm x 8cm 10cm x 10cm	Below 1M	16729	37640	21748	20075	15056	11710	8365	6692	5019
		1M to u/1.5M	30744	69174	39967	36893	27670	21521	15372	12298	9223
		1.5M to u/2.5M	35268	79353	45848	42322	31741	24688	17634	14107	10580
		2.5 tou/5M	38884	87489	50549	46661	34996	27219	19442	15554	11665
		5M & above	43585	980066	56661	52302	39227	30510	21793	17434	13076
Scantling	13cm x 8cm 13cm x 6cm 13cm x 5cm	Below 1M	19457	43778	25294	23348	17511	13620	9729	7783	5837
		1M to u/1.5M	33484	75339	43529	40181	30136	23439	16742	13394	10045
		1.5M to u/2.5M	38009	85520	49412	45611	34208	26606	19005	15204	11403
		2.5 tou/5M	42533	95699	55293	51040	38280	29773	21267	17018	12760
		5M & above	47005	105761	61107	56406	42305	32904	23503	18802	14102
Beam	Upto 200 Sq cm	Below 1M	19925	44831	25903	23910	17933	13948	9963	7970	5978
		1M to u/1.5M	35516	79911	46171	42619	31964	24861	17758	14206	10655
		1.5M to u/2.5M	38115	85759	49550	45738	34304	26681	19058	15246	11435

		2.5 tou/5M	44144	99324	57387	52973	39730	30901	22072	17658	13243
		5M & above	47675	107269	61978	57210	42908	33373	23838	19070	14303
Beam	200 sqcm to u/330 sqcm.	Below 1M	25988	58473	33784	31186	23389	18192	12994	10395	7796
		1M to u/1.5M	38982	87710	50677	46778	35084	27287	19491	15593	11695
		1.5M to u/2.5M	41580	93555	54054	49896	37422	29106	20790	16632	12474
		2.5 tou/5M	48510	109148	63063	58212	43659	33957	24255	19404	14553
		5M & above	50251	113065	65326	60301	45226	35176	25126	20100	15075
Beam	330 sqcm. &above	Below 1M	30177	67898	39230	36212	27159	21124	15089	12071	9053
		1M to u/1.5M	42603	95857	55384	51124	38343	29822	21302	17041	12781
		1.5M to u/2.5M	48818	109841	63463	58582	43936	34173	24409	19527	14645
		2.5 tou/5M	53254	119822	69230	63905	47929	37278	26627	21302	15976
		5M & above	59070	132908	76791	70884	53163	41349	29535	23628	17721

Table No. 7.18 :Revised General Selling Rate of Sawn Timber, 2017 (Rate per cum. excluding Taxes in Rs.)

Rate	Specification 2017	Length Class	Sal, Kasi, Panasa	Mehogani, Teak, Sisoo (Rose wood)	Bija, Kendu (with Black portion) Haldu/ Kurum	Gambhari, Champa	Bandhana, Balissoo, Accacia, Tentera, Sirisa, Kangada&Mitkinia	Asan, Jamu, Arjuna, L.Mai&Sidha	Dharua, Neem, Kendu(Without Black portion)	Harida, Bahada, Mango, Mahula, Kusuma, Veru, Sunari, Chakunda, MAngium and other Hard wood	Eucsalyptus, Simili, Rai, Mai, Salai, Chhatian&pother soft wood
1	2	3	4	5	6	7	8	9	10	11	12
Reapers	5cm x 1.3cm 5cm x2.5cm 2.5cm x 2.5cm 2.5cm x 3.8cm 2.5cm x 1.3cm	Below 1M	7115	14230	9250	8538	6404	4981	3558	2846	2135
		1M to u/1.5M	8894	17788	11562	10673	8005	6226	4447	3558	2668
		1.5M to u/2.5M	12533	25066	16293	15040	11280	8773	6267	5013	3760
		2.5 tou/5M	12936	25872	16817	15523	11642	9055	6468	5174	3881
		5M & above	13350	26700	17355	16020	12015	9345	6675	5340	4005
Battens	5cm x 5cm 5cm x 3.75cm 7.5cm x 2.5cm 7.5cm x 3.5cm	Below 1M	8894	17788	11562	10673	8005	6226	4447	3558	2668
		1M to u/1.5M	16174	32340	21021	19404	14553	11319	8085	6468	4851
		1.5M to u/2.5M	17787	35574	23123	21344	16008	12451	8894	7115	5336
		2.5 tou/5M	20213	40426	26277	24256	18192	14129	10107	8085	6064
		5M & above	22970	45940	29861	27564	20673	16079	11485	9188	6891
Scantling	8cm x8cm 6cm x 5cm 6cm x6cm	Below 1M	16346	32692	21250	19615	14711	11442	8173	6538	4904
		1M to u/1.5M	25755	51511	33482	30906	23180	18029	12878	10302	7727
		1.5M to u/2.5M	30710	61420	39923	36852	27639	21497	15355	12284	9213
		2.5 tou/5M	35167	70334	45717	42200	31650	24617	17584	10467	10550
		5M & above	40266	80531	52345	48319	36239	28186	20133	16106	12080
Scant ling	10cm x 5cm 10cm x	Below 1M	18736	37473	24357	22484	16863	13116	9368	7495	5621
		1M to u/1.5M	34433	68867	44763	41320	30990	24103	17217	13773	10330

	6xm 10cm x 8cm 10cm x 10cm	1.5M to u/2.5M	39500	79000	51350	47400	35550	27650	19750	15800	11850
		2.5 tou/5M	43550	87100	56615	52260	39195	30485	21775	17420	13065
		5M & above	48815	97630	63460	58578	43934	34171	24408	19526	14645
Scantling & Beam upto 200sqcm.	13cm x 8cm 13cm x 6cm 13cm x 5cm	Below 1M	21792	43584	28329	26150	19613	15254	10896	8717	6538
		1M to u/1.5M	37502	75004	48753	45002	33752	26251	18751	15001	11251
		1.5M to u/2.5M	42570	85140	55341	51084	38313	29799	21285	17028	12771
		2.5 tou/5M	47637	95274	61928	57164	42873	33346	23818	19055	14291
		5M & above	52646	105291	68439	63175	47381	36852	26323	21058	15794
Beam	200 to u/330sqcm.	Below 1M	28067	56134	36487	33680	25260	19647	14034	11227	8420
		1M to u/1.5M	42101	84201	54731	50521	37891	29470	21050	16840	12630
		1.5M to u/2.5M	44906	89813	58378	53888	40416	31434	22453	17963	13472
		2.5 tou/5M	52391	104782	68108	62869	47152	36674	26195	20956	15717
		5M & above	54271	108542	70552	65125	48844	37990	27136	21708	16181
Beam	330sqcm & above	Below 1M	33195	66389	43153	39834	29875	23236	16597	13278	9958
		1M to u/1.5M	46863	93727	60922	56236	42177	32804	23432	18745	14059
		1.5M to u/2.5M	53700	107400	69810	60004	48330	37590	26850	21480	16110
		2.5 tou/5M	58579	117159	76153	70295	52721	41006	29290	23432	17574
		5M & above	64977	129954	84470	77972	58479	45484	32489	23991	19493

The general trend in selling rates of Poles in different years is given below.

Table No. 7.19: GENERAL SELLING RATE OF POLES 2008 (Rate per pcs. in Rs. excluding taxes)

Butt end Girth Class	Length Class	Sal Poles	Teak poles	Other hard wood poles
In cm	In meter	In Rs. Per pieces	In Rs. Per pieces	In Rs. Per pieces
1	2	3	4	5
Below 20 cm (under sized pole)	Upto 2.75m	25	35	20
	2.75-3.99m	45	50	40
	4m & above	70	80	55
20-30 cm	Upto 2.75m	60	70	36
	2.75-3.99m	80	85	48
	4m & above	150	160	96
31-45 cm	Upto 2.75m	90	105	72
	2.75-3.99m	140	150	96
	4m & above	200	210	125
46-60 cm	Upto 2.75m	150	160	100
	2.75-3.99m	200	225	130
	4m & above	260	280	175

Table No. 7.20:GENERAL SELLING RATE OF POLES 2009 (Rate per pcs. in Rs. excluding taxes)

Butt end Girth Class	Length Class	Sal Poles	Teak poles	Other hard wood poles
In cm	In meter	In Rs. Per pieces	In Rs. Per pieces	In Rs. Per pieces
1	2	3	4	5
Below 20 cm (under sized pole)	Upto 2.75m	25	35	20
	2.75-3.99m	45	50	40
	4m & above	70	80	55
20-30 cm	Upto 2.75m	60	70	36
	2.75-3.99m	80	85	48
	4m & above	150	160	96
31-45 cm	Upto 2.75m	90	105	72
	2.75-3.99m	140	150	96
	4m & above	200	210	125
46-60 cm	Upto 2.75m	150	160	100
	2.75-3.99m	200	225	130
	4m & above	260	280	175

Table No. 7.21:GENERAL SELLING RATE OF POLES IN 2013 (Rate per pcs. in Rs. excluding taxes)				
Girth at butt end (Over bark)	Length Class	General Rate of Sal poles proposed by the committee (In Rs./ Pieces)	Teak &Sisoo	Other Species
1	2	3	4	5
Upto 30cm	Below 2.75 mtr.	37	37	26
30cm to U/40cm		88	88	62
40cm to U/45cm		131	131	92
45cm to U/50cm		218	0	153
50cm to U/60cm		240	0	168
Upto 30cm	2.75 mtr to U/4 mtr.	66	66	46
30cm to U/40cm		116	116	81
40cm to U/45cm		203	203	142
45cm to U/50cm		290	0	203
50cm to U/60cm		320	0	224
Upto 30cm	4 mtr. &above	102	102	71
30cm to U/40cm		218	218	153
40cm to U/45cm		290	290	203
45cm to U/50cm		378	0	265
50cm to U/60cm		400	0	280

Table No. 7.22:GENERAL SELLING RATE OF POLES 2017 (Rate per pcs. in Rs. excluding taxes)				
Girth and but end(over bark)	Length class	General rate of Sal poles proposed by the committee(In Rs. Per piece)	Teak & Sissoo	Others species
1	2	3	4	5
Upto 30cm	Below 2.75 mtr	80	80	56
30cm to U/40		100	100	70
40cm to U/45		144	144	101
45cm to U/50		240	To be sold as Timber	1678
50cm to U/60		264		185
Upto 30cm	2.75 mtr to U/4 mtr	107	107	75
30cm to U/40		186	186	130
40cm to U/45		223	223	156
45cm to U/50		319	To be sold as Timber	223
50cm to U/60		352		246
Upto 30cm	4 mtr & above	200	200	140
30cm to U/40		244	244	171
40cm to U/45		319	319	223
45cm to U/50		416	00	291
50cm to U/60		440	00	308

CHAPTER – VIII

MAINTENANCE AND ENHANCEMENT OF SOCIAL, ECONOMIC, CULTURAL AND SPIRITUAL BENEFITS

8.1. NO. OF JFM COMMITTEES AND AREAS PROTECTED BY THEM :

The need forenvironmental conservation and protection of forest and wildlife has been enshrine in our constitution. The National Forest Policy 1988 envisaged co-opeation of people in conservation and development of forest. In keeping with this policy, Govt. of Odisha adopted the Joint Forest Management (JFM) for community participation in regeneration, protection of forest and wildlife. The State of Odisha has been a pioneer amongst the states in involving the village community in protection and management of the forests. Odisha brought out the Odisha Village Forest Rules in 1985 and the first step for involving the people in forest protection through Government Resolution No. 10F (Pron.)-47/88/17240/FFAH dtd. 1.8.1988 which is enclosed as **Appendix–XV.** In this Resolution, the villagers are assigned a specific role in the protection of forest adjoining their villages and in return granted certain concessions in the matter of meeting their bonafide requirement of firewood and small timber. This Resolution was amended vide Resolution No. 10F(Pron.)-47/88/23638/FFAH dtd 13.10.88, which prescsribed the village level Forest Protection Committee (VFC) should be constituted in consultation with the local villagers by convening a meeting of the concerned villagers. This Resolution was further amended vide Resolution No. 10F (Pron.)-4/90/29825/FFAH dtd. 11.12.1990 in which Protected Forests were also included to JFM platform.

To make the involvement of villagers more effective, the Government of Odisha, issued Resolution No.10F (Pron.)20/93-16700/F&E dtd. 3.7.1993, which dealt in an exhaustive manner in the involvement of the local communities for protection of adjoining forests, formation of VanaSurakshyaSamiti (VSS) and Executive Committee, their duty and responsibility, preparation of JFM Plan, usufructuary benefits for the VSS and provision of MoU etc. in a standard approved format of MoU. As per thisresolution, VSS are being constituted and forests are being allotted to them for ptoection and management.

The Resolution of 1993 was subsequently modified in the year 2008, 2011 and finally in 2015. The said Resolution is enclosed in**Appendix–XVI.** J.F.M is the symbiotic relation between Forest Department and VSS member. In Keonjhar (WL) Division, 121 nos. ofV.S.S have been constituted and 9306ha.offorest area are assigned to them for protection in this division.

8.2 STATUS OF EMPOWEREMENT OF JFMCs :

Joint Forest Management (JFM) has improved the cohesion and unity in the villages. Everybody is treated equally in sharing of benefits of forest produces such as fuel wood, fodder, NTFP etc. All households have equal opportunity to participate for conservation of forests. Priority is given to poor & needy group and they are entitled to take poles, bamboos for constructing and repairing their houses. As per JFM Resolution'2011, at least 50% of the members of Executive Commitee shall be a woman and also either the Chair Person or Vice Chair Person shall be woman. The member of SC and ST in the Executive Body shall be in proportion to their membership in VSS. There is also provision of representation from the group of community who do not have any livelihood support other than depending on forest. Hence the JFM 2011 stresses upon women empowerment with due regard to SC,STandother Minority Communities. JFM is not only being a tool for forest regeneration but also means of employement generation and social empowerment for the forest dwellers.

After protection of forest, density of forest has beengone up. They are not allowing their cattle to the assigned forest area. They are observing '*thengapali'* for watch and ward to the assigned area. Every household is equally responsible for safeguarding the forest. They are protecting their assigned area to prevent forest fire. Threat level in JFM areas is assessd below.

Threats		Level of Threats.
Cutting		Low
Grazing	Low	
Fire		Low
Soil Erosion		Very Low
Encroachment		Nil.
Hunting	Nil.	

8.2.1 AmaJangalaYojana (AJY) is a pilot project of Govt. of Odisha aimed at restroatiaon of degraded forest and promotion of sustainable management of forest by strengthening participation of people in forest management through capacity building and improvement of livelihood of forest dependent communities through promotion of income generation activities. The main aim is to reduce pressure on forest by strengtheining the VSS already exist in fringe villages through income generation activities in turn protecting the forest by them.

Total 89numbers of VSS have been included under AmaJangalaYojana scheme within this Working Plan area. The list of V.S.S. included under AJY Scheme in Keonjhar (W.L) Division is given in **Appendix-XVII**.

The scheme has been implemented by the State Forest Department through Odisha Forestry Sector Development Society. The scheme has been implemented in VSS of Keonjhar (W.L) Division over a period of six years commening from 2016-17 to 2021-22. .In all 89 V.S.S of Keonjhar (Wildlife) division preparatory works like survey, demarcation of assigned area, prepraration of micro plan, technical training by partner NGO have been completed. Total 80 Ha of block plantation have been taken up in the year 2017-18.

The role of partner NGO is very crucial in AmaJangalaYojana Scheme. To make the community sustainable, capacity building of the VSS members is essential. Training of the VSS level on regeneration, protection, institution building, micro planning, fund management, micro enterprise development are being carried out by the partner NGO. It acts as a community mobilizer by planning and carrying out different activities like identification of different entry point activities, selection of SHGs and assisting them in preparation of plans for micro enterprise development, prepraration of income generation programmes, exploring different livelihood programme as well as their market access, inconsultation with other department & convergence of different schemes.

8.2.2 Performance Assessment of all the VSS under AJY has been carried out taking into consideration of 20 numbers of criteria in Range level and 4 numbers of criteria at Division level. According to their performance, the VSS are ranked in three categoriesi.e. very good, good and average. The list of VSS under different category is given in Table No. 8.1.

Table No. 8.1 : VSS Rank.

Sl. No.	Very Good	Good	Average
1	Jugalkishorepur	Ratuan	Haridabahali
2	Budhikud	Dihasahi	Dumuridiha
3	Mandapada	Kalabila	Khadikasulbahali
4	Khajuribani	Sailong	Bangurisuni
5	Badudighara	Sunduria	Ghutung
6	Dhabani	Arjunbania	Pathargoda
7	Haribeda	Marshapal	Basundhara
8	Kantala	Salkudahi	Hanuman Jew
9	Kusapada	Sandhyagotha	Samukanendi
10	Gumundu	Gohira	Jhinkipita
11	Gaaragadabahal 1	Putujhari	Kendudiha

12	Rangapata	Dahimalia	Madhusahi
13	Sagatpata	Bhalughar	Mausamjhari
14	Sangam VSS	Panasdiha	Panchugochia
15		Baranga	Talanatisahi
16		Nandabara	
17		Kainsiari	
18		Maa Mangala	
19		Nuniapatna	
20		Patharapada	
21		Baliparvat	
22		Bareigoda 1	
23		Bareigoda 1	
24		Bilesahi	
25		Budhipada	
26		Budhipada(Santal)	
27		Gopinathpur	
28		Kanjiapal	
29		Kuntala 1	
30		Kuntala 1	
31		Kusumjodi	
32		Laxmi Narayan	
33		Mahulpanga	
34		Mundasahi	
35		Nardangi	
36		Nipania	
37		Pancham	
38		Pateswari	
39		Putujhari	
40		Sanajimei	
41		Sanasiadimal	
42		Talapada	
43		Tentulipal	
44		Tukripada	
45		Basumati Thakur	
46		Bhagamuda	
47		Billa	
48		Charchika	
49		Gaaragadabahal 2	
50		Haticutcha	
51		Kaliahudi	
52		Bhikaramda	
53		Mahabira	
54		Maniabindha	
55		Manigiri	
56		Mudinucha	
57		Mundulisahi	
58		Palabani	
59		Sinduragouri	
60		Tasaragada	

8.3 LABOUR WELFARE :

8.3.1 All the works in forest department right from silvicultural works to raising of plantations to construction works are manual labour based. Their minimum wage rate and timely payment are being ensured by the Department following the state government guidelines. As per direction of State Govt. the working hour during summer season is reduced from 8 hours to 6 hours.

Some contractual staffare engaged seasonally or round the year as the members of the different squads. They are supplied with equipments and ammenties for smooth discharge of their duties according to the assigned works, which are given below.

a. Para staff :

Dress, cap, shoes are being supplied for their use.

b. Fire squad :

Dress, water bottles and shoes are being supplied to the fire fighting squad.

c. Protection Squad :

Shoes, uniform and camp materials are being suuplied to them for protection.

8.4 USE OF INDIGENOUS KNOWLEDGE :

8.4.1 Being one of the oldest department of the country forestry works have wide indigenly expertise. Traditional knowledge is transmitted orally from generation to generation. It is collectively owned and takes the form of folklore, rituals, legends stories, and songs. It is based on experience & observations of nature deeply rooted with spiritual & social values.

8.4.2 I.T.K (Indigenous Traditional Knowledge) is a holistic knowledge. It includes knowledge on agriculture, forestry, agroforsstry, soil conservation, human health care, animal care, economic strategies. It is having diversified production system without overexploitation of a single resource. It symbolises the respect towards nature. It also inspires social responsibilities.

8.4.3 Forest occupy the central position and forest dwellers/ forets fringe villagers culture, food, employment and income revolves around two issues, its sustainable use and preservation at macro and micro level. They see the ecology and economy of production and adapt their own technology in exploiting the resources.
They depend on forest for thir livelihood and health care till today. Some of the plants used for food are listed in Table No. 8.2.

Table No. 8.2 : Wild Edible Fruits, Berries, Leaves and Nuts

S.I No.	Local Name	Botanical Name
1	Bela	*Aeglemarmelos*
2	Ankula	*Alangiumsalvifolium*
3	Nuniari	*Antidesmaacidum*
4	Marmuri	*Antidesmadiandrum*
5	Jeuta	*Artocarpuslakoocha*
6	Narguni	*Atalantiamonophylla*
7	Kasi	*Brideliaretusa*
8	Latakasi	*Brideliastipularis*
9	Chara koli	*Buchananialanzan*
10	Gouri beta	*Calamuslatifolius*
11	Niphura	*Capparisbrevispina*
12	Khirakoli	*Carissa spinarum*
13	Phatuakoli	*Catuneragamspinosa*
14	Kainchikakudi	*Cocciniagrandis*

15	Rai	*Dilleniapentagyna*
16	Gaurakoli	*Diospyros ferrea*
17	Mankadakendu	*Diospyrosmalabarica*
18	Kendu	*Diospyros melanoxylon*
19	Halda	*Diospyros Montana*
20	Kalicha	*Diospyros sylvatica*
21	Durakoli	*Erycibepaniculata*
22	Sagarabatua	*Eugenia rothii*
23	Dimiri	*Ficus hispida*
24	Baincha koli	*Flacourtiaindica*
25	Chai garuda	*Gardenia gummifera*
26	Chauladhua koli	*Glycosmis pentaphylla*
27	Pharsakoli	*Grewia asiatica*
28	Mahi	*Lanneacoromandelica*
29	Panikusuma	*Lepisanthestetraphylla*
30	Kaitha	*Limoniaacidissima*
31	Baghaairi	*Litseaglutinosa*
32	Mahula	*Madhuca indica*
33	Khirani	*Manilkarahexandra*
34	Nigasa	*Memecylonumbellalum*
35	Baula	*Mimusopselengi*
36	Benta	*Niringicrenulata*
37	Bhada bhadalia	*Olaxpsittacorum*
38	Khajuri	*Phoenix sylvestris*
39	Narakoli	*Phyllanthusacidus*
40	Amla	*Phyllanthusemblica*
41	Akasakaiaa	*Pithecellobium dulce*
42	Patamasu	*Polyalthiacerasoides*
43	Guankoli	*Polyalthiasuberosa*
44	Gandhana	*Premna latifolia*
45	Machakoli	*Rubusellipticus*
46	Batra	*Salacia chinensis*
47	Kusuma	*Schleicheraoleosa*
48	Bhalia	*Semecarpusannacardium*
49	BhegiBaigan	*Solanumtorvum*
50	Ambada	*Spondiaspinnata*
51	Sahada	*Streblusasper*
52	Jhumpuri	*Streblustaxoides*
53	Khakada	*Casearia tomentosa*
54	Panijamu	*Syzyziumcerasoides*
55	Jamu	*Syzyumcumini*
56	Tundapoda	*Toddaliaasiatica*
57	Lakhankoli	*Uvariahamillonii*
58	Chun koli	*Ziziphusfuniculosa*
59	Kanteikoli	*Ziziphusoenoplia*
60	Sirkakoli/ Din koli	*Ziziphus rugosa*

8.4.4 Tribals can effectively use their habitats and derive maximum benefits out of these. Multiple usesof habitats are listed in Table No. 8.3.

Table No. 8.3 : Multiple uses of habitats

Method of Production	Sub-habitat	Product	Usage
Agriculture	Foot hills, valleys, wide slopes	Paddy, Millet, Pulses, Oil Seeds, Paddy Straw, water	Food, Fodder/Fuel Drinking/Irrigation
Horticulture	Middle hills, steep slopes	Orange, Banana, Coconut, Cashew, Mango, Jackfruit, Pineapple, Banana, Coconut Stem, Timber	Detergent, Fencing, Furniture and Fuelwood.
Rearing livestock	Grazing in the foest, stall-feeding	Dung, Milk, Draught force Hide	Food ploughing, Cart pulling.Leather
Gathering	Grassland	Themdasps. Grass	Thatching
	Scrubby jungle	Leaves (dry/fresh), Twigs, Branches, Timbers	Manure, Mulch, Fuel, Construction
	Hillocks with forests	Leaf (dry/fresh), Twigs, Branches, Grasses, Food Items, Timber Fuelwood	Manure, Mulch, Grazing, Construction, Cooking
	High quality Forests.	Honey, Wild Fruits, Flowers and Herbs.	Food, Medicine and Spices.

8.5 EXTENT OF CULTURAL/SACRED GROVES :

Sacred Groves are tract of forest rich in biodiversity protected by local communities on religious ground. The indigenous community dedicate sacred groves to the local deities or ancesterian spirits. The Deities are mostly feminine and general belief to be fearsome and quite different from deities of brahminical culture. Local folklores and taboos are associated with utilization of resources from the groves. The taboos are spread and stories of the ferocity of the deities are spread from generation to generation which invariable play a significant role in conservation of Sacred Groves for the presiding deity. It is believed that damage to the groves disobeying the rule of the area and the powers of deity result in serious harm to the people.

Sacred Groves act as invitiative on the part of local community towards biodiveristy conservation. As these small chunks of forest remain untouched through customaries taboos and sanctioned with cultural and ecological implications many rare and endemic wild plant species having medicinal values have been preserved. It gives shelter to lesser known wild animals unlike squirrels, crows, monkeys, fruit bats, arboreal birds, insects, rodents and is considered as store house of mirco fauna. It'ssoil is full of micro organism and function as gene pool. Sacred Groves serve as a centre of rare, endangered, threatened and endemic species as well as centre of seed dispersal.

8.5.1 Tradtional ownership and Management :

Mostly Sacred Groves are located outside the conventional forest areas or revenue or community land where there are no rules framed for their protection. Traditionally the chunk of forest which is regarded as sacred place and worship by all the members of a particular community. From time memorial they are conserving piece of land though they don't have written document for their ownership. The member of influencial family of the village or Disarior Dehuri or Headman (Mukhia) is the overall manager of the village and all the villagers abide by the rules and regulations of the Headman. He is responsible for well being of forest, villagers, cattles etc. Hence, Headman is also responsible for management of Sacred Groves with rituals of deity.

In many Groves, annual riturals are performed to propitiate the Deity, sacrifice of animals like fowl, goat, pig, buffalos are made. In some Groves, offering vegetable are made and the rituals are performed for the wellbeing of the inhabitanats, animals, crops etc. The presiding Deity is believed to look after the wellbeing of the people and protect the grove by punishing the offenders. The practice of oath/vow taking in the crisis is very common in the country side. People take vows for fulfilment of their wishes when there is a crisis. They offer to the Deity mostly animals, birds, elephants and horses made from terracotta etc. after their wishes are fulfilled. We find heaps of such terracotta offerinings of elephants and horses surrounding many shrines. It is hightime that animal sacrifice to be abandoned by educating people.

The Sacred Groves are in destruction due to different reasons. The most important reasons include population explosion and loss of belief towards the deity. Education and rise in literacy among villagers may be a reason for erosion of traditional beliefs. The political interference like ownership and management taken over by Government from private trust is also posing threat of the existing of Sacred Groves. The other threat like introduction of different programme, removal of biomass, mono culture plantation, piligrimage etc. cause extensive damage to the Sacred Groves. From the year 2015-16 to 2017-18, 55 Nos of Sacred Groves have been taken up by the Keonjhar (WL) Division for its conservation and development. Different activititing like awareness – cum – consultation meeting, management plan preparation, survey & demarcation, posting of heritage stones and green fencing, protection of deities have been taken up. The list of Sacred Groves taken up for conservation and development are given in the Table No.8.4.

Table No. 8.4 : List of Scared Groves.(2015-16)

Anandapur WL Range	Hadagarh WL Range	Deogaon WL Range	Brahmanipal WL Range
		1. Phulabahali. 2. Gopalpur (Nalasahi) 3. Jhinkipita 4. Manigiri 5. Barabahali. 6. Jamubahali. 7. Bailobeda. 8. Ksunijodi. 9. Gaduan. 10. Ostiaposi.	

2016-17 :

Anandapur(WL)Range	Hadagarh WL Range	Deogaon WL Range	Brahmanipal WL Range
1. Marshapal (A). 2. Marshapal (B). 3. Tilira. 4. Arjunbania. 5. Jajanda.	1. Purunapani 2. Rugudi. 3. Binapatia. 4. Haradabadi. 5. Dangachua.	1. Phulabani. 2. Hatikucha. 3. Bhandeesahi. 4. Barigaon. 5. Kolhabeda.	1. Panganal. 2. Tilakanagar. 3. Panchama(Tinipalia) 4. Tentulipal. 5. Talapada. 6. Rebana (Ka). 7. Rebana (Kha). 8. Daitari. 9. Gelhachapal. 10. MahabeerJahira (Kuntala)

2017-18 :

Anandapur WL Range	Hadagarh WL Range	Deogaon WL Range	Brahmanipal WL Range
1. KhanduraiNanikabahali. 2. ThakuraniMuktajharisahi. 3. Kantala. 4. Uleikundi. 5. Kuldiha. 6. Marandihi. 7. Pitujhari.	1. Barua. 2. Paitapani. 3. Chaturisahi. 4. Raipal.	1. Kaliahudi. 2. Dhurudiamba. 3. Billa. 4. Maniabindha.	1. MahabirJahiratigiria. 2. RajabafaJahiraKusumdiha. 3. DehuriysahiJahira Talapada. 4. DehuriysahiJahira Rebana. 5. Tangiriapal.

8.6 ECO-TOURISM AREAS AND ACTIVITIES :

Keonjhar (Wildlife) Division is situated on the strike line of coastal and hilly region surrounded by beautiful green hills. It is also situated on the bank of Baitarani known as "Budha Ganga" which is one of the sacred and oldest river of India. During the ruling of Keshri dynasty in Odisha, many temples of Shiv were constructed along the river bank. These temples are heritage sites and beautiful places of peace and devotion. Some of the temples are Jhadeswar temple, Uttare temple,Balunkeswar temple andKundeswar temple.Balunkeswar temple is situated in Fakirpur, one of the finest place of Buddhist site. Some of the idols have Budhistculture.MaaGadachandi temple in Boula mountain is very good place for picnic. This place is famous for temple of Goddess Chandiestablished on the bank of perennial stream nearby Boula mountain coming under Hatadihi Block. Other famous temples are Raghunathjew temple of Anandpur Range. Visitors come to this site for performing puja as well as sighting of deer in Barang R.F. One of the Shiv temple at Dantuani also famous for picnic spot. Some of the Eco-tourism sites are described as follows :

Chakratirtha:

It is located 3 Kms away from Kantipal villageunderHatadihi block. The perennial water fall Shiv temple and Ashram enhance the beauty of the spot. Visitors come here for picnic purpose and prefer to stay in the Ashram at night to watch the movement of elephant from close proximity.

Dargudisila :

Dargudisila is a small village situated at a distance of 26 Kms from Anandpur. This is famous as a picnic spot. It is full of natural greenery sites and the flow of rocking river Baitarani.

Chandangiri Cave :

Mushal river originates from this place. It is an important tourist place coming under Harichandanpur Tahasil.

Village Fakirpur :

Situated on the left Bank of River Baitarani about 4.8 Kms from Anandpur on Anandpur-Bhadrak road. It is famous for making varities of earthen pot and tusser products.

Apart from this, the Hadagarh Dam on Salandi river, Daitari Dam on Kushei river and GobaraDam on Gobara river, Remal Dam on Remal river are also famous picnic spots. Large

numbers of migratory birds add beauty to these sites which are given in the Table No.8.5.

Table No. 8.5 : Ecotourism Sites of Keonjhar Wildlife Division, Anandapur

Sl. No	Name of Eco-tourism Place	Nearest Village	Beat	Range	Nearby RF	Importance
1.	Chakratirtha	Sajanapal	Kathakata	Hadagarh	Baula	Shiv temple, water falls
2.	Gadachandi	Rangamatia	Baidakhia		Baula	ChandiMandir, Stream
3.	Hadagada Zero Point	Hadagarh	Hadagarh		Baula	Dam, Waterbody
4.	Ramachandi	Podasingh	Baidakhia		Adjacent Baula RF	Jain &Budha museum, stream
5.	Pichhila	Sanasidimal	Rebana (North)	Brahmanipal	Adjacent Rebana RF	On river Kushei, worship of Lord Shiv
6.	Daitary Dam	Daitary	Talapada		Rebana RF	Dam on Kushei
7.	Budhipada	BudhipadaJuangasai	Palaspal (West)		Rebana RF	Stream, Science Beauty
8.	Remal Dam	Barigaon	Gaduan	Deogaon	Rebana RF	Water Reservoir, Scenic Beauty, Birds
9.	Gobara Dam	Bhagamunda	Bhagamunda		Rebana RF	Water Reservoir, Scenic Beauty, Biards
10.	Patahara	Garagadabahal	Garagadabahal		Rebana	Waterfall on River Mushal, Caves
11.	Dantuani	Sagadapada	Sagadapada		Atei	Shiv temple
12.	Ganpur Temple	Ganpur	Ganpur	Anandapur	Barang RF	RaghunathajewMandir

8.7 SOCIAL CUSTOMS :

Tribals and other forest dwellers born in, grows and die in the forest. Forest govern their culture, economy, view, performing arts, their faith on spirits for good rains, crops, care of diseases and well being still exist in modern era. Forest plays an important role in ribaleconmy. Their economy mostly depend on shifting cultivations , collection of minor forest produce in lean season, poles, bamboos, creepers, bark and fibers are for constructing houseses and sheds. Ropes made out of the barks of trees and creepers are used for making cots and mats. Palm leaves are used as brooms. Agricultural implements such as ploughs and fishing nets as well as bows and their tools used for hunting are collected from the forest.

Sal is the most prominent trees in the life of forest dwellers. Sal twigs are used for tooth sticks, leaves are used for making cups and bowls, wood used as good quality fuel, leaves are also used as tobacco wrappers to make domestic cigarettes. Sal is the best wood for building houses and making agriculture implements. Sal resin is used for worship of deites. Tribals worship in the sal groves as a custom. The tribals hang sal twigs around their houses to repel the evil spirits. At the time of birth of child they bit the Sal twigs around the houses to repelthe evil stprit. They also use Sal branch at the time of marriage and the marital couple takes the blessing of sal branch.

Like *Sal, Mahua* tree has a special place in the life of forest dwellers. The liquor produced from Mahua Flower is widely used in their social activities like festivals, marriage and death ceremonies. On the occasion of arrangement of marriage, a quantity of liquor forms an important part of bargaining on the bride price and served during the marriage ceremony. It is also used while worshiping deities during the performance of various village festivals. Pure

mahua flower is given to mothers as a stimulating medicine. Further, pure mahua liquor is also used as antiseptic lotion applied on fresh cuts and injuries. Mahua seeds are also used for production of edible oil.

Aprt from these, myrobalans and other NTFPs are used profusely by the forest dwellers which are described in Para No. 8 .10.

Action is taken to preserve social customs.Action is being taken by the State Government to preserve the sacred groves and permission is not granted to fell the fruit bearing trees. Also under the Orissa Protection of Scheduled Caste and Scheduled Tribes (Interest in trees) Act, 1981, the protection of the members of the scheduled caste and scheduled tribes from exploitation in the matter of transfer of their interest in specified trees is being provided.

8.8. STATUS OF COMPLIANCE OF FOREST RIGHT ACT :

8.8.1 The Forest Right Act came into force during 2006 by the Parliament to address injustices perpetrated against millions of forest dwellers in India.

As a historical decision, on 18th December'2006 legislation passed called "Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forst Rights) Act,2006" or popularly called Forest Right Act. With certain amendments Forest Right Rules are made in 2012.

8.8.2 The Act grants legal recognition to the rights of tradtional Forest Dwelling Communities. It also makes a beginning towards communities a chance to conserve forest &wildife by fixing duties. Three types of rights have been recognized in this Act.

(1) Land right or Title Rights: The tribals who were occupying land as on 13th December'2005 will get the ownership of such land subject to maximum of 4 Ha. No new lands are to be granted. The land can not be sold or transferrreed to anyone except by inheritance.

(2) Use Rights: The law provides for rights to one and collect the following.
   (a) Minor Forest Produce excluding timber.
   (b) Grazing grounds & water bodies.

(3) Right to Protect & Conserve. The law provides right and power to conserve community forest resource.

There are three steps for deciding to get the rights.

(1) Gram Sabha recommend the name of the individual or the community who will be entitled to get the right under this Act.
(2) This recommendation goes to Sub-divisional Committee for screening for the recommendation.
(3) District level committee finally takes the final decision.

It is very alarming that though 480(approximately)ha.titleshave been issued under FRA Act till date, still some cases have been pending and authorities are still receiving applications.

8.8.3 FRA & Climate Change

FRA is an instrument for Indians to meet its commitment under Paris Agreement on climate change. Following the Paris Agreement, India has set an ambitious target to sequester 2.5

billion tons of carbon. FRA acts as a tool to achieve the target through recognition of community forest resources rights.

The law vests a number of rights over forest lands with forest dependent Schedule Tribes (STs) & Other Traditional Forest Dwellers (OTFDs) including individual rights and community rights over forest lands and the rights to protect and manage forest resources within traditional or customary boundaries of the villages.

The FRA is aimed at poverty alleviation; by providing food security through community rights. GRAM SABHA will be financially uplifted. In future, they will get funds from Govt. Directly, which will be used for protection & restoration of community forest in turn support the process of climate adaption & reduction of climate vulnerability of these communities.

8.9 OTHER RIGHTS AND CONCESSIONS :

8.9.1 As per Forest Enquiry Committee, 1959 published by Govt. of Odisha, no rights exist in 'A' class Reserve Forest while certain consessions are allowed to the cess paying rayats of the ex-State. Though under the Indian Forest Act, 1927/Orissa Forest Act, 1972, there is no legal distinction between A Class Reserve and B Class Reserve but State Govt. has allowed the concession to the cess paying tenants in B Class Reserve Forests. Thereafter, the Govt. abolished the Nistar Cess with effect from 01.04.1980 thereby barring the tenants from removal of forest produce and trees at concessional rate. The Govt. in their Order No. 23614/FFAH Dtd. 13.10.1988 completely banned the removal of forest produce by the tentants at a concessional rate. In view of the ban on green felling, neither the cess paying tenants nor the permit holders could be allowed to sell the trees. But they were allowed to collect dead and fallen trees on the strength of the Forest Department permit subject to the supervison of the local staff during the collection & transit as per the guideline of D.O. No. 274/Cs Dtd. 7.4.1991, Chief Secretary, Odisha communicated to Secretary, F&E Deparmtnet& PCCF, Odisha, Bhubaneswar. The timber for house building by the fire affected persons and for agricultural equipments are to be supplied by O.F.D.C Ltd. from their Depot as envisaged in Govt. of Odisha, F&E Depatment Circular No. 104 Dtd. 11.05.1990. After formulation of National Forest policy, 1988, the principal aim of ensuring environmental stability and maintenance of ecological balance, people participation in local forest managmenet is encouraged under Joint Forest Management programme through a Memorandum of Understanding (MoU) jointly signed by Forest Department and V.S.S members. The scope of Joint Forest Management(JFM) has been enlarged vide Resolution No. 10F(Pron.) Dtd. 04/90/29825/FFAH Dtd. 11.12.1990, forest land is to be assigned and earmarked by the Forest Department and to be protected by the particular villagers. Villagers have been entitled to get small timber & fire wood to meet their bonafide requirement free of cost.

Subsequently, Forest &Enviornment Department, Govt. of Odisha vide G.O. No. 16700 dtd. 03.06.1993 & 22180 dtd. 30.09.1996 has decided to implement a modified scheme of JFM where all types of forests were included. Further it was revised during the year 2008 & 2011. Joint Forest Management Resolution, 2011 came into force vide Resolution No. 16524-1F-Affn.17/2011/F&E Dtd. 09 Septmeber, 2011. According to this, the members of VanaSanakashyanaSamiti (VSS) are entitled to usufructs in terms of all intermediatary yields in shape of fire wood, small timbers and poles free of cost and 50% of the sale price after deduction of proportionate harvesting cost in major forest products. In case of Kendu Leave & specified forest produce other than bamboo if any, the VSS members will have the right to collect the same from the assigned forest. Other usfructs like fallen leaves, fodder grasses, thatched grasses, groom grasses, fencing materials, brush wood, fallen lobs, tops & twigs to be used as fuel shall be available to the V.S.S members free of cost. In case of bamboo harvested in

VSS asissigned area shall be made availblae to the VSS in a manner as may be decided by the Executive Committee. As per JFM Resolution, 102 numbers of V.S.S with 14034 Ha.of assigned area have been constituted in Keonjhar (WL) Division by March, 2017.

8.9.2 As per Scheduled Tribe & Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006 popularly known as Forest Right Act, community forest resources means customary common forest land within the traditional & customary boundary of the village and seasonal use of landscape in case pastaral communities etc. The Minor Forest Produce includes Bamboo, brush wood, stumps, cane, tussar, honey, wax, lac, Kendu leaf, Medicinal Plants, herbs, roots & tubers and are permitted for its collection & disposal as per the govt guidelines.

8.9.3 Panchayats(Extension to Scheduled Areas) Act, 1996(PESA) which is applicable to scheduled areas placed down as follows.

"*Every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity community resources and the customary mode of dispute resolution. Every Gram Sabha shall approve the plans & programmes and project for social and economic development before such plans and programmes are taken up for implementation by the Panchayat at the village level and be responsible for identification or selection of persons as beneficiaries under the Poverty Alleviation Programmes*".

This act vests the ownership of Minor Forest Produce to Gram Panchayats in scheduled areas. Accordingly, Govt. of Odisha vide G.O. No. 8131 Dtd. 28.05.2000, the Gram Panchayats are responsible for collection & trading of 69 items for M.F.P. In Keonjhar(WL) division, there is no area declared as Scheduled Areas.

8.10 DEPENDENCY OF LOCAL PEOPLE ON NTFPs :

8.10.1 Non-Timber Forest Produces (NTFP): -

The forest areas under this Division are rich in NTFP. The main sources of income of the local inhabitants are Mahua flower, Sal seed, Tamarind, Siali leaves, Sal Leaves and fibers. All other NTFPs contribute sizable portion of livelihood of local people. People use to collect edible fruits for their own consumption and some time sells them in the local weekly markets. People collect gum, resin, oil and necessary part of the trees for medicine throughout the year for their livelyhood. The important parts of different trees used for medicinal purpose is given in the Table No.8.6.

Table No. 8.6 : NTFPs and its uses

Sl. No	Name of tree	Flower		Seed		Parts used	Uses
		Time	Colour	Collection time	No/ kg		
1	Arjun	May	Faint yellow	Feb	1600	Bark	Tumer, cardio tonic, ulcers, diabetes, fracture
2	Asan	Jun	-do-	Apr	550	-do-	Timber, cardio tonic, wound, ulcer, dysentery
3	Anla	Feb	-do-	Mar	150	All	Firewood, diabetes, ulcer, asthma, digestive
4	Anchu	Feb	White	Jan	50	Root, leaf	Firewood and naturopathy
5	Amba	Feb	Greenish white	June	15	Root, bark, seed	Timber, syphilis, wounds, ulcer, diphtheria, rheumatism

6	Babul	Dec	Faint white	Apr	7500	Bark and gum	Firewood, asthma, haemostatic, antipyretic, diarrhea
7	Baruna	Mar	Faint red	July	22000	All	Firewood, cardio tonic, anticonvulsant
8	Bara	May	Faint green	June	25000	All	Firewood, diarrhea, dysentery, gonorrhea
9	Bahada	Mar	Faint white	June	120	Bark and fruit	Firewood, anemia, digestive, dysentery
10	Bela	May	Faint green	June	5300	Leaf and fruit	Firewood, diarrhea, dysentery, breathy, diabetes, gastric
11	Chaku-nda	Sep	Yellow	May	35000	Leaf and seed	Firewood, thermogenic, laxative, liver tonic
12	Champa	Apr	Yellow	Aug	7000	All	Firewood, chronic gastritis, malaria
13	Chan-dan	Jun	Faint green	Jan	6000	Root and stem	Firewood, cardio tonic, haemostatic, acidity
14	Dhaura	Aug	Faint yellow	Mar	120000	All	Timber, haemostatic, cold fever, skin disease
15	Gamb-hari	Mar	Faint yellow	May	1600	All	Timber, fever, dyspepsia, skin, hair
16	Gohira	Oct	Faint white	Apr	45000	Bark	Timber, vomiting, leprosy, ulcer, cough
17	Harida	Jan	Faint white	Apr	230	Fruit	Timber, cardio tonic, digestive, purgative
18	Jamu	Mar	Faint green	June	350	All	Firewood, ring warm, diabetes, teeth, gums
19	Karanja	Apr	Orange	Feb	500	All	Firewood, gonorrhea, teeth, beriberi, ulcer
20	Kamal-agundi	Oct	Yellow	Apr	x	Fruit's hair	Firewood, scabies, skin, ringworm, digestive
21	Kada-mba	Jun	Orange	Nov	6000	Bark, leaf, fruit	Firewood, febrifuge, ulcer, wound, gastric
22	Kochila	Mar	Faint white	June	x	Root, leaf	Timber, ulcer, diabetes, malarial, chronic wound
23	Kumbhi	Mar	White	July	x	Bark, leaf, fruit	Firewood, fits, tumors epileptic, colic, worm
24	Kusum	Mar	Faint green	Aug	1800	Bark, oil	Firewood, malaria, ulcer, burns
25	Mahula	Jan	Faint yellow	June	150	Bark, seed	Firewood, epilepsy, sprains, rheumatism
26	Maha-nimba	Mar	Faint violet	June	200	All	Firewood, asthma, fever, diabetes, hysteria, delivery
27	Mai	Mar	Faint white	June	x	Bark, leaf	Timber, wound, bruises, ulcer, sprains
28	Nimba	Mar	White	June	1500	All	Firewood, skin, malaria, bronchitis, paralysis
28	Panas	Jan	Green	June	50	All	Firewood, aphrodisiac, sedative, cough, bile
29	Palas	Feb	Red	May	x	Bark, seed, gum	Firewood, aphrodisiac, appetizer, digestive, worm, fracture, rectal disease
30	Piasal	Oct	Pale yellow	Apr	1500	Heartwood and gum	Timber, fracture, skin, leucaderma, diabetes
31	Rohini	Feb	White	June	10000	Fruit	Timber, fever, tonic
32	Saguan	Jun	White	Feb	1700	All	Timber, acidity, diabetes, leprosy, skin
33	Sal	Feb	White	June	500	Bark, fruit and resin	Timber, cough, ulcer, tuberculosis, eye

34	Simili	Jan	Red	May	26000	Root, bark, gum fruit	Firewood, skin, bladder, kidney
35	Sisoo	June	Pale white	Jan	53000	Root, leaf, bark and wood	Timber, skin, leucoderma, scabies, ulcer, syphilis
36	Siris	May	Pale yellow	Apr	7000	Bark, seed and flower	Firewood, cough, catarrh, asthma, leprosy, ulcer
37	Sunari	Jul	Yellow	Apr	5500	All	Firewood, skin, diabetes, leprosy, ring worm
38	Tentuli	Apr	Pale white	Mar	250	Root, fruit and seed	Firewood, anti-fungal, jaundice, scabies, diabetes, small pox.

Besides the above, people also collect edible fruits for their consumption and sale which is depicted in the Table No.8.7.

Table No. 8.7 : Collection of edible fruits.

Sl No.	Common Name	Botanical Name	Period of collection	Utilisation
1	Amba	*Mangifera indica*	April/ May	Ripe fruits are eaten & raw are used for making pickles etc. Mango Kernel is used as food also.
2	Aonla	*Emblicaofficinalis*	October/April	Fruit is eaten as raw and used in pickles & having medicinal value
3	Bankhajuri	*Phaseolus acaulis*	May/ June	Ripe fruits are eaten. Tadi(a country liquor) is extracted from the tree.
4	Barakoli	*Zizyphusjujuba*	January- March	Ripe fruits are eaten and used for making pickles.
5	Bel	*Aeglemarmelos*	One year after fruiting	Ripe fruits are eaten & used as medicinal purpose.
6	Bhalia	*Semecarpusanacardium*	June/July	Fruit, Kernel eaten and used for pickles.
7	Jamu	*Syzygiumcumini*	May, June, July	Ripe fruits are eaten & used in medicinal purpose.
8	Kendu	*Diospyros melanoxylon*	May, June	Ripe fruits are eaten.
9	Kusum	*Schleicheraoleosa*	June, July	Flesh of the fruit is eaten.
10	Mahula	*Madhuca indica*	May– July	Flowers eaten & used for preparation of country liquor. Unripe fruits used as vegetable.
11	Panasa	*Artocarpus integrifolia*	May-August	Unripe fruit is used as vegetable, ripe fruits & seeds are eaten.
12	Rai	*Dilleniapentagyna*	August	Young fruits are cooked & eaten.
13	Tentuli	*Tamarindus indica*	December, January	Fruits, flowers and leaves are used for vegetable & pickles.

The important species collected by local people for the sake of fibre is given in the Table No.8.8.

Table No. 8.8 :Fibre yielding leading species.

Sl No	Common Name	Botanical Name	Part yielding fibre	Utilization
1	Dhaman	*Grewiatiliaefolia*	Inner bark	Used for rope making
2	Kanchan	*Bauhinia variegata*	Bark	Used as cordage

3	Palas	*Buteafrondosa*	Bark	Used for rope making & for caulking boats.
4	Siali	*Bauhinia vahlii*	Inner bark	Used as cordage, mainly in bundling of kendu leaves.
5	Sisal	*Agave sisalana*	Leaves	Used for rope making, weaving mats.

The important species collected by local people for the sake of oil yielding is given in the Table No.8.9.

Table No. 8.9 : Oil bearing plants

Sl No.	Common Name	Botanical Name	Part yielding oil	Utilization
1	Karanja	*Pongamiapinnata*	Seeds	Oil used as medicine, antiseptic, sod making, perfume & leather tanning.
2	Kusum	*Schleicheraoleosa*	Seed, kernels	Oil as hair oil, for cooking, lighting, soap making.
3	Mahul	*Madhuca indica*	Seeds	Oil used for soap, hair oil and adulterant for ghee.
4	Neem	*Azadirachtaindica*	Seeds	Oil used as medicine, for soap making, oil cake as fertilizer.
5	Sal	*Shorearobusta*	Seeds	For cooking, lighting, soap making, in confectionary.

The important species collected by the local people for the sake of tannin yielding is given in the Table No.8.10.

Table No. 8.10 : Tannin yielding species

Sl No.	Common Name	Botanical Name	Part yielding tannin	Utilization
1	Babul	*Acacia arabica*	Bark of tree	Tanning of leather
2	Dhaura	*Anogeissus latifolia*	Dry matured leaves	Dyeing
3	Sunari	*Cassia fistula*	Bark	Blending and tanning of leather

The important species collected by the local people for the sake of Gum & Resin yielding is given in the Table No.8.11.

Table No. 8.11 : Gum & Resin Yielding spcies.

Sl No.	Common Name	Botanical Name	Part yielding gum & resin	Utilization
1	Asan	*Terminalia alata*	Stem	Gum used as incense & cosmetics.
2	Genduli	*Sterculia urens*	Stem	Gum karaya, used in confectionary.
3	Khair	*Acacia catechu*	Heart wood	Consumed in betel, pan masala.
4	Moi	*Lanneacorom andelica*	Stem	In calico penting, paper & cloth sizing, varnishes & confectionary, adhesive.

5	Piasal	*Pterocarpus marsupium*	Stem	Used as medicine
6	Sal	*Shorearobusta*	Stem	Used as incense, disinfectant and fumigant.
7	Salai	*Boswellia serrata*	Stem	Used as incense, curing rheumatism & nervous disorder.

8.10.2 The local people collect various species of NTFPs for their local consumption seasonally and sell the excess quantity in the local market at the prevailing market prices. Various Non Timber Forest Produce such as flowers, seeds, barks, fibres, fruitts and leaves are collected by the local people and use for different purposes. Most of rural families particularly those below poverty line depend on NTFPs for their livelihood for 8 to 10 months in a year. They collect fire wood, Sal leaves and seeds, Mohua flowers and seeds, kendu leaf, Siali leaves, different fibres and other NTFP items from the forests.

NTFP survey was carried out during 2013 by the Divisonal staff and data collected in different proformas.

1. Range wise distribution of NTFP species.
2. R.F wise distribution of NTFP species.
3. Village wise collection of NTFP species.

The detailed list of NTFP items Forest Block wise and Range wise as per NTFP survey are given in the Table No.8.12.

Table No. 8.12 : N.T.F.P collection of Deogaon Range of Keonjhar (WL) Division

Sl.No.	ITEM	Atei R.F	Rebena R.F	K.F	P.F	TOTAL	Rate (In Rs.)
1	Mahula Flower	340	334	81	90	845	1690000
2	Tola	67	86	31	0.25	184.25	184250
3	Chara	22.3	24.55	7.9	1	55.75	11150
4	Myrobalam	1.8	23	9	0	33.8	16900
5	Jhuna	3.95	4.2	1	0.6	9.75	97500
6	Kendu	2.25	2	3	0	7.25	1450
7	Pala leaves	23.3	48.5	3	0.7	75.5	377500
8	Sal Leaves	36	21.6	17	0	74.6	453000
9	Kusuma Seed	10.5	12	0	0	22.5	4500
10	Sal Seed	43	31	0	0	74	37000
11	Valia Seed	4	4	0	0.5	8.5	4250
12	Mushroom	1.7	1.2	0	0	2.9	1450
13	Tentuli	1.5	0	0	2	3.5	7000

Table No. 8.13 : N.T.F.P COLLECTION OF ANANDAPUR RANGE OF KEONJHAR (WILDLIFE) DIVISION

Sl. No.	ITEM	Chandamunda PF	KalaraGadia KF	Biragobindpur K.F	Marsapal K.F	Sendaigotha K.F	Badaikatali K.F	Mahisabahali K.F	Sundurai K.F	Baunsagarh K.F	Fakirpur K.F	Kantala K.F	Haridabola V.F	Andharajhari VF	Janjali V.F	Dhabani K.F
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Neem Seed	13.2	24	0	13.5	2.5	0	2.5	21.24	17.65	5	0	0	0	0	0
2	Mahula Flower	8.43	0	0	0	0	0	0	0	7	0	125	66	0	110	140
3	Tola	25.2	120	0	0	0	25	0	129.6	0	0	0	0	61	0	0
4	Chara	18	0	0	0	3.75	6.25	7.5	31.86	50.95	0	15	22	0	15	15
5	Myrobalam	14.4	0	0	27	0	0	0	53.84	28.64	0	0	0	21	0	0
6	Jhuna	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
7	Kendu	0	0	0	0	2.25	6.25	5	15.6	33.3	5	10	0	3	20	9.5
8	Sal Leaves	38	0	0	0	0	0	0	0	0	0	15	13	61	5	10.5
9	Kusuma Seed	0	0	27	72	7.5	0	20	0	1	20	0	0	0	0	0
10	Sal Seed	0	0	0	54	5	25	20	0	174.5	20	0	0	0	0	0
11	Lac	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
12	Karanja Seed	2.4	36	0	13.5	4	0	15	80.46	39.96	0	0	0	0	0	0

Table No. 8.14 : N.T.F.P COLLECTION OF ANANDAPUR RANGE OF KEONJHAR (WILDLIFE) DIVISION, ANANDPUR

Sl. No.	ITEM	Ostapura R.F	Atei R.F	Santoshpur R.F	Gayalamunda R.F	Patilo R.F	Kuldiha R.F	Panasadiha R.F	Total	Rate (In Rs.)
		16	17	18	19	20	21	22		
1	Neem Seed	18	39.3	81.9	0	0	0	0	**238.76**	
2	Mahula Flower	64.9	25	2081	185	2102	125	90	**5128.8**	10257580
3	Tola	0	27	892	0	0	0	0	**1280.1**	1280100
4	Chara	24.3	67.3	322	32.1	286	5	18	**939.79**	187958
5	Myrobalam	0	0	183	0	0	14	0	**341.77**	170885
6	Jhuna	0	0	0	0	0	0	0	**3.05**	30500

7	Kendu	14	37.5	200	33	0	6	12	**412.38**	82480
8	Sal Leaves	79	57.5	253	20.5	235	25	30	**842.71**	5056260
9	Kusuma Seed	0	170	0	0	0	0	0	**317**	63400
10	Sal Seed	0	120	249	0	0	0	0	**667**	333500
11	Lac	0	0	0	0	0	0	0	**3.05**	
12	Karanja Seed	15	22	177	0	0	0	0	**404.89**	80978

Table No. 8.15 : N.T.F.P COLLECTION OF BRAHMANIPAL RANGE OF KEONJHAR (WILDLIFE) DIVISION, ANANDPUR

Sl.No.	ITEM	Rabana RF	Palaspal RF	Matichudi KF	TOTAL	Rate (In Rs.)
1	Mahu	10.47	0	0	10.47	
2	Mahula Flower	1330.26	55.7	5	1390.96	2781920
3	Tola	517.7	24.54	3.5	545.74	545740
4	Chara	196.14	17.81	2.5	216.45	43290
5	Myrobalam	171.09	11.4	0	182.49	91245
6	Jhuna	31.23	0.35	0	31.58	315800
7	Kendu	48.6	1.25	0	49.85	9970
8	Pala leaves	4.52	0	0	4.52	0
9	Sal Leaves	104.41	2.5	0	106.91	641460
10	Kusuma Seed	19.38	0	0	19.38	3876
11	Sal Seed	171.58	2.5	0	174.08	87050
12	Valia Seed	15.66	0	0	15.66	7830
13	Siali Leaves	17.38	0	0	17.38	0
14	Tussar cocoon	38.71	0	0	38.71	3871
15	Mushroom	75.78	2.05	0	77.83	38915
16	Kurei	5.98	0	0	5.98	1196
17	Tentuli	211.34	22.51	5	238.85	47770

From the above table, it is found that in all Ranges Mahua flower is the main life line followed by Sal leaves and Mahua seed (Tola). Apart from this they also collect Sal seed, Myrobalan, Karanja Seed, Tamarind etc.

If we compare the NTFP R.F wise, then Santoshpur R.F is very rich in Mahua flower, Mahua seed (Tola), Sal leaves, chara, Myrobalan, Kendu etc. Rebana R.F is richer than Santoshpur R.F so far as quantity of NTFP production is concerned. Rebana R.F is rich in Mahua flower, Mahua seed, Tamarind, Sal leaves, Myrobalan, Chara, Sal seed, Valia seed and Karanja seed and Mushroom.

People are also collecting tussar cocoon from Atei & Rebana R.F.

8.10.3 From the Socio-Economic study carried out in 30 numbers of villages, it is found that all the species described above are being collected by these villagers. When we compare the quantity

of NTFPcollected by different villages, it is found that approximately 59.51% of house hold are collecting Mahua flower, 43.46% of house holds are collecting Mahua Seed (tola), 29.48% of house holds are collecting Sal leaves, 26.22% of house holds are collecting Sal seed and 10.40% of house holds are collecting Myrobalan and other NTFP items. Apart from this some medicinal plants like Agni jhal, Bhuin Neem, Satabari, Ganga Siuli, Palua, Kusuma, Guluchi MAP items are being collected by the villagers.

8.10.4 **NTFP Policy:**

Government of Orissa announced new NTFP policy during March 2000. The said NTFP policy rule is enclosed in **Appendix–XVIII.** The orientation is changed from revenue earning to livelihood approach. The ownership of control over 69 Minor Forest Produce items in the area under Division has been vested with Panchayats. The interested traders have to get registered in Panchayat. Subsequently 'Odisha Gram Panchayats Rule, 2002' have been framed by Panchayat Raj Department. The said Panchayats Rule, 2002 is enclosed in **Appendix-XIX.** Basing on the Rules, the Panchayat Samiti has to fix up the minimum support price for minor forest produce items. The prevailing market price of the following 69 items fixed by Government given in the Table No.8.16.

Table No. 8.16 : Rate of NTFP

Sl. No.	Name of the NTFP	Rate	Sl. No.	Name of NTFP	Rate
1	Tamarind	2000	36	Honey	500
2	Tamarind seed	2000	37	Sabai grass	500
3	Phulajhadu	1000	38	Thatch grass	100
4	Harida	500	39	Arrow root	400
5	Amla	500	40	Gaba	200
6	Siali leaf	200	41	Siali seed	200
7	Mango kernel	200	42	Gila	100
8	Simul cotton	500	43	Banahaldi	200
9	Bena root	200	44	Kanta padma seed	370
10	Baghanakhi seed	200	45	Baidank seed	200
11	Landabaguli	200	46	Kamalagundi fruit	200
12	Chiraita	200	47	Bela	200
13	Rohini fruit	200	48	Khajuripata	500
14	Sidha fruit	100	49	Bhrusunga leaf	500
15	Eksira fruit	200	50	Phenphena fruit	100
16	Nageswar flower	200	51	Satabari	200
17	Mahula seed	1000	52	Athundilai	100

18	Karanja seed	200	53	Suamlai	100
19	Char seed	200	54	Katha chhatu	500
20	Sal seed	500	55	Anantamuli	200
21	Mahula	2000	56	Mankendakendu	200
22	Hill broom	500	57	Kusum seed	200
23	Nux vomica	500	58	Neem seed	200
24	Bahada	500	59	Babul seed	200
25	Bhalia	500	60	Chakunda Seed	200
26	BaiBidanga	200	61	Kantiapata	100
27	MasinaGhasa	500	62	Anantamula	200
28	Hansalata	100	63	Katha lai	100
29	Sidha Palla	100	64	Rasna	200
30	BhuinNimba	200	65	Tala makhana seed	200
31	Palua	1000	66	Tulsi	200
32	BanaKolathi	200	67	BanaHaladi	200
33	Putrani	200	68	Dhatuki	200
34	Kataka	200	69	Sikakai	200
35	Jungle Jada	200	70	Indrajata	100
Sources – D.F.O, Keonjhar Wildlife Division, Anandapur.					

8.10.4 NTFP Trade :

Though new NTFP policy has been framed along with Odisha Gram Panchayats Rule, 2002 to strengthen the Panchayat, but till date there is no data available about the registered traders at Panchayat level. The gatherers are selling their produce to the middle man or traders sometimes in less than the rate fixed by the Government. Panchayat make no effort for marketing of the produce. There is no data base at Panchayat level, so far as exact quantity of forest produce marketed is concerned. This has to be looked in to by the DFO, Territorial to educate the VSS members about the scientific collection of NTFP species along with its disposal involving the Panchayati Raj Department and other N.G.O.

CHAPTER – IX

9.1 ADEQUACY OF POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK :

Introduction :

Forest represents a complex eco-system. From the beginning of human civilisation, man is dependent on forest for his basic needs. With the need of increased population, forests have been pressurised tremendously byway of industrialization, urbanisation, raw material for forest based industry, houses etc. Hence, sustainable development of forest is a complex issue. It is politically a sensitive issue. It requires cross-sectoral policy harmonisation at the regional, national and global levels involving the environmental, economic and social development, food security, empowerment of women and poverty alleviation. It requires long term commitment.

9.1.1 Pre-Independence period :

The systematic forest management began in the year 1855 with the enactment of first forest policy of the country. It's main objective was exploitation of forest resource for commercial purpose. Formulation of Indian Forest Act1927isthe first major attempt to bring uniformity in forest administration and management in the country. It's major aim is to revenue maximisation and meeting industrial and commercial demands considering forest as the major source of revenue.

9.1.2 Post-Independence Period :

Odisha Forest Act came into force during 1972 is based on Indian Forest Act, 1927 & Madras Forest Act 1882 having same objectives. The right and access to forest and forest produce got restricted & Wildlife (Protection) Act, 1972 is a one step forward in this aspect emphasizing conservation of biodiversity in a particular forest area. Emphasis was laid more on national interest and ecology and not on livelihood of people.

Subsequently, during 1976, the Govt. of India formulated the National Commission on Agriculture and Social Forestry and recommended for creation of forest corporation to improve the commercial feasibility.

Govt. of India enacted the Forest (Conservation) Act,1980 which came into force on 25th October, 1980. Ecological stability became the key objectives of Forest (Conservation) Act,1980. In order to prevent the Sate Govt. from allowing indiscriminate use of forest land for non-forestry purposes permission of Central Govt. was made mandatory. The law expanded the identification of non-forest purposes toinclude the cultivation of cash crops like tea, coffee, spices, rubber, palm, oil bearing plants, horticultural crops or medicinal plants and any purpose other than re-afforestation.

9.1.3 National Forest Policy, 1988 : A Paradigm Shift :

For the first time non-market & ecological benefits was emphasised in National Forest Policy. The Central Board of Forestry recommended a ban on commercial exploitation of degraded forests and regeneration of National Forest in order to reduce the growing pressure on forest resources. Removal of Forest products became State owned sacrificing the customary rights

of people. Hence, the National Forest Policy'1988 envisaged co-operation of the people in conservation & development of forests.

Hence, National Forest Policy, 1988 was the result of the realisation that life of the tribal communities & other people living in the fringe villages revolves around the forest & right & concessions enjoyed by them should be fully protected. The failure of State rules and acts in protection & sustainable management of forest resource prompted for involving the local communities in forest protection and management. Hence, this policy had two objectives viz; Ecological Stability & Social Justice.

Orissa Village Forest Rules,1985, Village Forest Protection Committees shall have 100% usufruct rights over the produce harvested from the plantation. It provides opportunities for creation of plantation over non-forest lands through community participation.

The provisions of Panchayats (Extension to the Scheduled Areas) Act,1996 (PESA) is an attempt towards the role of PRI in Natural Resources Management. PESA endows special powers & authority to the Panchayat at appropriate level. It has been mandated that State Legislature shall ensure these powers to Panchayat at appropriate level under Gram Sabha would be responsible for identification or selection of persons as beneficiaries under the poverty alleviation & other programmes. PESA stressed on ownership of Minor Forest Produce to the Panchayat Raj Institution.

OTHER ACTS AND RULES :

9.1.4 Environment (Protection) Act,1986 :

Another important general framework of Environment Protection is provided under the umbrella legislation of the Environmental Protection Act,1986& this law can be of great value in sustaining legal action for forest conservation. Under this Act, Govt. is vested with power to take all such measures, as it deems necessary for the purpose of protecting & improving the quality of environment & preventing, controlling environmental pollution.

9.1.5 The Orissa Timber and other Forest Produce Transit Rules, 1980 :

The Orissa Timber and other Forest Produce Transit Rules,1980 regulates the transit of timber and other forest produce within the state by means of Transit Permit. All forest produce shall be accompanied by transit permit issued by the competent authority. However, any forest produce that is removed for bonafide consumption in exercise of privilege granted by the State or through a right recognised under this Act does not require a transit permit.

9.1.6 TheOrissaSaw Mill & Saw Pit (Control) Act,1991 :

This Act provides that no person shall establish or operate a saw mill or saw pit for converting or cutting timber & wood without obtaining a license from the concerned Divisional Forest Officer.

9.1.7 Odisha Forest Corporation Act :

It provides establishment of a corporation for better preservation, supervision & development of forest including better exploitation of forest produce within the State. It empowers the corporation to undertake removal & disposal of trees & exploitation of forest resources entrusted to it by the Govt. with due regard to scientific management.

9.1.8 The Orissa Kendu Leaves (Control & Trade) Act, 1961 :

This Act restricts the sale, purchase & transport of Kendu Leave. Kendu Leaves business is the monopoly business of State Govt. The State fixes the price.

9.1.9 Bio Diversity Act,2002:

The Biodiversity Act,2002was enacted in pursuance of the United National Convention of Biological Diversity,1992. The preamble to the Act borrows objectives as laid down in convention and says that the Act is to provide for conservation of biological diversity, sustainable use of its components & equitable sharing of benefits arising there from.

The Act creates a three-tier structure of authorities to manage the biodiversity of the country. This includes National Biodiversity Authority (NBA), the State Biodiversity Board at State level and the Bio-diversity Management Committees at regional level.

As per this Act and Biodiversity Rule, 2012 till date, 53 Biodiversity Management Committees have been formed in 53 Panchayats of Keonjhar District. People's Biodiversity register are also under active progress. Capacity building programme for community as well as Forest Department staff are being organised to sensitize the importance of biodiversity. All these programmes are being carried out by Odisha Biodiversity Board.

9.1.10 New NTFP Policy,2000 :

This new policy was introduced by the Govt. of Odisha giving Panchayats the authority to regulate purchase, procurement and trade of 69 NTFP species. This new NTFP Rule is people's centric.

9.1.11 Forest Right Act, 2006 :

This Act was enacted in India so as to render justice to the intrinsic basic right of the forest dwellers.. Whether this Act has achieved its goal or not but surely the forest have been honey-combed due to Forest Rights granted. Apart from this in Odisha Vision : 2020 and climate change action plan of Odisha, forest find a special place. In millennium development goals of Odisha Report published in 2016 by Poverty and Human Development Monitoring Agency (PHMDA), Planning & Conversance Department, Govt. of Odisha ensuring of Environmental stability has been set as goal No.7.

9.2 STATUS OF APPROVED WORKING PLAN AND COMPLIANCE :

Revised Working Plan for the Reserve Forest and Proposed Reserve Forest of Keonjhar (T) Division & Keonjhar (WL) Division was prepared by Sri Narayan Samal, AIFC, OFS-I, the then Working Plan Officer, Working Plan Division, Keonjhar for the period from 2007-08 to 2016-17. The revised Working Plan has constituted seven working circles namely :

1. Improvement Working Circle.
2. Rehabilitation Working Circle.
3. Plantation Working Circle.
4. Village Forest Working Circle.
5. Joint Forest Management Working Circle.
6. Wildlife (Overlapping) Working Circle.
7. NTFP (Overlapping) Working Circle.

The Revised Working Plan has been approved by MOEF, Govt. of India in three phases i.e. 2011-12, [(Letter No. 13-FCWP-OS-KJR dated 05.08.2011 for the year 2011-12, letter of even No. Dtd. 7.2.2013 for 2012-13 to 2013-14 and letter of even No. dtd.30.05.2014 for the year 2014-15. The aforesaid working permission granted for the year 2014-15 is the last working permission and no further working permission has been accorded by MoEF, Govt. of India for the year 2015-16 and 2016-17.

The revised working plan in respect of Keonjhar (WL) Division has earmarked different silvicultural intervention whose status is given in Table No. 9.1.

Table No. 9.1 : Status of silvicultural intervention

Sl. No.	Prescription	Working Circle	Status
1.	SMC structure	IWC/RWC	47 Nos. of WHS has been created.
2.	Forest Type Improvement	IWC/RWC	Nil
3.	Plantation	IWC,RWC & Plantation	857 Ha. A.R and 3319.2 Ha. A.N.R.
4.	Boundary Verification	Misc. regulation	1786 Nos of new boundary pillars have been constructed but not as per prescription.
5.	JFM	Overlapping Working Circle	132 Nos. of VSS crated covering 9717.24 Ha.
6.	Protection from grazing	All circles	Not strictly implemented
7.	Construction of new building	Misc. regulation	New building were constructed as per prescription

Sources - DFO, Keonjhar (WL) Division, Anandapur

The deviation statement are given in **Appendix XX A**

9.3 NUMBER OF FOREST OFFENCES :

The forest offences committed in these forests include illicit felling &poaching of wildlife for bush meat purpose. Numbers of cases booked and taken to the court of law are provided in the Table No. 4.114.A & B. So far as Poaching of wild animal is concerned, it has already been mentioned in Table No.3.22.

9.4 STATUS OF RESEARCH AND DEVELOPMENT:

No Research plot, Preservation plot, Seed orchard exist in this division. Hence, there is no research work undergoing in this regard.

9.5 HUMAN RESOURCE CAPACITY BUILDING EFFORTS :

For Human Resources Development, there is a need of regular training of staff of all levels. In past, special training programmes have been imparted to the field staff on different subjects like use of GPS, Arms training, Law training programmes, Soil moisture conservation training etc under CAMPA Fund. Apart from this, computer training programme and other refresher course are being held for the frontline staff in different training institution.The different training programmes for the Capacity Building, outside and inside Division for the period from 2007-08 to 2016-17 is given in the Table No.9.2.

Table No. 9.2: Capacity Building. outside & inside Division From (2007-08 to 2019-20)				
Year	Subject	Duration	Training institution	Remarks (FG/ Fr no.)
2007-08	J.F.M. Training	1 week	RCCF, Rourkela	Fr.-3 nos. F.G.- 2 no.
	General Refresher Course	2 weeks	OFRC, Angul	F.G.- 1 no.
2008-09	General Refresher Course	5 days	OFRC, Angul	F/R- 2 no.
2009-10	Refresher Course	2 weeks	OFRC, Angul	Fr.- 1 no.
	Refresher Course	5 days	OFRC, Angul	F/R- 1 no.
	Refresher Course	2 weeks	OFRC, Angul	F.G.- 1 no.
	General Refresher Course	5 days	OFRC, Angul	Fr.- 1 no. F.G.- 1 no.
	Basic Computer Application	1 week	RCCF, Rourkela	FEO-1 no. VFW- 2 nos.
	Refresher Course	2 weeks	OFRC, Angul	F.G.- 1 no.
2010-11	Wildlife Crime	3 days	STR, Baripada	F/R-1 no. Fr.- 2 nos.
	Refresher Course	2 weeks	Forest Training School, G. Udayagiri	F.G.- 2 no.
	Basic Computer Application	1 week	OFRC, Angul	F.G.- 1 no.
	Thematic Course	5 days	OFRC, Angul	F/R/- 1 no.
	Tissue Culture of Important Forest Trees Bamboo & Medicinal Plants	5 days	Forest Research Institute, Derhadun	DFO- 1 no. F/R-1 no.
	Refresher Course	2 week	Forest Training School, G. Udayagiri	F.G.- 3 nos.
	Capacity Building Training	3 days	Regional Museum of Notional Heisting, Bhubaneswar	F/R-1 no. Fr.- 1 no.
2011-12	Human Resources Development Programme	5 days	OFRC, Angul	F/R- 1 no.
	Housing Urban & Rural	5 days	G.G.A, Bhubaneswar	F/R- 1 no.
	First Aid Training for treatment of Injured/ Rescued animal	2 days	Nandankan Zoological Park	Fr.- 1 no. F.G.- 2 nos.
2012-13	Refresher Course on Wildlife Management	1 week	Eastern F.R. College, Kurseong, Dorjing, (West Bengel)	F/R.- 1 no.

	Refresher Course	2 week	OFRC, Angul	Fr-1 no.
	Formulation of Communality Based Disaster Management Plan to Combat cyclone	1 week	G.A.A., Bhubaneswar	Fr.- 1 no.
	Refresher Course	2 week	OFRC, Angul	Fr..- 1 no. F.G.- 1 no.
	General Refresher Course	2 week	Eastern F.R. College, Kurseong, Dorjing, (West Bengel)	F/R- 1 no..
2013-14	Refresher Course	15 days	Forest Training School, G.Udayagiri	F.G.- 1 No.
	Geo referencing of work site	1 day	State Silviculturist, Ghatkia	Fr-1 no. F.G.- 1 no.
	Human Resources Development Programme	5 days	OFRC, Angul	F/R- 1 no. Fr.- 1 no. F.G.- 1 no.
	Refresher Course	2 week	Forest Training School, G.Udayagiri	F.G.- 1 No.
	Tranquilization Technique	3 days	Nandankanan Zoological Park	Fr.- 2 nos. F.G.- 2 nos.
2014-15	Refresher Course	13 days	N.F.T.S. , Champua	F.G.- 1 no.
	Basic Computer Application	5 days	OFRC, Angul	Fr.- 1 no. F.G.- 1 no.
	Geo referencing of Forest Block	1 day	ORSAC, Bhubaneswar	Dy/Ro- 1 no. Fr.- 1 no.
	Climate Change & Drought Risk Mitigation Management	3 days	Gopabandhu Academy, Bhubaneswar	Fr.- 1 no. F.G.- 1 no.
	Post Disaster Management & Needs Assessment & Recovery Frame Work	3 days	Gopabandhu Academy, Bhubaneswar	Fr.- 1 no. F.G.- 1 no.
	Forest Fire Risk Mitigation and Management	1 day	Gopabandhu Academy, Bhubaneswar	Fr.- 1 no. F.G.- 1 no.
	Geo referencing of Forest Block	1 day	ORSAC, Bhubaneswar	Fr.- 1 no.
2015-16	GPS-PDA Device	1 day	Chandaka Wildlife Division	F/R- 1 no. Fr.- 1no.
	Governance & Tribal Empowerment	1 day	SIRD, Bhubaneswar	F/R- 1 no.
	Forest Fire	3 days	Gopabandhu Academy, Bhubaneswar	ACF- 1 no.
	Human Resource Development Programme	5 days	OFRC, Angul	Fr.- 1 no. F.G.- 1 no.

	Governance & Tribal Empowerment	3 days	SIRD, Bhubaneswar	F/R- 1 no.
	Promotion of Livelihood for Rural Women	1 day	SIRD, Bhubaneswar	F.G.- 1 no.
	Estimation of Tigers in Odisha	1 day	STR, Baripada	Fr.- 2 nos. F.G.- 4 nos.
	Professional I.T.	6 days	Gopabandhu Academy, Bhubaneswar	Fr.- 1 no. F.G.- 1 no.
	Consultative working	2 days	RCCF, Rourkela	F/r-4 nos. Fr.- 1 no. F.G.- 1 no.
	Estimation of Tigers in Odisha	1 day	STR, Baripada	Fr.- 2 nos. F.G.- 4 nos.
2016-17	Basic Computer Application	6 days	OFRC, Angul	Fr.- 1 no.
	Human Resource Development Programme	6 days	OFRC, Angul	F.G.- 1 no.
	Implementation of Soil Moisture Conservation	2 days	Keonjhar (T) Division	ACF- 1 no. F/R- 4 nos. Fr.- 4 nos. F.G.- 5 nos.
	Human Resource Development Programme	5 days	Forest Training School, G.Udayagiri	F.G.- 1 no.
	Human Resource Development Programme	5 days OFRC, Angul		F/R- 1 no. Fr.- 1 no. F.G.- 1 no.
2017-18	…… Nil ……			
2018-19	Immobilization, Restraint, rescue & Rehabilitation of Tiger ect.	21.02.2019 to 23.02.2019	Pench Tiger Reserve, Maharastra	Forester--1
2019-20	Human Resource Management	23.09.2019 to 28.09.2019	Central Academy for State Forest Service, Burnihat	A.C.F.-1
	Legal Issues in Forestry & Wildlife	14.10.2019 to 19.10.2019	Central Academy for State Forest Service, ..	A.C.F.-1
	Eco-system Approach to Forest Management	18.11.2019 to 23.11.2019	Central Academy for State Forest Service, Dehradun	A.C.F.-1
	Upgrading Cyber Monitoring	01.12.2020 to 02.12.2020	Conference Hall, O/o the PCCC(WL)	A.C.F.-1 R.O.- 2 Dy.Ranger-1

9.6 FOREST RESOURCE ACCOUNTING :

Forest provide tangible and intangible benefits. Tangible benefits are the physical source like timber and non-timber produce which generate livelihood and incomes while intangible benefits are far more resourceful. It is the life line of a human being for existence. Now we are more concern about the accounting of intangible benefits.

9.6.1 Need for Forest Accounts :

An important aspect of forest accounting is thus providing definition & approaches for the measurement of stock of timber, its value and where relevant its depletion. The cultural connection between people and forest like dependency for food, energy, shelter and non-timber forest produce also need to be better understood and included in decisions about forest management.

The measurement of ecosystem services also recognises that forests play a generally un-priced role in supplying regulation services. These include regulating & filtering water flows, filtering pollutant from air, limiting the impacts of floods and heavy rains, sequestering and storing carbon and providing a habitat to many species, including pollinators of agricultural crops. To ensure that the contribution of forests to society is recognised as completely as possible, these regulating services should be accounted for.

The forest accounting otherwise called as capital value of forest is a broad term encompassing a number of parameters which may be expressed as cost value, expectation value, market value, rental value and environmental value. Calculations of all the above types of values are interlinked, so it is difficult to assess the value accurately. For the sake of appreciation of the worth of the forests, the cost value is the ideal one. There are different methods to calculate the value but it is proper to adopt the methods in vogue. The capital value of a forest includes both the tangible and intangible value.

Tangible Value :

The tangible aspect is well taken care in terms of net present value (NPV) of forest land as prescribed in pursuance to orders dtd. 28.3.2008 and 9.5.2008 of Hon'ble Supreme Court of India in I.A. No. 566 in W.P (O) No. 202/1995, guidelines of the govt. of India, Ministry of Environment and Forest vide their Letter No. 5-3/2007-FC Date.5.2.2009 and communicated to the Principal Chief Conservator of Forests by Govt. of Odisha, Forest & Environment Department vide their Letter No. 10F(L)-14/2009 (P)-21637/F&E Dtd. 22.12.2009 regarding realisation of net present value (NPV) of forest land from the User Agencies pertaining to diversion of forest land for non-forestry purpose, the Govt. have been pleased to adopt the following principals for realisation of the Net Present Value of the forest land proposed for diversion for non-forestry purpose basing on the eco value class of forest in Odisha as under.

Hon'ble Supreme Court of India vide its judgement dtd. 28.3.2008 has re-fixed the rates of Net Present Value (NPV) on the basis of scientific data taking in view the ecological role and value of the forest. The 16 major forest types have been regrouped into six ecological classes depending upon their ecological functions.

Eco-class I	Consisting of Tropical Wet Evergreen Forests. Tropical Semi Evergreen Forests and Tropical Moist Deciduous Forests.
Eco-class II	Consisting of Littoral and Swamp Forests.
Eco-Class-III	Consisting of Tropical Dry Deciduous Forests
Eco-Class-IV	Consisting of Tropical Thorn Forests and Tropical Dry Evergreen Forests.
Eco-Class-V	Consisting of Sub-tropical Broad Leaved Hill Forests, Sub-Tropical Pine Forests and Sub-Tropical Dry Evergreen Forests.
Eco-Class-VI	Consisting of Montane Wet Temperature Forests, Himalayan Moist Temperature Forests, Himalayan Dry Temperate Forests, Sub-Alpine Forests, Moist Alpine Scrub and Dry Alpine Scrub.

Based on the ecological importance of forest falling in different eco value and canopy density class, relative weight age factors have also been taken into consideration. The Net Present Value per ha of forest has been fixed based on these data. For calculating the average Net Percentage Value per ha of forest in India, the following components provided by forest is considered.

i. Value of timber and fuel-wood.
ii. Value of NTFP.
iii. Value of fodder.
iv. Value of eco-tourism
v. Value of bio-prospecting.
vi. Value of ecological services of forests.
vii. Value of flagship species.
viii. Value of carbon sequestration.

Based on the above, the NPV was fixed and the following recommendations have been made by the Hon'ble Supreme Court of India.

Eco value class	Very dense forest (canopy density 70% and above i.e. 0.7 and above) Rate of NPV in	Dense Forest (Canopy density from 40% to 70% i.e. 0.4 and up to 0.7) rate of NPV in	Open forest (Canopy density below 40% i.e. below 0.4) rate of NPV in
Class-I	10,43,000/-	9,39,000/-	7,30,000/-
Class-II	10,43,000/-	9,39,000/-	7,30,000/-
Class-III	8,87,000/-	8,03,000/-	6,26,000/-
Class-IV	6,26,000/-	5,63,000/-	4,38,000/-
Class-V	9,39,000/-	8,45,000/-	6,57,000/-
Class-VI	9,91,000/-	8,97,000/-	6,99,000/-

The Net Present Value of the forest of Keonjhar W.L Division as per NRSC report'2019 is projected below considering the forest under eco value class as per the guideline of Govt. of India. The Forest type of Keonjhar(WL) Division comes under broadly in 3 categories such as

1. Tropical moist deciduous forest such as Rebana, Atei, Santoshpur
2. Tropical Dry deciduous forest such as part of Rebana, Atei&Gayalmunda, Palalspal, Mahulpanga
3. Tropical Semi evergreen forest such as part of Rebana

The NPV value of forest comes under eco class I & eco class III

NPV of forests of Keonjhar (Wildlife) Division

Eco Value Class		Rate Per Ha. (In Lakh)	Area in Ha.	Amount (Rs. In Lakh)
Eco class I	>70% VDF (Very Dense Forest)	10.43	6200	64,666.00
	40 to 70% MDF (Moderately Dense Forest)	9.39	10585	99393.15
Eco class I	10 to 40% Open Forest (OF)	7.30	28190	2,05,787.00
Eco class III	<10% (Scrub)	6.26	13637	85,367.62
Total				**4,55,213.77**

Similarly, the non-tangible values mostly the environmental services have been prescribed for the forest land vide Govt. of India Letter No. 11-16/85-FRY (CONS.) Dtd. 15.1.1985. Since, both NPV and Environmental loss are calculated basing on the rate envisaged in the aforesaid orders throughout the country. Both the values are taken together to determine the total value of the forest. For the sake of convenience of calculation, the forest area belonging to different class has been converted to the area of fully stocked forest having 1.0 density. The details of such calculation for Keonjhar WL Division have been furnished in the tabular statement given below.

Valuation of Environmental service of forest of Keonjhar (Wildlife) Division.

Density Class	Average density of the class	Area in Ha. of the density class	Converted area in Ha. to fully stocked 1.0 density.	Environmental value per ha. per year in Lakh	Total environmental value in lakh
Above 70%	1.0	6200.08	6200	2.53	15686.00
40 to 70%	0.55	10584.76	5822	2.53	14729.66
10 to 40%	0.25	28189.96	7048	2.53	17831.44
Below 10%	0.05	13637.24	682	2.53	1725.46
Total		57734.04	19752	2.53	49972.56

Total Valuation: The capital value of the forests of Keonjhar (Wildlife) Division has been computed as taking sum total of NPV and valuation of Environmental Services per Ha. Forest.

Tangible (NPV)	455213.77
Intangible Environmental value	49972.56
Total	505186.33

9.7 BUDGETARY ALLOCATION TO FORESTRY SECTOR:

Table No. 9.3 : Budgetary allocation during 2007-08 to 2020-21

YEAR	FUNDS ALLOTMENT	FUNDS UTILIZED
2007-08	7635612	7635612
2008-09	14299314	14299314
2009-10	9091507	9091507

2010-11	10683163	10683163
2011-12	12208059.3	12208059.3
2012-13	16243786	16243786
2013-14	20224231	20230231
2014-15	21458270	21458270
2015-16	13725260	13725260
2016-17	20359560	20359560
2017-18	23932223	23932223
2018-19	50735413	50735413
2019-20	42858657	42858657
2020-21	33850897	33850897

9.8 EXISTENCE OF MONITORING ASSESSMENT & REPORTING MECHANISM:

For proper monitoring of different schemes, the department has a Cell under the control of the Addl. Principal Chief Conservator of Forests ((Monitoring & Evaluation)with the support of the Chief Conservator of Forests, Conservator of Forests, Divisional Forest Officer to perform the field work. The external monitoring of works has been performed by FSI as per guidelines of Central Government.

For evaluation of prescription of Working Plan, control forms prescribed by the department are given in **Appendix-XX B.** These forms are meant for evaluation of fellings+, subsidiary fellings, progress of regeneration, statement showing the deviations & works of maintenance, improvement and protection. It is the responsibilities of the Regional Chief Conservator of Forests to review the control forms annually during the annual office inspection of his sub-ordinate offices. The Regional Chief Conservator of Forests & his superior are supposed to inspect the coupes & see the exact requirement of operation in the different Working Circles.

9.9 PUBLIC AWARENESS AND EDUCATION :

Publicity and extension education is an important part of the Forest Department. Literature in the form of posters, pamphlets, hand outs on forest laws, fire protection are being printed and distributed to the public. For the general awareness, different acts & rules if printed in vernacular language will educate the general man. Public are educated through wall paintings &signage also. Meetings are being organised on fire protection, protection of Wildlife, Protection of Forests from illegal felling during celebration of World Forestry Day, World Environment Day, Wetland Day, Vanamahotsav Week, Wildlife Week celebration. People are educated about overall protection of Forests & Wildlife. For development of consciousness amongst the people “PrakrutiMitra”, ”PrakrutiBandhu” and Biju Pattnaik Award for wild life conservation have been introduced by the Forest Department, taking into consideration the remarkable work in the field of forestry sector. Emphasis must be given forinvolvements of Eco Club members for environmental awareness & their love for nature as a future green Corp.Media including electronic & print to be regularly briefed about forestry activities, awards, offences & success stories of protection by VSS. The list of award winners for the year from 2007-08 to 2016-17 is given in the Table No.9.4.

Table No. 9.4 : List of PrakrutiMitra&PrakrutiBandhu Award Winners (ECO Club) From 2007-08 to 2020-21

Year	District	Block	PrakrutiMitra	PrakrutiBandhu
2007-08	Keonjhar	-	-	-
2008-09	Keonjhar	-	-	-

2009-10	Keonjhar	Anandapur	Rural Reconstruction Organisation, At/Po-Tukuna	-
		Ghasipura	Cosmopolitan Club, At/po- Madanpur	BailochanSahoo At/po- Atasahi
2010-11	Keonjhar	Anandapur	MaaThanapatiBhaigaParibashUnanyan Committee, At- Kathakata	IndramaniNayak, At- Panchupali
		Ghasipura	MaaTarini VSS, At- Nuamalia	Niranjan Jena, At- Nandabara
		Hatadihi	AnchalikMahilaMandal, At- Hatadihi	Premananda Mishra, At- Ambagadia
2011-12	Keonjhar	Hatadihi	KeonjharBanchao, At- Kuradhighasa	
2012-13	Keonjhar	Anandapur	Voluntary Institute for Social Activities(VISA) At/po- Atopur	SahadevSethy, At/po- Belabahali
		Ghasipura	Alati Village, At/po- Alati	Ajay Kumar mohanty At/po- Sainkul
		Harichandanpur	Harichandanpur High School, At/Po- Harichandanpur	BhramarabaraSahoo At/po- Bhanarpur
		Hatadihi	Green Odisha At/po- Kuradhighasa	PitabasaPradhan, At- Dalki
2013-14	Keonjhar	Ghasipura	SaraswatiSisumandira At/po- Alati	GhanasyamSahoo At/po- Alati
		Anandapur		BailochanSutar At/po- Fakirpur
		Hatadihi	Bharatiya Association for Rural & Social Human Activities(BARSHA) At- Joragadhia	PrativaManjari Behera At- Kuradhighasa
2014-15	Keonjhar	Anandapur	Panchayat High School,Barigaon At/poBarigaon	ManguluCharanRana At/po- Kodapada
		Ghasipura	HansaHansiliAdibasi Youth Club At- Champapasi	Chaitanya Dash At/po- Khaliamenta
		Hatadihi	Gadachandi Yuba Parisada At- Sundarapal	SudarsanaPanigrahi At/po- Kahaligadia
2015-16	Keonjhar	Anandapur	Sunduria VSS At- Sunduria	Kamalakanta Dash At/po- Anandapur
		Ghasipura	KhetramohanVidyapitha At/po- Salapada	BhimasenRana At/po- Bhandaridiha
		Hatadihi	RamachandiAnchalika Development Committee At/po- Podasingidi	BishnuprasadBoitai At- Hatadihi
2016-17	Keonjhar	Anandapur	Marshapal Primary High School	Birabhadra Panda

			At- Marshapal	At- Barigaon
		Ghasipura		Keshaba Chandra sahoo At/po- Naduan
		Hatadihi	Balabhadra Nodal UP School At- Jambhira	Bijay Kumar Saha At- Chapundia
		Harichand anpur	GayatriParibar, GayatriSaktipitha, Mining Road.	Ramesh Chandra Mishra At- janghira
2017-18	Keonjhar	Anandapur	Primary School, Marshapal	Birabhadra Panda
		Hatadihi	Balabhadra Nodal UP School, Jambhira	Bijaya Kumar Saha
		Ghasipura	-	Keshaba Chandra Sahoo
		Harichand anpur	GayatriParibara	Ramesh Chandra Mishra
	Keonjhar	Anandapur	Panchupali High School Panchupali At/po- Panchupali	Judhistira Rout
2018-19		Ghasipura	D.N. Vidyapitha, At/po- Alati	PadmanavaHota
		Hatadihi	SulanaJalasarapur UP School, At- Badapalaspal	Chaturbhuja Das
		Harichand anpur	ChandanGiri High School, At- Badapalaspal	ParikhitaBaliarsingh
2019-20		Anandapur	Govt. Girls High School, Anandapur	Mani CharanParida
		Ghasipura	AtasahiGrama	
		Hatadihi	Govt. UP School, Dalki	BiswaRanjan Behera
		Harichand anpur	-	DuryodhanaNaik
2020-21		Anandapur	-	BailochanSutar
		Ghasipura	Panchayat High School, Balarampur	-
		Hatadihi	National Youth Club, Chapundia	-

9.10 ADEQUATE MANPOWER IN FOREST DIVISION :

The details of sanctioned permanent and temporary posts are given in the Table No. 9.5.

Table No. 9.5 :Sanctioned strength of staff of Keonjhar WL Division, Anandapur as on 31.03.2020.

SL. NO.	Name of the Post	Sanctioned strength	Present position.	Vacancy/ Excess
1	D.F.O.	1	1	0
2	A.C.F.	2	2	0

3	Range Officer	4	4	0
4	Range Officer (H.M.)	1	0	1
6	Dy. Ranger	3	2	1
9	Forester Section	25	21	4
12	Forester Guard	52	30	22
15	Head Clerk	1	0	1
16	Jr. Accountant	5	5	0
17	Jr. Clerk	7	3	4
18	Jr. Stenographer	1	0	1
19	Amin	1	0	1
20	Driver (L.V.)	1	0	1
21	Office Peon	2	2	0
22	Chowkidar	1	1	0
23	Sweeper	1	1	0
24	Mali	2	1	1
Sources - DFO, Keonjhar (WL) Division, Anandapur				

Incumbency List of D.F.O- The incumbency list of Divisional Forest Officers in different plan period is given in the Table No. 9.6.

Table No. 9.6 : Incumbency List of D.F.O

Sl No	Name of the D.F.O	Working period	
		From	To
1	Sri S.K. Mallick, OFS	01.10.2003	09.03.2005
2	Sri A.K. Mohapatra, IFS	10.03.2005	19.05.2005
3	Sri S.K. Mallick, OFS	20.05.2005	22.07.2005
4	Sri T.A.K. Sinha, IFS	23.07.2005	16.10.2007
5	Sri A. Brahma, OFS	17.10.2007	13.12.2007
6	Sri B.K. Parida, OFS	14.12.2007	17.05.2012
7	Sri B.N. Thakur, IFS	18.05.2012	26.11.2013
8	Sri R.K. Lenka, IFS	27.11.2013	24.01.2014
9	Sri S.K. Behera, IFS	24.01.2014	28.02.2017
10.	Sri S.K.Mahakud, OFS-I(J.B)	28.02.2017	07.03.2017
11.	Sri A.K.Satpathy, OFS-I (S.B)	07.03.2017	30.11.2019
12.	Sri B.Panda, OFS-I (S.B)	30.11.2019	01.01.2020
13.	Sri A.K.Satpathy, OFS-I(S.B)	01.01.2020	Continuing
Sources- DFO, Keonjhar (WL) Division, Anandapur.			

9.11 CATEGORY OF LABOUR AND WAGES:

The labourers are classified into Unskilled, Semi-Skilled, Skilled and Highly Skilled categories depending on their experiences and types of works. Accordingly the wages differ and the Government from time to time under the provision of the Minimum Wage Act fixes it. The different wages in force from 24.07.2015, vide Notification No.3716-LL-I-(AR)1/15/LESI

dt.30.04.2015 of Labour Commissioner, Odisha are given in the Table No. 9.7.

Table No. 9.7 : Category of Labour and Wages

Sl. No.	Quality of labour	Description of labour	Name of labour
1	Unskilled	It involves in simple operation and requires little or no skill on the job.	Mulia, Watcher
2	Semi-skilled	It involves some degree of skill and competence acquired through experience on the job and which is capable of being performed under the supervision of a skilled employee.	Mate, Helper, Cleaner
3	Skilled	It involves skill or competence acquired through training as apprentice into technical institute and the performance of which calls for initiative and judgment.	Driver, Typist, Clerk
4	Highly skilled	It involves skill or competence of extraordinary degree and supervising ability.	Head mason, Supervisor, Manager, and Cashier
Sources- DFO, Keonjhar (WL) Division, Anandapur.			

9.12 : PAST AND PRESENT WAGES:

The rate of all common articles including food materials are in increasing order. It is now essential to maintain equilibrium among persons of different status. Accordingly the wages of different qualities of labourer are in increasing order. Forest Department needs all qualities of labourer in different projects. The comparison of wages of all categories of labourer between past and present as per Labour and Employment Department is given in the Table No. 9.8.

Table No. 9.8 : Rate of Wages of all category of labour in Rs.

Year	Unskilled	Semi-skilled	Skilled	Highly skilled
1976	4.0	5.0	7.50	8.00
1981	6.00	7.50	10.00	12.50
1990	25.00	30.00	40.00	40.00
1996	30.00	36.00	48.00	48.00
1998	32.50	38.50	44.50	50.00
2000	40.00	48.00	56.00	64.00
2002	50.00	60.00	70.00	80.00
2004	52.50	62.50	72.50	82.50
2006	55.00	65.00	75.00	85.00
2007	70	80	90	100
2008	70	80	90	100
2009	90	103	116	129
2010	90	103	116	129
2011	90	103	116	129
2012	150	170	190	205
2013	150.00	170.00	190.00	205.00
2015	200.00	220.00	240.00	260.00
2016	207.20	227.20	247.20	267.20
2017	213.50	233.50	253.50	273.50

2018 (1.4.18 to 3.8.18)	224.30	244.30	264.30	284.30
2018 (3.8.18 to 31.3.19)	280.00	320.00	370.00	430.00
2019	298.00	338.00	388.30	448.00
2020	303.40	343.40	393.40	453.40
Sources- DFO, Keonjhar (WL) Division, Anandapur.				

9.13 : ANALYSIS OF WAGES:

The operation carried out in the forest with an aim to increase the volume of the growing stock and develop the present condition of the vegetation. All schemes prepared by the Forest Department are labour generated. The Forest Guard is taking the attendance of labourers in the Muster Roll while executing the field works. The labourers shall receive their wages for maximum six days in a week. During the Plan period the rate of wages has been increased from Rs.55.00 to Rs.298.00 for unskilled labourer. The rate of wages has been increased to 363.63 % within 10 years. Therefore the rise of wages per year is 36.36 %. Depending on the increase of wages, all estimates during the current Plan period will be furnished in the concerned chapter.

CHAPTER-X

FIVE YEAR PLANS

10.1 After Independence, the first Five Year Plan had been started from the year 1951 and by 2016-17, 12th Five Year Plan period is going to be completed. The main reason was the financial allocations for the different sector made in the Five Year Plan. In every plan period, the financial allocation in forestry is less than 1% of the total outlay of the country, which covers more than 25%of the land resources of the country. Thus one of the obvious reasons for the deterioration of the forest resources in quantity and quality wise in our country. The probable principle for allocation of plan and outlays may be the contribution to the country's gross National Revenue from Forestry Sector which is around 1%.The allocation of funds to forestry sector should be linked with the livelihood needs of the citizens dwelling in the vicinity of forest and their proportion is around 20% of the country's population and also take into accounts the huge environmental services provided by the forests. The Five Year Plan proposals have a great impact on attaining the management objectives and conservation of natural forests.

The financial allocation to the forestry sector was Rs.76 million at the time of initiation of 1st Five Year Plan, which went up to Rs.40818 million in the 8th Five Year Plan in (1992-97). Altogether Rs.85 billion had been spent from the 1st F.Y.P. to the end of 8th F.Y.P. that ended in 1996-97 on forestry development activities in the entire country. During this spell of time afforestation activities of about 26.9 million Ha. had been carried out.

The general priorities and investments made in the whole of the Union of India are also discussed below (in gist) to give a general picture regarding the investment trends in the forestry sector.

10.2 THE FIRST AND SECOND FIVE YEAR PLANS (1951-61) :

The first five year plan was launched in 1951 and it focus on agriculture as there was a severe food shortage in the country at that time. The power and transport were also priority areas. Forests got new direction during the Plan Period as the New Forest Policy in 1952 was enunciated. Large forest areas were diverted for agriculture during this plan period. As the second five year plan focused rapid industrialization, heavy and basic industries, the forests were felled for industrial uses and timber. Bamboo forest especially were given on lease to paper and pulp industries in these plans.

In this decade, the focus was on the rehabilitation of the degraded forests and the creation of plantations of economically important species. In the second plan, the stress was also on the conservation of Wild Life.

10.3 THE THIRD FIVE YEAR PLAN (1961-66) :

This plan laid special emphasis on measures to meet the long term requirements of the country. This ensured more economical utilization of the natural resources. The main objective was to increase the output from the existing forests through better techniques of timber extraction, improvement of communications and popularizing the minimum use of timber after seasoning and preservative treatment. Various schemes implemented in this period were oriented towards attaining self-sufficiency in industrial timbers, fuel wood and

other forest products. A new centrally sponsored scheme "Plantation of Quick Growing Species" was introduced. Improved logging tools have been used to reduce wastage of timber. Training of Forest Officers, Lessees and Forest Contractors in logging planning and efficiency studies were started with the assistance of United Nation Special Fund.

10.4 THE ANNUAL PLANS (1966-69) :

In this period three annual plans year have been implemented, where specific emphasis was laid on plantation of quick growing species, plantation techniques and modernizing harvesting.

10.5 THE FOURTH FIVE YEAR PLAN (1969-74)

In this plan period , there were three main objectives such as –

(a) To increase the productivity of forests.

(b) To link up forestry development with various forest based industries.

(c) To develop forests as a support to rural economy.

Emphasis was laid on measures to meet the immediate & long term agricultural and industrial requirements. Further efforts were made at creating large scale plantation of valuable quick growing species and species of economic and industrial importance. Concerted efforts at regenerating areas, where forest produce was removed for industrial uses, were taken. The object was to achieve self sufficiency in forest products as early as possible, specially for major forest based industries such as pulp, paper, news print, wood panel products and matches so that the imports of these items may be replaced and some sizeable exports of pulp and wood panel products built up. In the last two years of the plan period several important developments have taken place like promulgation of Orissa Forest Act,1972, Wild life (protection) Act,1972, and launching of Project Tiger in 1973.

10.5.1 Scheme wise Expenditure Incurred on Different Forestry Schemes in India:
I . State Scheme & Centrally Sponsored Scheme:

Table No. 10.1 : State Scheme & Centrally Sponsored Scheme

Sl. No.	Scheme	1st plan 1951-56	2nd plan 1956-61	3rd plan 1961-66	Annual plan 1966-69	Total plan 1951-69	4th plan 1969-74
1	2	3	4	5	6	7	8
1	Economic plantation for Industrial & commercial uses.	111.91	486.88	1163.16	934.01	2695.96	2014.99
2	Rehabilitation of Degraded Forest	16.42	199.23	380.58	229.84	826.07	322.17
3	Farm forestry – cum- fuel wood plantation			109.54	151.93	261.47	361.25
4	Development of minor forest products.			151.74	148.09	299.83	107.44
5	Communications	42.27	247.65	555.98	335.50	1181.40	553.01

6	Consolidation of forests(including survey & demarcation)	14.63	61.83	199.30	194.19	469.95	367.75
7	Development of pastures & grazing			52.93	47.13	100.06	77.82
8	Nature conservation		99.52	175.07	125.32	399.91	445.32
9	Training of staff	41.75	74.00	178.43	136.49	430.67	147.83
10	Timber operations			285.77	246.97	532.74	554.19
11	Forest protection			107.03	62.79	169.82	115.25
12	Working plan Organisation			121.55	100.90	222.45	132.91
13	Forest Research			25.61	46.64	72.25	156.27
14	Publicity			14.03	13.44	27.47	47.41
15	Establishment of Statistical cell & Planning cell				13.55	13.55	38.63
16	Construction of building	43.97	115.27	247.40	149.94	556.58	405.99
17	Amenities to staff & labour			48.05	14.63	62.68	31.10
18	Intensification of management				20.57	20.57	29.43
19	Cultural operation				42.89	42.89	71.33
20	Plantation of quick growing species			406.48	939.45	1345.93	1685.59
21	Forest Resources Survey			32.11	34.47	66.58	101.92
22	Miscellaneous scheme (NES)	478.83	738.28	248.54	95.47	1561.12	821.79

II. Central Scheme :

1	Forest Research Institute & Colleges		41.85	17.39	27.45	86.69	101.29
2	Delhi Zoological Park		56.20	34.67	6.43	97.30	22.75
3	Pre-investment survey of forest Resources			8.17	71.54	79.71	143.14
4	Logging Training Project			3.06	16.19	19.25	35.44
5	Scheme-wise details	100.00				100.00	6.85
	Total	**849.78**	**2120.71**	**4566.59**	**4205.82**	**11742.90**	**8898.86**
	Source: Report of the National Commission on Agriculture,1976, Part-IX, Forestry						

10.5.2 Financial Achievements upto Fourth Five Year Plans:

Scheme-wise details of expenditure incurred on forest development in the country is given below.These figures show that during 1951-69, 23% has been spent on economic plantations for industrial and commercial uses. The same percentage was maintained in fourth plan period. The scheme on Farm Forestry-cum-fuel wood plantations accounted for 2.2% of the total expenditure for the period 1951-69.

10.6 THE FIFTH FIVE YEAR PLAN (1974-79) :

In this plan period the main objectives were to take up a dynamic programme of production forestry, aiming at clear felling and creating large scale men made forest with the help of institutional financing and to develop farm forestry, improve degraded forests so as to increase the fuel and timber supply in the rural areas. A network of State Forest Corporations was proposed to be created for establishment and management of man-made forests and forest based industries. Special efforts were proposed to be made to prepare a number of projects in various States, for immediate and long term benefits in terms of increased raw materials for industries and additional revenues at different levels of investment.

10.7 ANNUAL PLAN (1979-80) :

In this plan period, emphasis was laid on plantation for rehabilitation of degraded forests.

10.8 THE SIXTH FIVE YEAR PLAN (1980-85) :

In this Plan period, the objective was to increase the productivity through proper land and water management, preservation of genetic and species diversity for the management of the ecosystem and further sustainable utilization of the resources. This helps in a big way for the future survival and development of the people. The necessity for constitution of Biosphere Reserve was also felt.

10.9 THE SEVENTH FIVE YEAR PLAN (1985-90) :

In this Plan period the main objectives were to restore the degraded ecosystem through proper field schemes, such as land reclamation, forestation, cleaning of water bodies Research training etc. The programme is also geared towards arresting for the damage to ecosystem and the promotion of a conservation based development strategy. It was to lay emphasis on the Research and Training aspects also, hence the Botanical Survey of India (BSI), Zoological Survey of India (ZSI) are re-oriented to deal with the lower forms of like fungi, bacterial invertebrates etc .Man and Biosphere Programme were also oriented towards the ecosystem development. Implementation of the Biosphere Reserve Programme started in the seventh plan with the Department of Environment acting as a nodal agency. The conservation programmes in the Reserves was to be supplemented by strong component of research studies on the living and non-living resources, rare and endangered species, socio economic interactions with local/surrounding populations and ethno biological relationships.

Eco-development programme like restoration of already degraded eco-systems through practical field schemes such as land reclamation, afforestation, cleaning of water bodies, etc. was to be strengthened in this plan period.

10.9.1 Review of The Seventh Plan :

Seven Biosphere Reserves were set up for preserving the genetic diversity in representative ecosystems. Ecological restoration work was undertaken in fragile areas. Schemes were initiated on breeding of plants and commercial utilisation of medicinal plants. A national environmental awareness campaign initiated in 1986 was continued. it covered a wide spectrum of the population through different media, and involving more than 200 non-governmental organisations.

10.9.2 Forest and Wild Life Policy :

A "National Forest Policy 1988" was formulated in December 1988 with the principal aim of ensuring environmental stability and maintenance of ecological balance. The Forest Conservation Act, 1980 was amended in 1988 to facilitate stricter implementation and to plug certain loopholes.

Implementation of the 10-point National Wildlife Action Plan (NWAP) was started. The Wildlife Institute of India published a comprehensive report incorporating a workable biogeographic classification system.

10.9.3 Afforestation Programme :

In the Seventh Plan there was increase in the total area brought under afforestation programme. Block plantations, strip plantations and farm forestry were carried out. Plan funds were made available through Forest Departments in the States. These were further supplemented in 15 states with new projects which received external assistance. While the total afforestation during the Sixth Plan period was only 4.65 million ha., the coverage in the Seventh Plan period was 8.87 million ha. A number of programmes of afforestation were taken up to secure people's participation. Under this scheme, priority was given to :

I. Establishment of decentralised nurseries and school nurseries.
II. Block plantation especially on community land and lands of SC/ST and people living below the poverty line.
III. Pasture development through people's participation and involvement.
IV. Assistance in the implementation of the Tree Patta Scheme.

Social Forestry Projects that were initiated in 1981-82 for periods ranging from five to eight years continued in the Seventh Plan. They envisaged tree planting and afforestation of 19,84,600 ha. of wastelands with a total investment of Rs.911.73 Crores. These Projects were assisted by several external agencies, including the World Bank, United States Agency for International Development, Overseas Development Agency of United Kingdom and Swedish International Development Agency etc.

Under the National Rural Employment Programme(NREP) and Rural Landless Employment Guarantee Programme(RLEGP) carried out by the Department of Rural Development, 25% of the funds were specifically earmarked for the social forestry component, during the first four years of the Seventh Plan. The afforestation component under theseprogrammes was implemented by the State Forest Departments mainly on government and community lands, road sides and canal embankments. Since the availability of community land was limited, afforestation was also carried out on degraded forest lands. Bulks of the funds for the forestry

sector came from the Rural Employment Schemes under the social forestry component. The area afforested in successive five years plans and the amount spent is given below.

10.9.4 Progress of Afforestation Through Successive Plan Periods:

Table No. 10.2 : Progress of Afforestation

Sl.No.	Five year Plan period	Area Afforested in Plan period (Lakh Ha.)	Cumulative (Lakh Ha.)
1	First	0.52	0.52
2	Second	3.11	3.63
3	Third	5.83	9.46
4	1966-69	4.53	13.99
5	Fourth	7.14	21.13
6	Fifth	12.21	33.34
7	1979-80	2.22	35.56
8	Sixth	46.50	82.06
9	Seventh	88.70	170.76

10.10 ANNUAL PLAN (1990-92)

In this period, main objectives were to protect the environment, increase productivity and generate employments. Emphasis has been given for plantation in degraded area.

10.11 THE EIGHTH FIVE YEAR PLAN (1992-97)

The major objectives for this plan were:

1. To protect the natural environment;
2. To generate and restore degraded ecosystems and increase their productivity and to generate employment through these activities;
3. To decentralise control over nature and natural resources;
4. To develop and share an understanding of nature and natural process;
5. To formulate a national policy for environment and an appropriate institutional and legal framework in support of the policy;
6. To ensure co-ordinated and integrated Governmental action aimed at conserving nature and sustainable use of natural resources;
7. To make individuals and institutions more accountable to the people for their actions impinging on environment and eco-system;
8. To monitor the state of environment.

Further National Park and Sanctuaries would be strengthened. Stress will also be laid on eco-development, especially around protected areas, so that the human population in these areas is not deprived of the basic life support resources and continue to participate in the protection of the environment.

10.11.1 Review of Eighth Plan : Bio-Diversity Conservation :

The scheme on Bio-diversity Conservation was initiated during 1991-92 to ensure proper co-ordination among various agencies concerned with the issues relating to conservation of biological diversity and to review, monitor and evolve adequate policy instruments for the same. The Convention on Biological Diversity (CBD) was signed by 168 countries, including India, during the Rio meetings. India has since ratified the Convention.

During the Eighth Plan, considerable attention was given to make the pollution control laws more effective and to bring umbrella legislation for protection of environment. A number of Central and State executive authorities have been delegated powers for effective implementation of the Environment Protection Act. The Air (Prevention and Control of Pollution) Act-1981 and the Water (Prevention and Control of Pollution) Act-1974 have been amended to bring certain provisions of the Acts at par with those of the Environment (Protection) Act-1986.

During the Eighth Plan, a Centrally Sponsored Scheme 'Modern Forest Fire Control Methods in India' was continued. The scheme was launchedduring the Seventh Plan with UNDP assistance as a pilot project in Uttar Pradesh and Maharashtra mainly to protect forests from fire. The project was implemented in 13 states during Eighth Plan.

10.11.2 Afforestation of Degraded Forests:

The National Afforestation and Eco-Development Board was created at the time of the bifurcation of the erstwhile National Wasteland Development Board, then under the Ministry of Environment and Forests in July,1992. Areas adjoining forests and fragile eco-systems were brought under the National Afforestation and Eco-Development Board (NAEB), while other wastelands were covered under the newly created National Wasteland Development Board in the Department of Wasteland Development in the Ministry of Rural Areas and employment. An outlay of Rs. 461 crore was finally allocated to the NAEB for reclaiming degraded forest area adjoining forests during the Eighth Plan. Some of the schemes of NAEB are given in the table below.

Sl.No.	Name of the Scheme
1	Integrated Afforestation and Eco-Development Projects Scheme (IAEPS)
2	Fuel wood and Fodder Project Scheme
3	Non-Timber Forest Produce Scheme
4	Grants-in-Aid Scheme
5	Encouraging NGOs for taking up Afforestation and building upon peoples' movement.
Source:	Developing Wasteland, Ministry of Environment and Forests.

10.12 THE NINTH FIVE YEAR PLAN (1997-2002) :

The main objectives of this plan were :

i. Empowering thepeople through information generation, dissemination and access.

ii. Involving the Industry in both the private and the public sector.

iii. Integrating environment with decision making through valuation of environmental

impacts; evolving market based economic instruments as an alternative to the command and control form of environmental regulation; appropriate pricing of natural resources based on their long-term marginal cost of supply; appropriate fiscal reforms and natural resource accounting.

iv. Evolving the rights for common property resources.

v. Inter-sectoral coordination and cooperation.

vi. Ensuring scientific and technological inputs.

vii. Participation of people (particularly women) in the management and sharing of usufruct through Joint Forest Management.

viii. Involvement of NGOs for awareness building and as an interface between forest department and the people would be encouraged during the Ninth Plan.

10.12.1 The main emphasis was to be given to the participation of people in the management and sharing of usufruct through Joint Forest Management. The involvement of NGOs was also sought for building awareness and acting as an interface. The priority was also to be given to the development of villages in and around the forest areas. It was also decided to take up the survey and demarcation of existing forest area during the Ninth Plan. Efforts were to be made to take advantage of various Employment Generation Schemes of Rural Development Department to supplement funds for plantation activities. Emphasis was also laid down on the research aspects like tree improvement, non-timber forest produce, agro-forestry, alternatives of timber, value addition to the various forest produce etc. The efforts were to be made to empower the women by ensuring their involvement from micro-planning stage to implementation and usufruct sharing.

10.12.2 **Evaluation of Ninth Plan:**

The programmes/schemes of Ninth Five Year Plan were generally similar to those taken up during the Eighth Plan, such as Integrated Afforestation and Eco-development project, Fuel wood and Fodder Project Scheme, Non-Timber Forest Produce Scheme, Grant-in-Aid Scheme, Seed development Scheme etc. With greater focus and improved implementation on the basis of the experience gained during Eighth Plan. The Planning Commission had set up a Working Group to examine the prospects of leasing out of degraded forest lands to the private entrepreneurs/Forest Corporations.

The main term of reference of the Working Group was to assess the economic, social and environmental feasibility of leasing or otherwise making degraded forest land available to the private entrepreneurs/ Forest Corporations. The Working Group submitted its report and did not recommend leasing of forest land to the private entrepreneurs either directly or indirectly through forest corporation.

10.13 THE TENTH FIVE YEAR PLAN (2002-2007) :

The main objectives of this plan are :

- Bringing one third geographical area under the forest cover.
- Adopting Watershed approach to develop and maintain the forest cover.
- JFM would be given more thrust for the regeneration of the degraded forests.
- The livelihood needs of the people living adjoining to the forests would be addressed.
- Efforts would be taken to reduce the import of the timber and the timber

requirementwould be met from the community lands, private farm lands and degraded lands.

- Food for work programme would be extensively implemented in the forest pockets toensure food security and productive employment.
- Efforts would be taken on protecting the natural forests to have a better carbon tradingpotential to increase the market avenues for forest protection and management.
- The conservation and protection of the medicinal plants is given priority.
- The bio-diesels coming from plants like jatropa, Pongamia etc. Would be promoted toencourage the livelihood opportunities of the rural masses.It was also decided to merge all Afforestation Programmes under National Afforestation and Eco-development Board (NAEB) into one scheme called 'National Afforestation Programme' and it would be implemented through Forest Development Agency (FDA).

10.14 ELEVENTH FIVE YEAR PLAN (2007-08 TO 2011-12):-

The different activities have been taken up in this division during the 11th five year plan periods depending on the allocation. The details of the work done and the expenditure made for the purposes are given in the Table No. 10.3.

Table No. 10.3 : Details of work done and expenditure incurred

Expenditure various work of Keonjhar (WL) Division in 11th plan period.

Year	Establishment Expenditure		Total Establishment	Work expenditure	G.Total Works + Establishment
	Salary	Others			
2007-08	7432000	186000	7618000	7183061	14801061
2008-09	8470000	75000	8545000	14365323	23544388
2009-10	9067263	111802	9179065	8327297	19831297
2010-11	11099000	405000	11504000	9471385	24738383
2011-12	14717998	549000	15266998	10393408	25660406

Sources- DFO, Keonjhar (WL) Division, Anandapur.

10.15 TWELFTH FIVE YEAR PLAN (2012-13 TO 2016-17):-

This plan seeks to have broad vision of faster, sustainable and more inclusive growth. Whereas inclusiveness is to be achieved to poverty reduction, reducing inequality, empowering people, the sustainability includes ensuring environmental sustainability, development of human capital through improve health, education, nutrition and development institutional capabilities. The plan envisages toincrease green cover by 1 million ha every year during the 12th Five Year Plan.

The different activities have been taken up in this division during the 12th five year plan periods depending on the allocation.The details of the work done and the expenditure made for the purposes are given in the table given below.

Table No.10.4 : Expenditure various work of Keonjhar (WL) Division in 12th plan period.					
Year	Establishment Expenditure		Total Establishment	Work Expenditure	G.Total Works + Establishment
	Salary	Others			
2012-13	16815230	687000	17502230	16253756	33755986
2013-14	18340746	724053	19064799	29056906	48121705
2014-15	20533829	793039	21326868	21458220	42785088
2015-16	20768416	1403284	22171700	13725260	35896960
2016-17	5644203	260508	5904711	1075486	6980197
Sources- DFO, Keonjhar (WL) Division, Anandapur					

10.16:NITI AAYOG:

Govt. of India in 2014 abolished Planning Commission and created NITI AAYOG through an executive resolution.

NITI AAYOG or National Institution for transforming India is a policy think tank of the Govt. of India established with an aim to achieve sustainable development goals with co-operative federation by fostering the involvement of State Govt. in the economic policy making process using a bottom-up approach. Forestry sector has found a special place in the sustainable development goals of Odisha. The decade old five year plan will make way for 3 year action plan which will be part of 7 year strategy paper and a 15 year vision document.

This plan stressed upon the following points in the forestry sector and this needs to be attended to.

10.16.1. Suggestion for future plan in Forestry sector

I. Biodiversity conservation strategy
II. Local governance and participatory forestry.
III. Increased flow of NTFPs.
IV. Sustainable forest management.
V. Improved forest extent and conditions.
VI. Higher allocation, investment, insurance and incentives for better forest management.

10.16.2. Biodiversity conservation strategy-

It is the biological diversity which includes different variety of animals, plants, micro-organisms and genes and various types of ecosystems. It is an important task for us to conserve it at any cost. Different threats to our biodiversity are:

i. Degradation,Fragmentation and loss of habitat.
ii. Spreading invasive species.
iii. Unsustainable use of natural resources.
iv. Inappropriate fire regimes.
v. Change of climate.

There are two types of biodiversity conservation methods.i.e In-situ conservation and Ex-situ conservation. Out of these In situ conservation is the most appropriate method for biodiversity conservation. In this strategy one has to find out the area with high biodiversity of species and planning should be done accordingly. It is an important tool to help mitigate the climate change.

10.16.3. Local governance and participatoryforestry–

The inclusion of local community in the management of state owned forestry resources has become increasingly common in the last 25 years. This participatory forestry refers to the processes and mechanism that enables those people to have a direct stake in forest resources. This five years plan aims at more participation at local people in the management of forest. JFM with involvement of local people is the right way to achieve sustainable forest management in forestry sector.

10.16 .4. Increased flow of NTFPs -

NTFPs are biological resources of plant and animal origin harvested fromthe natural forest,plantations, farm lands and trees outside forests. These products are the vital source of income, nutrition and sustenance for many forest based community. The use of NTFP s has received attention in light of their perceived potential to address to both poverty reduction andforest conservation. It is suggested that better management and utilization method has to be set for diversifying products benefits for the local community. Interest in NTFPs was predicted upon a few assumption i.e

i. Scientific Commercial exploitation of NTFPs is less ecologically destructive than timber harvesting and thus as better potential

ii. For sustainable forest management.

iii. NTFPs will more directly benefit people living nearby forest compared to timber harvesting.

iv. Contribution of NTFPs to livelihood of local rural communities is likely to persist as long as the resources are exploited on unsustainable basis.

vi. NTFPis one option for slowing the rise of green house gas concentration in atmosphere by removing carbon and storing in forest.

10.16.5:Sustainable forest management:

It is the management of forest accordingly to the principle of sustainable development. It is the balance between ecological,economic and sociocultural. It is the environmentally appropriate,society beneficial and economically viable management of forests for present and future generation. It ensures that the forest resources are preserved to meet the needs of future generation .It increases people benefits including timber and food to meet society needs in a way that conserve and maintains forest ecosystem for the benefit of present and future generations.

Conservation methods :

1. Conservation methods must be taken within perfect coordination between forest dept. and other linedepartment.

2. Peoples participation is vital.

3. Cutting the trees should be stopped.
4. Celebration of function,festivals should proceed with tree plantation.
5. Cutting of timber and other forest product should be restricted.
6. Grassland should be regenerated.
7. Forest conservation act should be strictly implemented to check the deforestation.
8. JFM should be followed.
9. Agro and Farm forestry should be encouraged.

But, however, attention must be given to under what conditions can NTFPs both plants and animals be sustainably harvested.

10.16.6. Improved forest extent and condition –

Evaluation on the status of the existing forest,their extent location,type and condition should be made,so that efforts can be made for further improvements of forest.Forest resources assessmentgenerally provides information on forest type,condition,wood volume and biomass. They may be done on a sub national, national,regional or global level.Global assessment are done in one of two ways:using a bottom –up approach which harmonizes and sums national statics or using a top down approach in which data are generated at the regional,continental or global level.

10.16.7. Higher allocation, investment, insurance and incentives for better forest management –

In the present context where massive plantation programme is desirable higher allocation of fund should be given in order to counter the adverse global warming and to mitigate the green house effect. Higher investment in the afforestation programme by the different institutions should be given top priority.Insurance sector should come forward to ensure the various plantation activities in the govt. level and private level. JFMs should be implemented in most of the forest and incentives should be given to the protection committees to encourage them in the protection and sustainable management of those forest areas where they are actively involved.

Further, protection machinery should be strengthened or modernised with infrastructure and staff augmentation for rigid protection and conservation of Natural Forest for its bio diversity. If biotic pressure is reducedwith rigid fire protection measures, the existing natural forests will be restocked. Depleted vegetation may come up as dense stands. Rivers originating from forested hills may not go dry during summer, once the barren hills are green.

INVESTMENT IN FORESTRY SECTOR (In million of Rs.)

The details investment in forestry sector in different plans is given in Table No.10.5.

Table No. 10.5 : Investment in Forestry Sector

Plan/Year	Total Plan		Agriculture Plan		Forest & Wildlife Plan		Forest Outlay
	Outlay	Actual	Outlay	Actual	Outlay	Actual	(% of total)
First Plan (1951-1956)	23780	19600	3540	2900	76	85	0.32
Second Plan (1956-1961)	45000	46720	5100	5490	212	212	0.47
Third Plan (1961-1966)	75000	8577	10860	10890	458	459	0.61
Annual Plan (1966-1969)	66250	66225	10370	11070	419	421	0.63
Fourth Plan (1969-1974)	159020	157790	27280	23200	894	938	0.56
Fifth Plan (1974-1979)	393220	394260	47660	48650	2088	2088	0.53
Annual Plan (1979-1980)	126010	121760	18150	19960	683	683	0.54
Sixth Plan (1980-1985)	975000	1092920	125390	152010	6924	6924	0.71
Seventh Plan (1985-1990)	1800000	2187300	222330	315090	18519	19759	1.09
Annual Plan (1990-1991)	647170	583690	91420	85420	6299	5764	0.97
Annual Plan (1991-1992)	723170	647500	100580	90600	7831	7153	1.08
Eighth Plan (1992-1997)	4341000	-	636420	-	40820	39930	0.94
Ninth Plan (1997-2002)	-	-	-	-	68228	-	-

Source: Developing Wastelands, Ministry of Environment and Forests.

CHAPTER – XI
PAST SYSTEM OF MANAGEMENT

11.1 **HISTORY**:

11.1.1 Prior to April 1896 there was no specific rule for conservation and management of forests. The then Maharaja of Keonjhar introduced some rules which came in to force on 1st April 1896. According to these rules people belong to large villages and small hamlets collected forest produce within a distance of 04 kms. and 02 kms. from their villages respectively. However collection of forest produce from greater distances required permission.

The primitive tribes i.e. Bhuyans and Juangas of Keonjhar District were practising jhum called shifting cultivation without any limitation though they were allowed to do the same within certain area. As per suggestion of Mr. A.N Gravey, an Agency Forest Officer, a number of Forest Blocks were taken up for reservation. It had no effect over the areas dominated by Bhuyans and Juangas. The constant efforts to motivate the tribes to be away from these illegal practices was failed rather they continued this practice up to integral pocket of the plateau destroying the valuable Sal forest.

A commercial exploitation system of forest management called "Ghati" was started in Boula Forest Block where a contractor purchased the right to sale the forest produce over certain area. On receipt of permits from the contractor, the people cut and removed the timber from the forest. Huge quantities of railway slippers were removed from Boula Forest Block during those periods

Certain rules were framed in 1896 for conservation of Forests. In the beginning one Head Moharir, two Moharirs and eight Peons were deployed for implementation of these rules. In 1901, the number of staffs increased and forest revenue amounting Rs. 23,887/- was collected. Attempts were made to place the Department in an organised way. In 1907, the British Government took over the direct management of forest and reservations of Forest Blocks were taken on priority which was started in Atei Block during the year 1911 and completed by 1924.

11.1.2 **Early Forest Exploitation :**

The selection and demarcation of Forest Blocks was completed soon after the closure of settlement operation during 1915. A lease was granted in favour of Mr. B. Barooah in 1906 and without any operation he delegated the rights to Bengal Timber Trading Company in 1910. In the lease contractproper management of forest, economic conversion of timber, number of trees removed and period of contract has not been mentioned. Revenue oriented felling work without considering the carrying capacity of forest resulting the Sal rich forest into a pole crop in many cases. Over exploitation of forest without any tending operation converted pure Sal forest to a miscellaneous one as seen in patches of Rebana Block at present.

11.1.3 **Systematic Working Plan**:

Dr. H.F Mooney, SC. D.F.L.S prepared the 1st Working Plan for Reserve Forestsand Proposed Reserve Forests of Keonjhar Forest Division from 1930 to 1960 which was implemented up to 1945-46. Thereafter Mr. A.B Lal wrote the Plan for 20 years from the period from 1945-46 to 1964-65. The Working Plan for the period from 1969-70 to 1988-89 was written by Mr. Prasad which got approval in the year 1983. Mr.Bhaskar Chandra Mohapatra, IFS's Plan was for 10 years from 1984-85 to 1993-94 and was extended up to 2003-04 vide No 3-RCMP/05

dtd.1.11.93 of CCF (Central), Govt. of India. The Working Plan from 2007-08 to 2016-17 was prepared by Mr. Narayan Samal, A.I.F.C, OFS-I.

11.2 PAST SYSTEM OF MANAGEMENT AND THEIR RESULT :

11.2.1 Dr. H.F. Mooney's Plan :

After expiry of lease period of Bengal Timber Trading Company, the first systematic Working Plan was written by Dr. H.F. Mooney for the period 1930 to 1960 which came into force on Dt.1.4.1930. No systematic management was there prior to this plan though the protected forests were managed under a system called Coppice with standard since 1915. He prescribed 3 working circles namely:

i) High Forest Working Circle.

ii) The Coppice Working Circle.

iii) The Miscellaneous Working Circle.

i. High Forest Working Circle :

Rebana Block came under this working circle where one felling series was formed by clubbing the Forest Blocks together. Felling cycle was 30 years and exploitable girth was 4.5 feet. Improvement felling was prescribed after main felling. The plan was not based on scientific inventory of growing stock. It resulted in inclusion of scrub jungles and unproductive areas under this Working circle thus upsetting the yield calculation. The annual coupes were invariably laid out in such a way that they embraced the best forests containing large number of trees resulting in temporary inflation of yield.

Except Rebana Block where there was no demand for small timber, improvement felling had been carried out and gave better result. But the whole forest could not be covered up during entire plan period. Thinning in the coupes could not be done due to want to sufficient fund. Suppressed and dominated trees could not be removed properly. Marking of selection coupes could not be done properly by the untrained Forest Officials. Climber cutting was not carried out in Rebana Block though prescription was there.

ii. The Coppice Working Circle :

Part of Santoshpur Block came under this working circle. Due to less demand for small timber and fire wood, the operations could not be done in time. Cleaning was prescribed in the second year and thinning in 10^{th}, 20^{th} and 30^{th} year. But cleaning operation was badly neglected due to paucity of funds for which there was poor crown formation and congestion in growth rate.

iii. The Miscellaneous Working Circle :

This Working Circle covered Atei Forest Block where there was ban on felling of green trees except removal of dead and dry trees. In rest of the area, thinning was prescribed which was badly neglected due to want of funds. The growing stock was allowed for sufficient rest either for its poor quality or due to inaccessibility which aimed that the crop could improve and different working circle may be prescribed in the next plan.

11.2.2 **Mr.A.B.Lal's Plan** :

After severe damaged by flood in Baitarani river attempts were made for plantation activities in Hatibandha and Nuniapatna Block of Anandpur Range. Sir S.H.Howard, the then I.G Forest, Govt. of India inspected this area and suggested for better management of forest by introducing conversion to uniform working circle where there is better quality of Sal Forest with profuse regeneration.
Mr.Lal's plan came into force from 1945-46 in which he had prescribed 7 Working Circles as follows.

i. Sal Conversion Working Circle :

This Working Circle aimed to convert the existing irregular forests into relatively even aged crop with a normal series of age classes**.** All good quality Sal Forests concentrated regenerations were included in this Working Circle which considered justifiable due to heavy demand and favourable market conditions. All these blocks were having easy accessibility.In absence of any tabular statement of felling or anything mentionedabout annual coupes in the map,the prescriptions for this Working Circle were defective. The compartments said to have been shown in the map had not been marked in the field. Thinning was not also prescribed in a tabular statement.

ii. Selection Working Circle :

In this Working Circle, felling was banned because of concentrated regeneration and inaccessibility areas. Selection-cum-improvement felling was prescribed with a felling cycle of 20 years and rotation at 140 years. No enumeration was done. Yield was fixed by area. 1/3rd of trees having exploitable girth were allowed to be felled. Remaining 2/3rd of trees was required to be healthy and sound for another 20 years. Climber cutting was prescribed along with main felling. Restrictions were imposed on felling of miscellaneous trees depending upon market demand and Silvicultural grounds. Subsidiary silvicultural operations included cutting back of damaged trees, felling of marked trees left over by the contractor, removal of trees standing over healthy advanced growth, thinning of congested crop and cleaning in moist area to favour Sal regeneration. Fire protection measures were strictly imposed. Grazing was strictly prohibited.

Due to remoteness of the area and scarcity of laborers many difficulties developed in the way of extraction of timber from coupes. This situation improved towards the end of plan period when the retention of exploitable girth trees was reduced from 66⅔% to 33⅓%. There seems to be no record of retention of reserved trees. No steps were taken to select healthy trees of exploitable diameter for the subsequent felling cycle. Subsidiary Silvicultural operations were ignored.

iii. Selection Coppice Working Circle:

Atei and Santoshpur blocks with two felling series were included in this Working Circle. Since these forests were susceptible to theft regularly, importance was given on catering to the needs of local people. The Silvicultural system prescribed was selection felling with coppice regeneration. Rotation was for 60 years and felling cycle was of 20 years. Yield was regulated by area. The rules of marking included cutting of all Sal trees of exploitable girth with climber cutting. Trees in the blanks without regeneration and valuable species were retained. Subsidiary Silvicultural operation included cutting of damaged trees and

unhealthy poles. Heavy restrictions were imposed on fire and grazing.None of the prescriptions of the working plan was seriously adhered to. Only annual coupes were marked. No steps were taken to regenerate the blanks or to get required coppice regeneration. Sound trees below exploitable girth were removed.

iv. Coppice Working Circle:

A part of Boula Forest was included in this Working Circle which is not a part of Working Plan area.

v. Protection Working Circle :

Forest under this Working Circle was divided into two groups. (a) Protection Forest which were meant for prevention of soil erosion and regulation of stream flow (b) Other forest in inaccessible area having good advance pole crop. Parts of Rebena and Boula Forest Blocks come under first category whereas Palaspal Block was under second category. Annually 50 Ac of plantation prescribed for Rebena Block with plantation of Sabai grass whereas thinning with improvement filling was recommended for Rebana. The above prescription was not implemented at all.

vi. Nistar Working Circle :

This Working Circle was constituted with an aim two open praja coupes to meet the requirement of local people. 27 felling series consisting of B class Reserve Forest over an area of 27,307.10 Ha allotted this Working Circle. Subsidiary Silviculture operation with fire protection and control of over grazing was prescribed. Increasing demand population damages the forest. Repeated fire and heavy grazing obstructed the regeneration. Inadequate Silviculture operation and failure to adopt swing and planting made this working circle deteriorated.Tenants payment nistarcess were allowed to work out the coupes from October to March every year. Half of the royalty extra was charged for extraction after March.

Playing out of annual coupes became unsystematic due to want of management map. Coupes could not be opened in thick populated areas due to want of materials.

vii. Plantation Working Circle:

Nuniapatna and Hatibandha Forest Block of Anandpur Range over 147.10 Ha. was allotted to this Working Circle. Casuarina and Sissoo were recommended for plantation. Both these species responded well in Hatibandha R.F over 83.4 Ha. However, 66.37 Ha in Nuniapatna Block did not respond well. Subsequently, plantation was taken up with Gambhar and Khaira in this area which was not successful.

11.2.3 **Prasad's Plan** :

During 1964 Mr. G.G. Das and Mr.P.K.Pani were assigned for revision of Working Plan of Keonjhar Division. Sri U.N. Sarangi, IFS was entrusted to complete the plan written by Mr.Pani who proceeded on deputation. Mr.Sarangi made some changes of the revised plan which was prepared for 1969-70 to 1988-89.

The plan prepared by Mr.Sarangi was not approved and printed. Thereafter, Mr. Prasad was entrusted with redrafting the plan. Mr. Prasad in his revision suggested 8 Working Circles as detailed under.

i. Sal conversion working circle :

A portion of Boula Reserve Forest included in this circle which does not come under this Working Plan.

ii. Selection Working Circle :

Santoshpur and a portion of Atei comes under this Working Circle. Enumeration of trees in the circle could not be done on the ground of variation of growing stock, poor vegetation, heavy encroachment and mining activities. Yield had been fixed by area. Safeguarding factor was 33%. Exploitable diameter for Sal in Rebana Block fixed to be 45cm. whereas for other species it was 35cm. Thinning with felling and subsidiary silviculture operation were prescribed.
Though some percentage of safeguard has been prescribed, but proper record were not maintained. Subsidiary Silviculture operation was totally neglected in some area. Dislocation in implementation of the prescription was noticed inRebana East felling series. A large number of trees marked in approach class and sub approach class in Santoshpur, Musala and Rebana Forest Block adversely affected the future yield. Heavy improvement marking had resulted in over felling.

iii. Improvement Working Circle :

The Forest Blocks instead of keeping under protection Working Circle could be brought under management through some conventional Silvicultural system as per recommendation of Working Plan Committee.

iv. Coppice Working Circle :

Under this Working Circle, 16 felling series were retained and 7 felling series were diverted to selection working Circle. 12 to 15 trees of 20 cm dbh were prescribed to be retained as standard per acre. Selection marking was prescribed in hill slopes whereas coppice was prescribed in lower slope with a rotation of 40 years. Thinning was prescribed during 10^{th}&25^{th}years.

Coppice felling in this division produced a very poor crop because of inadequate cultural operation, illicit felling, grazing, fire damage and massive mining operation.

v. Nishtar Working Circle :

Rotation was 40 years, 12 standards per acre and all advance growth up to 10 cm dbh was prescribed for retention. Regeneration cleaning showing and planting in open patches were prescribed; fire protection and grazing were also prescribed.
Serious irregularities were noticed in many nishtar felling series for non-availability of exploitable materials, heavy illicit felling and less public demand. Retention of advance growth was completely ruled out.

vi. Plantation Working Circle :

Three planting series over 1444.8 Ha were assigned to this Working Circle with an objective to rehabilitate and afforest the depleted B class R.F of Salapada and to harvest the matured plantation in Nuniapatna and Hatibandh Forest Block.

vii. Mining Working Circle :

Mr. Prasad formed this Working circle with the following objectives.

1) To clear the forest growth in advance of mining operation.

2) To maintain a vegetative cover over the mining lease areas except the mine faces as a measure of soil and water conservation.

3) To maintain vegetative cover over the idle mine faces and mines-spoils to prevent erosion.

4) To manage forests to get as much financial return as possible.

This working circle covered an area of 3792.7 ha. with three felling series. Coppice system was prescribed with a rotation of 40 years. Out of the three felling series, F.S covering a Rebena R.F., coupes was opened while no work was done in O.M.C. F.S. Although the main objective of management was to exploit forest growth before mining operations were started. The above objectives have not been fulfilled due to lack of proper co-ordination between Forest Department and Mines owner.

Viii :Soil Conservation Working Circle :

Mr. Prasad constituted this working circle covering a part of Rebena R.F. and extending over an area of 8,837.2 ha. This was previously included in Protection Working Circle in Lal's plan. The prescriptions were mainly Improvement fellings, which included both Selection and Improvement marking. Climber cutting, Contour bonding, Contour trenching and Gully plugging.

No action as per prescription under this Working Plan has been taken.

11.2.4 **Mohapatra's Plan** :

Mr. Bhaskar Ch. Mohapatra prepared the working plan of Keonjhar Division for the period from 1984-85 to 1993-94. Five working circles have been prescribed by Mr. Mohapatraviz; i. Sal Conversion Working Circle, ii. Selection Working Circle, iii. Coppice Working Circle, iv. Plantation Working Circle and v. Rehabilitation Working Circle.

i. Sal Conversion Working Circle :

Thinning and cleaning were prescribed for this Working Circle. Thinning was prescribed at 10^{th} and 20^{th} year with enrichment planting in blanks and eroded areas. From the yield table it was found that Sal reaches an average crop diameter of 42 centimeters in 120 years. Also want of big size timber was gradually becoming out of fashion for which he fixed the rotation at 120 years. Prescriptions were made for judicious opening in top stories to facilitate natural regeneration and removal of dead, uprooted and definitely hollow trees.The area, which had been converted during Mr. Lal's plan were kept under P.B.V. Regeneration was adequate, though Subsidiary Silviculture Operation was completely neglected during last plan. No felling was prescribed in this P.B except removal of dead, uprooted and visibly hollow trees. Climber cutting was prescribed all over along with C/D grade thinning in Sal areas.Ban was imposed on cutting of fruit bearing trees, trees in nala banks and eroded gullies. Climber cutting and control on fire were prescribed as Subsidiary Silviculture Operation. Mr. Mohapatra emphasized that, a complete stock map of the area should have to be done soon after thinning and cleaning, which would indicate the area to be taken up for artificial regeneration. He suggested for fire protection definitely for five years after cleaning and thinning. Artificial

regeneration was prescribed where Sal regenerations were less than 600 established Sal poles per ha. Due to such continuous conversion system, larger size trees were removed. At many places permanent gaps in the canopy were created and in some areas there were congestion also. Mr. Mohapatra suggested for strict Subsidiary Silviculture Operation measures and heavy restriction of grazing, fire and biotic interference but those were not followed. The prescriptions of plantation in eroded blanks were not carried out anywhere. Due to periodic block system, the mature trees were removed and lower girth class trees were heavily congested which badly hampered the diameter growth of the trees and thereby required yield could not be attained. Due to removal of bigger size trees the natural regeneration also hampered.

ii. Selection Working Circle :

In addition to the area allotted for this working circle to remain as such. In addition, he kept Atei, Santoshpur R.Fs under this circle where the crop was defective and unsound. The poorer crop of Rebena RF bordering to Atei RF near Baripal, Sagadapata and Alutuma village were also brought under this working circle. He emphasized to keep poorer and defective Sal areas under this circle. The main objectives were to protect, maintain and improve forest cover on hill slopes in the interest of soil and water conservation, to improve the composition of principal species through sound Silvicultural system, to encourage natural regeneration through proper tending operation and to maintain a balanced uneven aged crop.The crop condition in Rebena West, Rebena North, Rebena South, Rebena East are comparatively better than the rest of the areas like Santoshpur and Mushal South under this Working circle. Even the crop conditions in the later areas were mostly defective and unsound. Lower exploitable girth for Sal was fixed at 30-cm. d.b.h. in Mushal South, which led to heavy exploitation of Sal. Because of fixation of the lower exploitable girth, heavy marking and felling occurred leading to excess removal of sound and unsound trees. Whatever trees left as mother trees, were illicitly removed. Similar fate was also marked in Rebena West F.S. and Santoshpur F.S. where exploitable diameter was fixed at 35 cm. at b.h. Further, due to imposition of moratorium, the coupe working was stopped from 1992-93. So the objectives of Mr. Mohapatra could not be fulfilled.

iii. Coppice Working Circle :

This Working Circle includes the areas with heavy biotic interference and easy accessibility into the forests. In spite of this Sri Mohapatra had marked a very good regeneration in these blocks and kept them under Coppice with reserve system, as there was no other alternative. The main objectives of the prescription were to meet the local demand for small timber, poles, firewood and industrial requirements of poles, pit-props, tram line cogging and Charcoal and to have maximum yield.As these forests were having easy accessibility, did not sustain to the demand of the over population. So, slowly and gradually, the small timber and pole crops were illicitly removed and finally converting the tract into a bushy forest. The regenerations as observed were not actually from seed origin rather those were from coppice origin. Some of the coupes were devoid of trees at the time of working started.

iv. Plantation Working Circle :

This working circle was allotted over an area of 4367.99 Ha situated mostly on planes or gentle slopes of Boula and fringes of Atei R.F. The main objective of this working circle was to bring back the value of the forest by replacing the inferior

species with plantation of species like Teak, Semul and Bamboo and to restock the open forest with the valuable species. The objectives could not be achieved in practical due to various hazards like inadequate allotment of funds etc.

v. Rehabilitation Working Circle :

Mostof the degraded forest blocks were included in this working circle with a view to restock the barren, eroded and depleted areas and to tend the existing growth. Soil and Moisture conservation measures were suggested to check erosion and denudation. Steep hill slopes, devoid of vegetation were to be rehabilitated. Adequate protection against biotic interferences such as theft, fire, grazing was also prescribed. Mr. Mohapatra suggested retaining and tending of all existing growth except dead and up rooted trees. The species advised for plantations were Khair, Chakunda, Gohira, Karada, Siddha, Babool, Rohini, Mahala, Bamboo, Sisoo and Sabai grass. He also suggested for mixed plantation of fruit bearing trees and fodder species in the proximity of villages namely Subabul, Agasti, Mango, Tamarind and Jackfruit species. The prescriptions were very sound from the socio economic angle. But it could not be implemented due to paucity of funds.

11.2.5 **Narayan Samal's Plan** :

Revised working plan for the Reserved Forest and Proposed Reserved Forest of Keonjhar (Wildlife) Division has been prepared by Sri Narayan Samal, AIFC, OFS (I), the then Working Plan Officer, Working Plan Division, Keonjhar for the period 2007-08 to 2016-17. The revised working plan has been approved by the MoEF, Govt. of India in phases i.e. 2011-12 [(letter No. 13-FCWP-OS-KJR dated 05.08.2011, 2012-13 to 2013-14 (letter No. 13-FCWP/OS-KJR dated 07.02.2013 and 2014-15 (letter No. 13-FCWP/OS-KJR dated 30.05.2014)]. The aforesaid working permission granted for the year 2014-15 is the last working permission and no further working permission has been accorded by MoEF, Govt. of India for the year 2015-16 and2016-17. Considering the excessive biotic pressure on the forest resources and the present requirement of the increasing population on the forest products, the objective of management of the outgoing plan of Sri N. Samal, DFO are given below.

1) Maintenance of environmental stability through preservation and wherever necessary restoration of ecological balances that has been adversely disturbed by depletion of forest cover. As such, regulated felling of trees shall be confined to removal of dead, dying, up rooted and silviculturally available trees.

2) To increase forests and vegetal cover to help checking of soil erosion in hill slopes and denudation of catchments and riverbanks, water bodies and reservoirs by maintenance of permanent closed cover.

3) To maintain the hydrological cycle and to regulate water yields.

4) To conserve the natural heritage by preserving vast variety of flora and fauna, maintain biodiversity and genetic resources of the division.

5) To improve the condition, composition and productivity of the forests through appropriate scientific management and increased investment.

6) To meet the requirement of fuel wood, fodder, MFP and small timber of the rural and tribal population without putting additional pressure on the forest.

7) To supplement sustainability and the livelihood security of the people, living in and around it.

8) To create massive awareness amongst the people with the involvement of women

for achieving these objectives and minimizing pressure on forest.

9) To provide employment opportunity to the rural people, particularly weaker sections of the society through above-mentioned conservation oriented activities.

10) Not to look upon forest as a source of revenue.

11) To bring the Non-forest areas having forest growth to the management fold of the Department and to increase the forest cover.

11.2.5.1 **Discussion on working circles:**

Keeping in view of theabove objectives of management the following working circles have been constituted. The area allotted under different working circle is given in Table No. 11.1.

Table No. 11.1 :Constitution of working circle

Sl. No.	Name of the Working Circle	Area in ha.
1	Improvement of working Circle	31529.8628
2	Plantation Working Circle	2638.6034
3	Rehabilitation Working Circle	29228.6177
4	Village Forest Working Circle	411.540
5	Wild Life(overlapping) Working Circle	63397.0839
6	NTFP overlapping Working Circle	63397.0839

The range wise forest area allotted to each working circle is given in Table No. 11.2.

Table No. 11.2 : Range wise forest area allotted to different working circle (Reserve Forest)

Name of Range	Area	Improvement WC	Rehabilitation WC	Plantation WC	NTFP (Over lapping WC)	Wildlife WC
Anandpur	12274.9099	6596.5962	5678.3136	-	12274.9099	12274.9099
Brahmanipal	21998.0947	10989.1665	10611.9627	396.9655	21998.0947	21998.0947
Deogaon	28781.3971	13944.1001	12849.3417	1987.9533	28781.3971	28781.3971
Total	63054.4016	31529.8628	29139.6180	2384.9208	63054.4016	63054.4016

Proposed Reserve Forest:

Table No. 11.3 : Range wise forest area allotted to different working circle (PRF)

Name of Range	Area	Improve ment WC	Rehabilitation WC	Plantation WC	NTFP (Overlapp ing WC)	Wildlife WC
Brahmanipal	88.9997	-	88.9997	-	88.9997	88.9997
Deogaon	253.6826	-	-	253.6826	253.6826	253.6826
Total	342.6823	-	88.9997	253.6826	342.6823	342.6823
G. total	63397.0839	31529.8628	29228.6177	2368.6034	63397.0839	63397.0839

11.2.5.2 **Selection Working Circle**:-

No forest blocks were included under this working circle.

11.2.5.3 **Improvement Working Circle :**

The forest blocks with young Sal crops having good regeneration and good rooted stocks were allotted to this working circle. This working circle was constituted with 6 R.F. blocks namely Baigundi, Baranga, Ostapura, parts of Santoshpur, Rebana and Atei comprising of 31529.8628ha. Improvement felling along with removal of dead, diseased and malformed trees was prescribed in those areas. During 2010-11, two coupes namely STP-V and BPT-V in Santoshpur R.F and Baliparbata R.F respectively were worked out. 13 Nos. of trees suitable for felling were marked and felled. As a result of which 10.5816 cum timber and 14 stacks of fire wood were collected from the above coupes.

Subsidiary Silviculture Operation with soil and moisture conservation was also prescribed for the above Forest Blocks. Grazing was strictly prohibited and the coupes were rigidly free from fire. Though prescriptions as above were made, no activities have been carried out from the year 2007-08 to 2013-14.

11.2.5.4 **Plantation Working Circle:**

The forest blocks with permanent blanks and devoid of rootstock were kept under this working circle. The existing plantations raised in the past were included in this working circle. Parts of R.F. block of Atei & Turkipada, PRF block of Sapanposi and Tangiriapal comprising of 2638.6034ha.were kept under this working circle. No plantation was raised in the year 2007-08 and 2008-09, though more than 600 Ha. was prescribed for this purpose. Plantation raised under different schemes like FDA, CAMPA and OBDP etc. Survival percentages of the plantations vary from 20% to 80%. Biotic interference is the main reason for poor survival of the plantations.

11.2.5.5 **Rehabilitation Working Circle** :

This Working Circle was formed with main objective to arrest further degradation by adequate protection, nurse, and enrich the existing crop and taking up plantations wherever necessary with people's participation. The Working Circle covered 29228.6177ha.area in 13 RFs namely Gayalmunda,Hatibandha,Kuldiha,Meghanadpahi,Nuniapatna,Panasdiha,Patilo,partsofSantoshpur, Mahulpanga, Palaspal, parts of Rebana, parts of Atei, Kadagotha and 1 PRF namely Brahmanipal. During the last plan period, 7706.699 Ha has been covered under this Working Circle. No operations were carried out in the year 2007-08 and 2011-12. In rest of the years, achievement was very less in comparison to the area under prescription except the year 2015-16 & 2016-17. Aided natural regeneration was done under various scheme like Economic Plantation, MGNREGS,FDA, SFDA and CAMPA. Similarly, water harvesting structures were constructed for Soil & Moisture Conservation purpose.

A comparative statement showing the area according to prescription and achievement under Improvement Working Circle, Rehabilitation Working Circle and Plantation Working Circle is given in the Table No. 11.4.

Table No. 11.4 : Comparative statement of Improvement Working Circle, Rehabilitation Working Circle and Plantation Working Circle.

Year	Improvement Working Circle			Rehabilitation Working Circle			Plantation Working Circle		
	Area as per prescription (in Ha.)	Achievement (in Ha.)	% of Achievement	Area as per prescription (in Ha.)	Achievement (in Ha.)	% of Achievement	Area as per prescription (in Ha.)	Achievement (in Ha.)	% of Achievement

2007-08	2963.2988	-	-	2838.7573	-	-	300.7414	-	-
2008-09	2753.4884	-	-	2851.7267	200	7	303.626	-	-
2009-10	4092.3907	-	-	2363.0544	1070	45	394.7898	365	92
2010-11	3029.5255	-	-	3102.6522	10	0.3	266.1329	437	164
2011-12	2773.2326	-	-	2719.3544	-	-	390.5289	20	5
2012-13	3460.0688	-	-	2566.6476	600	23	194.6514	185	95
2013-14	3210.5402	-	-	3443.0479	420	12	265.5605	193	73
2014-15	2570.0773	2700.00	105	3026.9704	180	6	223.9338	30	13
2015-16	2687.9393	2687.940	100	3087.4275	1608	52	148.6857	80	54
2016-17	3789.3012	3789.302	100	3109.3943	3618.699	116	149.9533	150	100
Total	31529.8628	9177.242	29	29228.6177	7706.699	26	2638.6034	1460	55
Source : DFO, Keonjhar (W.L) Division									

11.2.5.6 **Joint Forest Management Working Circle** :

Massive plantations have been undertaken by erstwhile Social Forestry Division, Keonjhar in most of the villages.56 numbers of V.S.S. have been constituted for protection and management of degraded forest over an area of 411.54ha. One hundred and two (102) Nos. VanaSurakshyaSamitis (V.S.S.) have been constituted in Keonjhar Wildlife Division with assigned forest area over 14034 ha. Fifty two (52) Nos. VSSs have been taken up under FDA covering an area of 1995 ha from 2007-08 to 2014-15.

11.2.5.7 **Non Timber Forest Produce (Overlapping) Working Circle**:

This working circle overlaps in three Ranges of this division viz. Brahmanipal Range, Deogaon Range and Anandapur Range. Importance was given on the collection of MFPs which may result in sustainable production. Sixty-four NTFP items have been handed over to the Gram Panchayats vide Govt. Of Odisha Resolution No.5503/F&E dated Bhubaneswar the 31st March 2000.The Boula Reserve Forest of Hadagarh Range has been excluded from this working circle as it is coming under Hadagarh Sanctuary. NTFP inventorisation has been completed in three (3) Ranges viz. Brahmanipal Range, Deogaon Range and Anandapur Range during 2012-13 under the State Plan scheme 13th FC.

11.2.5.7 **Wildlife (Overlapping) Working Circle** : As it is an overlapping working circle the area of this working circle extended over entire Division with an aim to protect, conserve and scientifically manage the rich and varied endangered species of wild life. Different activities as per Draft Working Plan prescription have been taken up for enrichment of wildlife habitats and protection of wildlife under different scheme as detailed under: -

i. Formation of Anti-Poaching Squad- Anti-Poaching Squads have been constituted by engaging 10 nos. of local youths having keen interest in nature and Wild Life with physical fitness to face the poachers in any unwanted situations under the guidance of Local Forester/Forest Guard. Each Squad is provided with a four wheeler for mobility and to collect intelligence regarding Wild Life Crime.

ii. Habitat Development Works undertaken- Habitat is regarded as a part of an area of environment in which an organism or biological population normally lives. There are certain pockets which are liked by wild animals and birds for their habitation. For improvements of habitats some efforts have been made to provide adequate food, water and shelter to the wild life which has been already discussed in Chapter – III.

iii. Control of man wild life conflict- The wild animals causing harm to the human beings are mainly Elephant, Bear and Wild Boar. The crop damaged by Elephants during the harvest season is a matter of great concerned. The no. of cases arised from such menace is already discussed in Chapter – III.

Working schemes 2018 – 19 to 2020-21

After the expiry of the outgoing plan, Working Schemes have been submitted by DFO, Keonjhar (WL) Division which have been approved by the Regional office, MoEF. Accordingly following works have been undertaken, which are depicted in the table No. 11.5A and 11.5.B.

Table No.11.5.A.Working Scheme

	Item	Year			
		2017-18	2018-19	2019-20	2020-21
Rehabilitation Working Circle	ANR (Gap Plantation)	295 ha.	2247 Ha.	2872 Ha.	1500 Ha.
	Silvicultural Operation	3789.3012 ha.	NIL	NIL	NIL
	Soil & Moisture Conservation	Check dam-1no. LBCD 96 nos Staggered Trench 5630nos Subsurface dyke 17nos. Earthen Bond 4000cum	LBCD 5nos. Staggered trench 743nos Sub surface dyke 2nos.	1. Check dam3nos. 2. LBCD 294nos 3.Sub surface dyke 61nos 4. Earthen bond 2057.34cum & 35650rmt	NIL
Improvement Working Circle	NIL				
Protection Working Circle	Fire Protection	Nil	38.344 Km Fire line creation	67.14 Km Fire line creation	Yet to be done
			683 Km Maintenance	356.36 Km Maintenance	Yet to be done
	Squad	02 squads of 10 persons	13 squads of 80 persons	13 squads of 80 persons	03 squads of 15 persons
		11 squads of 66 persons	17 squads of 96 person	17 squads of 96 person	13 squads of 80 persons
Plantation Working Circle	Block Plantation	120 ha.	16.59Ha.	228.9Ha. and 15 Ha. Bald Hill Plantation	60Ha.
Wildlife Working Circle	WHS	04 nos.	06 Nos.	05 Nos.	01 Nos.
	Meadow Development	11 ha.	25Ha.	52.6Ha.	NIL
	Immunizations of cattle	11 sites	11 Sites	17 Sites	NIL
	Weed eradication	92.83 ha.	79.13Ha.	150Ha.	To be taken up
Tree outside forest	Avenue Plantation	50 RKM	60 RKM	60 RKM	50
	Urban Tree Plantation	-	-	7000 Nos.	NIL

Source: DFO, Keonjhar(WL)

Table No.11.5.B.Abstract of Working Scheme						
Year	Improvement working circle (in Ha.)		Rehabilitation Working circle (in Ha.)		Plantation working circle (in Ha.)	
	Target	Achievement	Target	Achievement	Target	Achievement
2017-18	1366.4094	0	4435.6468	0	140	140
2018-19	1225.9008	0	4399.3142	1500 ANR	100	115
2019-20	4092.3907	0	2363.0544	500 ANR	125	110
2020-21	3029.5255	0	3102.6522	1500 ANR	25	60

Source: DFO, Keonjhar(WL)

11.2.6 **Status of JFM**

Joint forest management came into existence for protection, conservation & management of Forest by the Forest Department and local people combindly. Government of Odisha vide resolution No. 17240/FFAH, dt.01/08/1988 created village forest protection committees in order to protect Reserve Forest involving local people under usufruct sharing mechanism.
In the process of involving of people in protection and management of Forests got on impetus during 1990. Detailed guideline regarding constitution of VanaSurakshyaSamitis (VSS), executive committee, their duties, responsibility and benefits to VSS were issued vide resolution No. 10AF (Pro) 20/93- 16700/ F&E dt.03/07/1993. The resolution was revised and amended periodically in 2011 & 2015 with some addition like inclusion of villages located within National Park/ Sanctuaries as well as adjacent to the same covering RF/ PRF / VF/Revenue Forest having crown density less than 0.4 for protection & management of Wild Life habitat under Joint Forest Management.
In Keonjhar WL Division, 121 numbers of VSS have been constituted. Participation of local people is going momentum gradually in this score.

11.2.7 **Functioning of Forest Development Agency :**

National Afforestation programme has been formulated with a view to reduce multiplicity of schemes ensuring uniformity in funding pattern, avoiding delay in availability of funds to the field level and peoples participation in project formulation and implementation. The scheme is operated by National Afforestation & Eco-development Board, ministry of Environment & Forest & Climate change, Govt. of India. As 100% centrally sponsored scheme, the project is taking care of the developmental needs of the people through Entry Point activities. The scheme is implemented in participatory mode involving two-tier set up mainly Forest Development Agency (FDA) and joint Forest Management committee(JFMC). FDA is a federal body comprising all VSS of the Division and JFMC in a village level body where all the activities under the scheme are prepared. The most important thing to be developed is institutional building by which the village level institution will be able to manage the resources in a sustainable manner after stoppage of Government.
In Keonjhar WL Division, the scheme started functioning from 2008-09. The main components of the scheme areAided Natural Regeneration (ANR), Artificial Regeneration (AR), Mixed Plantation, Soil & Moisture Conservation (SMC) &strengthening of VSS etc.

There are80nos. of VSS under the FDA in Anandapur, Deogaon & Brahmanipal Range whose phase wise list is appended in the **Appendix XXI.** No interventions have been carried out in the VSS of 10th Phase of 2019-20.

The detail activities undertaken in FDA VSS taken up phase wise from 2009-10 to 2020-21(Plantation Year) is appended in **Appendix XXII.**

11.2.8 Invasive Weed Eradication :

The main evasive weeds found in different Forest Blocks of Keonjhar Wildlife Division areLantana, *Eupatorium* &*Ageratum conyzoides,* which obstruct the hygiene of the forest curbing productivity. The following forest blocks are treated for eradication of weeds during last plan period is given in the Table No. 11.6.

Table No. 11.6 : Forest blocks treated for eradication of weeds

Year	Name of the Range	Location	Area (In Ha.)
2007-08 to 2012-13	Nil		
2013-14	Anandapur	Santoshpur RF	8
	Deogaon	Atei R.F	8
	Brahmanipal	Rebana	9.3
2014-15	Anandapur & Hadagarh	Santoshpur, Atei, Boula R.F.	40
2015-16	-	-	-
2016-17	Anandapur	Santoshpur	12
	Brahmanipal	Rebana	
	Anandapur	Santoshpur	40
2017-18	**General Budget**		
	Anandapur	Baranga RF	4
		Kantpal	4.16
	Deogaon	Gounighasa	4.16
	Brahmanipal	Rebana RF	4.17
	CAMPA APO-2016-17		
	Anandapur	Hatibandha RF	5
		Atei RF	20
	Deogaon	Atei RF near Plabani	12.5
		Rebana RF near Chasatangiri	12.5
	Brahmanipal	Rebana RF near Ghat Road	25
2018-19	**CAMPA APO-2017-18**		
	Anandapur	Baranga RF	16.67
		Santoshpur RF	16.66
	Deogaon	Rebana RF	10.83
		Atei RF	5.83
	Brahmanipal	Rebana RF near Ghat Road	33.36
		Rebana RF near Talapada	16.64
		General Budget	
	Anandapur	Baranga RF	8.5
		Baranga RF	4
2019-20	**CAMPA APO-2019-20**		
	Anandapur	Chhitijhari	11.91
		Arjunbania	11.91
		Baranga RF	14.28
		Budhikud	11.9
	Brahmanipal	Chhutung	11.92
		Pongaposi	11.92
		Kanjiapal	28.57
		Talapada	11.92
		Sunapentha	5.5
		Rebana	11.93
		Pokharikiari	13.8
2020-21	NIL		

Source: DFO, Keonjhar(WL)

11.2.9 Fuel and Fodder Collection :

(i) In the past massive Plantations have been raised under SIDA assisted Social Forestry Project in Keonjhar Wildlife Division & subsequently declared as village forest, to fulfil the bonafide need of the villagers.

(ii) Plantations are raised in different schemes like F.D.A under Joint Forest Management in which people are collecting fire wood being the usufruct rights.

(iii) Plantations of fast growing fodder species & grasses are raised through VSS under different schemes to meet the requirement of fodder of the people.

Hence the pressure on collection of fuel wood& fodder from the RFs has remarkably been decreased.

11.2.10 Catchment Area Protection :

Catchment area treatment in different forest blocks have been undertaken through soil and moisture conservation measures to control surface run off, soil erosion, water conservation and enhancing water table in and around the forest area. Under this programme, loose bolder check dam, staggered trenches, gully plugging, brush wood check dam, machinery structures have been done.

11.2.11 Insect & Pest management :

The damage caused by the defoliators, borers & other insects to the Forests & Plantations has not been quantitatively estimated, However some of the harmful insects found in the Division are

(i) *Hoplocerambyxspinicornis* – Sal heartwood borer

(ii) *Hapaliamachaeralis*- Teakskeletonizer which damages Teak leaves.

(iii) *Hybleapeurea*– Teakdefoliator

No systematic management has been adopted to conclude the insects & pests & their harmful effects.

11.3 SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN :

11.3.1 Fire Protection :

Forest Fire causes great damage to the regeneration, young coppice suits and young pole crop. It destroys the organic elements and micro fauna in the upper layer of the soil, which are most essential for the growth of plants. It is primarily responsible for predisposing the trees to unsoundness. It also accelerates the process of soil erosion through the destruction of ground vegetation. The loss of increment due to fire is inestimable. The climatic condition envisages the period from February to May as most vulnerable for fire incidence.

It is obvious that efforts made so far to check fire have become extremely difficult without active support from the local people. There is lack of interest and willingness among the people at present. All attempts for complete fire protection have proved futile.
The following preventive steps are taken to combat fire hazard in the Division.

1. Formation of fire fighting squad :
   40 Nos of Fire Fighting Squads comprising 10 young persons in each squad are constituted to extinguish forest fire under the guidance of concerned Forester assisted by Beat Forest Guard during the fire season. Apart from this, 5 Nos of youth from each

VSS have been selected as VanaSathi for prevention of fire and to help the Forest Officials at the time of any eventuality.

2. 10 Nos. of Fire Blowers with fire fighting equipments such as Scrapper, Beater, Shoe, Helmet, Spot Lights etc have been purchased and provided to the Ranges to control forest fire.

3. Celebration of Fire Week :
In the last week of February, Fire Week is celebrated with involvement of frontline forest staff and VSS members to create awareness among the people to protect forest from fire. Leaflets explaining the harmful effect of fire hazard and remedial measures for its prevention and control in local languages are distributed. The VSS having outstanding performance in prevention of fire is awarded.

4. Operation of Control Room :
The Control Rooms in the Division office as well as in Range Offices are operated round the clock to keep constant vigil on the menace.Responsible staffs are deployed to collect information from higher quarters like GIS Cell, PCCF & HoFF.Bhubaneswar, FSI Dehra Dun on fire incidence/location and to transmit the same to the field for taking necessary preventive measures.

5. Convergence with other Department :
Co-ordination meetings are organised at Division level and Range level with the officials of Fire Department, OFDC Ltd, Kendu Leaf Wings and VSS members to discuss regarding plan of action for prevention and control the Forest Fire.

6. Incentives to VSS :
Incentives are given to VSS for controlling forest fire.

The details of action taken in different Forest Blocks to control forest fire from 2007-08 to 2020-21 areappended in **Appendix XXIII.**

11.3.2 Improvement in Communication:

11.3.2.1 Installation of VHF Station :
Very High Frequency Tower stations are installed in the Division office (Controlling Unit) and also in various locations within the Division for transmission of important and urgent messages. The person engaged in the Control Room is in touch with all the peripheral stations to contact twice in a day. Normally, 7 A.M in the morning and 7 P.M in the evening. All important messages are transmitted to the field level staff through VHF Station as and when required.

11.3.2.2 Internet Connectivity to Range Offices :
All the information are sent to different corner through e-mail, so that it can reach the destination within no time. For this purpose, Division office is well equipped and trained talented personnel are engaged for sending and receiving the information. Laptops & Desktops are supplied to the Division Office & Range Offices for this purpose.

11.3.2.3 Supply of Mobile Set/ GPS PDA :
Mobile Sets are issued to Foresters and Forest Guards for effective communication of important messages. Similarly, GPS PDA are supplied to the field staff for foot patrolling, asset mapping , illicit felling, elephant tracking, crop damage reporting, wild depredation etc. Forestry App has been introduced and uploaded in GPS-PDA & Mobile Set.

11.3.2.4 Supply of Vehicles :

Four wheelers like Camper, Jeep & Bolero have been supplied to the Ranges and Section Headquarters. Similarly, some of the Foresters and Forest Guards are supplied with Motor Cycles and fuel for use in the departmental work.

Detailed list of materials supplied to the Division Office & Range Offices are furnished in the Table No. 11.7.

Table No. 11.7 : List of materials supplied to the Division Office and Range offices

SL. No.	Name of item issued	Division Office	Anandapur Range	Deogaon Range	Brahmanipal Range
1	Mobile Set	3	10	9	10
2	GPS PDA	0	2	2	4
3	Vehicle(Four Wheeler)	2	1	1	1
4	Vehicle(Two wheeler)	2	2	2	3
5	Lap Tops	04	0	0	0
6	Desk Tops	09	02	02	02
7	VHF Stations	01	05	04	05
Source: DFO, Keonjhar(WL)					

11.3.2.5 Improvement of Forest Road and Inspection Path :

The total length of Notified Forest Road in Keonjhar(WL) Division is96Kms., in which 55 kms is coming under Working Plan jurisdiction. These forest roads are being maintained year wise for smooth management of Forest Division.

Table No. 11.8 : List of Forest Roads in Keonjhar(WL) Division, Anandapur as on 01.04.2020

Sl. No.	Name of the Forest Road	Name of the District	Name of the Range	Length in K.M.	Remarks
1	Chhenapadi-Sajanpal	Keonjhar	Hadagarh	25	
2	Kathakata-Pitanau		Hadagarh	9	
3	Dalki-Hadagarh		Hadagarh	3	
4	Raighati-Phuljhar		Hadagarh	4	
5	Hatichapal-Gayalmunda		Anandapur	8	
6	Sagadapata-Kanto		Deogaon/ Anandapur	17	
7	Brahmanipal-Palaspal		Brahmanipal	30	
			Total	96 kms	
Source: DFO, Keonjhar(WL)					

11.3.3 Interface Activities :

11.3.3.1 Formationof V.S.S/EDC:

VanaSarankshyanaSamiti and Eco-Development Committee are constituted to involve the local people in protection and management of forest. Meeting of General Body and Executive Body of the VSS/EDC are conducted time to time to discuss the details of plan and execution of different activities for development of forest& wild Life.

11.3.3.2 VanaSathi :

05 youth volunteers from each VSS are identified as VanaSathi to assist the forest officials in protection of forest, prevention of forest fire, wild life poaching and conflict resolution.

11.3.3.3 Celebration of Important Days :

Vanamohostav, Wildlife Week, World Environment Day, World Forestry Day, World Elephant Day are observed in Range and Division level involving the VSS/EDC members, students from Schools & Colleges, Govt. Officialsin order to create awareness.For outstanding performance in protection of forest the best VSS are awarded

11.3.3.4 Convergence with Other Department :

The VSS members are motivated to avail different welfare schemes from time to time from other Govt. Departments like Agriculture, Horticulture, Animal Husbandry, Health, Revenue etc. Self Help Groups are formed and link with banks for livelihood support. Every VSS are engaged in Swachha Bharat Abhiyan to make their villages clean and green. In most of the villages, VSS members are given LPG connection under PradhanmantriUjalaYojana for reduction of fuel wood requirement by them.

11.3.3.5 Formation of WhatsAppGroup :

AWhatsApp Group is formed involving all VSS members under "Ama Jungle Yojana" for communication ofdifferent activities of VSS among themselves.

11.3.4 Amenities to Staff :

11.3.4.1 Building: Building is the most important infrastructure which is essential to provide accommodation for the staff working mostly in remote and inaccessible areas. The detailed position of construction of building during the last plan period is given below. Besides this, all habitable buildings are repaired, renovated as and when required. Similarly, barracks are constructed in selective locations for accommodation of protection squad. Bore wells are dug for supply of safe drinking water to the staff. The details of construction of buildings during last plan period are given in **Appendix XXIV**

11.3.4.2 Provision for Vehicles :

Vehicles like motor cycle and four wheelers are supplied to the staff for use in performing departmental work.

11.3.4.3 Supply of Computer and GPS PDA :

GPS PDA device has been provided to the field functionaries which help in incident reporting like illicit felling, Forest fire, wildlife depredation animal death/injury, encroachment etc. It also helps them in tracking and arriving at the destination.

11.3.4.4. Supply of Mobile Phone :

Mobile phones are provided to Foresters and Forest Guards for easy and fast communication purpose.

11.3.4.5. Supply of Uniform Articles :

Uniforms like clothing, belts, shoes, mosquito net, rain coat and rain shoe are supplied to Foresters and Forest Guards as per provisions made in Odisha Forest Department Code, 1979.

11.3.4.6 Arms & ammunitions: To counter the smuggling activity the department has supplied various Arms & ammunitions for use at the time of Patrolling. The details are furnished In Table No. 11.9

Table No. 11.9 : Arms &Ammunition supplied to staff		
Sl.No.	Particulars	Nos.
1	12 bore D.B.B.L. gun	01
2	.315 Sporting Rifle	09
3	Revolver	05
4	Pump action gun	03
Source: DFO, Keonjhar(WL)		

11.4 PAST YIELD REVENUE AND EXPENDITURE :

Past Yield :

11.4.1 Improvement felling along with removal of dead, diseased, uprooted and malformed trees were felled during 2010-11 as per prescription. The detailed yield report is given in the Table No. 11.10.

Table No. 11.10 : Past Yield.				
Year	Name of the Forest block	Coupe No.	Yield	
			Timber(In cum)	Fire wood (Stacks)
2010-11	Santoshpur R.F	STP-V		
2010-11	Baliparbata R.F	BPT-V	10.5816	14
Source: DFO, Keonjhar(WL)				

11.4.2 Keonjhar Wildlife Division was separated from Keonjhar Forest Division Vide F&E Department Notification No.1F(A)-99/2003/13214/F&E Dtd. 08.08.2003. The revenue realised& expenditure incurred in respect of Keonjhar Wildlife Division from 2007-08 to 2020-21 is given in the Table No. 11.11.

Table No. 11.11 : Revenue and expenditure from 2007-08 to 2020-21							
Year	Revenue in Rs.	Expenditure in Rs.					
		Non plan	State plan/ Prog.Expr	Central plan	Centrally Sponsored Scheme	Forest Deposit	Total
2007-08	1467877	2065071	1287990	2410000	800000	1072551	7635612
2008-09	772490	2460703	8549620	2675000	0	613991	25201816
2009-10	8095062	1991670	3545330	2458000	332000	764507	21639824
2010-11	675986	625490	6179500	3429950	0	448223	24982441
2011-12	4851054	573000	8382550	1675330	1362500	214679.3	27368405
2012-13	2479855	698180	13014606	2531000	0	0	31839411
2013-14	1508174	11188894	6537932	2453580	49825	0	20230231
2014-15	1275939	11066572	8082798	2308900	0	0	41938589
2015-16	3426294	883500	12841760	0	0	0	35056676
2016-17	1450967	809000	19550560	0	0	0	44841846
2017-18	1835900	1339000	22593203	0	0	0	23932203
2018-19	965788	1595000	49140413	0	0	0	50735413
2019-20	846735	2252890	40605767	0	0	91743627	134602284
2020-21(Up-to Oct'20)	122760	1412240	9878554	0	5692100	29833635	46939289
	29774881	**38961210**	**210190583**	**9941760**	**8236425**	**124691213**	**536944040**

Source: DFO, Keonjhar(WL)

CHAPTER – XII

STATISTICS OF GROWTH AND YIELD

12.1. STATISTICS OF GROWTH:

The growth rate and yield of the growing stocks of a particular patch of forest is affected by different parameters like the geology, climatic factor, position of ground water table, mineral content of soil and biomass on the particular patch. Soil formation on the earth's surface is a slow continuous process, taking ages. Even changing climatic factors like temperature, light, rainfall, wind etc. is bound to exert considerable impacts upon the growth rate of the growing stocks thereby affecting yield statistics of that particular patch of forest. So at the time of assessment of growth and yield of growing stock, a localized patch needs to be considered and all research works need to be focused on that patch.

12.1.2 : Experimental Plot: -

Keonjhar (WL) Division, Anandapur does not have any experimentation wings to assess the growth rate and yield of the forest crop on a regular basis. The Silviculture and Research wings of Forest Department have not undertaken any research works within the jurisdiction of Keonjhar (WL) Division. No research station of the Government or by any private agency exists within the division from where information and data on the growth rate and yield of species in different site quality could be obtained. Under these circumstances the Writer does not have the scope of getting up-dated data on research within this division. The accurate relationship between height and diameter with respect to time period of principal species cannot be prepared.

12.1.3 : Moreover, outgoing plan did not prescribe for selection working circle.

12.1.4 : **Local Volume Equation :**

The Forest Survey of India has developed local volume equation for different principal and secondary species taking the forest of Phulbani, Sambalpur and Koraput District as per their sampling for Odisha state. The 'Report on Resources Survey of Phulbani Forest Catchments (Odisha) prepared by Forest Survey of India, Dehradun, 1982 has been referred for relevant local volume equation for determination of volume and yield in this Plan. In these equation 'V' denotes under bark round timber volume in cum and "D" denotes over bark diameters in meters at breast height, where D = 7g / 22 and "g" denotes over bark girth in meter at breast height. All other species including fruit bearing species like Mahul, Kendu, Mango, Siris and Kusum etc. have been categorized as other miscellaneous species. The local volume equations for different species are shown in the table below. The NRSC has also used these equations to estifmate the volume of Keonjhar (W.L) Division.

Table No.12.1 Volume Equations Used for Stem Volume Estimation in Keonjhar (WL) Division.		
Species	Volume Equation	Wood Density
Adina cordifolia	$V=0.08507+0.19669D+7.16812D^2$	0.633
Anogeissus latifolia	$V=0.045731-1.020606D+9.656667D^2$	0.79
Bombax ceiba	$V=0.136196-2.07674D+10.1566D^2$	0.329
Boswellia serrata	$V=0.36432-1.32768D+9.48471D^2$	0.633
Buchanania lanzan	$V=0.019341-0.262689D+4.293135D^2$	0.458
Bursera serrata	$V=0.057424-1.153088D+8.542648D^2$	0.633
Dalbergia latifolia	$V=0.00965+0.58546D+2.5605D^2+24.34215D^3$	0.633
Diospyros melanoxylon	$V=-0.009124-0.494103D+7.610416D^2$	0.678
Garuga pinnata	$V=0.077965-1.481043D+9.797028D^2$	0.633
Lagerstroemia parviflora	$V=0.07199-1.25923D+9.28416D^2$	0.633
Lannea coromandelica	$V=0.057424-1.153088D+8.542648D^2$	0.54
Madhuca indica	$V=0.10423-1.38429D+8.39379D+0D^2$	0.743
Mitragyna parviflora	$V=0.08444-1.26801D+8.75274D^2$	0.633
Pterocarpus marsupium	$V=0.058424-1.233468D+9.433633D^2$	0.671
Shorea robusta	$V=0.109884-1.804754D+10.297714D^2$	0.752
Tectona grandis	$V=0.1657-1.1235D+8.0855D^2$	0.55
Terminalia tomentosa	$V=0.103171+1.684599D+10.107586D^2$	0.633
Syzigium cumini	$V=0.30706+5.12731D-2.0987D^2$	0.65
MISCELLANEOUS	$V=0.088074-1.449236D+8.760534D^2$	0.633

12.1.5 : STUDY OF GROWTH AND YIELD IN THIS PLAN :

GIS Based Methods: - In this Working Plan advanced technologies has been applied to make an assessment of the growing stock of the forest of this division. Satellite remote sensing and GIS based methods have been operationally employed to provide Working Plan inputs.

12.1.6 : METHODLOGY ADOPTED :

The methodology adopted by the NRSA, ORSAC and Forest Department for assessment of the growing stock in Keonjhar (W.L) Division is depicted below. The yield has not been calculated in this working plan as there is no prescripton of selection working circle for felling of timbers.

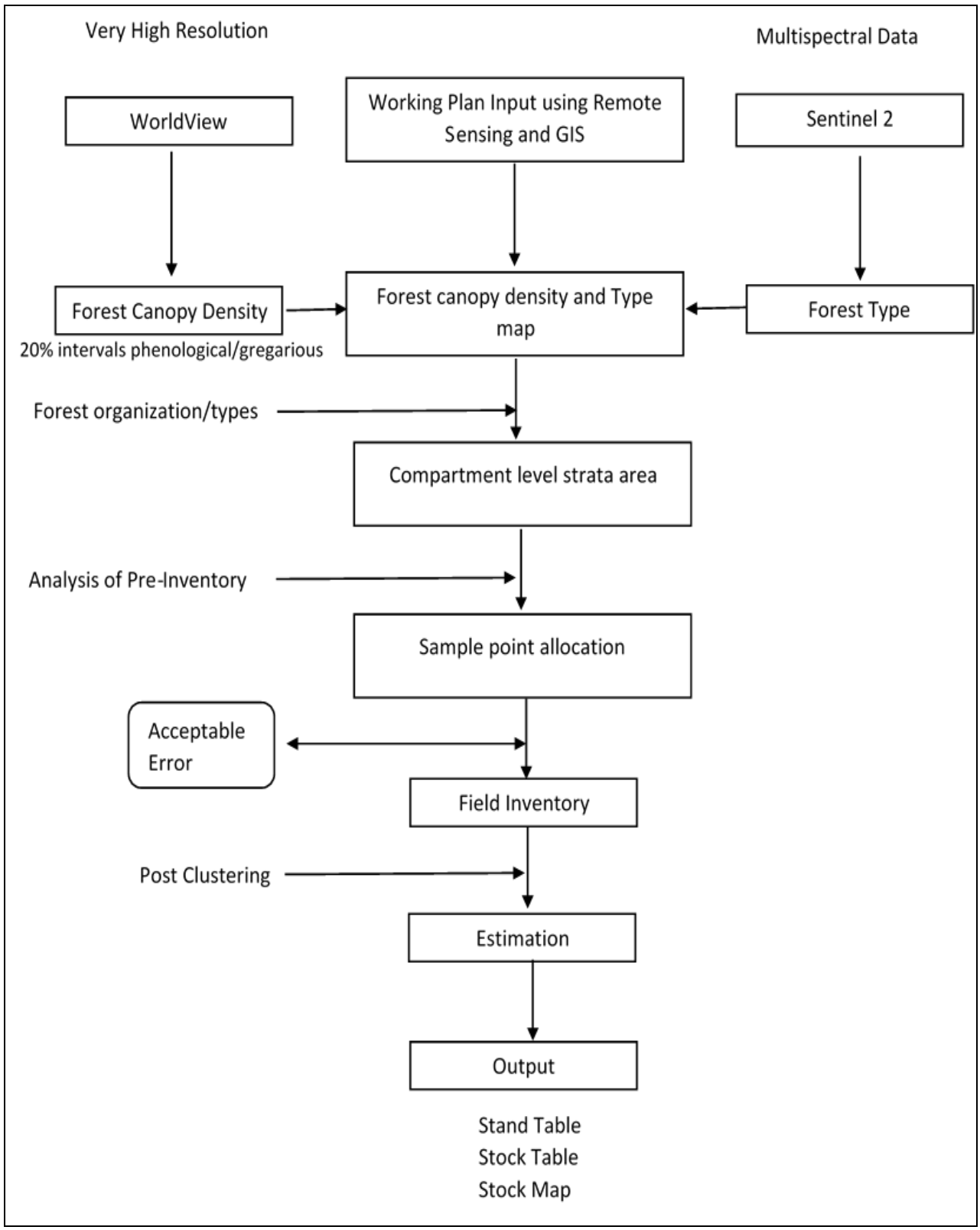


Figure 1 : Methodology flow chart

Stand and Stock Estimation :

Volume equations given in table 12.1 are used for tree volume estimation for the economic and rest of the species by NRSC. Tree attributes recorded during field sampling are diameter, tree height and species type (local and scientific name). Volume equation developed by Forest Survey of India was used for tree volume calculation based on measured diameter. Tree level volumes are aggregated at plot level and plot volumes. Volume of Major 5 economic species are aggregated separately while remaining species are labelled as miscellaneous tree class.

Stratify and multiply approach has been used for forest stand and stock estimation at compartment level. Forest type and density maps have been used as two strata for stratification. Average volume density and stem density for 5 major species are estimated separately for each stratum. Remaining species are clubbed together to miscellaneous class. Forest area at each compartment coming from forest type and density maps are multiplied with these averaged and aggregated to compartment, range and division level for report generation. Forest type and density stratification used in the study is given in table 12.2.

Table No.12.2.Forest type & density stratification

Recode	Class	Type	Density
1	SALDOM(>70)	SAL DOMINATE	>70
2	SALDOM(40-70)	SAL DOMINATE	40-70
3	SALDOM(10-40)	SAL DOMINATE	10-40
4	MXSAL(>70)	MIX SAL	>70
5	MXSAL(40-70)	MIX SAL	40-70
6	MXSAL(10-40)	MIX SAL	10-40
7	MMISC(>70)	MISCELLENEOUS	>70
8	MMISC(40-70)	MISCELLENEOUS	40-70
9	MMISC(10-40)	MISCELLENEOUS	10-40
10	SCRUB	SCRUB	<10

Flowchart for forest stand and stock estimation:

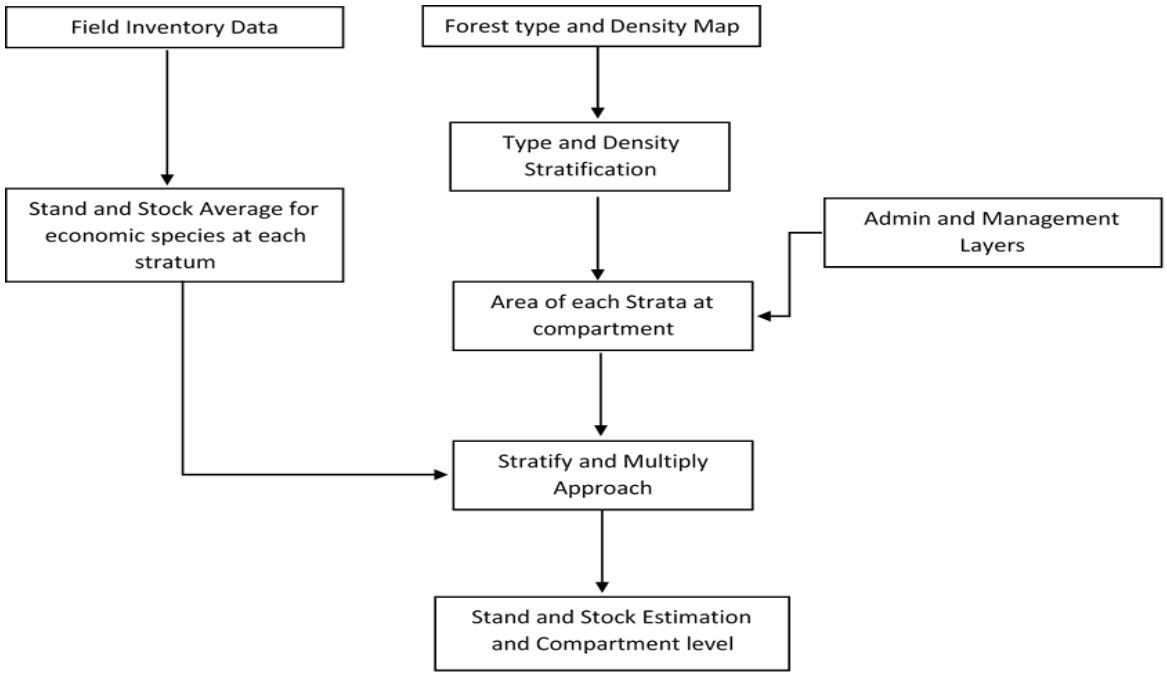


Figure 2: forest stand and stock estimation

Quantitative estimates are presented in the form of tables while spatial distribution is shown at compartment level maps. A total of 13 tables are generated for each division which includes Block wise area, sampling intensity, No of stems and stock volume at each compartment. List of all tables computed by NRSC is given below:

1. Block Wise Area Statistics: This table contains the information on area under each forest type at all the block of forest division.
2. Canopy density wise distribution of Inventory Points: This table shows the range wise distribution of sampleplots in different forest canopy density classes.
3. Realized Sampling Intensity: This table provides the sampling intensity at SFC, NON SFC and overall area for each canopy density classes. Sampling intensity is estimated based on total area inventoried (depend on no of sample plots) at each class divided by total area covered by forest in respective canopy density class.
4. Stand Table Summary Estimated Number of Stems: This table contains the counts of estimates stems under different girth class for major economic species of the division grouped by different coupe types (SWC, RWC etc)
5. Block Wise Stand Table Estimated Number of Stems: This table contains the estimated numbers of stems in each girth class for major economic species for each block in the forest division.
6. Range Wise Stand table Estimated Number of Stems (NON-SFC)
7. Stand Table, Compartment wise Estimated Number of Stems (NON-SFC).
8. Block Wise Stock Table: Block wise estimated volume of all major species in each girth class.
9. Range Wise Stock Table Estimated Volume of Trees (NON-SFC)
10. Stock Table, Compartment wise Estimated Volume of Stems (NON-SFC).

11. Density Strata Area: Compartment wise forest area under each canopy density class.
12. Type Strata Area: compartment wise forest area under each forest type.

12.2. Statistics of Forst Carbon Stock :

NRSC has estimated the carbon content of the forest of Keonjhar W.L Division. The following methods were used by NRSC for estimation of carbon stock.

The allometric equations used in volume estimations are designed for the diameter range 10-100cm by NRSC. A regression model was established between Basal Area density (BA) and volume density of trees with diameter more than 10cm. Regression equations were used to calculate biomass stock of trees less than 10cm DBH . The step by step method used for volume calculation and estimation of carbon stock is given in the following chart.

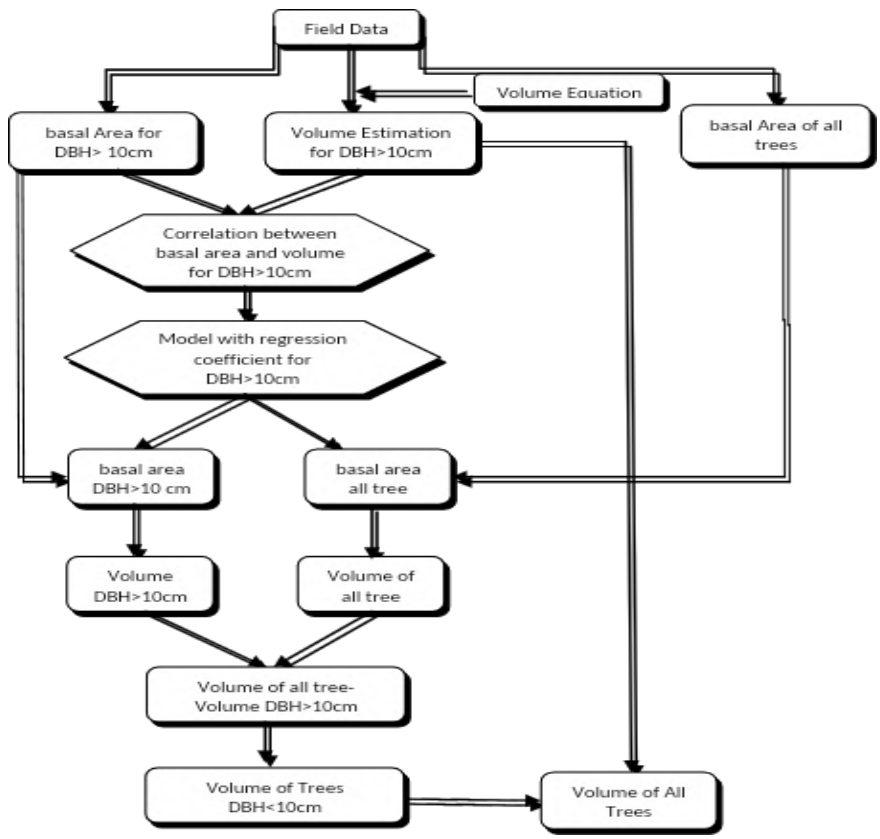
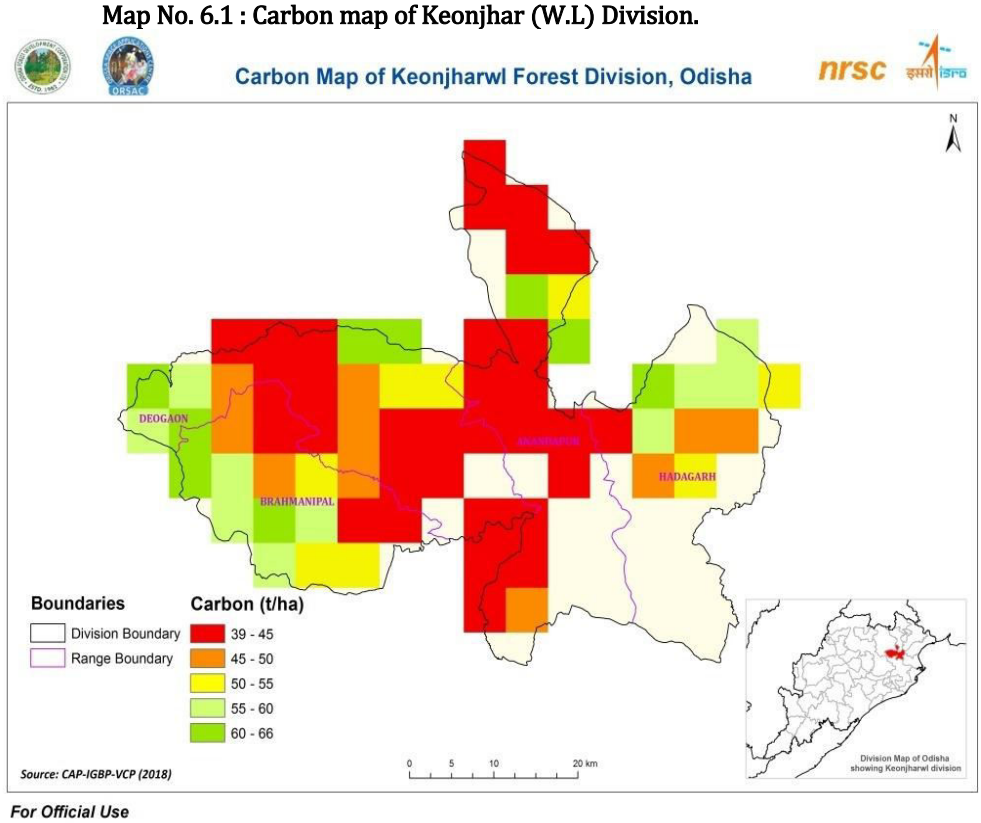


Table No.12.3.A : Range-wise Biomass and Carbon Table

Name of the Range	Area in Ha.	Average		Estimated	
		Biomass (In Ton/Ha)	Carbon (In Ton/Ha)	Biomass (In Ton)	Carbon (In Ton)
Anandpur	15498.22	94.36	44.35	1,462,412	687,346
Brahmanipal	27144.17	99.23	46.64	2,693,515	1,266,004
Deogaon	16311.51	85.14	40.02	1,388,761	652,786
Total	**58953.90**	**94.09**	**44.22**	**5,544,688**	**2,606,136**
Source: NRSC					

As per report of NRSC, the carbon content of Brahmanipal Range is highest having 1,266,004 Tons among other two ranges that means the Forest Blocks of Brahmanipal Range has more numbers of trees so also total stock.

Map No. 6.1 : Carbon map of Keonjhar (W.L) Division.



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Table No. 12.3.B : Carbon Table

Sl.	Category	Forest Blocks	Comp. No.
1	60-66	Rebana	1,2,3,13,14,15,21,29(Part),30, Turkipada(Part)
		Atei	50,51,52,53,54
		Santoshpur	10,11,13,17
2	55-60	Rebana	5,6,16,17,19,20,25,26,28,29(Part), Turkipada(Part)
		Mahulpanga	
3	50-55	Rebana,	25,26,31,32,33,34,46,47
		Koldiha	--
		Atei	55,56,57,58,59,60(Part),64
4	45-50	Rebana	7,8,9,10,11(Part)31(Part),35,36,37,39,
		Palaspal, Baranga(P)	--
5	39-45	Ostapura, Patilo, Meghanadpoi, Hatibandha, Nuniapatna,Baranga(Part), Sapanaposi PRF, Kadugotha, Tangriapal PRF, Brahmanipal PRF, Panasdiha, Baigundi, Gayalmunda	

PART -II

FUTURE MANGEMENT

DISCUSSED AND PRESCRIBED

CHAPTER - I
FUTURE MANAGEMENT

1.1 BASIS OF PROPOSAL:

The most revolutionary Act namely Forest (Conservation) Act,1980 followed by National Forest Policy, 1988 have changed the dimensions of the forest management. Now Panchayats (Extension to the scheduled areas) Act, PESA 1996, Biological Diversity Act, 2002 Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and other international conventions/agreements on climate change has changed our management perspective towards more people centric and towards ecological stability. The objectives for attaining the above goals include conservation of forests and reducing forest degradation, maintenance and enhancement of ecosystem services including ecotourism, enhancement of forest health and vitality as per ecological and silvicultural requirements of the species progressively increasing the growing stock and carbon sequestration potential, maintenance of biological diversity, prevention of soil erosion, improvement of hydrological regime, peoples involvement in planning and management of forests fulfilling socio economic and livelihood needs of people.

1.1.1 General Objective of Management:

Adhering to the above principles, the working plan sets up the following general objectives of management.

The main facts affecting the general objectives of management are :

(a) 60% of the forest of this Division is dominated by Sal but the condition of Sal varies from quality iii to iv. The Salcrops have been deteriorating in quality and quantity over the years because of previous forest working and forest fire coupled with biotic pressure like encroachment & developmental work.
(b) Nearly 65% of forests have been degraded. There is an intense biotic pressure on the forest due to increase in human population and cattle of the fringe villages which causes grazing, illicit removal of fuel wood and fodder.
(c) The forest area lies in plateau region of Anandpur Sub-Division and in two masses of hills lying east and west of Salandi river. The hills are very prone to soil erosion and every year the nearby areas of Baitarani river are affected with flash flood. Hence, the forests are absolutely necessary to give protective cover to the ground.
(d) The invasive weeds like Eupatorium, Ageratum have penetrated deep into the forest and the main cause of deterioration of the condition of the forest, reducing biodiversity and productivity.
(e) Over the years due to settlement the boundary of forest has been rendered undecipherable affecting the forest area.
(f) There is linkage between the forest of Similipal biosphere and the forest of Keonjhar (W.L) Division. Once upon a time, Rebana R.F was very rich in biodiversity and had reached the climatic climax. It is the home of rare orchidsand has vast biodiversity which needs to be protected and preserved.

Objectives of management :

i. To preserve and manage the forests through healthy silvicultural practices, to increase the stand density thereby nurturing the eco system and vitality.
ii. To reduce splash erosion, sheet erosion, rill erosion & gully erosion adopting different watershed treatment plan.
iii. To treat the catchment area of the forest landscape to conserve water thereby maintaining the hydrological cycle.
iv. To conserve species diversity & to ensure natural sustainability of Life Forms.
v. To create large volume of Carbon sink by massive afforestation & creation of large water bodies.

vi. To involve the local people in management of forest resources through joint forest management enhancing livelihood and employment opportunities & protecting the cultural practices.

vii. To create avenues for integrated development right from fuel wood collection to infrastructure development.

1.2 METHODS OF TREATMENT :

The forests are in general in a state of degraded condition. Most of the Forest Blocks like Santoshpur, Rebana, Atei, Palaspal, Nuniapatna, Patilo, Gayalamunda, Ostapura, Meghanadpoi etc. have been degraded and needs special rehabilitation treatment.

The catchment areas of Musala river and Baitaranai have moderately dense forest. A silvicultural intervention to improve the crop is needed.

The hills of Rebana, Santoshpurand Atei need protection from soil erosion.
The areas having devoid of root stock and previously shifting cultivated areas are to be planted with indigenous species to restock the forest.

NTFP plays an important role in rural economy of the tribals and forest dwellers. There is necessity to increase the productivity of all such NTFP items and monitor its collection and disposal. Special attention need to be given regarding over exploitation.

This Division is rich in Wildlife fauna and due to various reasons their population is alarmingly decreasing. So an attempt has been made in this plan to improve the habitats and implement strategies for wildlife protection.

1.3 CONSTITUTION OF WORKING CIRCLE :

1.3.1 In accordance with the above facts, the following Working Circles are proposed.

Table No.1.1-Working Circle wise Area

Sl. No.	Name of Working Circle	Area
1.	Rehabilitation	29721.9894
2.	Improvement	18342.34
3.	Plantation	3233.0754
4.	Protection	7313.51367
5.	JFM (O)	9081.243 +636.00*
6.	NTFP (O)	58610.92
7.	Wildlife (O)	58610.92

***JFM area under Revenue Forest**

1.3.2 <u>Rehabilitation Working Circle</u> :

The Forest Blocks situated in the close proximity of villages and having degraded root stock due to heavy biotic pressures and grazing comes under this Working Circle. It has under stock and degraded stock but having adequate rooted waste, capable of regenerating by protection, Silvicultural intervention and soil and moisture conservation. The objectives of the working circle are to check further degradation by providing protection, filling the gaps by plantation and providing adequate soil moisture conservation measures. Most of the areas of 17 RFs, 3 PRFs, 10 DPFs, 8 PFs and 56 VFs have been kept under this working circle.

1.3.3 **Improvement working circle** :

Forest block with good regeneration and good root stock and having canopy density of 60% & above have been allotted to this working circle. Most of these areas of Forest Block lie in hills and catchment areas of Musala River and Baitaranai River. Adequate attention is given towards soil and moisture conservation. Only removal of dead, diseased and malformed trees are prescribed. Some parts of Atei, Rebana and Santoshpur have been included in this working circle.

1.3.4 **PlantationWorking Circle** :

The Forest Blocks with permanent blanks and devoid of root stock have been kept under this Working Circle. The existing plantations raised in the past are included in this working circle. The blanks of the previous plantations should be restocked by plantations and Tending operations are to be carried out in suitable old plantations.

1.3.5 **Protection Working Circle**:

The theft prone areas, eco fragile areas have been included in this working circle.

1.3.6 **JFM(Overlapping) Working Circle** :

This will overlaps the area of RWC giving role to community participation in management of forest areas to village level Joint Forest Management Committees.

1.3.7 **NTFP(Overlapping)Working Circle** :

This will overlaps the entire area of the division with an aim to identify the NTFPs to be managed and to evaluate the existing system of management and potential for future sustainabilityof creating livelihood for the people.

1.3.8 **Wild Life (Overlapping) Working Circle**:

This will overlaps the entire area of the division. The objectives will be to identify important areas of wildlife and to conserve & redress the man animal conflict through different interventions.

1.3.9Allocation of Area to Different Working Circle :

As per field survey and N.R.S. Data 17nos. of RF blocks and 3no. of PRF blocks, 10nos of DPFs, 8nos. of PF and & 56 nos. of VFs constitutes 6nos. of Working Circles. The Reserve Forest namely Boula and Salapada have been excluded from this working Plan as Boula comes under Sanctuary area and Salapada is heavily affected by Settlement & encroachment. The detailed distribution of different forest blocks is given below:

Table No.1.2. Range wise Working Circle Area in Ha.

Sl. No.	Name of Working Circles	Anandapur Range	Deogaon Range	Brahmanipal Range	Hadagarh Range	Total Area of Working Circle
1	Rehabilitation W.C	6508.657	10278.7224	12934.61	0	**29721.9894**
2	Improvement W.C	5476.37	5362.50	7503.47	0	**18342.34**
3	Protection W.C	2268.3025	0	5045.21117	0	**7313.51367**
4	Plantation W.C	854.393	574.254	1617.00	187.4284	**3233.0754**
	Total	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.91847 or 58610.92**
5	JFM(O) W.C.	3485.313 +47.00*	3112.254 +112.00*	2411.00	72.676+ 477.00*	**9081.243+ 636.00***
6	NTFP(O)W.C.	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.92**
7	Wild Life (O)W.C.	**15107.7225**	**16215.4764**	**27100.29117**	**187.4284**	**58610.92**

***VSS area under Revenue Forest**

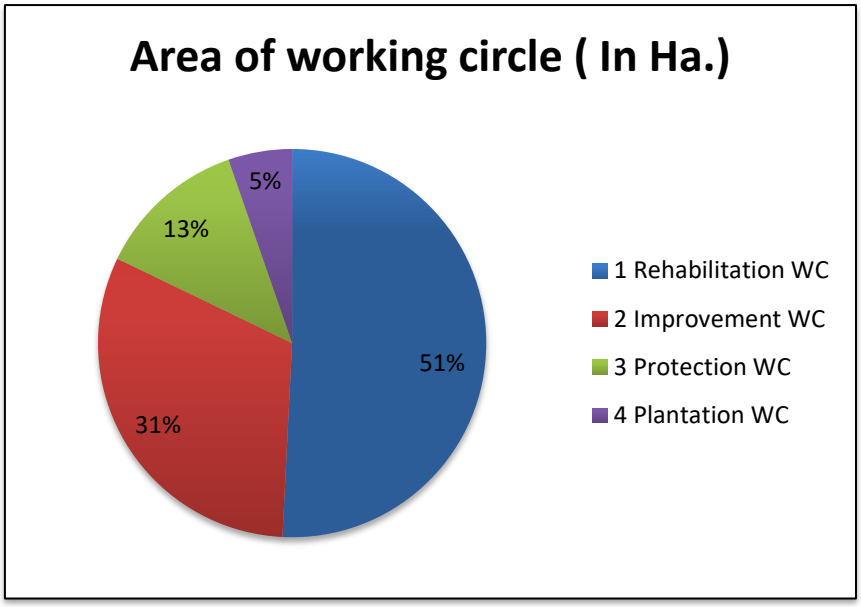


Table No. 1.3 : Block-wise distribution of Working Circle.

Sl. No	Name of the Forest Block	Area under this Plan (in Ha.)	Area allotted to different Working Circle						
			IWC	RWC	Plantation WC	Protection WC	JFM (O) WC	NTFP(O) WC	Wild Life(O) WC
1	2	3	4	5	6	7	8	9	10
	RF								
1	Rebana	31097.03117	9278.11	15188.71	1585	5045.21117	3855	31097.03117	31097.03117
2	Atei	11589.6544	4505.31	6857.3444	227	--	1722	11589.6544	11589.6544
3	Santoshpur	8125.7925	4558.92	1132.82	208	2226.0525	1509	8125.7925	8125.7925
4	Turkipada	306.95	--	188.95	118	--	--	306.95	306.95
5	Mahulpanga	207.62	--	207.62	--	--	--	207.62	207.62
6	Palaspal	2584.57	--	2463.57	121	--	255	2584.57	2584.57
7	Kadugotha	62.228	--	62.228	--	--	73	62.228	62.228
8	Baranga	1180.37	--	963.37	217	--	143	1180.37	1180.37
9	Patilo	466.27	--	465.27	01	--	306	466.27	466.27
10	Meghanadpoi	332.86	--	314.86	18	--	51	332.86	332.86
11	Hatibandha	82.93	--	72.93	10	--	51	82.93	82.93
12	Nuniapatna	67.25	--	--	25	42.25	68	67.25	67.25
13	Ostapura	220.157	--	171.157	49	--	466	220.157	220.157
14	Gayalmunda	120.44	--	109.44	11	--	100	120.44	120.44
15	Panasdiha	62.39	--	62.39	--	--	--	62.39	62.39
16	Koldiha	32.57	--	32.57	--	--	--	32.57	32.57
17	Baigundi	42.52	--	42.52	--	--	71	42.52	42.52
		56581.60307	**18342.34**	**28335.7494**	**2590**	**7313.51367**	**8670**	**56581.60307**	**56581.60307**
	PRF								
18	Tangriapal	124.16	--	124.16	--	--	--	124.16	124.16
19	Sapanaposi	57.95	--	42.95	15	--	--	57.95	57.95
20	Brahmanipal	53.99	--	53.99	--	--	--	53.99	53.99
		236.1	--	**221.1**	**15**	--	--	**236.1**	**236.1**

Sl. No	Name of the Forest Block	Area under this Plan (in Ha.)	Area allotted to different Working Circle						
			IWC	RWC	Plantation WC	Protection WC	JFM (O) WC	NTFP(O) WC	Wild Life(O) WC
1	2	3	4	5	6	7	8	9	10
	DPF								
21	Talagaon A	14.18	--	14.18	--	--	--	14.18	14.18
22	Andharajhari	76.1	--	76.1	--	--	--	76.1	76.1
23	Baniajodi	80.94	--	80.94	--	--	--	80.94	80.94
24	Biragobindpur A	388.51	--	388.51	--	--	--	388.51	388.51
25	Biragobindpur B	20.23	--	20.23	--	--	--	20.23	20.23
26	Sanapurunapani	127.48	--	127.48	--	--	--	127.48	127.48
27	Talagaon B	186.56	--	186.56	--	--	--	186.56	186.56
28	Alughati	48.56	--	48.56	--	--	--	48.56	48.56
29	Madhubhandar	64.75	--	64.75	--	--	--	64.75	64.75
30	Champapal	157.83	--	157.83	--	--	--	157.83	157.83
		1165.14	--	**1165.14**	--	--	--	**1165.14**	**1165.14**
	PF								
31	Arjunbania	12.08	--	--	12.08	--	--	12.08	12.08
32	Matha	32.9981	--	--	32.9981	--	--	32.9981	32.9981
33	Asanbahali	90	--	--	90.00	--	--	90	90
34	Bahabaradanda	32.763	--	--	32.763	--	--	32.763	32.763
35	Asia	12.9985	--	--	12.9985	--	--	12.9985	12.9985
36	Thunigaon	3.9983	--	--	3.9983	--	--	3.9983	3.9983
37	NuaRugidi	15.9973	--	--	15.9973	--	--	15.9973	15.9973
38	PadhiarPalli	15.9972	--	--	15.9972	--	--	15.9972	15.9972
		216.8324	--	--	**216.8324**	--	--	**216.8324**	**216.8324**
	VF								
	Panchupalli	0.403	--	--	0.403	--	0.403	0.403	0.403
	Other VFs	410.84	--	--	410.84	--	410.84	410.84	410.84
		411.243	--	--	**411.243**	--	**411.243**	**411.243**	**411.243**
	Grand Total	**58610.91847 Or 58610.92**	**18342.34**	**29721.9894**	**3233.0754**	**7313.51367**	**9081.243 + 636.00 [Revenue Forest =9717.243**	**58610.91847 Or 58610.92**	**58610.91847 Or 58610.92**

1.4 PERIOD OF WORKING PLAN AND NECESSITY FOR INTERMEDIATE REVISION:

This working plan will be formulated for 10 years with effect from 2021-22 to 2030-31. A midterm review shall be undertaken for mid-course correction by the Consultative Committee under the Chairmanship of Principal Chief Conservator of Forests (HoFF) with representation for Addl. PCCF (MoEF).

CHAPTER-II
IMPROVEMENT WORKING CIRCLE

2.1 : GENERAL CONSTITUTION OF WORKING CIRCLE :

2.1.1 : The Forest blocks & compartments which have adequate natural regeneration but lacks good growth because of congestion of crophave been included in the improvement working circle.Three nos. of Reserve Forest Blocks totalling an area of **18342.34** ha. has been allotted to this working circle. Here the crop density varies from 0.4 to 0.6. All forest blocks in this working circle have mainly Sal & other Misc. Species & the crops are mostly even aged.

2.2 : GENERAL CHARACTERISTICS OF VEGETATION :

2.2.1 **:** Even aged crop having good natural regeneration, the major forest type included under this improvement working circle are

I. Moist peninsular valley Sal(3C/ C_2E),
II. Dry Peninsular Sal (5B/ C_1C),
III. Dry mixed Deciduous forest (5B/C_2)
IV. Lateritic semi evergreen Forest (E_4).

2.2.2 : Vegetation consists of mainly Sal. Biotic interference likeillicit felling is not severe; however forest fire occurs moderately causing some damage to regeneration. Weed growth is rampant.

2.3 : SPECIAL OBJECTIVES OF MANAGEMENT :

2.3.1 : The following special objectives have been set for this working circle.

1. To improve the growing stock& quality of the forest by undertaking sound silvicultural operation.
2. To maintain the greencover with a view to prevent the soil erosion & to conserve the moisture for regulation of water supply.
3. To meet the bonafide needs of the local people for fuel wood to possible extent out of silvicultural operation.
4. To tend the existing crop to achieve maximum growth.
5. To improve the density & composition of the crop.

2.4 : IMPROVEMENT SERIES :

Area allotted to this Working Circle is **18342.34** Ha. in three treatment series which constitutes 31% of total plan area.

Table No.2.1.Forest Range wise Improvement Working Circle Area

Improvement Series	Forest Block	Compt. No.	Total area in Ha.	Treatment area (Ha.)
KEONJHAR (WL) DIVISION- ANANDAPUR RANGE				
Budhikuda Series	Santoshpur	8	519.31	
		9	347.59	
		10	593.51	
		11	461.88	
		12	110.00	
		13	374.80	

		14	579.69	
		15	270.79	
		16	353.04	
		17	183.75	
		18	396.13	
		19	146.03	
		20	222.40	
	Atei	58	478.02	
		59	439.43	
	Total		**5476.37**	**5476.37**
DEOGAON RANGE				
Tikira Series	Atei RF	50	415.55	
		51	450.48	
		52	593.70	
		53	512.32	
		54	521.05	
		57	836.31	
		65	258.45	
	Rebana R.F	1	344.78	
		5	547.55	
		6	262.82	
		7	457.39	
		13	21.30	
	Total		**5221.70**	**5221.70**
BRAHMANIPAL RANGE				
Tikira Series	Rebana	5	30.59	
		6	19.44	
		13	770.23	
		14	601.33	
	Total		**1421.59**	**1421.59**
BRAHMANIPAL RANGE				
Kusei Series	Rebana	10	506.67	
		11	468.94	
		12	239.42	
		15	306.62	
		16	308.41	
		17	419.75	
		18	409.52	
		21	269.10	
		22	413.79	
		23	180.81	
		24	924.21	
		25	554.24	
		28	229.45	
		46	589.05	
		47	261.90	
	Total		**6081.88**	**6081.88**
DEOGAON RANGE				
Kusei Series	Rebana	8	140.80	
	Total		**140.80**	**140.80**
	Grand Total			**18342.34**

2.5 : ANALYSIS & VALUATION OF CROP : As the crop to a larger extent is middle aged so no exploitation of any particular girth class is prescribed.

2.6 : SILVICULTURAL SYSTEM :

2.6.1 : The crop varies in density & quality. In the well-stocked area the crop is young to middle age. Tending of these young crops is to be carried out through proper silviculturalmethod. In the under stocked area, tending of existing crop coupled with artificial natural regeneration is required to restock the area. So the best system is tending of natural regeneration of the crop. Accordingly no silvicultural system can be prescribed for this working circle. No felling of trees of any species shall be carried out except for removal of uprooted trees to maintain the hygiene. Sowing of fodder grasses along with soil conservation structure is also prescribed.

2.7 : CHOICE OF SPECIES:

2.7.1 : Not applicable to this Working Circle.

2.8 : EXPLOITABLE GIRTH CLASS :

2.8.1 : Like outgoing working plan, in this working plan also the harvestable girth class for Sal & Teak is prescribed as 120 cm and for other species 150cm..

Sl. No.	Name of the species	Harvestable girth at breast height in CM	GBH class of Approach class	
			Lower	Upper
1	Sal	120	90	120
2	Teak	120	90	120
3	All other species	150	120	150

2.9 : IMPROVEMENT CYCLE :

2.9.1 : The improvement cycle has been fixed at 10 years, which synchronizes with the plan period. With this felling cycle of silvicultural operation are to be taken up at certain intervals.

2.10 : CALCULATION OF THE YIELD :

2.10.1 : The Forest Blocks having density 0.4 to 0.6 are included in this working circle. Atei (P) and Rebana (P)included under this working circle are hilly. The average stand per Ha is 240. Felling is prohibited in hilly areas.

The Santoshpur (Part) included in this working circle are having good sal forest with average stand 270 Per ha. There is a proposed corridor plan for Tiger developed by NTCA (National Tiger Conservation Authority), the main aim of which is to link two mega habitats namely Hadagarh Sanctuary of Keonjhar (W.L) Division with Similipal Tiger Reserve. In this plan, Santoshpur RF has been included. Hence, any felling in this area would be detrimental for the proposed Tiger corridor.

No appreciable yield is expected.Yield is mostly from wind fallen, uprooted, dead &diseased trees. So, no yield is prescribed.

2.11 : SEQUENCE OF IMPROVEMENT OPERATION:

2.11.1 : The improvement of forest area allotted to the improvement working circle has been distributed into different improvement series . While constituting the same care has been taken to restrict the area within the jurisdiction of a range for proper execution.Each improvement series is divided into 10 annual coupes of the entire area within the plan period. The coupe working will commence from 2021-22 till 2030-31. The sequence of operation under this working circle in different years is given below in table No. 2.2.

Year wise distribution of Improvement Working Circle

Table NO. 2.2.A : Kushei Series (KSI) :(Page 389)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	KSI I	Brahmanipal	Rebana	RF	16	308.41	728.16
				RF	17	419.75	
2022-23	KSI II		Rebana	RF	18(p)	409.52	590.33
				RF	23(p)	180.81	
2023-24	KSI III		Rebana	RF	22(p)	413.79	413.79
2024-25	KSI IV		Rebana	RF	28(p)	229.45	229.45
2025-26	KSI V		Rebana	RF	21	269.10	269.10
2026-27	KSI VI		Rebana	RF	47(p)	261.90	261.90
2027-28	KSI VII		Rebana	RF	46(p)	589.05	589.05
2028-29	KSI VIII		Rebana	RF	10	506.67	1247.17
				RF	24(P)	523.06	
				RF	25(P)	217.44	
2029-30	KSI IX		Rebana	RF	11	468.94	1206.89
				RF	24(B)	401.15	
				RF	25(B)	336.80	
2030-31	KSI X	Deogaon	Rebana	RF	8(p)	140.80	686.84
		Brahmanipal		RF	12(p)	239.42	
				RF	15	306.62	
Total						6222.68	6222.68

2.2.B :Budhikuda Series.(BKD)(Page 390)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	BKD I	Anandpur	Santoshpur	RF	8(p)	519.31	519.31
2022-23	BKD II		Santoshpur	RF	9(p)	347.59	809.47
				RF	11	461.88	
2023-24	BKD III		Santoshpur	RF	10	593.51	703.51
				RF	12(p)	110.00	
2024-25	BKD IV		Santoshpur	RF	13	374.80	645.59
				RF	15(p)	270.79	
2025-26	BKD V		Santoshpur	RF	14	579.69	763.44
				RF	17(p)	183.75	
2026-27	BKD VI		Santoshpur	RF	16(p)	353.04	721.47
				RF	19(p)	146.03	
				RF	20	222.40	
2027-28	BKD VII		Santoshpur	RF	18	396.13	396.13
2028-29	BKD VIII		Atei	RF	59	439.43	439.43
2029-30	BKD IX		Atei	RF	58	478.02	478.02
2030-31	-		-	-	-	-	-
Total						5476.37	5476.37

2.2.C :Tikira series (TKR) (Page 391)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	TKR I	Deogaon	Atei	RF	52	593.70	593.70
2022-23	TKR II		Atei	RF	53	512.32	512.32
2023-24	TKR III		Atei	RF	54	521.05	779.50
					65	258.45	
2024-25	TKR IV		Atei	RF	57	836.31	836.31
2025-26	TKR V		Rebana	RF	1	344.78	627.04
					6(p)	262.82	
		Brahmanipal			6(P)	19.44	
2026-27	TKR VI	Deogaon	Rebana	RF	5(P)	547.55	578.14
		Brahmanipal	Rebana	RF	5(B)	30.59	
2027-28	TKR VII	Deogaon	Rebana	RF	7(p)	457.39	457.39
2028-29	TKR VIII	Brahmanipal	Rebana	RF	13	770.23	791.53
		Deogaon			13	21.30	
2029-30	TKR IX	Brahmanipal	Rebana	RF	14	601.33	601.33
2030-31	TKR X	Deogaon	Atei	RF	50	415.55	866.03
					51	450.48	
Total						6643.29	6643.29

2.12 : SOIL & MOISTURE CONSERVATION MEASURES :

2.12.1 : Soon after the receipt of approval,Soil & moisture conservation work will be taken up with improvement working & will be completed before onset of monsoon in the next year .
These working include two main operations.

1. Contour trenching
2. Nala bunding dams.

2.12.2 : Contour trenches will be taken up all over the coupe due for working. Trenches will be done in accessible areas only where the slope is above 25 degree. The measurement of each trench is 60 cm width and 30 cm depth. Soil from trenches will be heaped on the lower side of the trenches. The contour intervals between consecutive trenches will be 1.5m apart depending upon the slope. The distance between two consecutive trenches will vary as follows.

Slope in degree	Distance between consecutive trenches
Up to 15	8m
15 to 25	5m
Above 25	3m

Nala bunding/check dams will be constructed to reduce runoff and to arrest the silt.Nala bonding will start from the top of nallahs downwards.

2.13 : SUBSIDIARY SILVICULTURAL OPERATION :

2.13.1 : Area to be protected from biotic interference

2.13.2 : The following silvicultural operations will be carried out in the subsequent years. Improvement marking is intended for improvement of crop with practically no objective of yield. The following prescriptions which is applicable to site specific may be followed.

A. Cutting back operation:
   i. Climber cutting.
   ii. Cutting of coppice shoots where natural regeneration is adequate.
   iii. Cutting of malformed regeneration above 15cm gbh

B. Cleaning : The following operations will be done .
   i. Climber cutting.
   ii. Cutting of all coppice shoots where naturally regeneration is adequate & reducing them two per stool where regeneration is inadequate.
   iii. Removal of undergrowth interfering or likely to interfere with the growth of seedling.

C. Thinning - Thinning will include the following operations.
   i. Climber cutting
   ii. Removal of dead,badly damaged trees or trees uprooted by wind or storm after leaving two dead trees per ha. for benefit of wildlife .
   iii. Reduction of coppice shoots to two vigorously growing shoots per each stool.
   iv. Removal of inferior growth, interfering or likely to interfere with the growth of main species.
   v. Fruit bearing trees will not be felled except if they are congested.

2.14 : CONTROL :

2.14.1 : Compartment histories, control forms and other records shall be maintained for each improvement coupe/ compartment and improvement series as per National Working Plan Code.

2.15 MISCELLANEOUS REGULATIONS :

2.15.1 **Grazing:**

The coupes shall be closed for grazing for five years including the year of working. Grazing shall be regulated in other areas on the basis of rotation. Lopping for the purpose of fodder is strictly prohibited.

2.15.2 **Fire Protection:**

The annual coupes will be rigidly fire protected at least up to a period of five years after main felling. The coupe lines should be maintained like fire lines every year. Since forest fire is mainly responsible for damage of Sal regeneration, the area need to be protected from fire strictly. The area burnt by forest fire shall be shown in map every year and remedial measures shall be taken up. The Orissa Forest (Fire Protection) Rules 1979 shall be strictly followed. Awareness regarding fire hazard and fire safety should be created in the villages adjacent to the forest area. Appointment of suitable temporary firewatchers from the villages adjoining to the forest blocks should form a part of the subsidiary operations.

2.15.3 **Collection of NTFP items**:

Collection of NTFP items shall be allowed from the worked out areas with caution till it has completed five years. The forest floor should not be swept for the purpose of NTFP collection.

2.15.4 **Protection of coupe area:**

To protect the coupe area from grazing, fire and illicit felling.Coupes shall be inspected frequently and observations shall be recorded in compartment history.

2.15.5 **Operation in coupe area:**

Efforts will be made to constitute VSS in all areas under this Working Circle and all operations as far as possible shall be taken up in the JFM mode or with active participation of the local people.

2.16 : RIGHTS AND CONCESSIONS:

2.16.1 **:** Rights and concessions shall be regulated as per the provisions of the Orissa Forest Act and Rules and relevant Government policies in force.

2.17 : COST NORM:

2.17.1 : The Cost Norm of this Working Circle has been discussed in Chapter – XIV of Part – II.

2.18: INTERIM REVISION

2.18.1: Intermediate revision is not anticipated. However, if necessary, prescriptions may be reviewed after 5 years jointly by the RegionalChief Conservator of Forests, Baripada Circle and Chief Conservator of Forests (Working Plan). Any deviation suggested shall be subject to the sanction of the competent authority.

CHAPTER-III
REHABILITATION WORKING CIRCLE

3.1 : GENERAL CONSTITUTION :

3.1.1: The Forest blocks included in this Working Circle are under stocked forest having root stock. This Working Circle comprises of such blocks which are either in bushy/ scrubby stages i.e rooted waste or in perpetual sapling stage since long and are not able to grow up and establish into pole crop by itself due to adverse factors and interferences such as grazing, fire, illicit/ unregulated felling and encroachment etc. Here crop density is below 0.4.

3.1.2: The hills and hillocks which have suffered the most due to loss of soil resulting in loss of vegetation are also included.

3.1.3: Areas with inferior misc. growth of poor density but have the potentiality of reversal into a good forest with proper protection in a lesser period of time are also included in this working circle.

3.1.4: An area of **29721.9894 ha** has been allotted to this working circle which constitutes 51% of total forest area.

3.2 : GENERAL CHARACTER OF VEGETATION :

3.2.1: The vegetation of forest are of the following types.

i. Moist peninsular valleys Sal forest :$3C/C_2e$
ii. Dry peninsular Sal forest-$5B/C_{1c}$
iii. Dry mixed deciduous forest-$5B/C_2$
iv. LateriticSemi evergreen forest- E_4
v. Moist mixed scrub deciduous forest-$5/DS_1$

3.2.2: The vegetation is mostly bushy growth & pole size crop with scattered matured trees. The natural regeneration is struggling with biotic interference.

3.3 : SPECIAL OBJECTIVES OF MANAGEMENT :

3.3.1: The following special objectives have been set for this working circle.

1. To restrict the degradation of forest by reducing biotic interference & reverse the trend towards the process of restoration
2. To restock the blank patches by artificial regeneration with site specific indigenous species, preferably Sal associates.
3. To restore & improve the micro climate & micro edaphic condition through Soil & moisture conservation thereby ensuring environmental stability.
4. To develop the forest by providing site specific silvicultural treatment.
5. To improve the existing forest through protection against biotic interferences.
6. To increase the biodiversity & heterogenetic by encouraging natural regeneration.
7. To meet bonafide need of the local people with regard to firewood & small timber keeping pace upon the productivity & to ensure peoples participation in the protection of forest.

3.4 : AREA & ITS ALLOTMENT :

Table No.3.1. Forest Range wise Rehabilitation Working Circle Area

KEONJHAR (WL) DIVISION					
Rehabilitation Series	**Forest Block**		**Compt. No.**	**Total area in Ha.**	**Treatment area in Ha.**
GAYALMUNDA SERIES					
Anandapur Range					
	Reserve Forest(RF)	Santoshpur RF	2	268.50	
			8	162.22	
			12	191.63	
			15	115.28	
			16	158.15	
			17	125.81	
			19	111.23	
		Baranga RF	-	963.37	
	Demarcated ProtectedForest(DPF)		-	609.48	
	Total			**2705.67**	**2705.67**
	Series Total			**2705.67**	**2705.67**
RAMACHANDRAPUR SERIES					
Anandapur Range					
	Reserve Forest(RF)	Atei RF	60	542.55	
			61	882.61	
			62	636.07	
			63	186.10	
		Meghanadapoi RF	-	314.86	
		Patilo RF	-	465.27	
		Baigundi RF	-	42.52	
		Hatibandha RF	-	72.93	
		Gayalamunda RF	-	109.44	
		Koldiha RF	-	32.57	
		Panasadiha RF	-	62.39	
		Ostapura RF	-	171.157	
	Demarcated Protected Forest(DPF)		-	284.52	
	Total			**3802.987**	**3802.987**
Deogaon Range					
	Reserve Forest(RF)	Atei R.F	61	184.39	
			62	96.36	
			63	198.02	
			64	434.28	
	Total			**913.05**	**913.05**
	Series Total			**4716.037**	**4716.037**
KEONJHAR (WL) DIVISION-					
Rehabilitation Series	**Forest Block**		**Compt. No.**	**Total area in Ha.**	**Treatment area in Ha.**
HARICHANDANPUR SERIES					
Deogaon Range					
	Reserve Forest(RF)	Rebena RF	2	683.27	
			3	388.15	
			4	21.20	
			6	395.69	
			7	236.46	

			34	455.19	
			35	629.25	
			36	292.17	
			37	878.94	
			38	845.33	
		Total		**4825.65**	**4825.65**
Brahmanipal Range					
	Reserve Forest(RF)	Rebena RF	34	5.69	
		Total		**5.69**	**5.69**
		Series Total		**4831.34**	**4831.34**
BHAGAMUNDA SERIES					
Deogaon Range					
	Reserve Forest(RF)	Atei RF	55	498.5444	
			56	668.84	
			66	524.44	
			67	555.54	
			68	866.94	
			69	582.66	
		Kadagotha RF	-	62.228	
	Demarcated Protected Forest(DPF)		-	113.31	
		Total		**3872.5024**	**3872.5024**
Brahmanipal Range					
	Protected Reserve Forest(PRF)	Sapanaposi	-	42.95	
		Tangiriapal	-	124.16	
		Total		**167.11**	**167.11**
		Series Total		**4039.6124**	**4039.6124**
DAITARI SERIES					
Brahmanipal Range					
	Reserve Forest(RF)	Rebena RF	44	637.72	
			45	615.26	
			46	986.73	
			47	1158.76	
		Palaspal RF		2272.46	
	Protected Reserve Forest	Brahmanipal PRF		53.99	
		Total		**5724.92**	**5724.92**
Deogaon Range					
	RF	Palaspal RF		191.11	
		Total		**191.11**	**191.11**
		Series Total		**5916.03**	**5916.03**
MAHULPANGA SERIES					
Brahmanipal Range					
	Reserve Forest(RF)	Rebana RF	9	271.22	
			12	339.67	
			18	76.51	
			22	139.76	
			23	203.03	
			27	512.48	
			28	390.00	
			31	575.23	
			32	630.43	

			33	564.50	
			39	733.41	
			40	417.43	
			41	484.17	
			42	517.64	
			43	627.01	
		Mahulpanga RF	-	207.62	
		Turkipada RF	-	188.95	
	Demarcated Protected Forest(DPF)			157.83	
	Total			**7036.89**	**7036.89**
Deogaon Range					
	Reserve Forest(RF)	Rebana RF	08	202.26	
			09	145.41	
			32	128.74	
	Total			**476.41**	**476.41**
	Series Total			**7513.30**	**7513.30**
	Grand Total			**29721.9894**	**29721.9894**

3.5 : ANALYSIS & VALUATION OF CROP :

3.5.1: Heavy biotic interference like illicit felling, fire, grazing, shifting cultivation & other adverse factors have made this area ecologically fragile. Crop of these forest Blocks are badly degraded & very few matured trees in scattered patches in most of the forest blocks are present. So rehabilitation measures are necessary to promote natural regeneration, increase the crop density and the stocking.

3.6 : SILVICULTURAL SYSTEM :

3.6.1: No formal Silvicultural system is prescribed excepting the following treatments.

1. Protection from grazing.
2. Protection from theft.
3. Protection from forest fire.
4. Tending Operation.
5. Silvicultural cleaning operation.
6. Gap planting.
7. Soil & Moisture conservation.

3.7 : ROTATION & CONVERSION PERIOD :

3.7.1: Rotation and conversion period has not been suggested as the same are not relevant to this working circle. The cleaning materials obtained from Silvicultural operation may be distributed to the VSS member as per the MoU.

3.8 : CHOICE OF SPECIES FOR PLANTATION :

3.8.1: As the preliminary objective is to rehabilitate and restore these areas& to improve existing forest growth preference shall be given to local indigenous species for artificial regeneration. Species suitable for different problematic sites are given below.However, the site specific species are to be decided by the DFO.

SPECIES SUITABLE FOR PROBLEMATIC SITES :

Site	Measure To Be Taken	Species To Be Planted	RF Compartment No.
R a v i n e	1. Soil and water conservation measures 2. Full protection from grazing and fire 3. Safe disposal of run off 4. Grassland development 5. Afforestation	*Dalbergiasissoo,Pterocarpusmarsupium, Albizziaprocera,Albizzialebbek, Accasia Catechu, Acacia niloteca, Agave americana, Agave sisalana, Eulaliopsisbinata, Sachharum species*	*44,45,46,47 of Rebana, Brahmanipal PRF*
Laterite Soil	1. Soil and water conservation measures 2. Full protection from grazing and fire 3. Afforestation	*Dendrocalamusstrictus, Madhucaindica,Bombaxceiba, Soymidafebrifuga, Cleistanthuscollinus, Albizzialebbek, Agave spp, Hardwickiabinata, Azadirachtaindica, Acacia nilotica, Acacia leucophloea, Derris indica, Dalbergiasisoo,Tamarindusindica, Eulaliopsisbinata, Ailanthus excelsa, Acacia catechu, Terminalia tommentosa, Jatropha species, Grass species*	*Atei 60, 61, Rebana 7(p), 8(p), 9,12(p)*
Skeletal Soils	1. Contour bunding, trenching 2. Afforestation 3. Soil and water conservation measures 4. Protection from grazing and fire 5. Sowing grasses 6. Seed dibbling / Afforestation		*Rebana RF 31,32,33,34,40*
Water loggged areas	**1.** Preparation of mounds **2.** Planting of tall plants **3.** Early planting **4.** Drainage	*Anthocephaluschinensis, Syzygiumcumini, Terminaliaarjuna, Terminalia tommentosa,Bombaxceiba, Lagerstroemia speciosa, Dalbergiasisoo, Derris indica, Acacia nilotica, Callophyluminnophylum*	*Atei Compartment : 59,60 (Sites close to Garh Reservoir) Patilo RF (part) Rebana RF-Compt 38 (Site of Remal dam) (Site dam) Compartment 45 (Site of Kusei River)*

3.9 REHABILITATION CYCLE :

3.9.1 A ten year cycle has been prescribed.

3.10 CALCULATION OF YIELD :

3.10.1. No yield is prescribed.

3.11 REHABILITATION TREATMENT :

3.11.1 The sequence of rehabilitation measures of different blocks & compartments shall be carried

out as per the annual coupe which has been constituted by dividing each series into 10 segments to work annually. Care has been taken to constitute the annual coupe taking permanent features like Nala, Ridge, Compartment line into consideration. Such coupes have been delineated on the management map. The block and compartment included in the coupe has been shown rehabilitation series wise for each range and the same has been furnished in the following table. These tables givethe annual coupe for each rehabilitation series with its number and year of treatment along with the name of the forest Block, its Compartment No. and area included in the coupe.

3.11.2 **Demarcation of Coupe :**

The annual rehabilitation coupewill be demarcated during October/ November of previous year. Small stone cairns of 2 feet height will be erected at corner on the periphery for easy demarcation of coupe boundary. In case the line of demarcation passed through the dense forest growth, ground flora may be also cleared wherever necessary in a width of 1meter to ensure easy identification ofdemarcation line. Double coaltarring may be painted at the breast height and at the base of the trees standing on the line of demarcation. Sign boards indicating the details of areas i.e. forest block/compartment number, rehabilitation series, coupe no, year of rehabilitation and measure rehabilitation work for species planted etc. shall be fixed at conspicuous point.

Year wise distribution of Rehabilitation Working Circle

Rehabilitation working circle

Table No. 3.2.A :Gayalmunda Series (GLM) (Page 392)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	GLM I	Anandpur	Santoshpur	RF	8(B)	162.22	162.22
2022-23	GLM II		Baranga	RF	(P)	420.09	420.09
2023-24	GLM III		Baranga	RF	(P)	345.75	345.75
2024-25	GLM-IV		Santoshpur	RF	15(B)	115.28	115.28
2025-26	GLM V		Santoshpur	RF	19(B)	111.23	145.64
			Talagaon A	DPF		14.18	
			Biragobindapur B	DPF		20.23	
2026-27	GLM VI		Baranga	RF	(B)	197.53	197.53
2027-28	GLM VII		Santoshpur	RF	16(B)	158.15	158.15
2028-29	GLM VIII		Santoshpur	RF	17(B)	125.81	514.32
			Biragobindapur A	DPF		388.51	
2029-30	GLM IX	Anandapur	Santoshpur	RF	2(P)	268.50	455.06
			Talagaon B	DPF		186.56	
2030-31	GLM X	Anandapur	Santoshpur	RF	12(B)	191.63	191.63
Total						2705.67	2705.67

Table No. 3.2.B :Ramachandrapur Series.(RPR)(Page 393)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	RPR I	Anandapur	Atei	RF	60	542.55	575.12
			Koldiha	RF		32.57	
2022-23	RPR II		Atei	RF	61 (P)	450.75	450.75

2023-24	RPR III		Panasadiha	RF		62.39	507.10
			Atei	RF	61 (P)	264.22	
		Deogaon	Atei	RF	61(P)	180.49	
2024-25	RPR IV		Atei	RF	61(P)	3.9	549.59
		Anand apur	Atei	RF	61(P)	167.64	
				RF	62(P)	378.05	
2025-26	RPR V		Atei	RF	62(B)	258.02	525.537
		Deogaon	Atei	RF	62(P)	96.36	
		Anand apur	Ostapura	RF		171.157	
2026-27	RPR VI		Atei	RF	63(P)	186.10	541.16
		Deogaon	Atei	RF	63(B)	198.02	
		Anand apur	Andharijoda	DPF		76.10	
			Baniajodi	DPF		80.94	
2027-28	RPR VII	Deogaon	Atei	RF	64	434.28	561.76
		Anand apur	Sanapurunapani	DPF		127.48	
2028-29	RPR VIII		Meghanadapohi	RF		314.86	314.86
2029-30	RPR IX		Patilo	RF		465.27	465.27
2030-31	RPR X		Baigundi	RF		42.52	224.89
			Hatibandha	RF		72.93	
			Gayalamunda	RF		109.44	
Total						4716.037	4716.037

Table No. 3.2.C :Harichandanpur series (HPR) (Page 394)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	HPR I	Deogaon	Rebana	RF	6(B)	395.69	395.69
2022-23	HPR II		Rebana	RF	7(B)	236.46	236.46
2023-24	HPR III		Rebana	RF	36(P)	292.17	292.17
2024-25	HPR IV	Brahmanipal	Rebana	RF	34(P)	5.69	460.88
		Deogaon		RF	34(B)	455.19	
2025-26	HPR V		Rebana	RF	35	629.25	629.25
2026-27	HPR VI		Rebana	RF	37(P)	528.60	528.60
2027-28	HPR VII		Rebana	RF	37(B)	350.34	659.81
				RF	38(P)	309.47	
2028-29	HPR VIII		Rebana	RF	38(B)	535.86	535.86
2029-30	HPR IX		Rebana	RF	2	683.27	683.27
2030-31	HPR X		Rebana	RF	3	388.15	409.35
				RF	4	21.20	
						4831.34	4831.34

Table No. 3.2.E :Bhagamunda Series(BGM) (Page 395)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	BGM I	Deogaon	Atei	RF	66	524.44	524.44
2022-23	BGM II		Atei	RF	67	555.54	555.54
2023-24	BGM III		Atei	RF	68(P)	300.70	414.01
			Alughati DPF	DPF		48.56	
			Madhubhandar DPF	DPF		64.75	
2024-25	BGM IV		Atei	RF	68(B)	566.24	566.24
2025-26	BGM V		Atei	RF	69	582.66	582.66
2026-27	BGM VI		Kadagotha	RF		62.228	105.178
		Brahmanipal	Sapanaposi PRF	PRF		42.95	
2027-28	BGM VII		Tangiriapal PRF	PRF		124.16	124.16
2028-29	BGM VIII		Atei	RF	55	498.5444	498.5444
2029-30	BGM IX		Atei RF	RF	56(P)	332.65	332.65
2030-31	BGM X		Atei RF	RF	56(B)	336.19	336.19
						4039.6124	4039.6124

Table No. 3.2.F :Daitari series (DTI) (Page 396)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	DTI I	Brahmanipal	Rebana	RF	46 (P)	475.69	475.69
2022-23	DTI II		Rebana	RF	47 (P)	585.34	585.34
2023-24	DTI III		Rebana	RF	46 (P)	511.04	511.04
2024-25	DTI IV		Rebana	RF	47 (B)	573.42	573.42
2025-26	DTI V		Rebana	RF	44	637.72	637.72
2026-27	DTI VI		Rebana	RF	45(P)	615.26	615.26
2027-28	DTI VII		Palaspal	RF	(P)	428.25	619.36
		Deogaon	Palaspal	RF	(P)	191.11	
2028-29	DTI VIII	Brahmanipal	Palaspal	RF	(P)	657.30	657.30
2029-30	DTI IX		Palaspal	RF	(P)	674.01	674.01
2030-31	DTI X		Palaspal	RF	(B)	512.90	566.89
			Brahmanipal	PRF		53.99	
Total						5916.03	5916.03

Table No. 3.2.G :Mahulpanga Series.(MLP) (Page 397)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	MLP I	Brahmanipal	Rebena	RF	43(P)	627.01	825.36
				RF	18(P)	76.51	
				RF	12(P)	121.84	
2022-23	MLP II		Rebana	RF	27	512.48	933.34
				RF	23(B)	203.03	
				RF	12(B)	217.83	
2023-24	MLP III		Rebana	RF	28(B)	390.0	390.0
2024-25	MLP IV		Rebana	RF	31	575.23	714.99

				RF	22(P)	139.76	
2025-26	MLP V	Deogaon	Rebana	RF	32(P)	128.74	759.17
		Brahmanipal			32(B)	630.43	
2026-27	MLP VI		Rebana	RF	33	564.50	772.12
			Mahulpanga	RF		207.62	
2027-28	MLP VII		Rebana	RF	41	484.17	673.12
			Turkipada	RF		188.95	
2028-29	MLP VIII		Rebana	RF	42	517.64	675.47
			Champapal	DPF		157.83	
2029-30	MLP IX	Brahmanipal	Rebana	RF	39(P)	733.41	935.67
		Deogaon	Rebana	RF	8(B)	202.26	
2030-31	MLP X		Rebana	RF	9	145.41	834.06
		Brahmanipal			9	271.22	
					40	417.43	
Total						7513.30	7513.30

3.11.3: **Preparation of Site and Treatment Map** :

This rehabilitation working circle consists of forest areas, degraded and eroded in varying degrees. Theareas included in this working circle is classified into 3(Three) categories .The following classifications and requirements of forest managements shall be kept in few while preparations site for prescribed rehabilitation measures.

3.11.3.1 **Category-1 :**

It consists of those areas where there is good regeneration and presence of 300 or more number of root stocks per hectare.The main objectives of the management shall be to encourage establishment of regeneration and promotion from open density to close density. The rehabilitation treatments are:

A. Soil and moisture conservation measures

B. Protection from illicit felling

C. Protection from forest fire

3.11.3.2 **Category-2 :**

It consists of those areas where density of crop and regeneration are poor i.e less than 300 root stock per hectare. It consists of those areas where plantations were taken up earlier or large gaps are available. These are badly eroded or degraded than category - 1. The rehabilitation treatments are :

a. Intensive soil and moisture conservation measures

b. Cleaning operation

c. Intensive Gap plantation should be of site specific may be 200 plants per hectare or 400 plants perha.

3.11.3.3 **Category -3 :**

These areas are worst affected and have not been treated since long. Hence, priority should be given to treat the areas under this category. It consists of those areas which are mostly degraded .These are badly eroded sites with stiff slopes .The soil have very poor carbon and

nutrients contents.
Now –a – days fund is not a constraint. Special site specific plan can be prepared for treatment of these areas. Required funds and technical support can be obtained from OMBADC.
The rehabilitation measures to be taken up are-

a. Intensive soil and moisture conservation measures

b. Intensive Gap plantation & broadcasting of seeds of different grass species.

3.11.4 **Preparation of Treatment Plan :**

Each rehabilitation coupe shall be treated for four years excluding the zero year. The Range Officer shall prepare the annual treatment plan in the zero year in consultation with the VSS.Efforts shall be made to constitute the VSS where ever feasible.The action plan prepared by Range Officer shall be scrutinized by the ACF and will be approved by the DFO. All these work shall be completed in the zero year.

3.11.4.1 The treatment plans shall include the vital information like followings,

1) Site identification (Forest block/Compartment No./Coupe No.)
2) Area and treatment map
3) Site category
4) Site characteristics like terrain,slope, drainage,soil type,soil depth etc.
5) Vegetation and status of natural regeneration.
6) Watershed No.
7) Extend of degradation
8) Details of operation
9) Cost norms and scheduled of operation
10) Monitoring and evaluation.

3.12 : REHABILITATION MEASURES :

3.12.1 The following major operations are prescribed in general.

A. Silvicultural operation
B. Soil and moisture conservation measures
C. Planting

3.12.1.1: **(A) Silvicultural operation**

The rehabilitation coupe shall be subjected to the following Silvicultural operation.

a) Live high stumps of good coppice species like *Sal,Kuruma,Mai,Sissoo* shall be cut back flush to the ground encouraging emergence of Coppice shoots from ground level. Multiple coppice shoot shall be cut retaining the promising one.
b) Where ever a climber is creating hindrance in the growth of a promising pole /tree , then the said climber shall be cut back at 2 points i.e one at the ground level and another at a height of 3 feet .
c) Atundi (*Combretumdecandrum*) climber should not be eliminated as it is used by the elephants .
d) *Eupatorium*and *lantana* should be uprooted before flowering /seeding period for effective elimination .

e) The edible tree *Jamu,Mahua ,Mango ,Tamarind ,Chara ,Harida,Bahada,Amla, Bel*shall not be thinned out .
f) Gap planting shall be carried out where ever the gap is a patch of minimum 0.2 hectare of area
g) Soil and moisture conservation measures shall be carried out before the gap planting.

3.12.1.2 **(B) Soil and moisture conservation measures :**

Before going for any kind of SMC structure there must be a proper planning. SMC Planning is a tool, designed to select the required treatment desired to mitigate the soil erosion process to make it a stabilized site in future. It ensures judicious resource utilization without disturbing the ecological balance of the treatment site. Proper planning requires proper knowledge of different Parameters like Soil texture, Soil erosion, Soil depth, Slope class etc.

Table No.3.3 : Determination of Soil texture by Feel Method

Textural class	Feel of fingers	Ball formation	Stickiness	Ribbon formation
Sand (s)	Very gritty	Does not form ball	Does not stain fingers	NIL
Loamy sand (ls)	-do-	Forms very easily broken ball	stains fingers	NIL
Sandy loam(sl)	Moderately gritty	Forms fairly firm ball but is easily broken	Definitely stains fingers	Nil
Loam(l)	Neither very gritty nor very smooth	Forms firm ball	Definitely stains fingers	Nil
Silt Loam(sil)	Smooth or slick, buttery feel	Forms firm ball	Definitely stains	Slight tendency to form ribbon with flaky surface
Clay loam(Cl)	Slightly gritty feel	Moderately hard ball when dry	Definitely stains fingers	Ribbons out on squeezing but ribbon breaks

Table No.3.4 :Soil erosion

Sl. No.	Erosion phase	Characteristics
1.	No erosion or slight (sheet) erosion	0-25% top soil or original plough layer within A horizon removed
2.	Moderate (sheet and rill)	25-75% top soil removed
3.	Severe erosion (small & medium gullies)	75-100% top soil and up to 25% sub soil removed.
4.	Very severe erosion (shallow gullies).	Gullied land/ 25-75% sub soil removed
5.	Very very severe erosion.	Very severely Gullied land or sand clues

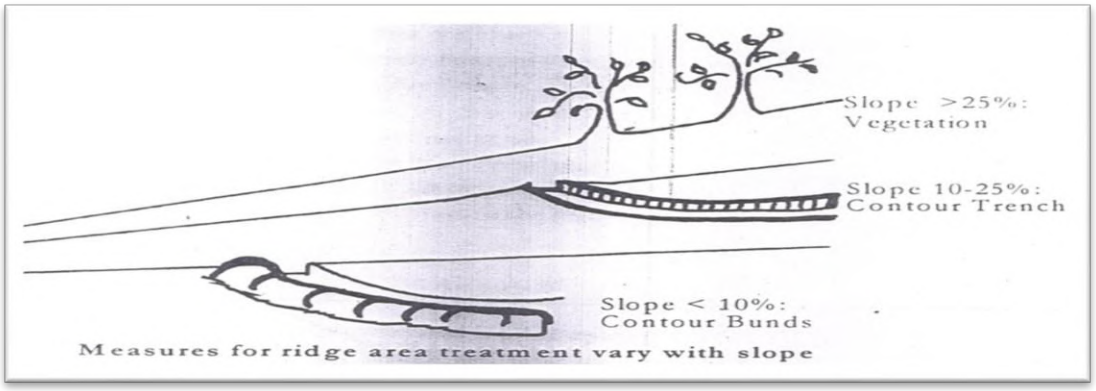
Table No.3.5 :Soil Depth

Sl.No.	Name	Depth range
1.	Very deep	> 90 cm
2.	Deep	45-90
3.	Moderately deep	22.5-45
4.	Shallow	7.5-22.5
5.	Very shallow	0-7.5

Table No.3.6. : Slope Class

Sl.No.	Slope	Description
1.	0 -1 %	Nearly level
2.	1- 3 %	Very gently sloping
3.	3 – 5 %	Gently sloping
4.	5 -10 %	Moderately sloping
5.	10 -15 %	Strongly sloping
6.	15 - 25 %	Moderately steep
7.	25 - 33 %	Steep
8.	33 - 50 %	Very steep
9.	> 50 %	Very very steep

Treatment option in varying slopes



The main component of the rehabilitation operation is the soil and moisture conservation measures.Proper soil and moisture conservation measures reduces the velocity of water flow and retain the top soil and improves the water tables It should be implemented on water shed basis so as to ensure maximum conservation of soil and moisture. The importantprescriptions are as follows.

1) Gully plugging
2) Check damming
3) Contour trenching
4) Contour bonding
5) Percolation tanks

6) Terracing

7) Gabion Structure.

1) Gully plugging-

Gullies formed due to long soil erosion are to be plugged across by various methods to check the soil erosion. Three methods have been prescribed as under.

(a)Brushwood dams &Live hedges
(b) Temporary Structure
(c) Permanent structure

a. Brushwood dams & Live hedges

The above structure are erected across the gullies so that the speed of run of becomes slow and siltation occurs in the gullies, resulting a stable site for further planting of soil binder grasses like *Sabai,Vetiver* grass ,Agave species and plants for stabilization of soil. The tree species suitable for plantation in gullies are *Prosopisjuliflora, Acacia nilotica, Acacia leucophloea,Mitragynaparviflora,Ziziphusjujuba,Azadirachtaindica,Dalbergiasisso*and *Meliaazaderachta.*

b. Temporary Structure

Gully plugs (also called check dams) protects the gully beds by reducing the velocity of the flow, redistributing it, increasing its infiltration, encouraging silting and improving the soil moisture regime for establishing grasses and other vegetative cover. As far as possible such structures should have low heights, proper provision for dissipating kinetic energy, and be spaced. Such structures may usefully be combined with vegetative measures to help stabilization. Various types of gully plugs or temporary structures are made of locally available materials, earth, sand bags, loose rock dams, and others. Most readily available material are economical to construct earthen gully plugs where possible, but they require stabilization and vegetative cover. Loose rock dams are effective and longer lasting, provided its availability is near the site. For smaller amount of runoff to be handled, hedges or sod strip checks can also be effective.

Design criteria

The check dams should be extended far enough into the bottom and side of the gully to prevent washouts underneath or around the ends. Sufficient spillway capacity must be provided in the structure. The overall height of a temporary gully plug should not ordinarily be more than 75 cm. An average effective height of about 30 cm is usually considered satisfactory.

Spacing

Check dams theoretically should be spaced so that the crest elevation of one will be the same as the trough elevation of the adjacent check upstream. However in practice a small grade is usually allowed in the gully bed to reduce the number of checks. A grade of 1% is usually allowed in fine sand and silt loam soils, and about 0.5% in silt and clay soil.

c. Permanent structure

Permanent masonry structure are very costly structures and, therefore, justifiable only in case of extreme erosion. Drop spillways, chute spillways, and drop inlet spillways are the basic permanent structures. These should be constructed only after considering the essential design parameters to avoid failures. Critical design is highly technical, and the relevant references must be consulted.

Vegetation establishment in gully control work

All structural measures used in gully control must be accompanied with vegetative measures to obtain a sound result.

- All structural measures should be completed in the dry season and the accompanying vegetative measures undertaken during the following rainy season.
- Suitable tree seedlings and cuttings must be planted just behind the structural measures.
- Shrub and grass cuttings must be planted between the structural measures.
- Tree and grass seeds should be sown between the structural measures, and on gentle, bare slopes which have sufficient soil.
- Gentle slopes which do not need any structural measures should be planted with tree seedlings, and grass and shrub cuttings.

2) **Check damming** :

Check dams are the structures, generally constructed on a small river or nalla in order to break the flow of water during the monsoons, and allow it to seep into the soil. Check dams range in size, shape and cost. It is possible to build them out of easily available materials and even at a very little cost. Decision of building such a dam depends on its location. Essentially a check dam has an earthen dam and masonry spillway.

Purpose

- It cuts the velocity and reduces erosive activity
- The stored water improves soil moisture of the adjoining area and allows percolation to recharge the aquifers
- Spacing between the check dams should be such that water spread of one should be beyond the water spread of the other
- Height depends on the bank height, varies from 1 metre to 3 metre and length varies from less than 3m to 10m

Location :

- A low weir normally constructed across the gullies
- Constructed on small streams and long gullies formed by erosive activity of flood water

a Brushwood Check dam :

Brush check dams made of posts and brush are placed across the gully. The main objective of brushwood check dams is to hold fine material carried by flowing water in the gully. Small gully heads, no deeper than one meter, can also be stabilized by brushwood check dams. Brushwood check dams are temporary structures and should not be used to treat ongoing problems such as concentrated runoff from roads or cultivated fields. They can be employed in connection with land use changes such as reforestation or improved range management until vegetative and slope treatment measures become effective.

If soil in the gully is deep enough, brushwood check dams can be used in all regions. The gradient of the gully channel may vary from 5 to 12 percent, but the length of the gully channel, beginning from the gully head, should not be more than 100 meters. The gully catchment area should be one ha or less.

There are many types of brushwood check dams. The type chosen for a particular site depends on the amount and kind of brush available. Whatever sort is used, the spillway crest of the dam must be kept lower than the ends, allowing water to flow over the dam rather than around it. The maximum height of the dam is one meter from the ground (effective height). Both the upstream and downstream face inclination is 30 percent backwards. The spillway form is either concave or rectangular.

Technical specifications for Brushwood Check dam :

Posts are set in trenches (0.3 by 0.2 m in size) across the gully to a depth of about 1/3 to 1/2 of the post length, and about 0.3 to 0.4 m apart. -The length of the posts is 1.0 to 1.5 m and

their top-end diameter is 3 to 12 cm.

- Any tree or shrub species capable of vegetative reproduction, locally available can be used as posts.
- The ends of interlink materials should enter at least 30 cm into the sides of the gully.
- The space behind the brushwood check dams must be filled with soil to the spillway.
- If sprouting species are selected as posts and interlink materials, brushwood check dams should be constructed when the soil in the gully is saturated or during the early rainy season.
- If non-sprouting species are used, brushwood check dams can be constructed during any season.

The primary materials used are brushwood, posts, or pegs and the filling materials are soils and stones.

This can be used on small gully heads for stabilization. Posts or pegs to be used could be sprout-producing tree species available in the area. First, a foundation extending into the banks is dug. The brushwood is then placed between two rows of pegs driven in 40 cm apart across the gully bed. The distance between the rows is from 80-100 cm for gullies with about 5 m in width. The brushwood is then packed firmly and the two rows of pegs are tied together with wire. A notch or spillway of about half of the span and the top of the dam is then spared. On the lower side of the dam; brushwood is placed lengthwise to provide an apron that will prevent scouring by overflow. It is very important that these temporary structures are supplemented by cuttings and seedlings, which will replace the brushwood when decayed.

bLog check dams :

Log check dams made of logs and posts are placed across the gully. They can also be built of planks, heavy boards, slabs, poles or old railroad ties. The main objectives of log check dams are to hold fine and coarse material carried by flowing water in the gully, and to stabilize gully heads. They are used to stabilize incipient, small and branch gullies generally not longer than 100 m. and with catchment areas of less than two hectares.

The maximum height of the dam is 1.5 m from the ground level. Both its downstream and upstream face inclination are 25 percent backwards. Its spillway form is rectangular. In general, the length and depth of its spillway are one to two meters and 0.5 to 0.6 m.

cBoulder check dams :

Boulder check dams placed across the gully are used mainly to control channel erosion and to stabilize gully heads. In a gully system or multiple-gully system all the main gully channels of continuous gullies can be stabilized by boulder check dams. The maximum total height of the dam is 2m. Foundation depth must be at least half of effective height. The thickness of the dam at spillway level is 0.7 to 1.0 m (average 0.85 m), and the inclination of its downstream face is 30 percent (1:0.3 ratio); the thickness of the base is calculated accordingly. The upstream face of the dam is usually vertical.

Loose Boulder Structure :

These are the structures made up of loose stones and boulders in upper reach gullies. It reduces velocity of runoff water and trap silt and soil which promotes vegetation in the upstream side.

Suitability

- Gully size of 1.2 to 1.5 m .depth with contributory runoff area less than 2.00 ha.

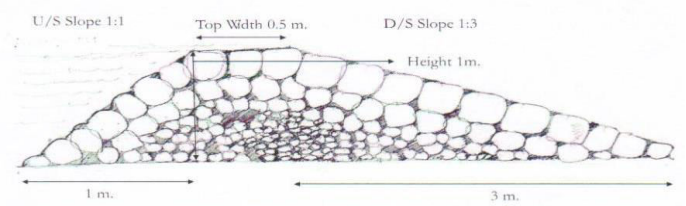
Area where plenty of stone and boulders are available

Location

- Constructed in series on a drainage line.
- Independent catchment of LBS should not be more than 1 ha.
- Should not be constructed where bed slope is more than 20%
- Locate the structure where the upstream slope is flatter to store more water and more

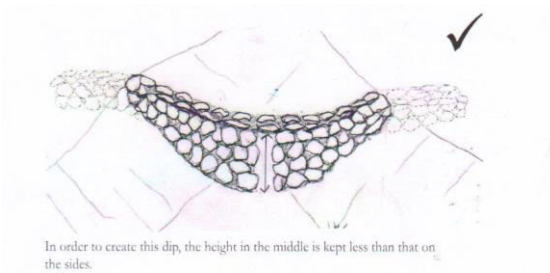
recharge

- Height of gully = max depth of flow in stream + design height of structure in central portion of gully.
- Smaller angular stones (not less than15cm preferably 20-25 cm or1kg) can be used to interior portion.
- Angular stone is preferred for greater stability.
- Shale, lime stone or any loose rock should not be used as these disintegrate when comes in contact with water.
- The largest boulder must be placed at the lowermost edge of the d/s side of the LBS and preferably be anchored to ground.



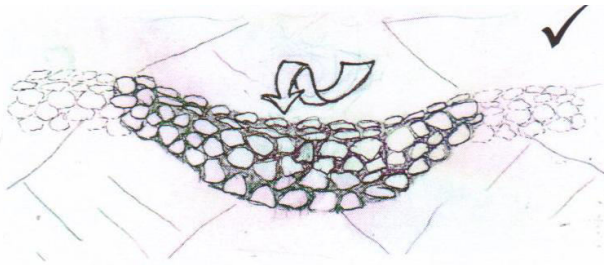
In the construction of a boulder check, bigger boulders are placed outside and smaller ones inside. On the outside, the biggest boulders are placed on the downstream side.

Figure 9.1: Cross section of a boulder check



In order to create this dip, the height in the middle is kept less than that on the sides.

Figure 9.2: It is advisable to direct the maximum overflows through the middle of the structure



With a dip in the middle and sides embedded on either embankment, water flows over the dip safely without endangering the bund

Design

- Maximum height = 1.0m (at the deepest section of gully / nalla).
- Top width= 0.4m
- U/S slope = 1:1 to 1:2, D/ S slope=1:2to1:4
- Provide a dip in the middle to avoid erosion at sides by directing max flow at the middle.
- Height of LBS at both side = height of embankment or 1.5m. whichever is lower.
- LBS should be embedded 0.5m in to both the embankment stop prevent erosion where the LBS joins the embankment.
- If nallah/gully bed is hard and rocky, no base stripping is required, otherwise excavate max.0.25m.

Layout

- Minimum V.I. between two LBS= height of the structure.
- Height of structure = height of gully – max. depth of flow in the stream.
- H.I depends on bed slope of the gully (e.g.If VI= 1.0m, for 5% bed slope HI=20m and for10% bed slope HI=10m.)
- HI=VI/S(in%)

Distance between two LBS

- Thumb rule in practice
- On higher slopes, LBS should be closer, but not close than10m.
- On lower slopes, LBS should be far, but not farther than50m.

Construction steps

- Start construction from ridge to valley
- After finalizing the location, the site must be cleared by removing boulders and debris.
- Mark the bottom width and length of structure by lime and excavate trench with uniform depth of 45 cm (maximum) across the gully. Normal depth is 30.0 cm,
- The centre of the proposed site for LBS till it reaches on over the bed on nalla, if embankment is less than1.5m embankment only.
- From this line, draw two parallel lines at 20 cm. at both the u/s and d/s end up to the embankment (these two lines are the boundaries of crest, if top width is 40 cm.)
- Suppose u/s slope is 1:1 and d/s slope is 1:3 (a) Mark at 1.0 m perpendicular to u/s crest line (b) mark at 3.0 m distance perpendicular to downstream crest line. (these points are upstream end and downstream end of the LBS respectively and draw lines at both the sides)
- The LBS should be raised in horizontal layers.
- Using larger size stones laying in layer with proper interlocking fill up trench. Care should be taken so that last layer of the stone in trench is half inside the trench and half above the ground level.
- Use smaller stones to fill up the gaps in layers and use hammer or boulder to fix small stones for better stability of the structure.
- The upper portion is completed in the similar manner keeping the side slope in view.
- Care should be taken so that one layer of stone is interlocked with another layer of stone.
- The structure must keyed (extended) minimum of 1.5 ft into both side of the gully bank.
- Larger boulder must be placed outer sides (especially in downstream side).
- Care for maintaining both the slopes during raising of layers.
- Provide dip at middle, allow safe exit of excess runoff.

d. Masonry check dams :

Masonry check dams constructed with cement mortar and non-disintegrating stones are generally used in torrent control. The main objective of the dam is to hold fine and coarse material carried by flowing water in the gully or torrent. From a technical and economical point of view, it is not necessary to build masonry check dams to control channel erosion in gullies. Every kind of gully that is about 1000 m long and covers an area of 20 ha or less can be stabilized easily by boulder check dams. In a series of boulder check dams, the first dam can be built with cement masonry as well as those above and below a road at the junction points where the gully crosses it.



3. Contour Trenching :

Contour trenching is excavating trenches along a uniform level across the slope of the land in the top portion of catchment. Bunds are formed downstream along the trenches with material

taken out of them. The main idea is to create more favourable moisture conditions and thus accelerate the growth of vegetation.

Design

Plants are put on the trench side of the bunds along the berms. If not continuous, trenches are not more than 15m long and are generally staggered. The side slopes of the trenches shall be 1:1 or 0.5:1, according to the nature of the soil.

- ✓ Vertical interval between two successive contour trenches is fixed at 1m.
- ✓ Trench should be closer, but not closer than 10m on higher slopes.
- ✓ Trench should be far, but not farther than 30m on lower slopes.
- ✓ Depth: 30-50cm, width:30-50cm.
- ✓ Practically adoptable size 45cm x 45cm.

Dimensions

For continuous trenches/ staggered trenches with the in between gap equal to length of trench, the runoff from the contributing area is estimated for 2 year frequency and the following formula is used to work out the dimensions.

$$Q = \frac{W \times D}{100\,HI}$$

Where,

Q=depth of run off from area in cm

W=width of trench in cm

D=depth of trench in cm

HI=horizontalinterval in metres

Staggered trenches with gap not equal to length of trench:

$$Q = \frac{W \times D}{100\,HI(1+X/L)}$$

X=gap between trenches in m
L=length of the trench in mtr.

For convenience of layout and construction, shorter lengths of 3.5 or7 m are generally adopted.



Step wise practice

- ✓ Measure the slope in one section of the ridge area.
- ✓ Join the highest point and lowest point along the slope by a straight line with a rope and lime (wet).
- ✓ Calculate the interval between successive lines of trench.
- ✓ On the straight line, mark points at the calculated interval.
- ✓ Demarcate the contour line starting from each of the mark points (using A-frame, pipe level).
- ✓ Excavate trenches along the demarcated contour line starting from the mark so that when the trench is filled with rain water, water remains at the level of the marked. Contour line or below.
- ✓ Always start excavation from the highest contour line.
- ✓ Pile the excavated earth at least 20cm, away from the trench in the downstream side.
- ✓ Deposit stones, gravels found during excavation/or collect freely available material nearby area in a layer of 1.0 ft/ or promote soil binder grass in the upper edges of the trenches.
- ✓ Suitable plantation works must be undertaken in the lower edge of the trench.

Suitable time

- ✓ Trenching is preferably carried out during winter and spring so that sowing and planting can be done during first monsoon.

4. Contour Bonding –

- ✓ Contour bunds are constructed following the contour as closely as possible.
- ✓ A series of such bunds divide the area into strips and acts as barriers to the flow of water, thus reducing the amount and velocity of the runoff.
- ✓ No cultivation is allowed on the earthen embankments.
- ✓ Under these bunds an area of about 5% is lost, i.e. not available for cultivation.
- ✓ Studies have shown that contour bunds result in a saving of soil ranging from 25 to 162 tons/ha/annum.
- ✓ In addition to controlling soil erosion and maintaining soil fertility, the construction of bunds helps in better infiltration of water into bunds ultimately replenishing the groundwater.

Suitability

- ✓ In un-bunded agricultural lands with 2.6% slope (maximum 10%)
- ✓ Area having low annual rainfall (less than 800mm)
- ✓ All permeable soils except black cotton soil.

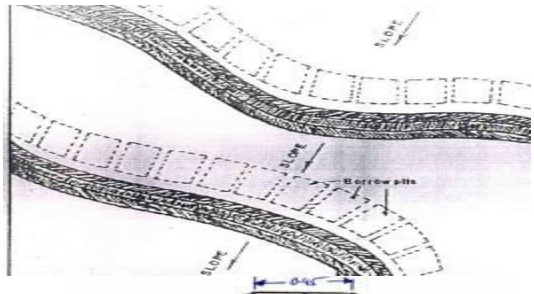
Distance between two bunds

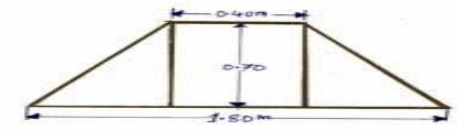
- ✓ Greater the rainfall and greater the slope, lesser shall be the distance
- ✓ More permeable the soil, greater the distance.

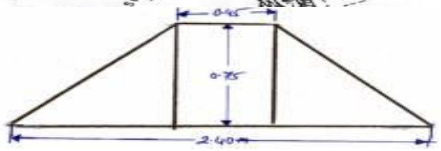
Thumb rule

- ✓ Vertical interval between two successive contour bunds is fixed at 1m.
- ✓ On higher slopes, bund should be closer, but not closer than 30m.
- ✓ On lower slopes, bund should be far, but not far than 60m.









Design of contour bund

- ✓ Design of contour bund involves the selection of vertical and horizontal intervals and determination of bund cross section.
- ✓ The criteria for fixing the vertical interval is same as discussed under graded terrace.
- ✓ The cross section of the bund is determined by fixing the side slopes, base width and top width.
- ✓ The height of the bund should provide sufficient storage behind the bund to handle the expected runoff. But in any case it should not be less than 45 cm.
- ✓ In practice, capacity is provided to take care of runoff from rains expected in 10 year's recurrence interval.
- ✓ The maximum runoff volume is estimated from the maximum amount of rainfall expected during the recurrence interval and infiltration characteristics of the area.
- ✓ The height of bund should be provided with a freeboard of 20% of the design depth.
- ✓ The top width varies from 30 to 90 cm, depending on the height of bund (greater the height, more should be top width).
- ✓ The side slopes depend on the nature of the soil. The following side slopes should be provided.

Recommended side slopes for different soil

Table No.3.7. Soil wise Side slope

Type of soil	Side slope (H.V)
Clay	1:1
Loam	1.5:1
Sandy	2:1

- The base width depends upon the depth of water and soil type.
- The base should be sufficiently wide so that the seepage line does not go in the middle.

5. Percolation tank –

Percolation tank is a farm pond type structure constructed in relatively permeable soils in the upper reaches of the watershed to facilitate groundwater recharge. The runoff from the catchment gets harvested in the percolation tank where it gets sufficient time to slowly recharge the groundwater. The percolation tanks are generally constructed in the first and second order streams. The average catchment area in these streams is 50 ha. So, one percolation tank can be constructed in a 50 ha catchment area.



Purpose

The purpose is to arrest runoff, to enable collection and percolation of surface water in order to recharge the ground water table.

Location

Usually suitable in upper and middle reach in common/ revenue/degraded/forest lands. These percolation tanks are required to be constructed in hilly terrain where rainfall is inadequate or badly distributed and there is not enough time for the rain water to infiltrate and soak into the ground. It is observed that streams or nalas in such tracts get floods of short duration and remains dry for the major period. The percolation tanks are essential in these area to impound the short flow, spreading to large area and allow it to stand for long period so that water percolate down in to soil and recharge the ground water. The catchment should be above 40 ha. The dugout earth from the Percolation tank should be placed in an inverted trapezoid manner and the soil should be compacted. No inlet & outlet should be provided from the percolation tank. The bond should be treated with seeds of *Sesbaniaaculeata* (Dhanicha), *Crotalaria juncea* (Sunn hemp) or *Mycrotylomauniflorum* (Horse gram).

6. **Terracing –**

The commonest type in this group is referred to as Bench Terracing. Platforms or Benches are cut into the hill in a step like fashion and supported by almost vertical returning walls made with rugs and earth or by vegetation. The water mix soil flowing will get deposited arresting the soil.

7. **Gabion Structure :**

If abundant stones are available but their shape and size makes them unsuitable for loose stone construction or expected water velocity is very high gabions can be used for construction check dams. A gabion is a rectangular shaped cage made of galvanized wire which is filled with locally found rocks or stones. To facilitate transport gabions are conveyed flat and are folded to required shape at construction site. The gabion check dams are made by connecting several gabion in both horizontal and vertical direction. An important advantage of gabion structure is its flexibility; it will shape itself according to stream bed when changes occur due to erosion without loosing its stability. After construction gabions are permeable but they will slow down water velocity considerably causing sedimentation and finally complete filling up behind the gabion check dam is achieved.



3.12.1.3: **(C)Plantation :**

In this chapter in most coupes gap planting is prescribed .In different Forest Blocks there are many patches where permanent gaps are found. Here the density of crop and regeneration is poor. In these areas ANR with gap planting (200 seedlings per Ha.& 400 seedlings per ha) depending on gap in concentrated patches need to be carried out, so that in future there will be permanent forest cover in these denuded areas.

The plantation area shall be indicated by sign boards at corners or at point of intersection with roads,inspection path and boundary lines of reserve forest. The sign boards should contain the name of the plantation site,area,year of plantation,Compartment No. and other details.

(i) Nursery – Seedlings will be raised in temporary/permanent central nursery .Care shall be taken to raise quality seedlings from the certified seeds,superior clonal propagules. Seeds should be procured from the Silviculturist, Rayagada or Bhubaneswar or any other reputed supplier.

(ii) Site map-A site map on 1:50000 scale topo sheet showing the details of area, direction of slope ,nature of erosion, biotic interference ,site specific species, want of people and other factors shall be prepared .Species suitable for the site shall be identified in accordance with the objectives of the managements .

(iii) Treatment map – A treatment map shall be prepared along with a statement showing estimates of financial requirement and calendar of operation .This job shall be done by a officer not below the rank of a Forest Ranger and checked by ACF .It should be completed by the end of the October of the year preceding to the plantation.

(iv) Plantation plan – Each plantation site should be taken care for 4 years including the main year of operation .The plantation plan along with the treatment map shall be prepared by the Range Officer ,checked by an ACF and approved by DFO .Abstract of approved estimate of all plantation in the division is to be sent to the CF for information.

(v) Preparation of planting area –By December of zero year or pre-planting year the plantation site should be properly demarcated. All the dried materials should be collected and heaped in the blank area .Control burning of the heaped materials will be done and completed by December to January of the pre-planting year.

(vi) Stacking and pitting – After completion of site preparation by the end of the January. Stacking shall be taken up at aspacing of 2.5 m x2.5 m and 200 no. of pits per Ha.have been prescribed .The standard size of pit i.e 45cm x45 cmx 45 cm shall be dug in the entire area other than degraded area.Stacking and pitting shall be completed by Mar- Apr.

(vii) Planting – Planting shall be taken of immediately after onset of monsoon and completed by the second week of July. Insecticides and organic fertilizers in proper quantity shall be applied as a basal dose. Planting will be done departmentally and plantation journal shall be maintained as per Odisha Plantation Manual.

The blank areas which have least chance of restocking through promotion of existing growing stock shall be covered through planting. Choice of species for the planting shall be based on the suitability of site , need of local people and easy propagation of indigenous species along with NTFP ,fruit bearing , medicinal plant species ,Bamboo are to be planted during the planting season .

The important tree species suitable for different problematic sites as prescribed earlier should be taken into consideration at the time of plantation.

As the vast area of the forest blocks lies within open and scrub category and to

combat climate change there should be massive plantations. Apart from gap plantations, new technologies & method may be used to cover up the degraded area. Some of the methods are discussed below.

1. Use of Drone Technology in Plantation : During 1st week of July, the following seeds may be sown aerial to enhance regeneration Accacia nilotica, *A. leucophloea, A.Catechu, Azadiractaindica, Ailanthus excelsa, Albizziaprocera, Adina cordifolia*.
2. Seed Ball : Small Balls of earth &cow dung manure may be prepared inside which seeds comparatively bigger in size may be set inside the ball. These balls can be thrown in inaccessible areas as a method of plantation.
   These methods may be tried in ravine areas.

Apart from Tree species many of the grass species can be planted which can act as a soil binder in eroded areas .These grass species can be raised either by planting or by dibbling of seeds or both depending upon the degree of eroded condition of site . However,a list of such grasses is furnished below.

Important Grass species :

Table No.3.8 : List of Important Grass species according to soil type

Species	Type	Habitat factor
Aristidasetacea	Fodder	Brown soil ,Sandy loam with gravel , PH 7.0
Arundinellabengalnensis	Fodder	Yellowish brown soil ,Sandy loam , PH 6.2
Arundinellanepalensis	Fodder	Slopes having good drainage and permeability ,Sandy loam PH 6.5t
Cenchrusciliavis	Fodder	Grows in semi arid zones and sandy soil . PH 7.5 to 7.7
Chrysopogonaciculatus	Fodder	It is a creeping rhizome and prefers sandy loams ,acidic soils on level or moist slopes ,PH 5.1 to 6.1 can withstand heavy grazing, cannot survive or dry stones and sandy soils . Promising species for stabilization of embankments.
Chrysopogongryllus	Fodder	Strong acidic soil on high hills ,PH 4.2
Chrysopogonfulvus	Fodder	Prefers hilly gravely ,black cotton soils and red soils and low level of moisture
Cymbopogoncoloratus	Non-fodder	Occurs in variety of sites of dry areas having gravely to sandy loam exposed rocks ,acidic to neutral soil and hill and plains .
Cymbopogonjwarancusa	Fodder	Prefers level to hilly topography ,sandy and rocky soil .PH 6.5 to 7.5
Cymbopogon martini		Wide distribution ,PH 5.2 to 7.0
Cynodondactylon	Fodder	Wide distribution prefers moist and level land,withstand moderate grazing and trampling .
Dactylocteniumindicum	Fodder	Dry areas ,prefers slightly alkaline soil
Demostachyabipinnate	Fodder	Prefers semi areid and arid condition ,can tolerate PH up to 9.5 .
Dichanthiumannulaltum	Fodder	A species of level and prefers sandy loam to loamy soil moist areas .

Dichanthiumcaricosum	Fodder	A species of level and prefers sandy loam to loamy soil moist areas
Dimeriafuscescens	Fodder	Prefers good drainage and permeability ,PH4.2
Eleusinecompressa	Fodder	A grass of arid region
Eragrostiscurvula	Fodder	A xerophytic grass
Eremopogonfoveolatus	Fodder	Grows in skeletal soil ,PH 6.6 to 7.5
Eulaliatrispiccata	Fodder	Prefers deep soil and low land
Eulaliopsisbinate	Fodder	Can grow up to 50% hot dry localities ,withstand forest fires
Heteropogoncontortus	Fodder	Shallow eroded ,black or red soil ,PH 6.8 to 7.0
Imperatecylindrica	Fodder	Prefers moist swampy areas ,Ph 4.0 to 7.5
Ischaemumindicum	Fodder	Low lying wet area ,heavy black soil ,PH 7.1 to 8.5
Ischaemumtimorense	Fodder	Damp land
Iseilema species	Fodder	Low lying area ,black soil ,PH 6.1 to 7.4
Lasiurus species	Fodder	Brown sandy soil ,PH 8.5
Leersiahexandra	Fodder	Prefers low lying land ,semi aquatic condition
Narengaporphyrocoma	Fodder	Level land with good drainage and permeability .
Neyraudiareynaudiana		Favours moist sandy loam area ,PH 5.0 .
Paspalumconjugatum		Moist areas
Phragmiteskarka		Low lying land, PH 4.5 .
Saccharum species		Mesophytichabitat .
Sclerostachyafusca		Clay soil in depression of salforest ,PH 4.75 .
Sehimanervosum	Fodder	Wide range of soil ,deepsoil,PH 6.5 .
Sporobolusindicus	Fodder	Withstand inhospitable soil,drought ,PH 6.5 .
Sporobolusmarginatus	Fodder	Level sandy tract of arid zone
Themdatriandra	Fodder	Gravelly soil on hills ,PH acidic to neutral
Vetiveriazizaniodes	Non-fodder	Ill drained land where water table is high .Soil sandy loam to clay .PH 4.0 to 7.5

3.13 : MISC. REGULATION–

Protection from biotic interference such as illicit felling,fire and grazing are to be carried outcombinely by anti-smuggling watcher, fire watcher with the involvement of VSS from the year of initiating of rehabilitation work.

3.13.1 Fire Protection :-

I. Maintenance of fire lineon the boundaries of each coupe during the month of February.
II. The Orissa Forest Fire Protection Rule 1979 should be followed.
III. Fire watchers should be engaged from February to June.
IV. VSS should be formed or they are to be motivated to extinguish fire if occurs.

3.13.2 **Grazing** :–

I. The coupe shall be closed for grazing at least for 5 years including the year of operation to facilitate the natural regeneration to come up.
II. Watchers should be engaged to ensure strict prohibition of grazing.
III. VSS should be motivated in this aspect.

3.13.3 **The Resource mobilization :–**

The DFO shall make effort to secure funding from all possible sources to ensure sufficient fund forimplementation ofthe prescription of the working plan.

3.14: RECORD KEEPING :

The journals and other records will be maintained for each coupe in accordance with the provisions of Orissa forest plantation manual 1977 .The copy of such journal shall be submitted to division office for reference and records .Necessary entry shall be made in respective compartment history indicating the details of operation carried out.

3.15: RIGHTS &CONCESSION:

Rights & Concession in this working circle shall be regulated in accordance with the provision of the relevant gazette notifications of the respective forest blocks and the Govt. of Odisha policies with regard to JFM.

3.16: COST NORM:

The Cost Norm of this Working Circle has been discussed in Chapter – XIV of Part – II.

3.17: INTERIM REVISION:

No major changes in the prescriptions of this Working Circle are anticipated. However, it may be reviewed if necessary, after five years jointly by the RegionalChief Conservator of Forests Baripada Circle and Chief Conservator of Forests (Working Plan). Any deviations suggested shall be subjected to the sanction of competent authority.

CHAPTER-IV
PLANTATION WORKING CIRCLE

4.1 GENERAL CONSTITUTION :

4.1.1 An exclusive plantation working circle has been prescribed in this plan. The blocks having permanent blank, devoid of root stock, lacking natural regeneration due to heavy biotic pressure and requiring artificial/aided regeneration have been included in this working circle in addition to some old plantation which are in need of tending operation for further development. Accordingly compact blank patches more than 10ha. in size, scattered gap inside natural/plantations raised in previous plan periods under different schemes including Village Forest and existing old plantations having more than 40% canopy density in need of tending operation for further improvement/enrichment are also included this working circle.The total area allotted to this working circle comes to **3233.0754**ha. which is about 5% of total plan area.

4.2 GENERAL OBSERVATION OF VEGETATION :

- The barren areas having negligible vegetation or weed growth are in need of complete artificial regeneration.
- Established old plantations having more than 40% density in bare need of tending operation to boost its growth for maturity ultimately leading to final harvest.
- Some plantations raised in previous plan periods having scattered opening susceptible for invasive weed growth are required to be restocked for enrichment both in density & quality will be treated with gap planting along with ancillary silvicultural operation.

4.3 SPECIAL OBJECTIVE OF MANAGEMENT :

4.3.1 The following special objectives have been set for this working circle. All plantable both block & gap,tendable& restorable area included in this working circle shall be planted/tendedwithin 10years synchronizing the plan period.

I. Block plantations to be raised in blank area identified in different forest blocks with site specific treatment plan.
II. Seedlings of 6month old of indigenous species to be planted.
III. The plantation area shall be provided with suitable soil moisture conservation measures.
IV. All plantations shall be maintained for 3 years with proper watch and ward.
V. To recover eco-system biodiversity thereby creating space for small wildlife and aviary population.
VI. To create space for carbon stocks thereby creating carbon sink.

4.4 AREA ALLOTMENT AND PLANTING SERIES :

4.4.1 The areas included in this working circle areto be treated broadly under 3 categories. Area suitable for block plantation exclusively will be taken up under planting series where as old plantation area having more than 40% canopy density requiring only tending operation will be treated under tending series. Besides that old plantations having less than 40% survival rate requiring restocking will be taken up for augmented natural regeneration through gap plantationalong with site specific cultural operation. In this context it is to mention here that plantations declared as Village Forest under section 30 of OFA 1972 and managed under Joint forest management guidelines have been included in this working circle to give emphasis for focused attention & concentrated operation to develop into dense patches.

4.4.2 **Allotment of area-in the Plantation Working Circle is depicted as per the table below.**

Table No.4.1. Forest Range wise Plantation Working Circle Area

Name of Range	Forest Block	Plantable (Ha.)	Planted (Ha.)	Total (Ha.)
Anandapur Range	Gayalamunda RF	11.00	0	11.00
	Baranga RF	57.00	160.00	217.00
	Ostapura RF	20.00	29.00	49.00
	Nuniapatna	25.00	0	25.00
	Santoshpur RF	71.00	137.00	208.00
	Meghanadpoi RF	18.00	0	18.00
	Hatibandha RF	10.00	0	10.00
	Atei RF	80.00	46.00	126.00
	Patilo RF	0	1.00	1.00
	Protected Forest	0	12.08	12.08
	Village Forest	0	177.313	177.313
	Total	**292.00**	**562.393**	**854.393**
Deogaon Range	Atei RF	40.00	61.00	101.00
	Rebena RF	27.00	195.00	222.00
	Protected Forest	0	90.00	90.00
	Village Forest	0	161.254	161.254
	Total	**67.00**	**507.254**	**574.254**
Brahmanipal Range	Rebena RF	627.00	736.00	1363.00
	Turkipada RF	36.00	82.00	118.00
	Palaspal RF	25.00	96.00	121.00
	Sapanaposi PRF	15.00	0	15.00
	Total	**703.00**	**914.00**	**1617.00**
Hadagarh Range	Protected Forest	0	114.7524	114.7524
	Village Forest	0	72.676	72.676
	Total	**0**	**187.4284**	**187.4284**
Grand Total		**1062.00**	**2171.0754**	**3233.0754**

4.5 SILVICULTURAL SYSTEM :

4.5.1 Since the area of this working circle are to be treated under 3 broad categories, site specific silvicultural system suitable to different category have been prescribed under

4.5.1.1. **Planting Series area:**

Only block plantation will be taken up on compact blank area requiring site preparation and artificial regeneration through planting. No yield is expected. Further plantations are to be raised afresh & maintain as per prescription of Plantation Manual considering the site characteristics in to consideration. The DFO is required to prepare a site specific micro plan before executing this operation. However prescription in general has been prescribed.

The plantable area of **1062 Ha** has been divided into two planting series. Each planting series is divided into 10 annual coupes .The said sequence of planting series is shown in 1:250000 management maps. A statement of allocation of blocks and compartments into different planting series with area is given in Table No.4.2.

Table No.4.2.Planting Series

Plantation Series	Name of Range	Forest Block	Compt. No.	Total area (Ha.)
Kusaleswar Series	Anandapur Range	Gayalamunda RF	-	11.00
		Baranga RF	-	57.00
		Ostapura RF	-	20.00
		Nuniapatana	-	25.00
		Santoshpur RF	-	71.00
		MeghanadapoiRF	-	18.00

		Hatibandha RF	-	10.00
		Atei RF	60	40.00
			61	40.00
		Total		**292.00**
Kusaleswar Series	Deogaon Range	Atei RF	68	40.00
		Rebena RF	36	27.00
		Total		**67.00**
		Grand Total		**359.00**
Talapada Series	Brahmanipal Range	Rebena RF	18	81.00
			19	176.00
			20	93.00
			22	27.00
			26	10.00
			39	43.00
			43	86.00
			45	38.00
			46	73.00
		Turkipada RF	-	36.00
		Palaspal RF	-	25.00
		Sapanaposi PRF	-	15.00
		Total		**703.00**
		Sum total		**1062.00**

4.5.1.2. **Tending Series:**

Old & established plantations having more than 40% stocking requiring operations to boost growth for maturity leading to final harvest will be treated exclusively through tending operation for which detail prescription has been prescribed under that series.

Treatment For Existing Plantations of Last Working Plan Period:

The plantations raised during outgoing plan period as per the list provided by Divisional Forest Officer were verified in the field on random sample basis to the extent of 3% of the total area and the details of which is given in **Appendix –XXV(A)**. As per the field assessment, these plantations are grouped into two categories.

Plantation having more than 40% survival is kept under category A as detailed in Table No.4.3 with the prescription of tending operation for further growth to become harvestable.

Plantations having less than 40% survival is furnished in Table No.4.4 with the prescription of restocking the barren patches.

Apart from that old plantation raised prior to the outgoing plan as per the annexure XXII [A,B,C(Part-I), XL] of the said plan have been apportioned range wise pertaining to Keonjhar WL Division exclusively and have been furnished vide **Appendix- XXV (B,C,D,E,F)**of this plan with the regulatory recommendation for field verification by the Divisional Forest Officer during the first year of implementation of this plan through responsible field functionaries to treat those plantation as per the silvicultural requirement. The plantation raised prior to this working plan overlaps over the rest working circles for which no separate prescription has been formulated. The plantations raised during 2006-07 to 2020-21 is given in **Appendix-XXV(G).**

Tending operation is to be carried out over an area of **1467.8324 Ha**. situated in the respective forest blocks and year of operation is prescribed in the following table.

Table No.4.3. Tending Series(>40% survival)

Year of Operation	Year of Plantation	Range	Location	RF/PF	AR (Ha.)		Total
					Compt.	Area	Area
1	2	3	4	5	6	7	8
2021-22	2009-10	Anandapur	Marshapal	Atei	61	10.00	185.00
	2009-10	Anandapur	Dantia	Ostapura		25.00	
	2009-10	Brahmanipal	Mahulagoda	Palaspal		40.00	
	2009-10	Brahmanipal	Kusumdiha	Turkipada		20.00	
	2009-10	Brahmanipal	Kamalangi	Rebana	9	25.00	
	2009-10	Brahmanipal	Badasiadimal	Palaspal		25.00	
	2009-10	Brahmanipal	Rebana	Rebana	21	40.00	
2022-23	2009-10	Deogaon	Madhyapur	Rebana	9	20.00	177.08
	2009-10	Deogaon	Chasatangara	Rebana	8	25.00	
	2009-10	Deogaon	Bhoka	Rebana	7	50.00	
	2009-10	Deogaon	Palabani	Atei	68	20.00	
	2010-11	Brahmanipal	Gopinathpur	Palaspal		26.00	
	2010-11	Deogaon	Chhutung	Rebana	24	24.00	
	2010-11	Anandapur	Arjunbania	**PF**		12.08	
2023-24	2010-11	Brahmanipal	Kantala	Rebana	10	26.00	160.00
	2010-11	Deogaon	Thakurpada	Rebana	9	25.00	
	2010-11	Brahmanipal	Turkipada VSS	Turkipada		24.00	
	2010-11	Brahmanipal	Sanajimei	Rebana	20	14.00	
					21	10.00	
	2010-11	Brahmanipal	Gumunda	Rebana	30	14.00	
					25	10.00	
	2010-11	Brahmanipal	Pathuripentha, Putujhari	Rebana	29	24.00	
	2010-11	Deogaon	Bhagamunda	Rebana	36	10.00	
	2010-11	Anandapur	Patharapada	Patilo		1.00	
	2010-11	Anandapur	Jugalkishorepur	Atei	61	1.00	
	2010-11	Anandapur	Gohira	Ostapura		1.00	
2024-25	2010-11	Anandapur	Jugalakishorpur	Atei	61	25.00	140.00
	2010-11	Brahmanipal	Talapada	Rebana	25	50.00	
	2010-11	Deogaon	Jhinkipita	Atei	68	5.00	
	2012-13	Brahmanipal	Turkipada	Rebana	19	60.00	
2025-26	2012-13	Anandapur	Baranga	Baranga		80.00	186.00
	2012-13	Deogoan	Billa	Atei	55	6.0	
	2012-13*	Brahmanipal	Rebana	Turkipada		10.00	
	2013-14	Brahmanipal	Turkipada	Rebana	19	60.00	
	2013-14	Brahmanipal	Kanjiapal	Rebana	19	30.00	
2026-27	2013-14	Brahmanipal	Gumundu	Rebana	22	20.00	140.00
					23	30.00	
	2015-16*	Anandapur	Chandikhamana	Santoshpur	19	5.00	
	2015-16	Anandapur	Chandikhamana	Santoshpur	18	20.0	
	2015-16	Brahmanipal	Kamalangi	Palaspal		5.00	
	2015-16	Brahmanipal	Talapada	Rebana	30	10.00	
	2016-17	Anandapur	Bhikaramada	Santoshpur	1	40.00	
	2016-17	Anandapur	Rugudisahi	Santoshpur	1	10.0	
2027-28	2016-17	Brahmanipal	Pathargoda	Rebana	18	40.00	140.00
	2017-18	Anandapur	Baranga RF	Baranga		30.00	

	2017-18	Deogaon	ChandanHudi	Rebana	19	15.00	
	2017-18	Brahmanipal	BadaJimei	Rebana	20	15.00	
	2017-18	Anandapur	Khajuribani	Santoshpur	18	10.00	
	2017-18	Anandapur	Kantala	Santoshpur	18	10.00	
	2017-18	Brahmanipal	Gumundu	Rebana	22	10.00	
	2017-18	Brahmanipal	Rebana	Rebana	21	10.00	
2028-29	2017-18	Hadagarh	Padhiarpalli	**PF**		15.9972	114.7524
		Hadagarh	Nuarugudi	**PF**		15.9973	
		Hadagarh	Thunigaon	**PF**		3.9983	
		Hadagarh	Asia	**PF**		12.9985	
		Hadagarh	Bahabaranan da	**PF**		32.7630	
		Hadagarh	Matha	**PF**		32.9981	
2029-30	2018-19	Deogaon	Asanabahali	**PF**		90.00	105.00
	2018-19	Anandapur	Baranga	Baranga		15.00	
2030-31	2018-19	Brahmanipal	Pancham	Rebana	46	20.00	120.00
	2019-20	Anandapur	Arjunbania	Atei	59	10.00	
	2019-20	Anandapur	Nandabar	Baranga		10.00	
	2019-20	Brahmanipal	Baliparbat	Rebana	46	15.00	
	2019-20	Brahmanipal	Gopinathpur	Rebana	45	40.00	
	2020-21	Anandapur	Baranga	Baranga		25.00	
					Total	467.8324	467.8324

***The bamboo plantation will be treated as per standard Silviculture operation noted below as in point 7

Operation in Tending Series :

The following major operations are prescribed in general as the tending measures to improve the condition of plantation and enhance its growth. Silvicultural operations like weeding,pruning,thinning and climber cutting are quite necessary for improvement of the crop. However the following works shall be carried out in the annual coupes.

1. Weeding shall be done for the good health of the plantation.
2. Pruning should be done in the plantations to encourage the growth.
3. High stumps should be cut flush to the ground to encourage coppice shoots.
4. Singling out of multiple coppice shoots to retain the most promising one.
5. Cutting up all climbers strangulating the growth of plants.
6. Loranthus attacked branches should be lopped off and moribund trees to be removed.
7. Areas under bamboo plantation should be treated as per the provision of Bamboo Silviculture operation like cleaning of clumps, soil mounding around the clump should be done to facilitate the new shoots and other SMC measures shall be done as per requirement.

4.5.1.3. **Plantation Restoration Series:**

Plantations with less than 40% stocking are to be treated for restocking through gap plantations coupled with ancilliary cultural operations. The detailed prescription has been prescribed in that series.

As mentioned above plantations having <40% survivals are taken up for restoration. Site specific suitable species should be included for restoration.Restoration operation is to be carried out over an area of **703.243ha**. situated in the respective forest blocks and year of operation is prescribed in table no. 4.4.

Table No.4.4: Restoration Series(<40%survival)

Year of Operation	Year of plant ıtion	Range	Location	RF/VF	Compt. No.	Area (Ha.)	Total
1	2	3	4	5	6	7	8
2021-22	2010-11	Anandapur	Ostapura	Ostapura		1.00	78.00
	2010-11	Anandapur	Kalabilla	Ostapura		1.00	
	2010-11	Anandapur	Silong	Ostapura		1.00	
	2010-11	Brahmanipal	Chhutung	Rebana	11	40.00	
	2010-11	Deogaon	Mudinucha	Atei	67	10.00	
		Anandapur	Salapada	VF		5.00	
		Anandapur	Hasanpur	VF		5.00	
		Anandapur	Bailo	VF		5.00	
		Anandapur	Khailo	VF		5.00	
		Anandapur	Patapal	VF		5.00	
2022-23	2010-11	Brahmanipal	Rebana	Rebana	21	30.00	88.61
					30	20.00	
		Anandapur	Kalimati	VF		11.46	
		Anandapur	Tampo	VF		5.00	
		Anandapur	SalapadaCol. (B)	VF		10.2.	
		Anandapur	Barigaon	VF		4.43	
		Anandapur	Madanpur	VF		7.52	
2023-24	2010-11	Deogaon	Billa	Atei	55	20.00	56.2
	2011-12	Anandapur	Budhikud	Santoshpur	14	7.00	
	2011-12	Brahmanipal	Talapada	Rebana	25	7.00	
		Anandapur	Panchiora	VF		0.57	
		Anandapur	Saladei	VF		1.45	
		Anandapur	Patapada	VF		5.00	
		Anandapur	Anjar	VF		3.68	
		Anandapur	Madanpur	VF		11.50	
2024-25	2011-12	Deogoan	Garagadabahal	Rebana	2	6.00	54.63
	2012-13	Brahmanipal	Rebana	Turkipada		5.00	
	2012-13	Brahmanipal	Bareigoda	Turkipada		3.00	
	2013-14	Brahmanipal	Talapada	Turkipada		10.00	
		Anandapur	Suanpada	VF		7.60	
		Anandapur	Lunuhar	VF		7.59	
		Anandapur	Godipatna	VF		5.00	
		Anandapur	Sarei	VF		5.04	
		Anandapur	Satatira	VF		5.40	
2025-26	2013-14	Brahmanipal	Rebana	Turkipada		10.00	49.13
	2013-14	Brahmanipal	Kantajhari	Rebana	24	6.00	
	2013-14	Brahmanipal	Kantala	Rebana	10	20.00	
		Anandapur	Haridapal	VF		5.43	
		Anandapur	Kalaragadia	VF		0.44	
		Anandapur	Golabandha	VF		0.96	
		Anandapur	Kundibahali	VF		6.00	
		Anandapur	Anranga	VF		0.30	
2026-27	2014-15	Brahmanipal	Turkipada	Rebana	19	30.00	77.743
		Anandapur	Talagaon	VF		8.64	
		Anandapur	Khadibil	VF		4.93	
		Anandapur	Fakirpur	VF		13.19	
		Anandapur	Panchupali	VF		0.403	
		Anandapur	Bailo	VF		10.28	
		Anandapur	Khalana	VF		10.30	
2027-	2015-16	Brahmanipal	Pancham	Rebana	46	5.00	41.476

28	2015-16	Deogoan	Ostiaposi	Rebana	6	5.00	
	2015-16	Anandapur	Santoshpur	Santoshpur	11	10.00	
		Hadagarh	Saramanga	VF		1.40	
		Hadagarh	Ambo	VF		6.50	
		Hadagarh	Tarava	VF		10.08	
		Hadagarh	Bancho	VF		3.496	
2028-29	2015-16	Anandapur	Tavakud	Santoshpur	11	15.00	71.2
	2015-16	Anandapur	Mandapada	Santoshpur	15	5.00	
		Hadagarh	Jambhara	VF		13.50	
		Hadagarh	Jambhara (Majhisahi)	VF		5.85	
		Hadagarh	Ambrutpur	VF		1.85	
		Hadagarh	Aitpur	VF		5.00	
		Hadagarh	Anjara	VF		5.00	
		Hadagarh	Govindapur	VF		10.00	
		Hadagarh	Balipada	VF		10.00	
2029-30	2016-17	Anandapur	Chandikhaman	Santoshpur	19	5.00	106.764
	2016-17	Deogoan	Kamalangi	Rebana	9	5.00	
	2016-17	Brahmanipal	Champanagar	Rebana	46	5.00	
		Deogaon	Kantipada	VF		71.19	
		Deogoan	Chasatangar	VF		5.074	
		Deogoan	Pitatangar	VF		5.00	
		Deogoan	Bayapita	VF		5.50	
		Deogoan	Raidhiha	VF		5.00	
2030-31	2017-18	Deogoan	Chasatangiri	Rebana	9	10.00	79.49
		Deogoan	Singibila	VF		6.00	
		Deogoan	Hatisila	VF		5.30	
		Deogoan	Rekutia	VF		10.00	
		Deogoan	Kainipura	VF		10.00	
		Deogoan	Kainipura	VF		1.94	
		Deogoan	Kathapala	VF		11.25	
		Deogoan	Raidiha	VF		10.00	
		Deogoan	Aonlajodi	VF		5.00	
		Deogoan	Singibila	VF		10.00	
					Total=	**703.243**	**703.243**

4.6 CHOICE OF SPECIES :

4.6.1 Indigenous species specially Sal associates shall be given priority in all planting series. The indigenous species particularly Bamboo and NTFP species should be planted near the fringes.However economically important species like Gambhar,*Sisso,Dhaura,Sahaja, Bandhan,Asan* may be planted in the areas close to habitation. Fuel wood and fruit bearing species such as *Acacia* species, *Siris,Simul, Mango,Tamarind,Jackfruit,Mahula,Amla,Genduli,Kusum,Harida,Bahada*and *Neem* shall be planted. Since site specific species have a great bearing on the success of plantation ,the species with regard to soil depth.,P_H,slope and erosion ,soil texture ,soil moisture ,nutritional requirement ,ground water table ,regeneration potential, local and commercial demand shall be taken into account while selecting species for plantation.

4.6.2 Regarding the selection of species for taking up plantation activities, Principal Chief Conservator of Forests' Circular No. 1102 /12 (Affn.)258/2018 Dtd. 4th October,2018 should be strictly adhered to which is given in **Appendix - XXVI**.

4.6.3. Methodology for pre planting, planting and post planting activities are to be adopted as per site specific plan to be prepared by the DFO in accordance to the guideline and operations prescribed in Orissa plantation Manual 1977.

4.7 ROTATION :

4.7.1 As the plantations is to be carried with indigenous species, no final felling is contemplated within the currency of this plan nor it is advisable to decide on future rotation at this stage a provisional rotation of 60 years is fixed formiscellaneous species.

4.8 YIELDS AND REGULATIONS :

4.8.1 The prime objective of the circle is to restock the barren and blank forest areas as well as lesser stocking areas with artificial regeneration within the plan period of 10 years.

4.9 PLANTATION CYCLE :

4.9.1 All the plantable areas included in this working circle shall be planted within 10yrs to synchronise the plan period.

4.10 METHOD OF EXECUTION OF PLANTING OPERATION :

4.10.1 Prior to taking up any operation, it is necessary to prepare an operation schedule,so that the work can be executed smoothly and properly in time.However the following operations are prescribed to be carried out systematically in order to accomplish the special objectives of management effectively.It is needless to emphasize that the success of the plantation depend largely on good planting stock and timely planting and post planting operation in the field. Involvement of the local people would motivate them for post care and protection of the raised plantations.

4.10.2 **Demarcation of the Annual Plantation Coupes :**

Each planting series isdivided into 10 annual coupes. If the plantation operation could not be taken up in a particular year because of lack of funds,staff and other factors,those back logs will be taken in the subsequent years in addition to current years areas.If more funds are available or the emergency situation warrants, the areas due for plantation in future can also be done in advance.However all this deviation shall be subjected to the formal approval of the competent authority and duly reflected in the respective compt. history file as well.

The annual coupe shall be surveyed one year in advance which shall be treated as 0th year.The areas prescribed for the plantations are shown in the management maps. The plantation area boundary pillars are to be fixed as per the size prescribed by PCCF. The plantation areas shall be indicated by sign boards at corners or at the point of intersections with roads,inspection path and boundary lines of RF. The sign board should contain the name of the plantation site,area,year of planting,compartment no and other details.

Year wise distribution of Plantation Working Circles Area

Table No. 4.5.A :Talapada Series.(TPD) (Page 398)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	TPD I	Brahmanipal	Rebana	RF	19(P)	32.00	72.00
				RF	20(P)	40.00	
2022-23	TPD II		Rebana	RF	19(P)	42.00	70.00
				RF	26(B)	10.00	
				RF	20 (P)	18.00	
2023-24	TPD III		Rebana	RF	19(P)	19.00	46.00
				RF	22(B)	27.00	
2024-25	TPD IV		Rebana	RF	18(P)	40.00	78.00
				RF	45(B)	38.00	
2025-26	TPD V		Rebana	RF	18(B)	41.00	74.00

				RF	46(P)	33.00	
2026-27	TPD VI		Rebana	RF	46(B)	40.00	83.00
				RF	39	43.00	
2027-28	TPD VII		Rebana	RF	43(P)	48.00	84.00
			Turkipada	RF		36.00	
2028-29	TPD VIII		Rebana	RF	43(B)	38.00	78.00
			Palaspal	RF		25.00	
			Sapanaposi	PRF		15.00	
2029-30	TPD IX		Rebana	RF	19(P)	38.00	73.00
				RF	20(B)	35.00	
2030-31	TPD X		Rebana	RF	19(B)	45.00	45.00
Total						**703.00**	**703.00**

Table No. 4.5.B :Kusaleswar Series.(KLR) (Page 399)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021-22	KLR I	Anandpur	Baranga	RF	(P)	20.00	30.00
		Anandpur	Hatibandha	RF		10.00	
2022-23	KLR II	Anandpur	Baranga	RF	(P)	10.00	37.00
		Deogaon	Rebana	RF	36(B)	27.00	
2023-24	KLR III	Anandpur	Atei	RF	60(B)	20.00	36.00
		Anandpur	Baranga	RF	(P)	16.00	
2024-25	KLR IV	Anandpur	Atei	RF	60(P)	20.00	45.00
		Anandpur	Nuniapatna	RF	(B)	25.00	
025-26	KLR V	Anandpur	Atei	RF	61(P)	25.00	25.00
2026-27	KLR VI	Anandpur	Atei	RF	61(B)	15.00	45.00
		Anandpur	Santoshpur	RF	2(P)	30.00	
2027-28	KLR VII	Deogaon	Atei	RF	68(P)	20.00	20.00
2028-29	KLR VIII	Anandpur	Meghanadpoi	RF		18.00	18.00
2029-30	KLR IX	Anandpur	Gayalamunda	RF		11.00	43.00
		Anandpur	Baranga	RF	(P)	01.00	
		Anandpur	Santoshpur	RF	9(B)	11.00	
		Deogaon	Atei	RF	68(B)	20.00	
2030-31	KLR X	Anandpur	Baranga	RF	(B)	10.00	60.00
		Anandpur	Santoshpur	RF	2(B)	30.00	
		Anandpur	Ostapura	RF		20.00	
Total						**359.00**	**359.00**

4.10.3 **Preparation of Treatment Map** :

The identified site shall be demarcated and mapped on 1:25000 scale topo-sheet by the concerned Forester/Range Officer.Map so prepared shall include relevant information regarding slopes,contours,watershed boundaries,nature of erosions, depth of soil ,crop condition etc. Species suitable for the site shall identify in accordance with the objectives of the management. A treatment map shall be prepared along with a statement showing estimate of financial requirement and calendar of operation. This shall be done by an officer not below the rank of a range officer and checked by an ACF.

Nursery, site preparation,planting and post planting :

1. Prescription given in the Odisha Plantation Manual 1977 shall be followed. Seedlings will be raised in temporary,permanent or central nursery .Care should be taken to raise quality seedlings from certified seeds , superior clonal propagules from non seed orchards and stand. As far as possible seeds, seedlings or propagules will be obtained from or through the Silviculture Division Rayagada/Bhubaneswar.

2. Site preparation shall begin in the zero year and pre planting operation as envisaged in the Orissa Plantation Manual, 1977 shall strictly be adhered to. These pre planting operation shall be completed by October to December of 0^{th} year.

3. Alignment,stacking and pitting should be taken up at a spacing of 2.5 x 2.5 m for economic species and 2mx2m for other miscellaneous species .The standard size of pit i.e 30cm x30cm x 30cm shall be done in the entire area. Stacking and pitting shall be completed by April so as to provide intervening time for weathering of opened up soil. However, seedling planting shall be commenced immediately on the onset of monsoon and not later than first week of July .At the time of planting the insecticides &fertilizers shall be applied as a basal dose depending on the requirement.Planting will be done departmentally and plantation journal shall be maintained as per Orissa Plantation Manual.

4. Post planting operation shall include casualty replacement, weeding, soil working, manuring etc. The planting and post planting operation should be carried out as per the norm approved by the Govt. from time to time and in accordance with the prescription given in the Orissa Plantation Manual'1977. The plantation shall be fully protected from biotic interference .Local villagers should be involved in the protection of the plantations .Formation of VSS as per JFM resolution should be explored. The tentative schedule of planting operation is given in Table No.4.4

Table No.4.6. Tentative schedule of Planting operation

Tentative Schedule of Planting operation	
Operation	Tentative period of execution
0^{th} year Operation	
Raising of Nursery	September-October
Advance preparation of site	October-December
Alignment and Stacking	February
Soil and Moisture conservation (Mechanical Part)	February-March
Digging of pits (Part Major Work)	February-March
Planting and Post planting operation 1^{st} year	
Digging of pits (Balance left over)	April
Soil and Moisture Conservation(Balance)	April- May
Scooping of Pits already Dug	May-June
Polypot Planting	June last to 1^{st} week of July
Casualty replacement	July last to August
1^{st}Soil working ,weeding ,manuring	August –September
2^{nd} Soil working ,and weeding	December
Mulching	January-February
Fire tracing	February –March
Posting planting operation in 2^{nd} year	
Casualty replacement	Within July
One weeding ,soil working &manuring	August –September

Fire Tracing	February-March
Post planting operation in 3rd and subsequent years	
Soil working and casualty replacement	July – August
Pruning and other cleaning operation as required	May-June or November
Fire tracing	February-March

As per Regional Empowered Committee (REC) under the chairmanship of the Dy. Director General of Forests(Central), Eastern Regional Office, Bhubaneswar, in Plantation Working Circle the following prescriptions would be strictly followed:-

1. The sections size at a place should not exceed 20ha.
2. 5m. wide strip of natural forest should be retained on all sides of sections.
3. 40-60 healthy trees per hectare of valuable and fruit bearing species be retained in areas where plantations are undertaken.
4. No fruit trees, rare species and trees of religious importance not otherwise dangerous to human and wild life (leaning) should be felled.
5. No felling should be done on either side of Nullahs, streams and River Banks up to 20m. distance.
6. The improved planting stock should be used in order to increase productivity.

4.11 CONTROL :

The Nursery Journal, Plantation Journal and other records will be maintained for each plantation separately in accordance with the provisions of the Orissa Forest plantation Manual'1977 indicating the physical & financial achievements. Necessary entries with regard to plantation activities undertaken shall be entered in the compartment histories. All the plantations done shall invariably be shown on the topo maps of 1:25,000. Records of Tending operations carried out will be maintained in an appropriate register at the Division as well as Range level.

4.12 MISCELLANEOUS REGULATION :

4.12.1 Plantation and nursery journal shall be maintained for every plantations as per Orissa Plantation Manual 1977 indicating the physical and financial achievement, necessary entry with regard to plantation activity under taken shall be made in the compartment history. The entire plantations has done invariably be shown in the topo maps of 1:25000. Records of tending operation carried out will be maintained in an appropriate register at the Division and Range level. The compartments history files,control forms besides other records shall be maintained for each coupe/compartment in accordance with the National Working plan Code.2014.

4.12.2 All the annual coupes under different series shall strictly protected from grazing and fires. Suitable areas adjacent to these coupes should be developed into fodder plantation so as to even encourage stall feeding thereby diverting the grazing pressure on the annual coupes. The people in the adjoining areas of the plantations should be formally or informally associated in the plantations works which includes the protection of plantation.

4.12.3 PRA exercise shall be undertaken before executing the activities under the planting series to assess the needs of the people and accordingly choice of species so as to ensure their continued support in the entire process of regeneration.

4.13 RIGHTS AND CONCESSION :

4.13.1 Only such rights and concessions shall be admitted as have been described earlier. Additional usufructuary right may be allowed in accordance with the provision of the current policies and programmes of the Govt. with regards to JFM .No other right and concession shall be admitted in this working circle.

4.14 COST NORM :

4.14.1 The Cost Norm of this Working Circle has been discussed in Chapter – XIV of Part– II.

4.15 INTERIM REVISION :

4.15.1 No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans. Any deviation suggested shall be subjected to the sanction of the competent authority.

CHAPTER-V
PROTECTION WORKING CIRCLE

5.1 GENERAL CONSTITUTION

5.1.1 There is urgent need to see that forest on steep slopes & ecologically fragile areas are not disturbed and are completely protected. As per the decision of PWPR meeting protection working circle has been given independent status which includes ecologically fragile, catchment area of reservoirs and steep precipitant slopes with higher altitude will be included in this working circle.

5.2 GENERAL CHARACTER OF VEGETATION

5.2.1 Constant biotic pressure from human and cattle has led to degradation of vegetative cover which is the main cause of rapid soil erosion and high run –off. The forest blocks included here are those which have badly affected by regular removal of biomass and forest blocks having valuable forests which are prone to theft.Both these type of forest blocks need adequate protection measures so that pressure on removal of biomass is reduced substantially.

5.3. SPECIAL OBJECTIVE OF MANAGEMENT

i. To keep the eco-fragile areas intact by maintaining adequate vegetative cover.
ii. To check over degradation and augmentation of natural regeneration by strong protection measures and minimizing biotic interferences like illicit felling, encroachment & other biotic factors
iii. To protect these forest from fire and provide strict vigil against the same
iv. To check the soil erosion by suitable soil conservation measures

5.4. AREA ALLOTMENT :

5.4.1 The area allotted to this working circle is **7313.51367Ha.** constituting 13% of total plan area. This working circle includes the forest blocks which are ecologically fragile having slopes more than 30 degree, catchment of reservoir and water sources. The statement showing the forest block and compartment along with their area are given below.

Table No.5.1 : Forest Range wise protection Working Circle Area

Protection Working Series	Forest Block	Compt. No.	Total area in Ha.	Treatment area in Ha.
Anandapur Range-				
Anandapur Series	Nuniapatana RF		**42.25**	
	Santoshpur RF	1	412.64	
		3	217.77	
		4	261.80	
		5	447.19	
		6	480.14	
		7	406.5125	
		Total	**2268.3025**	**2268.3025**
Brahmanipal Range				
	Rebena RF	19(P)	797.11	
		20(P)	1178.66	
		25(P)	576.67117	
		26(P)	1128.93	
		29	662.20	

		30	701.64	
	Total		**5045.21117**	**5045.21117**
	Grand Total		**7313.51367**	**7313.51367**

5.5. ANALYSIS AND VALUATION OF CROPS :

5.5.1 As stated earlier the crops included in this circle are either in degraded condition or high vulnerable forest which need adequate protection along with soil and moisture conservation measures. With proper protection.These forest blocks, the area will regain its original status. Protection from fire and grazing will improve the regeneration status of these crop.

5.6. SILVICULTURAL SYSTEM :

5.6.1 As these forest included in this working circle are to be protected at any cost, there is no need to prescribe any silvicultural system for this working circle .

5.7. MEASURES TAKEN UP TO IMPROVE PROTECTION OF FORESTS :

5.7.1 For achieving the special objective of management of this circle, the following operations are prescribed.

1. The area shall be rigidly protected from illegal biomass removal so as to keep it under nature's own care.
2. The areas with steep slopes would be specially protected to ensure there is no further loss of vegetation or soil cover.
3. Step shall be taken up to prevent fires and grazing in the forests.
4. Forest road should be maintained properly for easy mobility for protection.
5. Boundary of compartment of Blocks should be demarcated & maintained.
6. Communication network should be strengthened.
7. Special anti-smuggling squad and fire fighting squad are to constituted for each protection unit.
8. VSS should be involved in forest protection.

5.8 PROTECTION UNIT AND CYCLE :

5.8.1 Since the protection is to be given around the clock, there is no need for any cycle. However, adequate soil and moisture conservation measures shall be taken up year wise to check the soil erosion as well as to increase the water regime of the soil as per the following table

Table No.5.2 : Year wise distribution of Protection Working Circle(Page 400)

YEAR	Coupe No.	Range	Forest Block	Status	Comptt. No.	Comptt. area	Coupe area
2021 -22	APR I	Anandpur	Santoshpur	RF	1	412.64	672.66
				RF	3	217.77	
			Nuniapatna	RF	(P)	42.25	
2022 -23	APR II	Brahmani pal	Rebana	RF	19(P)	797.11	797.11
2023 -24	APR III	Brahmani pal	Rebana	RF	20(P)	576.29	576.29
2024 -25	APR IV	Brahmani pal	Rebana	RF	20(P)	602.37	602.37
2025 -26	APR V	Brahmani pal	Rebana	RF	29	662.20	662.20
2026 -27	APR VI	Brahmani pal	Rebana	RF	26(P)	567.44	567.44

2027-28	APR VII	Brahmanipal	Rebana	RF	26(P)	561.49	561.49
2028-29	APR VIII	Brahmanipal	Rebana	RF	30	701.64	963.44
		Anandpur	Santoshpur	RF	4	261.80	
2029-30	APR IX	Anandpur	Santoshpur	RF	5	447.19	927.33
				RF	6	480.14	
2030-31	APR X	Brahmanipal	Rebana	RF	25(P)	576.67117	983.18367
		Anandpur	Santoshpur	RF	7	406.5125	
						7313.51367	7313.51367

5.9 METHOD OF EXECUTION OF OPERATION :

5.9.1 It is the fundamental duty of the forest personnel to provide necessary protection to the forest from biotic interferences such as illicit felling, fire, grazing, encroachment, shifting cultivation and poaching etc. Protection of forest from these interfering radicals is now a matter of serious concern and also emerged as a great challenge to the forests. Unless necessary measures are taken to combat these pressures effectively, this precious natural resource will perish. Therefore this working circle has been constituted comprising 13 compartments of Santoshpur, Rebana and Nuniapatna Forest Blocks which are under threats from the aforesaid activities.

According to Odisha Forest Department Code, the forest officials starting from Forest Guard are responsible for protection of forest within the area of his jurisdiction. Due to increase in human and cattle population, the pressure on forest is more day by day. The efforts made by the staff with the active co-operation of VSS are insufficient particularly for the vulnerable areas to ensure satisfactory protection. Therefore some additional efforts are necessary to achieve the special objective of this working circle.

5.9.2 **Engagement of Anti- Smuggling Squad :**

As the forest officials are entrusted with multifarious activities, it is difficult on their part to control the crime alone. Supporting hands like Anti Smuggling Squad constituted by engaging the local youth can yield good result as they are well acquainted with the topography of the forest as well as attitude of the local people along with their modus operandi and can face any untoward situation. One such squad consists of 5 members is prescribed for each protection unit under the control of concerned Forester. The DFO will decide the headquarter of the protection unit considering the vulnerability of the area. The deployment of the squad shall be changed in rotation to different locality which shall be decided by the Range officer with periodical check and review by the Assistant Conservator of Forest. Emphasis must be given to foot patrolling by field staff along with GPS-PDA.

5.9.3 **Strengthening of Infrastructure** :

A mobile squad with required number of staff, arms and vehicles in Division level will be constituted. They will be deployed by the Divisional forest officer for regular patrolling and on the requisition by the Range Officer as and when required.

All forest check gates shall be strengthened with the staff as well as provision of daily wage watchers to assist the forest officials in discharging their duty.

Range officer, Forester, Forest Guard should be trained from time to time to handle modern arms and ammunition, collection of intelligence and fire fighting methods.

5.9.4 **Fire protection measures** :

Fire continues to be the major threat to forest regeneration and establish crop. Forest blocks vulnerable to fire based on satellite imageries have been identified. Protection against fire requires concerted efforts of the field staffs and the forest fringe villagers during the period fromFebruary to May.
Besides anti-smuggling squad some additional manpower i.e fire watchers are necessary for effective control of this menace. Fire watchers will be engaged depending on the vulnerability of the area.

The VSS should be involved in containing forest fire. Incidence of annual fire should be entered in the compartment history. Forest fire maps should be prepared block wise every year. Provision for incentives/reward may be given for fire protection.
Annual fire line clearance of one to two chain widths in fire sensitive area shall be done in fire sensitive areas.

Old fire lines, forest roads, boundary lines shall be cleaned by control burning in one chain strip on both sides of it.

5.9.5 **Communication System :**

The staff shall be provided with pre paid mobile phone for effective communication in transmitting information. The areas not covered on the mobile networks shall be provided with VHF system. Communication through mobile phone is very fruitful now-a-days since deployment of person for sending message and receiving at the other is not necessary. The persons while moving on the forest can call from the spot if the area is covered by mobile networks. Further VHF system is sometimes out of order or require frequent repair during Cyclone /Strong wind. Therefore it is suggested to emphasise on mobile phone to build up effective communication system.

5.9.6 **Intelligence networks :**

Collection of information secretly through intelligence networks is of paramount importance to combat forest crime successfully. Without obtaining proper information, physical force is ended without any result. So Range officer shall build up such a system in his range to collect secret information. Some secret fund shall be placed at the division level which will be utilized for the said purpose. A list of smugglers and poacher shall be prepared range wise and complied at the Division level.

5.9.7 **Incentive and Reward** :

Incentive shall be paid to the VSS for out -standing performance in protection of forest, which will encourage the participation of local people. Individuals shall also be considered for the same. Similarly there shall be provision for reward to the staff for extra–ordinary performance in protection matters. This is ascertained by reviewing the performance of the staff during the year.

5.9.8 **Soil & Moisture Conservation Measures (SMC)**

Soil and Moisture conservation measures should form one of the important components of protection operations. Appropriate soil and moistures conservation measures shall be taken up to reduce the run off and to retain the top soil. Measures like Gully plugging, loose boulder check dams, contour bunds ,Nalabunding and vegetative bunds are prescribed . It should be implemented on watershed basis so as to ensure maximum conservation of moisture and soil, which will act as drought proofing measures. The execution of Soil-Moisture conservation measures will be carried out as prescribed in Chapter-2 of Part-II.

5.10 CONTROL

5.10.1 All the works undertaken should be entered in the respective compartment history files for further analysis.

5.11 MISCELLANEOUS REGULATION

5.11.1 Besides the aforementioned prescriptions some other regulation are necessary for effective results. These are as follows :

Monitoring& Evaluation- Normally the monitoring is done by departmental staff but evaluation should be done by an outer agency for providing correct position .For evaluation purpose,the Divisional Forest Officer should prescribe a suitable format and reputed Agency/NGO can be entrusted for evaluation. Evaluation shall be done in the month of April for the performance of the preceding financial year. The flaws noticed shall be taken care to ensure effective implementation

5.11.2 People's participation –Without participation of the local people the protection of forest is not sustainable. So joint forest management is a tool to ensure involvement of forest fringe villagers .Steps shall be taken to motivate the local people for participating in the process through constitution of VSS and assigning the area to them.

5.12 COST NORM :

5.12.1 The Cost Norm of this Working Circle has been discussed in Chapter –XIV of Part – II.

5.13 INTERIM REVISION :

No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans. Any deviation suggested shall be subjected to the sanction of the competent authority.

CHAPTER-VI
J.F.M. (OVERLAPPING) WORKING CIRCLE

6.1 GENERAL CONSTITUTION

6.1.1 The National Forest Policy,1988 envisaged protection,conservation and management of the forest through the active participation of the people. Our state is pioneered in involvement of local people in forest management by bringing out Orissa Village Forest Rules, 1985 vide Resolution No. 10F (Pron.)-47/88/17240/FFAH dt. 1.8.1988 .On the strength of this resolution the villagers adjoining to the forests have been assigned with the protection of peripheral reserve forest area. In return they are granted certain concessions in the matter of meeting their bonafide requirements of firewood and small timber.

6.1.2 This resolution was amended vide Resolution No. 10F(Pron.)-47/88/23638/FFAH dt. 13.10.1988. As per this resolution, the village level forest protection committee (FPC) should be constituted in consultation with the local villagers.

6.1.3 This resolution was superseded subsequently by Resolution No. 10F(Pron.)-47/88/29825/FFAHdt.11.12.1990. By this resolution, the Protected forests were also included for assignment to adjoining villages. In order to make the involvement of villagers more effective, the Govt. Of Orissa again issued Resolution No. 10F(Pron.)-20/93-16700/F&E dt. 3.7.1993. In 2011, the resolution dealt with exhaustive involvement of local communities in protection of adjoining forests, formation of VanaSamrakshaynaSamities(VSS)and their executive committees, duties and responsibilities of the VSS and their executive committees , preparation of JFM plan, usufructuary benefits for the VSS and provision of MOU etc. In 2008, the resolution was issued to extent the participating approach to all types of forest.

6.1.4 In response to this resolution, 121 VSS Committees are constituted in Keonjhar wildlife divisionand they are protecting 9306 Ha. of forests. In addition to the above VSS, 56 nos. of VFs having an area of 411.24 Ha. also comes under the JFM Working Circle. Therefore, a total area of 9717.24 Ha. have been allotted to this overlapping working circle. The area allotted to this working circle will remain open and is likely to increase as more and more degraded forest is allotted to the VSS. Therefore this working circle is an overlapping one. The allotted area is degraded forest and the crop present in these forest are not fit for felling .Protection of these area are at stake for which the adjoining villagers are to be involved in its protection and overall management pursuant to silvicultural practice.

6.2 GENERAL CHARACTERISTICS OF VEGETATION :

6.2.1 Since, this working circle is overlapping and extended to all Forest Blocks, the characteristic of vegetation has been described in Chapter-3. In general the vegetation is in degraded condition and under the process of restoration with the support of VSS on the pattern of JFM. The forest blocks kept under this working circle have potentiality for speedy rejuvenation due to the availability of rooted waste, coppice shoot and pole crops. Degradation of these forestshas taken place due to relentless excessive biotic pressure on these forests. It is expected that with the formation of VSS and assignment of these degraded forest to the villagers most of the biotic pressure will be reduced thereby encouraging the rejuvenation of crop with a rapid pace.

6.3 SPECIAL OBJECTIVE OF MANAGEMENT:

6.3.1 The special objectives of management of this Working Circle is to ensure sustainable use of forests to meet the local needs equitably while ensuring environmental sustainability and biodiversity conservation. The forest areas allotted to this working circle are basically of sparse vegetation, predominated by invasive weed growth and low productivity. The reclamation of vegetation & soil matrix followed by implementation of JFM through a comprehensive micro-plan is the special objectives of its management. The thrust is upon

motivation, education, publicity & capacity building to accomplish the desired goal. Therefore the JFM(O) Working circle area has been categorized basing on the VSS area inside the notified forest block and the VSS forest area assigned outside the forest block i.e. Revenue Forest.

1. To restock the under stock forest through scientific forestry operation like ANR and afforestation
2. To protect the allotted forest assigned to the VSS from fire, grazing and illegal quarrying.
3. To reclaim the poor soil matrix through scientific soil and moisture conservation measures.
4. To create favourable condition for sustenance of wild life and aviary population.
5. To motivate and educate the villagers to identify themselves with the protection and development of forest assigned to them from which they derive benefit through the application of JFM.
6. To draft micro-plan to ensure sustainable use of forest to meet the local needs through different entry point activities with special emphasis to the participation of women and augmenting their income generating activity.
7. To create space for carbon stock thereby creating a carbon sinks.

MANAGEMENT OF VILLAGE FORESTS

The erstwhile Social Forestry Project Division, Keonjhar created plantations in community lands which had subsequently been declared as village forest as per section 30 of Orissa Forest Act 1972. Total 56 plantations of 411.54 Ha. had been notified as Village Forest. As per Village Forest Rule forests are being managed by village forest committee comprising of Sarpanch(s) of the concerned GramPanchayats and Ward Member(s) belonging to the village of a group forest for which the Village Forest is notified. The Committee also include Foresters or Revenue Inspectors and 3-5 selected persons of the village.

Participation of people through VSS in forest protection is the main aim. Hence, Village Forest of Keonjhar (WL) Division are kept under this Working Circle though prescription for these forests are different.

General Character of Vegetation: -

The vegetation mainly consists of the first growing species like Eucalyptus hybrid, Accaciaauriculiformis, Cassiaauriculata, etc.

From field survey it is observed that, local people rarely maintainthe forests but are satisfying their day to day needs from these forests.

Method of Execution : -

The method of execution would be as per Village Forest Rule 1985. As specified there in, subsequent plantation would be takenup from the sale proceeds of the existing plantation. Where plantations are not available, the villagers can be persuaded to take up plantation of desired species by collecting seedlings from Divisional Forest Officer which have been raised under increasing tree cover for distribution.

The list of Notified Village Forest to be included under this Working Circle is given in Table No. 6.1.

Table No.6.1 : List of Notified Village Forests

Sl No.	Name of the Range	Name of Village Forest	Notification No.	Area in ha.
1	Anandapur	Salapada	No. 19852/F&E dt. 13.11.91	5
2		Hasanpur	No. 19852/F&E dt. 13.11.91	5
3		Bailo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
4		Khailo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
5		Patapal	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
6		Kalimati	AFFN(SIDA) 3756/F&E dt. 18.02.1992	11.46
7		Tampo	AFFN(SIDA) 3756/F&E dt. 18.02.1992	5
8		Salapada Col.(B)	AFFN(SIDA) 3892-24958/F&E	10.2
9		Barigaon	AFFN(SIDA) 3892-24958/F&E	4.43
10		Madanpur	AFFN(SIDA) 3892-24958/F&E	7.52
11		Panchiora	AFFN(SIDA) 3892-24958/F&E	0.57
12		Saladei	AFFN(SIDA) 3892-24958/F&E	1.45
13		Patapada	AFFN(SIDA) 3892-24958/F&E	5
14		Anjar	AFFN(SIDA) 3892-24958/F&E	3.68
15		Madanpur	AFFN(SIDA) 3892-24958/F&E	11.5
16		Suanpada	AFFN(SIDA) 3892-24958/F&E	7.6
17		Lunuhar	AFFN(SIDA) 3892-24958/F&E	7.59
18		Godipatna	AFFN(SIDA) 3892-24958/F&E	5
19		Sarei	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.04
20		Satatira	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.4
21		Haridapal	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.43
22		Kalaragadia	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.44
23		Golabandha	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.96
24		Kundibahali	Assn(SIDA)91- 1977-F&E dt.28.01.92	6
25		Anranga	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.3
26	Anandapur	Talagaon	Assn(SIDA)91- 1977-F&E dt.28.01.92	8.64
27		Khadibil	Assn(SIDA)91- 1977-F&E dt.28.01.92	4.93
28		Fakirpur	Assn(SIDA)91- 1977-F&E dt.28.01.92	13.19
29		Panchupali	Assn(SIDA)91- 1977-F&E dt.28.01.92	0.7
30		Bailo	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.28
31		Khalana	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.3
32	Hadagada	Saramanga	AFFN(SIDA)3892-24958/F&E	1.4
33		Ambo	AFFN(SIDA)3892-24958/F&E	6.5
34		Tarava	Assn(SIDA)91- 1977-F&E dt.28.01.92	10.08
35		Bancho	Assn(SIDA)91- 1977-F&E dt.28.01.92	3.496
36		Jambhara	Assn(SIDA)91- 1977-F&E dt.28.01.92	13.5
37		Jambhara(Majhisahi)	Assn(SIDA)91- 1977-F&E dt.28.01.92	5.85
38		Ambrutpur	Assn(SIDA)91- 1977-F&E dt.28.01.92	1.85

39		Aitpur	No. 19852/F&E dt. 13.11.91	5
40		Anjara	No. 19852/F&E dt. 13.11.91	5
41		Govindapur	No. 19852/F&E dt. 13.11.91	10
42		Balipada	No. 19852/F&E dt. 13.11.91	10
43	Deogaon	Kantipada	No. 19852/F&E dt. 13.11.91	71.19
44		Chasatangar	No. 19852/F&E dt. 13.11.91	5.074
45		Pitatangar	No. 19852/F&E dt. 13.11.91	5
46		Bayapita	No. 19852/F&E dt. 13.11.91	5.5
47		Raidhiha	No. 19852/F&E dt. 13.11.91	5
48		Singibila	No. 19852/F&E dt. 13.11.91	6
49		Hatisila	AFFN(SIDA)3892-24958/F&E	5.3
50		Rekutia	AFFN(SIDA)3892-24958/F&E	10
51		Kainipura	AFFN(SIDA)3892-24958/F&E	10
52	Deogaon	Kainipura	Assn(SIDA)91- 1977-F&E dt.28.01.92	1.94
53		Kathapala	Assn(SIDA)91- 1977-F&E dt.28.01.92	11.25
54		Raidiha	AFFN(SIDA)38/92-3264/F&E	10
55		Aonlajodi	AFFN(SIDA)38/92-3264/F&E	5
56		Singibila	AFFN(SIDA)38/92-3264/F&E	10
			Total	**411.54**
Source : DFO, Keonjhar WL Division				

****Out of total 411.54 Ha., 0.297ha. fromPanchupalli has been diverted under FRA. Thus the total area comes to 411.243Ha.

6.4 ANALYSIS & VALUATION

6.4.1 The areas allotted to different VSS and VFs were once degraded. The active participation of villagers through JFM has bettered the crop condition in these areas. The role of VSS can be both social & economical. The areas allotted to them has sustainable yield to meet their day to day needs of forest materials. The concept of JFM has vast impact on the social life of the people.

6.5 ALLOTMENT OF AREA :

6.5.1 A total area of 9717.24 Ha has been allotted to this working circle.

6.6 SILVICULTURAL SYSTEM :

6.6.1 No conventional silvicultural system is prescribed for JFM (Overlapping) WC. The trees attended exploitable girth shall be retained during the plan period. As this working circle is an overlapping working circle, the silvicultural system to be followed depends on the prescription outlined for the main working circle to which the block is primarily allotted. The system of working in these particular areas are to be guided by the micro-plan prepared in conformity with the prescription of the main working circle, jointly by the Forest Department and VSS.

6.7 CHOICE OF SPECIES :

6.7.1 Choice of species in plantations of JFM areas should be as per need of the people and as per VSS resolution.

6.8 CALCULATION OF THE YIELD:

6.8.1 Felling of exploitable green trees are prohibited in Joint Forest Management (overlapping) Working Circle. Only uprooted, dead and illicit felled trees are to be marked for extraction. So yield calculation is not applicable in Joint Forest Management (overlapping) Working Circle. The list of VSS of Keonjhar (WL) Division for JFM Working circle under Reserve forest and Revenue forest is appended in **Appendix XXVII.**

6.9 METHOD OF EXECUTING THE JOINT FOREST MANAGEMENT :

6.9.1 **Demarcation: -** All annual units will be inspected during October/November previous to the year in which it is due for working. As far as possible one or two VSS protected area is allotted one unit. The unit number shall be shown in the displayed signboard of the VSS area.

6.9.2 **Micro Plan: -** This is the important document of JFM. Though elaborate procedure has already been prescribed for preparation of such micro plan in the guidelines issued by government, still three basic aspects namely i) Need of villagers for forest produce ii) Need of the forest for rejuvenation and improvement iii) The need for other supporting non-forest activities shall be assessed properly and considered as a guideline factor for preparation of the micro plan .The Micro Plans should be prepared for each VSS irrespective of whether money for implementation is available or not. Planning should be done first and efforts should be made to obtain funds from different sources like State Budget, District Budget, DRDA, MP and MLA grants and any other sources. While preparing the Micro Plans, tools like GIS could also be used for better planning. For this, the help of ORSAC and NGOs can also be taken.

As per the JFM Resolution of the State, Micro Plans are prepared for the area allotted to the VSS. Since forests allotted to the different are basically degraded therefore it is prescribed that the broad treatment for the crop, soil & moisture conservation be emphasised. The VSS micro-plans will be site specific treatment plan and will generally follow the prescription of the main Working Circle.

6.9.3 **P.R.A: -** One micro-plan shall be prepared for every VSS adopting the 'Participatory Rural Appraisal' technique (PRA). Before the preparation of Micro Plan, the forest assigned to the VSS shall be surveyed and demarcated. Pillars should be posted to avoid any future area conflict among different VSS. A map will be prepared by the field staff and enclosed with the Micro Plan. Different activities like plantation, soil conservation measures, silvicultural operations like tending and cultural operations, disposal of the cleaning materials, water harvesting structures, pastures etc shall be discussed in detail along with financial outlay in the micro-plan. Even, sharing mechanism for usufruct shall also be clearly spelt out. However, the provisions of this micro-plan shall be in conformity with the overall prescriptions of this Working Plan. The tentative format for PRA exercise as prescribed in Working Plan Code, 2014 is annexed in **Appendix –XXVIII**

Wherever plantations exist in VSS allotted area, these plantations with respect to age shall be thinned and pruned as per silvicultural practice. Sweeping off the floor of plantations for leaves and twigs should be discouraged as it affects regeneration. Grazing and fire protection should be the priority to all plantations. These prescriptions should serve as a guideline while preparing the micro-plans in these areas. Efforts should be made as far as possible to identify the contiguous patches of RF and KF and these areas should be planted with suitable species to meet the firewood and small timber needs of the villages with a joint consensus of the Forest Department and villagers.

6.9.4 **Motivation:** Motivation is a process of stimulating people into action to accomplish goals. It is a natural thing that nobody acts without a purpose behind. Therefore a hope for sustainable employment and material gain in shape of fuel wood, small timber, NTFP is a powerful incentive to motivate.

Apart from the Forest Department non-political entity in the locality is to involve in this campaign of JFM as conflict of interest is sure to arise because of the long gestation period for the produce to be harvested and appropriated.

6.9.5 **Entry Point Activities: -** In each village, efforts should be made to create sustainable income generating activities which may be forest product based. Income generating activities (IGA) like Sericulture, Pisciculture, Vermiculture, Lac, and Honey collection could be encouraged through the VSS. Many NTFP items are also collected from the forests and efforts should be made to explore processing, value addition and linking to good markets for these forest based products. The entry point activities done in different programmes should aim at sustainable income generation to the villages. NGOs specialising in IGA and SHG and marketing should be entrusted with promotion of livelihood amongst the members of the VSS. These NGOs could impart vocational training on sustainable livelihood and value addition for different NTFP items.

6.9.6 **Reward: -** Well managed VSS should be identified for reward. Their success stories should be given wide publicity. The other VSS members and potential VSS villages should be taken to these successful VSS villages to get inspiration and ideas. These promotional visits would help a great deal to promote the VSS movement in the division. Awards should be instituted to adjudge the best VSS of the Year in the division to inculcate the idea of health competition among them.

6.9.7 **Training: -** The capacity of the lower functionaries of the Forest Department should be improved by training and exposure visits, to work better with the villagers. During training special emphasis should be on enhancement of communication skills of the staff. Proper orientation of the field staff through training, workshops and discussions on the philosophy and need of participatory forest management should be imparted. Similarly the VSS members also need training and exchange of ideas through exposure visit as narrated earlier.

6.9.8 **Meeting: -** As per JFM resolution, 2011, General Body meeting of VSS shall be held in every six months and Executive Body meeting should meet as often as possible not less than once in two months. Range officer should act as facilitator to convene the meeting. Concerned Forest Guard the Ex-officio member of Executive Committee should attend the meeting. The Range officer should review the performance of VSS under his jurisdiction in each month.

For implementing JFM programme following points shall be kept in mind.

- Local people's interest, motivation and responsibilities prior to starting the programme at given location.
- Initial emphasis should be given on places where good and constructive local leadership is forthcoming and forest dependency is higher.
- The process should provide for local people's requirement and needs in planning, including some non-forestry developmental initiatives and programmes to be implemented by Forest Department.
- There shall be regular review of the programme to identify the strength and weaknesses so that decision can be taken for forest conservation and local people's development.

6.10. STATUS OF JFM :

6.10.1 Though report says positive impact on forest after enforcement of JFM policies, but still performance of the most of the VSS is not up to mark. In highly productive areas with relatively thin population, the needs of the villagers can be finally met through the forest products obtained from JFM area.

The VSS are participating actively but when JFM is introduced to improve degraded forests, then poses significant challenges to sustain local people's interest in forest management.

In the absence of significant forest products, village development assistance (through any scheme) proved to be major attraction to the villagers. Several villages come forwarded to take up the enormous tasks of forest protection anticipating some developmental assistance. For this reason, Entry Point Activity is the major component of any JFM assistance programme.

But the aim is capacity building of the JFM institution so that they can be finally be benefited with the help of alternate livelihood option. (Mostly forest dependent community). The following are some of the strategies to sustain Joint Forest Management.

6.11 METHOD OF TREATMENT :

6.11.1

1. Weed Eradication : In almost all the Forest Blocks RFs the forest areas are heavily infested with weeds like eupatorium, Ageratum etc. After rainy season before flowering these weeds should be uprooted so that further regeneration will not take place. With the help of VSs members, there areas should be cleared of the invasive weed, so that grass would come up which would be stall fed to the cattle population of the JFM areas.

2. Plantation : The VSS should be encouraged to plant suitable species of their need in the blank areas of their assigned area. The plants distributed by the Forest Department during July free of cost from different scheme are helpful in this process. Common lands of the VSS may be planted with fodder grass to decrease the grazing pressure on forest.

3. Fire Protection : Awareness should be created among the VSS to protect the forest, from fire by educating the detrimental effect of forest fire. The VSS having nil forest fire should be awarded by incentive.

4. NTFP Value addition and linkage : As per JFM Resolution,2011 EC shall try to establish market linkage for various NTFP items for securing better return and Forest Department will provide necessary support in this regard.

5. Establishment of Self Help Groups and promoting Micro Credits : Money available for supporting individuals or SHGs is constituted as a revolving fund invested through micro credit basis (Funds need to be returned to the VFCs along with interest). Emphasis should be given to women and poor groups.

6. Encouraging Corporate Investments in Forestry : Some of the industries are doing roadside plantations making provision of drinking water to the villagers etc through their Corporate-Social responsibilities. Plantation of degraded forest can also be taken up by the corporate groups. It can be included under proposal for diversion of forest land under Forest Conservation Act.

7. Provision of Energy Efficient Chullahs/LPG Gas : Forest personnel should pursue the members of VSS and Executive Committee to opt for LPG for cooking instead of fuel wood. The members who are not able to afford LPG should be provided by energy efficient chullahs.

8. Some of the social sector schemes which aim to reduce pressure on forests are given below.
   i. Ujjala Yojana – (Central Govt.) It is found by supply of LPG connection nearly 50% firewood consumption has been reduced.
   ii. Biju Gram JyotiYojana.
   iii. Odisha Fish Pond Yojana.

9. Regular health camp needs to be organized to look into the health of the villagers and animals of the village.

6.12 CONTROL :

6.12.1 All the areas assigned to VSS should be marked in Topo sheets. The works taken up in the VSS area should be entered in the compartment history.

6.13 MISC. REGULATION :

6.13.1 Beside the prescriptions cited above sum other regulations are necessary for effective results. These are as follows :-

i. Monitoring & Evaluation
Periodical assessment is necessary to improve the implementation by removing the bottlenecks noticed. Normally, the monitoring is done regularly through departmental staff but the evaluation should be done by an independent agency preferably by NGO for providing the correct position.

ii. Review
The evaluation reports shall be examined through a review by a committee which will finalise the list of best three VSS basing on the scores in the evaluation reports. This will be treated as a guiding factor for the next course of action on JFM.

iii. Rewards
VSS showing praise worthy performance should be rewarded as token of recognition to their work. It will encourage a healthy competition among the VSS to propagate the JFM.

iv. Conflict Resolution
Sometimes conflict arises with inhabitants of other villages for their unauthorized and forcible collection of forest produce from the assigned area of VSS. It is necessary to resolve the same from the very beginning. The Range Officer shall visit the area at the earliest in case of conflict and try to settle the matter amicably. If not legal action shall be taken departmentally.

v. Convergence with other rural development activities
JFM cannot be fully successful in isolation. An integrated approach along with other developmental activities will make the process easier and quicker for achievement. Needful co-ordination with other departments like Revenue, Agriculture, Horticulture and Animal Husbandry be taken up for converging various activities in the village.

vi. Publicity
Wide propaganda is of immense help for successful implementation of JFM. So, exposure visit to successful VSS area as well as the success story shall be circulated. Frequent awareness programme shall be organised to allure the villagers towards the usefulness of JFM.

6.14 RIGHTS AND CONCESSIONS :

6.14.1 Rights and concessions in this Working Circle shall be regulated in accordance with the provisions of relevant Gazette Notifications of the respective forest blocks and the Govt. of Odisha policy with regard to JFM.as per the provisions of the Orissa Forest Act and Rules and relevant Government policies in force.

6.15 COST NORM :

6.15.1 The Cost Norm of this Working Circle has been discussed in Chapter – XIV of Part – II.

6.16 INTERIM REVISION :

No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans. Any deviation suggested shall be subjected to the sanction of the competent authority.

CHAPTER-VII
NTFP (OVERLAPPING) WORKING CIRCLE

7.1 GENERAL CONSTITUTION:

7.1.1. People indispensably dependent on Non-timber forest produce for its use in daily consumption, socio cultural, spiritual and health care. The dependency is more in rural and acute in tribal pockets. NTFP is the product derived from the parts of the plant other than timber which may be leaves, flower, fruit, seed, root, tuber, rhizome, bark etc. Earlier it was considered as minor forest produce in view of the focus on timber as a major forest produce. In the changing scenario for Bio-diversity conservation necessitate a stringent check on removal of tree composition; the attention is shifted to this product other than timber. Most of the NTFPs are the annual products having medicinal properties for which it is considered as a potential source of income from forest. Due to the over and unscientific collection of NTFPs, the possibility of extinction of some species can't be ruled out. Quite a sizeable proportion of Anandapur sub-division are forest dwellers. They owe their sustenance to forest to a great extent. Their interest can be solved better through NTFP sector only on sustain basis with bio-diversity conservation simultaneously. This can suitably address the growing discontentment of the forest dwellers with regard to their interest vis-a-vis for protection of forest. Therefore, non-timber forest produce (overlapping) working circlehas been constituted with assignment of the entire plan area of the Division which comes to 58610.92 Ha.

7.2 GENERAL CHARACTER OF THE VEGETATION:

7.2.1 In most of the hillyforest blocks Sal ascends to the top ,either predominantly or mixed with its associates like *Bija ,Kusuma,Bandhana ,Kuruma ,Kasi , Mango,Dhaura,Sisso,Kendu ,Haldu, Gambhari* etc. The regeneration is purely natural. The forest types are mainly moist & dry peninsular Sal , Northern dry mixed deciduous ,Lateritic semi evergreen and mixed scrub forest . The composition and diversity of the forest allotted to this working circle have been discussed earlier in Part I of this plan.

The area allotted to this working circle is distributed in all Ranges which comprises 100% of the total managed area of the working plan. The NTFP items are distributed in all Ranges and available in all the forest tract.

All age classes of trees of different species are present in this tract . It is found out that as the age of trees increases the no. of tree decreases due to illicit felling, wind felled, rotting.

The forest of Keonjhar WL Division has got tremendous potential for NTFPssuch as Kendu leaf, Mahua flower, Mahua seed,Sal seed, Siali fibre, Siali leaves, TussarCocoon,Char seeds, Chakunda seeds, Kusuma seeds,BanaTulasi,Fanafana,Lodha etc. NTFPs are the major source of livelihood and means of economic development for the local tribal and poor people. The new NTFP policy aims to provide remunerative price to the primary collectors on healthy competition among the buyers.

7.3 SPECIAL OBJECTIVES OF MANAGEMENT :

7.3.1

1. To nurture the crops having the potentiality of NTFP including medicinal plant species for their improvement through suitable silvicultural treatment to increase the production on perpetuity.
2. To take up measures on priority basis to prevent destructive harvesting method with a view to check further degradation of the crop and to ensure the collection within permissible limit.
3. To facilitate the marketing of the products collected by the local people.
4. To promote the local scheme for value addition, processing and marketing of some

major products to enhance the income.

5. To ensure peoples participation in all activities related to the regeneration and propagation of NTFPs.
6. To promote plantation of various NTFP spp.
7. To explore scientific utility of many NTFPs including medicinal herbs found abundant in the forest.
8. To deviate focus from podu cultivation by encouraging collection, extraction & utilisation of different NTFP by value addition.

7.4 AREA ALLOTMENT :

7.4.1 This working circle overlaps the entire working plan area.

7.5 ANALYSIS AND VALUATION OF CROP :

7.5.1 No systematic study has been done in the past in this Division to assess the potential production of various NTFPs and to ascertain impact of collection of such NTFPs on sustainability of the forest. The paucity of funds and non-availability of skilled human resources restricted to go for a study to assess the potential of availability of various NTFPs and to ascertain impacts of collection/ extraction/ utilisation practices on sustainability of these forests. An indicative list of NTFPs in Keonjhar WL Division is given below in the table.

7.5.2 An attempt has been made by the Forest Resources Survey Division, Cuttack during the Year 2000 to carry out survey work to assess and estimate the availability of various NTFP items in different parts of Keonjhar (WL) Division. Though such estimation does not report about the sustainability of extraction but it gives some idea about their availability in different parts of the Division. This assessment by the FRS Division was carried out with regard to tanning materials, fibre yielding, oil yielding, gum and resin yielding, medicinal value yielding species found in different parts of the Division.

Table No.7.1. List of NTFPs with regards to their importance

Table No. 7.1.A : Important Fibre yielding forest species			
1	Girdhini	*Sterculiaurens*	Bark
2	Dhaman	*Grewiatiliaefolia*	Bark
3	Siali	*Bauhinia vahilii*	Bark
4	Palas	*Buteamonosperma*	Young roots
5	Salapa	*Caryotaurens*	Leaves
6	BanaNalita	*Corchorusolitorius*	Bark
7	Kanchan	*Bauhinia variegate*	Bark
8	Sisal	*Agave sisalana*	Leaves

Table No. 7.1.B : Important Oil yielding forest species			
1	Karanja	*Pongamiapinnata*	Seed
2	Mahula	*Madhucaindica*	Seed
3	Sal	*Shorearobusta*	Seed
4	Kamalagundi	*Mallotusphillipinensis*	Seed
5	Kusum	*Schleicheraoleosa*	Seed
6	Neem	*Azadirachtaindica*	Seed
7	Palasa	*Buteamonosperma*	Seed
8	Babul	*Acacia nilotica*	Seed
9	Gila	*Entadascandens*	Seed
10	Kochila	*Strychnosnux-vomica*	Seed

Table No. 7.1.C : Important Flosses yielding forest species			
1	Simili	*Bombaxceiba*	Capsules

Table No. 7.1.D : Important grass species			
1	Thatch grass, Chhana grass	*Imperatacylindrica*	Leaves
2	Sabai	*Eulaliopsisbinnata*	Leaves

Table No. 7.1.E : Important tans and dyes yielding species			
1	Dhaura	*Anogeissuslatifolia*	Leaves
2	Sunari	*Cassia fistula*	Bark
3	Karada	*Cleistanthuscollinus*	Bark
4	Amla	*Emblicaofficinalis*	Twigs/bark
5	Sal	*Shorearobusta*	Bark
6	Bahada	*Terminalia bellerica*	Nut
7	Harida	*Terminalia chebula*	Nut
8	Asan	*Terminalia tomentosa*	Bark
9	Babool	*Acacia nilotica*	Bark

Table No. 7.1.F : Important Gum & resin yielding forest species			
1	Dhaura	*Anogeissuslatifolia*	Stem
2	Baghamari	*Bauhinia retusa*	Stem
3	Moi	*Lanneacoromandelica*	Stem
4	Girdhini	*Sterculiaurens*	Stem
5	Sal	*Shorearobusta*	Stem
6.	Babool	*Acacia nilotica*	Bark
7.	Khaira	*Acacia catechu*	Heartwood
8.	Salai	*Boswelliaserrata*	Stem
9.	Asan	*Terminalia tomentosa*	Stem
10.	Piasal	*Pterocarpusmarsupium*	Stem

Table No. 7.1.G : Important Medicinal value yielding forest species			
1	Patalgaruda	*Rauwolfiaserpentina*	Stem
2	Chhatian	*Alstoniascholaris*	Bark
3	Sunari	*Cassia fistula*	Bark
4	Kurei	*Holarrhenaantidysenterica*	Bark
5	Neem	*Azadirachtaindica*	Seed/Leaves
6	Bel	*Aeglemarmelos*	Leaves/Fruits
7	Amla	*Emblicaofficinalis*	Root/bark/seed

Table No. 7.1.H : Important Fruit bearing forest species			
1	Banakhajuri	*Phaseolusacaulis*	Fruit
2	Amla	*Emblicaofficinalis*	Fruit
3	Bahada	*Terminalia belerica*	Fruit
4	Barakoli	*Zyzyphusmauritiana*	Fruit
5	Baula	*Mimusopselengi*	Fruit
6	Bela	*Aeglemarnelos*	Fruit
7	Bhalia	*Semicarpusanacardium*	Fruit
8	Chara	*Buchananialanzan*	Fruit
9	Dimiri	*Ficus recemosa*	Fruit
10	Harida	*Terminalia chebula*	Fruit
11	Jamu	*Syziziumcumini*	Fruit
12	Karanja	*Pongamiapinnata*	Fruit
13	Kendu	*Dyospyrosmelanoxylon*	Fruit
14	Kusum	*Schleicheraoleosa*	Fruit

15	Mahula	*Madhucaindica*	Fruit
16	Neem	*Azadirachtaindica*	Fruit
17	Panasa	*Artocarpusintegrifolia*	Fruit
18	Rai	*Dilleniapentagyna*	Fruit
19	Simili	*Bombaxceiba*	Fruit
20	Tentuli	*Tamarindusindica*	Fruit
21	Amba	*Mangiferaindica*	Fruit

7.5.3 The Govt. of Odisha has transferred 69 items from the control of Forest & Environment Department to Gram Panchayats for regulation in collection and trade in phases wise vide Govt. of Odisha, Forest & Environment Department Resolution No.5503, dt.31/03/2000 (60 items), Resolution No. 13285, dt.23/08/2000 (7 items), Resolution No.15325, dt.21/09/2000(1 item) and Resolution No.3695,dt 02/03/2006(1 item) An exhaustive list of such species along with their local name, trade name, botanical name, English name, parts used, purpose of use and collection period are furnished in Table No. 7.2.

Table No.7.2. List of NTFP Items

Sl. No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
1	2	3	4	5	6	7	8
1	Tamarind	*Tamarindusindica*	Tamarind	Tentuli	Fruits, Pulp, Seed	Food preparation, Adhesive book binding,cardboard manufacture.	Mar-Apr
2	Mahua flower	*Madhucaindica*	Mowrabuttertree	Mahula	Flower	Liquor & vinegar.	Mar-Apr
3	Hill broom	*Thysanolaenamaxima*	Broom grass/Tiger grass	Phulajhadu	Stem	Reed pen	Dec-Jan
4	Thorn broom	*Aristidasetacea*	Thorn broom	Kantajhadu	Culms	Making brooms & brushes.	Jan-Feb
5	Broom grass	*Arundinellasetose trin*	Broom grass	Jhadughasa	Grass	For making brooms.	Jan-Feb
6	Kochila seeds	*Strychnos-nux-vomica*	Nux-vomica	Kochila	Seeds	Ayurvedic medicines	Dec-Jan
7	Harida	*Terminalia chebula*	Chebulicmyrobolan	Harida	Fruit ,rind	Ayurvedic medicine	Jan-Mar
8	Bahada	*Terminalia belerica*	Belericmyrobolan	Bahada	Fruit rind	Ayurvedic medicine	Dec-Jan
9	Amla	*Emblicaofficinalis*	Emblicmyrobolan	Amla	Fruit rind	Ayurvedic medicine	Dec-Jan
10	Ritha fruit	*Sapindusemarginatus*	Soap nut tree	Ritha	Fruit	Soap manufacturer	Nov-Dec
11	Bhalia fruit	*Semecarpusanacardium*	Mark ing nut tree	Bhalia	Fruit	Wood preservative	Nov-Dec
12	Clearing nut	*Strychnospotatorum*	Clearing nut tree	Nirmuli	Seeds	Tonic,cleaning dirt from water.	Jan-Mar
13	Honey	*Product of Honey bees*	Honey	Mahu	Honey	Ayurvedic medicines	Oct-Jun
14	Siali leaf	*Bauhinia vahlii*	-	Siali	Leafs	Preparing of leaflet and umbrella.	Oct-Dec
15	Sabai grass	*Eulaliopsisbinnata*	Sabai grass	Sabai	Grass	Used for ropes,mats&paper.	Dec-Jan
16	Mango kernel	*Magniferaindica*	Mango	Amba	Kernel	Used as food & feed.	May-Jun.
17	Chhana grass	*Imperatacylindrica*		Thatch grass	Chhana grass	Ropes,mats,baskets,bag, packing materials.	Dec-Feb

18	Similitula	*Bombaxceiba*	Silk cotton tree	Simuli	Cotton	Preparing pillows	Mar-April
19	Palua	*Curcuma angustifolia*	East Indian arrow root	Palua	Tuber	Used as food commodity	Jan-Feb
20	Dhatuki	*Woodfordiafruticose*	Fire flame bush	Dhataki	Flowers	Ayurvedic Medicines,flowers yield red dye,alsocontain tannin, astringent & stimulant	Feb-Mar
21	Putrani	*Premnaherbacea*	-	Putrani	Roots	Asthma,Rheumatism,Dropsy	Dec-Jan
22	Shikakai	*Acacia sinuate*	-	BanaRitha	Pods	Detergent,hair washing and soap manufacture	Feb-Mar
23	Jangle Jada	*Jatrophacurcas*	Physic nut purging nut	Jungle judda, jahagy gab	Seeds	Bio diesel, manufacture of candles. Lubricants,	Dec-Jan
24	Palasa Seeds	*Buteamonosperma*	Flame of the forest/ bastard teak	Palasa	Seeds	Anthelmintic	May-June
25	Indrajaba	*Holarrhenapubescens*	Conessi bark tree	Kure	Seeds	Ayurvedic medicines like dysentery,intestinalworms, stomach disorders	Dec-Feb.
26	Gila	*Caesalpiniabonduc*	Boducnut ,Fever nut.	Gilo	Seeds	Antipyretic,used as cosmetics ,malaria fever .	Jan-Mar
27	Benachera	*Vetiveriazizanioides*	Vetiver /Khaskhas	Bena	Roots	Roots essentials oil,used in perfumery & cosmetics .roots used in doors & windows screen .	Dec-Feb
28	Banahaladi	*Curcuma aromaticsa*	Wild turmeric .	Banahaladi	Rhizome	Bruises &sprain .Aromatic adjunct .	Jan – Feb
29	Banakolatha	*Tephrosiapurpurea*	Wild indigo	Banakolatha	Roots & seeds.	Used as insecticide ,laxative , diuretic , dyspepsia , rheumatism , elephantiasis , asthma , scabies , piles . plant used as green manure	Oct-Jun
30	Gaba	*Ricinuscommunis*	Castor	Jada	Seeds	Castor oil used as a cathartic lubricants , illumination , hair oil ,soap making and type writer ink	Most part of the year.
31	Basil	*Ocimumbasilicum*		Van tulasi ,gangatulasi	Seeds	Seeds yield fatty oil , which is anti microbial .	Dec-Jan
32	Kantapadma	*Euryale ferox*	Fox nut ,Gorgaon nut	Kantapadma ,makhana seeds	Seeds	Seeds are roasted &eaten .Known as Makhanaseeds . The flour used as the substitute of arrowroot .it is used as tonic .	May-Jun
33	Tal makhana seeds /Koilekha seeds	*Hygrophyllauriculata*	-	Tal makhana /Koilekha seeds	Seeds	Ayurvedic medicine for arthritis ,tonic and other ailments .Aphrodisiac property .	Jan-Feb
34	Baidanka seeds	*Mucunaprurieins*	Cowhage,Common cow itch .	Baikhujen ,Baidanka .	Seeds	Used as nerve tonic aphrodisiac,anthelmintic, The active ingredient L-DOPA used for parkinsonism.	Jan-Apr

35	Baghanakhi seeds	*Martyniaannua*	Tiger claw,Devel claw	Baghanakhi	Seeds	Anti-inflammatory, Seeds yield oil .	Dec-Jan
36	Kamalagundii	*Mallotusphilippensis*	Kamala tree ,monkey face tree	Kamalagundi	Fruits .	Grandular hairs from fruits yield a dye called Kamala powder .seeds yield fatty oil used in paints &varnishes. Seeds are also anthelmintic.	Feb-Mar
37	Landabagulli	*Ocimumcanum*	Hoary basil	Landabaguli/Ghodatulsi .	Seeds	Seeds oil used in soap and cosmetics .seeds are diuretic ,tonic& preparation of cooling drink .	Feb-Mar
38	Bela	*Aeglemarmelos*	Bel tree	Bel	Fruits	Unripe or halfripe fruit pulp used for Ayurvedicmedicines,used as digestive ,stomachic and laxative . gummy substances around seeds used as adhesive for paint and watercolour paint .	Mar-Apr
39	Bhuineem	*Andrographispaniculata*	Creat King of bitters	Bhuineem	All parts	Tonic for liver and fefrifuge& anthelmintic also used in preparation of ayurvedicmedicines .	Oct-Dec
40	Banakhajuri	*Phoenix acualis*	-	Banakhajuri ,bhuikhajuri	Leaves	Leaves used for thatching & making mats ,broom ropes etc .	Dec-Jan
41	Rohini fruit	*Soymidafebrifuga*	Indian red wood , bastard cidar	Rohini	Fruits	Used for preparation of ornamental 7 artistic materials .	May-June
42	Bhursunga	*Murrayakoenigi*	Curry leaf tree	Bhursunga	Leaves	Used as a flavouring agent for preparation of food .it is also a common condiment ,Essential oil used for soap perfume .	Octobe r-Jun
43	Rasna root	*Vanda tessellate*	-	Rasna	Roots	Roots used in manufacturing ayurvedic medicines for rheumatism ,inflammation nervous disorder and liver tonic .	June
44	hanaphana ruit	*Oroxylumindicum*	Indian trumpet flower ,Midnight horror .	Phanapha na / Phaphen	Fruits	Preparation of ornamental articles .Tender fruits are stomachic and expectorant .Seeds used as purgative .	Feb-Mar
45	Sidha fruit	*Lagerstroemiparviflora*	-	Sihina /Sidha	Fruits	Used in making ornamental making .	Nov-Dec
46	Satabari	*Asparagus racemosus*	Asparagus	Satabari/ Debadhun	Roots	Used as tonic, galactagogue,nervous& rheumatic complaints .	Feb-Mar
47	Khatalai	*Pentapetesphoenicea*	-	Khatalai Satghodia	Capsule	Used in bowels & as an emollient .	Nov-Dec
48	Atundilai	*Cumbretumroxburghii*	-	Atundi/Denulaha	Creeper	Used for basket making .	Oct-Jun
49	Suamalai	*Ichnocarpusfr*	-	Suamalai/	Roots	Tonic ,diuretic for fever	Dec-

		utescens		khetuanai		dyspepsia ,diabetes .	Jan
50	Eksira fruit	*Schreberaswietenioides*	Weavers beam tree	Makha	Fruit	Medicine for hydrocele .	Feb-Mar
51	Khelualai	*Ichnocarpusfruitescens*	-	Thapalah asunani	Branches	Fishing net & basket making .	Oct-Jun
52	Katha chattu	*Mushroom grown*	-	Katha chatu	Mushroom	Edible mushroom	Oct
53	Sapamasina grass	*Typhaangustifolia*	Cat tail	Sapamasina grass	Leafs& Stem	Thatching ,Screen ,mats ,Ropes ,stuffing .Fishing .	Dec-Feb
54	Anantamula	*Hemidesmusindicus*	Indian sarsaparilla	Anantamula	Roots	Ayurvedic medicines ,Skin diseases ,Impurity of blood ,diuretic ,urinary ,rheumatism	Feb-Mar
55	Antia rope	*Helicterisisora*	East Indian screw tree	Modimodica	Bark	Used to expectorant ,astringent , anti gallactogogue .diarrhoea ,Dysentry .	Feb-Mar
56	Nageswar flower	*Mesuaferrea*	Mesua tree/Iron wood .	Nagewar	Flower .	Ayurvedic medicine ,Gyanaecological disorder ,dysentery .anaaemia ,expectorant rheumatism .	Mar-Jun
57	Mankadakendu	*Diospyrosmalbaric*	Goub persimmon	Mankadakendu	Fruits	Ripe fruit ,edible ,raw fruit contain tannin ,preservatives for fishing nets .	Mar-Apr
58	Atundi fruit	*Cumbretumroxburghii*	-	Atundi	Fruit	Making for ornamental articles .	May-Jun
59	Mahua seeds	*Madhucaindica*	Mohua tree	Mahula	Seeds	Edible purposes ,soap manufacturing ,rheumatism ,mahua cake used as manure and biopestiside .	May-Jun
60	Kusuma seeds	*Schleicheraoleosa*	Lac tree	Kusuma	Seeds	Fatty oil ,used for culinary lighting purposes ,lubricant for mechinary and skin diseases .	Jun
61	Karanja seed	*Pongamiapinnata*	Pongam oil tree	Karanja	Seeds	Biodiselmproduction ,used in tanning industry ,preparation of soap sand candles ,lubricants for engine .	Mar-Apr
62	Neem seed	*Azadirachtaindica*	Neem tree ,margosa tree.	Neem	Seeds	Seeds oil used as biopestiside ,fungicide and for soap soap making .Also suitable for biodiesel production. Oilused for skin diseases. Kernel used for preparation of ayurvedicmedicine .	May-Jun
63	Chara seed	*Buchananialanzan*	Almondette	Char	Seeds	Kernel eaten, substitute of almond in confectionery . Substitute for olive and almond oil and used for glandular swelling of neck .	Apr-May
64	Chakunda seed	*Casiatora*	Ringworm plant	Chakunda	Seeds	Substitute for coffee and as a mordant in dyeing .Used in skin diseases specially ringworm and scabies etc .	Nov-Dec
65	Babool seed	*Acacia nilotica*	Babool tree	Bamur	Seeds	Used as cattle feed .Pods used in urinegenitodisorders .	Mar-Apr

66	Bidanga	*Embeliaribes*	-	Vidanga	Seeds	Used as stomachic ,anthelmintic ,tonic ,astringent . Dried food used in preparation of ayurvedicmedicines .	Oct-Nov
67	Sal seed	*Shorearobusta*	Sal tree	Rengal ,Sargi ,Sal	Seeds	Seed oil used for cooking ,lighting ,manufacture of chocolate .Seed cake used as cattle &pultry feed .	May-Jun
68	Phulajhadu	*Thysanolaena maxima*	Broom grass,tiger grass	Phuljhadu	Panicles	Panicles made into soft broom.stems used for making reed pens for writing	Dec-Jan
69	Siali seeds	*Bauhinia vahlii*	-	Siali	Seeds	Seeds eaten raw or fried when ripe they taste like cashew nuts	Feb-March

7.6 METHOD OF COLLECTION :

7.6.1 The primary collector should be properly guided and trained to collect the NTFPs in scientific ways. Latest technique of collection,drying and storage should be imparted to them to fetch cash. Village micro entrepreneur based on NTFP should be encouraged.

7.7 METHOD OF TREATMENT FOR MAJOR NTFP AND THEIR IMPROVEMENT–

Bel(*Aeglemarmelous)*

- **Collection period**- Mar to Apr.
- **Usable parts** –Fruits.
- **Scientific method of processing & storage** - -Collected fruits should be kept for 3-4 days on clean cloth or tarpaulin or poly sheet for sun drying. Fruits are put in extremely hot water for few minutes and then remove. This process is repeated for 2-3 times for removing its hard cover. The pulp of fruit should be cut in four parts then pulp spread on clean cloth or bamboo mats for drying. Fruits completely dry in 15- 20 days.

The dry orange colour and spotless pulp should be packed in bags.

- **Value addition**- The extractedbel pulp are used for the preparation of various fruit products i.e. preserved candy, jam, RTS, nectar squash/leather/slab, powder etc., which can be commercially exploited.

The fruits wrapped with blue cellophane paper, butter paper, perforated polythene bag with $KMnO_4$ and perforated polythene bagging showed maximum extension of period 24 days. The fruits can be treated with NAA 100 ppn .$GA_{3\ 50\ ppn,}$ Stanus chloride 250 ppm and Cobalt nitrate 250mm to extent the storage life.

A large number of Bel processed products can be made by different value addition methods.

1) Preserve and candy- The osmotic dehydration technique can be adopted to increase the storage of fruit and preserve its flavour colour and texture and prevents microbial spoilage. The pieces of fruits impregnated with sugar or glucose syrup, subsequently drained free of syrup and dried is known as candied fruit. The total sugar content of the impregnated fruit each kept at about 70% to prevent fermentation

2) Bel fruit squash is formed by 50% extracted pulp , 50 degree Brix and 1% aciidity. The squash is chemically preserved by addition of 300 ppmSO_2 . Fruit beverages

contain 25% of fruit pulp or juice and 40% to 50%TSS and1% acid. The squash is prepared by adjusting the TSS and adding preservatives like sodium met bisulphate(350 PPM) and Sodium Benzoate.(1 gm, per ltr.). The squash is then is filled in sterilised bottles and pasteurized at 80 degree centigrade for 30 min. Followed by cooling and wax ceiling to ensure air tightness.

Bel fruit pulp-
The ripe fruit is washed with tapped water and broken by striking against hard object. The fruit pulp along with its seeds and fibres was scooped with the help of stainless steel spoon. Amount of water equal to the weight of pulp is added. The mixture of pulp and water is heated upto 80 degree centigrade for 1 min. and cooled. Pulp free from the seeds and fibres then obtained by passing through 20 mesh stainless steel sieve. The extracted Bel pulp is improved by adjusting the TSS by addition of sugar and acidity by the addition of Citric acid.

The dehydrated Bel –
Select mature green fruits , wash and cut 1-1.5 cm thick slices of the fruit pulp after removing its hard shell. Fumigate the slices of fruits with sulphur dioxide fumes for an hours in sulphur box and dehydrated at 55-60 degree centigrade in oven upto constant weight. Dried slices are packed in a polythene bag or glass Jar.

Bel Powder-
This can be prepared by grinding fruit slices in a grinder. The ground bel powder is packed in polythene bags and stored in dry places after proper sealing.
Jam is prepared by boiling the fruit pulp and juice with sufficient quantity of sugar to a reasonably thick consistency to hold fruit tissue properly. The fruit jam should contain a minimum 45% of fruit pulp and a minimum of 68% of total soluble solids.

Toffee-
The Bel fruit toffee is prepared by mixing 40 parts of cane sugar, 4.5% of glucose , 10 part of skim milk powder and 6 part of hydrogenated fat to 100% part of fruit pulp. The final moisture contained of the toffee is kept at 8.5% .

Chara – (*Buchnanialanzan*)

- **Collection period**- April to May .
- **Usable parts** – Seeds.

- **Scientific method of collection** - The ripe fruits are collected by plucking from the trees by using a long bamboo with hook or by collecting fallen fruits from the ground In no case the branches are to be lopped off which is a destructive method of collection .
- **Scientific method of processing & storage -** Collected fruits should be put in a tank which is filled with fresh water than fruits rubbed under water so that pulp come out and float, which could be removed by decantation and seeds settled down on the bottom. To test healthy seeds for storage, seeds are put in a tank full of water, seed settled in bottom would be considered as sound seed. Well-dried seeds should be packed in jute bags for storage.

- **Value addition-** Roasted seeds are used as dry fruit. Seeds are used as condiment and to increase flavour in various sweets. After collecting the ripen char fruit it may be clearly washed in water and Kernel should be completely detached from seed. Then the seed may be completely dried on drying yard. Care may be taken for bagging and storing to facilitate better remuneration. Then the seeds should be well dried in sunlight and packed in jute or plastic bags for storage.

Myrobalans :

Harida (Terminalia chebula)

- **Collection period**- January to Mar and October.
- **Usable parts** – Fruit rind .
- **Scientific method of Collection-** There is two types of collection in case of Harida. One is collected during the first fortnight of October before seed development which is called Bal Harida. It is primarily used for medicine. The others are collected during January to March where seeds are developed completely called mature Harida . These are used in tanning industry. The fruitcollected during January contains more tanning than any other time.The fruits should be collected from the ground when only they fall from the trees.Cutting of branches for collection of fruit should be prohibited.

- **Scientific method of processing & storage -** Collected fruits should be spread on clean cloth for 10-15 days then its hard portion should be separated from mingi (seeds).

  Completely dried fruit should be packed in Jute bag, which has plastic cover in inner part.

- **Value addition**–Harida is an ingredient of Triphalachurna. The collected fruit should be spread on in clean cloth for 10 to 15 days and then its hard portion should be separated from the seed. The dried fruit should be packed in jute bag which has plastic cover in the inner part.

Bahada- (Terminalia belerica)

- **Collection period**- Dec to Jan.
- **Usable parts** – Fruit rind.
- **Scientific method of Collection- The best time for** collection is Dec-Jan where matured fruits can be collected when they falls on the ground only. Cutting of branches for collection of fruits to be prohibited.

- **Scientific method of processing & storage - Collected** fruits should be spread on clean cloth for 10-15 days then its hard portion should be separated from mingi (seeds). This separate hard cover/pulp again is keep for 4-5 days to dry.

- **Value Addition**- The collected fruit should be spread on clean cloth and dried for 10 to 15 days. Then it's hard portion should be separated from the seed. The separated hard pulp are kept for another 4 to 5 days to dry . The completely dried pulp should be packed in jute bag which has plastic covered in its inner part. This dried fruit part is one of the ingredient of the TriphalaChurna.

Amla – (Emblicaofficinalis)

- **Collection Period-** Dec to Jan However the best collection period is in the month of March
- **Usable parts** – Fruit rind .
- **Scientific method of Collection-** The best time for collection of fruit is March when it is matured and ripe. The fruits are either carefully plucked using long bamboo poles with a hook or collected from the ground after they fall.Cutting of branches for collection of fruit is to be prohibited. Collection is preferred in the morning because increasing solar heat may turn the fruit black.
- **Scientific method of processing & storage** - Collected fruits are washed in plenty of running water. For commercial production, rotary washers, or fitted with moving conveyor belt and soft roller brushes are generally employed. Blower fan, solar dryer or pressure less dehydration process is used for drying. Vacuum dehydration process is used at commercial level to maintain its original value.

Completely dried reddish brown coloured fruits should be packed in plastic bags for storage. During packing time mouth of bags should be kept little open to avoid smell.Amla is used as Jams, jellies, tarts, chutneys, beverages nectar, squash and syrup Pickle and candy etc.

- **Value Addition-** The collected fruits are washed in running water properly for commercial production. Rotary washers or fitted with moving conveyer belt and soft roller brushes are generally employed. Blower fan, Solar dryer or pressure less dehydration process is used for drying. Vaccum dehydration process is used at commercial level to maintain its original value. Completely dried reddish brown colour fruits should be packed in plastic bags for storage. During packing time mouth of bags should be kept little open to avoid smell. The dried fruit pulp is a important ingredient of TriphalaChurna. The dried fruits are used for preparation of jams,jellies, chatnies,beverages (nectar,squash and syrup),pickles and candy etc.

Sal seed-(Shorearobusta)

- **Collection Period-** June to July
- **Usable parts** – Seeds.
- **Scientific method of processing & storage** – The seeds are cleaned manually and sun dried the wings and seed coat is separated manually to obtain seeds without wings and kernels. Sal seeds should be properly dried, dewed and decorticated. The Kernel contains higher oil percentage as compared to seed with wing and seed without wing
- **Value addition**- Proper drying of Sal seed till evaporation of moisture is itself its value addition and minimization of storage period reduces the chance for fungus attack which is the main cause of its market value,It is found out that the oil contents of the kernel will be higher than those of seeds with wings and without wings. With this proper drying method the Sal seed is used for extraction of oil which is a key ingredient in soap making, chocolate making, pharmaceutical industry and cattle and poultry feed. Also Sal oil can be used as cooking oil and substitute for cocoa butter in chocolate industry.

Tamarind-(Tamarindusindica)

- **Collection Period- March to April**
- **Usable parts** – Seed.
- **Scientific method of processing & storage** – Collected fruits were spread on polythene sheet for 2-3 days to dry then uncovered. Uncovered fruits fibre and seed should be removed, which is called seed less Imli or Tamarind. Tamarind with seeds and fibre called AutiImli.

PhoolImli should be packed in plastic bags and AutiImli packed in Jute bags for storage. It is used as Jellies, chutneys, beverages (nectar, squash and syrup) Pickle and candy etc.

- **Value addition-** After collection of Tamarind pod, the hard cover is decorticated manually which is sold in much higher price than the seeded one . Collected fruits are to be spread on polythene sheet for 2-3 days for drying and the hard cover, fibre and seed should be removed properly so that this seedless Imli can fetch good price .They should be packed in plastic bags for storing .This seedless Imli can be used as jellies ,chutneys ,beverages ,pickle and candy etc . After decorticated the hard cover from the pod the seeds should be dried and grinded which is used for cattle feed and poultry feed .Tamarind kernel powder can also be used at textile and paper industry .

Kusuma-(Schleicheraoleosa)

- **Collection Period- June**
- **Usable parts** – Seed.
- **Scientific method of collection –** The bunch of fruits is plucked by climbing the trees or by using bamboo sticks rather than by looping of branches.
- **Scientific method of processing & storage** –

First uncover the collected fruits then crushed by means of fluted wooden roller or crushers are used to remove its pulp. Collected seed evenly spread on clean cloth or polythene sheet for 4-5 days for drying.

Dried seeds should be packed in jute bags for storage.

- **Value addition**- The dried seeds are packed in jute bags for storage. The seeds are processed in mills for extraction of oils. The oil is yellowish brown, semisolid with the faint odour of bitter almond. When allowed to settle a light coloured solid fat get setteled. The oil contains oleic acid 2-3 %, stearic acid 2-6 % , gadoleic acid, arachidic acid and sanogenic compound, which must be removed for human consumption.Also the oil contains linoleic acid 42-50 %, palmitic acid 5- 8 % and hydrocyanic acid which must be removed prior to consumption .

The seeds yield fatty oil called Macassar oil which is used for hair dressing , culinary, lighting purpose, lubricants for machinery and pharmaceutical industry .

Karanja-(Pongamiapinnata)

- **Collection Period- March to April**
- **Usable parts** – Seed.
- **Scientific method of collection –** The fruits are plucked by climbing the trees or by using long bamboo stick with hook.
- **Scientific Method of Processing & storage** -The hard cover is removed like crushing the fruits by wooden roller or crusher. The collected seed are spread in polythene sheet for a week for drying.

- **Value addition** – Karanja seed contain 32-36 % oil which is a rich source of protein (20-28%) .Karanja oil contain 5-6 % flavomoids oil, the main constituent of karanjin . The karanjin has to be isolated from Karanja seeds .The karanjin is to be recovered from the seed oil by subjecting it to liquid –liquid extraction with methanol. The extract is further purified by chromatography on alumina followed by crystallization. This Karanjin is recovered in pure form which is massively used in pharmaceutical industry. The fatty oil is suitable for bio diesel production used in tanning industry, preparation of soap and lubricants for engine. The cakes are used as manure and bio- pesticides.

Mahua Flower-(Madhuca indica)

- **Collection Period- March to April**

- **Usable parts** – Flowers.

- **Scientific Method of Collection**- Theground underneath the tree is cleaned.**A mat** is spreaded under the tree to get Mahua flowers free from unwanted materials. Usually the flowers fall between 4 O clock to 10 O clock in the morning which is the proper time for collection.The primary collectors often set fire to leaves and grasses underneath the trees. This practice should be stopped and awareness be created not to set fire as such fire often spreads to the adjacent area.

- **Scientific Method of Processing & storage** - Collected flowers should be spread as thin layer on polythene sheet for drying in sunlight.

  Well-dried flowers should be packed in jute or plastic bags immediately after last drying.
  Food material (laddu,kismis), bio diesel and alcohol are derived from it.

- **Value addition** – The flowers were graded and dried at drying yard for a period of 5 to 7 days.. Collected flowers should be spread as thin layer on polythene sheet for drying in sunlight. After drying for 5 to 7 days the flower should be packed in jute or plastic bags . So that the dried flowers would not come in contact with moisture . The dried flowers can be processed in food factory as laddu&kismis. Even they can be is used as biodiesel and in preparation of alcohol.

Sal Leaf (Shorearobusta)

- **Collection Period- September to January**
- **Usable parts** –.Leaves
- **Scientific Method of Collection**- The leaves are collected by plucking manually in the month of September to January. Collection of leaves should not be allowed during March to May and even in rainy season. Total sweeping of plants for collection of leaves should not be allowed. The limit should be fixed for extraction of leaves and in no case it shall be more than 2 quintal. Per ha.

- **Scientific Method of Processing & storage** - Primary processing done by sun drying in open ground. The dried leaves are left in the same position till next morning to absorb moisture from the atmosphere and get soften. The soften leaves are made to a stratum by placing one over the other and packed tightly into bundles which are subject to pressure.
- **Value addition** -Again pressing machine and mounding machines may also provide to each VSS for value addition of plates and cups. Sal leaves plate making through traditional method is a common practice for livelihood among the ethnic people of most of the tribal villages .Value addition by mechanised pressing is a vital intervention to improve productivity and income opportunity for the ethnic people . The cost for installation of a small sized house hold processing unit is Rs. 15000 which includes leaf plate pressing machine, bulk of raw materials and other service equipment . The processing unit used electricity or biomass fuel as a source of energy to run the machine that can be used in Sal leaves plate . Two sets of ordinary raw Sal leaf plates are machine traced together with a thin polythene sheet (12.5 cm x 12.5 cm) in between the two plates to make one moulded plate . This mechanised pressing gives sufficient tensile strength and proper shape to the plate . A mechanised pressing unit provides a net profit of Rs. 241 for one thousand pressed plates .It is estimated that the mechanised moulding may yield income of Rs.49100 per year with employment of 450 mandays per year for each house hold . The machine adds rigidity and gives good shape with raised edges to the plate. The intervention will enhance the income of forest dwelling families having abundant Sal leaves around them . A single unit functioning for 20 days a month can produce up to 50000 plates.

Siali leaf :(Bauhinia Vallie)

- **Collection Period- October to December and April to June**
- **Usable parts** –.Leaves
- **Scientific Method of Collection**- Leaves should be collected by plucking the matured leaves of requisite size and thickness leaving the immature and old leaves on the climber itself. In no case the climber should be cut down for easy collection of leaves which is a destructive method of collection.
- **Scientific Method of Processing & storage** - The leaves are dried in small bundles of 7 to 8 leaves and fanned over a rope to prevent blackening of the surface. Siali leaves take few hours for drying. After drying it is bundled and stored for further processing.
- **Value addition** - After plucking Siali leaves without stalk is dried for one to two days at drying yard after which it is ready for plates and cups .The Siali leaf bundles contain 1600 nos. of plates which cost about Rs 300 . More value can be added if one leaf can be found on thick paper pressed plate by gums collected from forest which comes naturally

Siali Fibre-

- **Collection Period- October to December and April to June**
- **Usable parts**–.Fibre
- **Scientific Method of Collection**-. The proper time for extraction of fibre is when the climbers attain 2 feet girth. This is the girth when the climbers moves towards maturity and quality of leaves also get reduced. Cutting cycle of 5 years is to be adopted for sustainable production of Siali fibre.
- **Scientific Method of Processing & storage** - The climbers are cut flush to the ground.Then it is subjected to water treatment for removal of gumming materials. Fibres are removed after beating and scrapping. The fibres are then sun dried and after drying for 6 to 7 days made into bundles for storage.
- **Value addition** - Removal of Siali fibre from 2' girth size at base level of the climber is itself a value addition of the extracted fibre. The fibres is used for making ropes, threads etc.

Bhuin Neem-(Andrographispaniculata)

- **Collection Period-** October to December
- **Usable parts** –.All parts
- **Scientific Method of Collection**-. The plants are cut flush to the ground without damaging root system . Also twigs are to be collected rotationally in a phase manner in a locality to facilitated natural regeneration .
- **Scientific Method of Processing & storage** -..The best harvesting period of Bhui Neem is when 3 to 5 months old or at 50% blossom of the leaves followed by final harvesting after 2 to 3 months . After harvest the plants are cleaned and cut into pieces. The cut pieces are dried at 46 to 50 degree centigrade for 8 hours or until properly dried in hot air oven.

  The dried plant parts are stored in airless plastic bags and kept in clean cool place but not beyond a year otherwise medicinal values may decrease.
- **Value addition** - Cleanliness of the plant parts and proper drying adds to the marketing value of the product. Clean product has high demand in pharmaceutical industry.It is used in preparation of Ayurvedic Medicines and a tonic for liver and febrifuge and anthelmintic.

Dhataki-(Woodfordia fruticosa)

- **Collection Period- January to April**
- **Usable parts** –Flowers .
- **Scientific Method of Collection**-The flowers are collected from the plants rotationally in a phase manner so that natural regeneration will not be affected. In no case the twigs are to be lopped off which is a destructive method of collection.Flowers are collected with gummy substance in it.
- **Scientific Method of Processing & storage** - Flowers are dried on a cement platform or on a mat and preferably under shed to maintain the colour and quality .The dried flowers are stored in airless plastic bags and kept in cool places.
- **Value addition** – The dried flowers should be used within 3 months of its collection to prevent deteristionof quality. The dried flowers are used in preparation of Ayurvedic Medicines. It is also used in preparation of red die.

Hill Brooms-(Thysanolaena latifolia)

- **Collection Period- March to June**
- **Usable parts** – Panicles
- **Scientific Method of Collection**-Collection is done by cutting of broom lasheswiththe help of a sickle without disturbing the root stag which affects regeneration adversely. While collecting the panicles care should be taken to left some matured grasses for seeding and natural regeneration.
- **Scientific Method of Processing & storage** - After cutting the broom they are sun dried for 2 to 3 days and separated into equal length. The brooms of different sizes are tied in orderly manner with plastic rope at the lower end.
- **Value addition** – The broom should be collected at a stage when it looks greenish and fine textured. Value addition through proper binding and tying to prepare brooms fetches high price. The dried broom stocks are fast shaved with the help of knife for removing loose leaf sheaths to ensure binding strength. Sorting and grading is done basing on the length of the stalk. Various patterns like spiral, diamond etc. Are adopted for tying with the help of plastic string to make the groom more attractive. Some plastic covers are put in the basal stalk portion to make the broom durable and comfortable for use. Sometimes the binded brooms are kept inside a thin polythene cover for save transportation and marketing.

Neem-(Azadirachtaindica)

- **Collection Period- June to July**
- **Usable parts** –Seeds
- **Scientific Method of Collection & storage** - **The Neem fruits** should be collected when it become yellowish. The twigs of the trees are shaken and the fruits fallen on the ground are collected.Before collection the ground should be cleaned and a tarpaulin bespread on the ground.

- **Scientific Method of Processing and Storage**- After collection, the fruits are treated with warm water so that it can be de-pulped easily to obtain seeds, After de-pulping the seeds are dried in sunlight and the moisture content of the seed should be brought down to 10% or less.
  After drying the seeds are stored in perforated sacks
- **Value addition** – Use of low cost Neem seed decorticators can help to produce seed kernel and further processing of seed kernel to oils and oil cake shall help in increasing market value of the product.Neem seed kernel is used in preparation of Ayurvedic medicines. Neem seed oil is used as bio-pesticide, fungicide and for soap makingcake is used as manure and bio-pesticide.

As per sample point survey the prevalent NTFP species found in different Forest blocks of Keonjhar Wild Life Division is given below.

Table No.7.3 Block wise prevalent NTFP species

Sl.No.	Name of Forest Block	Name of prevalent NTFP species
1	Rebana RF	Sal, Mahula,Kusuma,Chhana,Gilari,Suama,Atundi,Siali,Bhui Neem,Dhataki,Satabari,Char,A.Mula,Jammu,Bhalia,Bahada,Harida,Amla, Banakolatha,Sugandhi,Bela,Banakhajuri,M.Kendu,Phuljhadu,Pedipedika
2	Atei RF	Sal,Mahula,Jammu,Siali,Bhalia,Char,BhuiNeem,Banakolatha,Satabari,Sugandhi,Kusuma,Amla,Atundi,Harida,Bahada,Banatulasi,Chhana,Phuljhadu,Suama,Gilari,Anta mula
3	Santoshpur RF	Mahula,Sal,Bhalia,Char,BhuiNeem,Banahaladi,Satabari,Kendu,A.Mula,Suama,Atundi,Bahada,Bela,Amla,Saugandhi,MankadaKendu,Pitaalu,Harida,Kusuma
4	Turkipada	Sal,Mahula,Char,Kendu,Jammu,Kusuma,Harida,Bahada,Suama,Atundi,Tentuli,Panasa,Satabari,Bhuin neem,B.Kolatha,A.Mula,Banakhajuri
5	Hatibindha	Mango,Panasa,Mahula,Dhataki,
6	Baigundi	Sal,Char,Kusuma,Mahula
7	Baranga	Char,Atundi,Sal,Satabari,Jammu, BhuiNeem,AntaMula,BanaKolatha
8	Gayalamunda	Sal,Mahula,Char,Banahaladi
9	Mahulpanga	Sal,Char,Amla,Banahaladi,Atundi,Suama,Jammu
10	Meghanadapohi	Chhana,Banakhajuri,Bhui Neem
11	Ostapura	Sal,Char,mahula,Neem,Jammu,Bhuinneem,Sugandhi,Siali,Atundi,Suama
12	Palasapal	Sal,Char,Bhuinneem,Suama,Mahula,Jammu,Banakhajuri,Bhuinamla,jammu,Banakhajuri, Bhuinamla,bahada,chhanagrass,harida,A.Mula
13	Patilo	Sal,Bela,Atundi,Suama,A.Mula,mahula,Chhana,Char,Banakhajuri
14	Tangiriapal PRF	Sal,Pitalu,Mahula,Kendu

7.8. MANAGEMENT OF NTFP:

7.8.1 Active management of NTFP collection and utilization can help to maintain Eco system complexity & also play an important role in restoring biodiversity. Managing forest by focusing on NTFP will also help in increasing the long term value of Forest resources & also lead to biodiversity conservation & sustainable forest management.

7.9 PRESENT STATUS OF EXPLOITATION:

7.9.1 NTFPs are still being extracted from the natural forest haphazardly. Unregulated & unscientific harvesting, lack of monitoring and evaluation system, ignorance for conservation & sustainable management by user community & middle men leads to the decline of these resources.

7.9.2 NTFPs include medicinal plants, fuel wood, fodder & forage, wild edible plants, house building & thatching materials, fibres, tannins, resins etc. Forest dwellers especially Tribals depend on the forest not only to supplement their domestic requirements but also to supplement their income generation by selling them in local market.

7.10 METHOD OF EXECUTION :

7.10.1 Enrichment of NTFP species

The Resources survey has pointed out that the availability & density of NTFP species are very less as uncontrolled exploitation in the past has made the depletion of many plant species. As a result of which Dhaura, Kendu, Kusuma, Mahula, Chara, Bela, Sunari, Jamu are restricted to following compartments of the RFs noted against each. However the above species in other forest blocks are found inadequately. The species wise occurrence in different compartments of different Forest blocks is given as under.

Table No.7.4 Enrichment of NTFP Species in Forest Blocks

Sl. No.	Forest Block	NTFP Species							
		Compartments	Dhaura	Kendu	Kusuma	Mahula	Char	Bela	Sunari	Jamu
1.	Atei		67	66,51,53	55,57,58	53,55,56,62	53,56,68	51	57,58	60
2.	Rebana		1,11,46	26,38,47	25,26,38	42,43,47	2,25,33	22,46,47	1,13,46	11,16,30
3.	Santo shpur		9	8,10,11,14	6,9,10,14	3,8,14	9,11,14	9,11	5,14	9,11,14

Therefore 20% of the block and ANR plantation should be of NTFP species. In VSS areas the choice of species should be need based.

Considering the survey data, it is proposed to plant *Mango, Bahada, Barakoli, Jamu, Neem, Mahula, Bela, Arjuna, Amla, Kusuma, Karanj, Tentuli*in AR& ANR plantations. Seedlings of Medicinal herbs like *Sarpagandha, Tulsi, Pudina,Kalmegh, Satabari*etc. should be raised in existing temporary & permanent nurseries. These seedlings should be planted as under-crop in VSS areas. After that these plants should be introduced in Forest areas.

7.10.2 Augmentation of Regeneration of NTFP species

Sal leaves, Sal seeds are major NTFP product of Keonjhar (WL) Division. Areas having poor Sal regeneration like Santoshpur(Comp.No.-2,18,19)Patilo, Meghanadpoi, Hatibandha, Nuniapatna should be taken proper care from biotic pressure. The species wise good regeneration in different compartments of different forest blocks is given as under.

Table No.7.5. Augmentation of Regeneration Species

Sl No.	Forest Block	Species	Compartment Nos.
1	Rebana	Char	1,2,5,7,8,9,10,12,18,19,22,24,25,26,28,30,32,034,40,41,42,43,44,45,47
		Bela	8,17,18,20,22,46
		Sunari	11,13,17,18
		Jamu	1,7,10,11,13,14,16,17,19,20,24,25,30,33,38,45
		Arjuna	19,33
		Amba	25
		Amla	42
		Rohini	45
		Harida	45
		Bahada	20
		Kendu	1,5,6,10,11,12,18,20,22,24,25,26,27,28,29,30,32,33,34,35,37,38,39,41,42,43,45,47
		Sal	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,37,38,39,41,42,43,44,45,46,47
		Kusuma	5,7,8,19,22,25,26,38,39,40,42,46

		Sidha	17
		Karada	9,13,14,17,26,27,29,32,34,35,37,38,40,41,45,46
		Kurei	3,13,18,19,28,29,30,32,33
		Asana	10,11,12,16,19,24,25,26,28,29,30,32,33,38,42,43,44,45,46
		Mahula	24,39,40,42,43,44,45,47
2.	Atei	Chara	50,51,53,56,58,59,60,63,64,68
		Sal	50,51,52,53,54,55,56,58,59,60,61,62,66,67,68,69
		Bela	51
		Kendu	51,52,53,56,57,58,59,61,62,64,66,67
		Khakada	51,55,61,
		Mahula	52,53,55,56,67,68
		Jamu	54
		Kusuma	55,57,69
		Kurei	60,61,62
		Telkuruma	62
		Amla	64
		Bhalia	68,69
		Harida	68
3.	Santoshpur	Char	1,4,6,7,8,9,10,11,12,14,17,18,20
		Kendu	Comp. (01-20) except 02
		Kusuma	01,04,05,06,11,14
		Amla	03
		Karada	04,05,10,14,15
		Mahula	05,08,14,20
		Jamun	09 & 17
		Bahada	11
		Sunari	12

Similarly, good regeneration of important MAP species found in different Forest blocks is given as under.

Table No.7.6 Enrichment of MAP items

Sl. No.	Forest Block	Compartments	MAP Items in abundant
1.	Atei	51,56,57,60	Satabari, Aswagandha, Bhuineem, Mayurchulia, Talamuli, Anantamula
2.	Rebana	1,3,10,26,30	
3.	Santoshpur	11,13,14,16,17	
4.	Ostapura	-	
5.	Patio	-	

7.10.3 Awareness

People should be well aware about the scientific collection procedure, grading, value addition, storage and marketing of NTFP species available locally. The main reason attributed to the destructive method of harvesting procedure is the poor knowledge the primary collectors regarding the proper mode and time of collection as well as subsequent processing. Due to such destructive collection, damage is caused to the source plant. Such destructive method is a matter of serious concern which needs to be tackled on priority basis. Awareness campaign to educate the local people should be made through organization of workshop to explain them the need of proper harvesting and processing method.

7.10.4 **Marketing**

To streamline the system of collection and disposal of NTFP which are the major source of livelihood of rural poor,the State Government came out with a New Policy Guideline in the year 2002. It bestowed the ownership rights to the Gram Panchayats. Any person interested in purchasing or trading of NTFPs will need to register under any GP with a registration fee prevalent as per govt. guideline. No person shall be entitled to procure or trade of NTFPs in any GP without being registered in the GP. GPs were also vested with authority to cancel the registration of any trader who procures any NTFP from primary gatherers at a rate lower than the Minimum Procurement Price fixed for that NTFP. District Collector is empowered to fix minimumprocurement prices with respect to all NTFP items.

New several avenues have opened up which are given below.

1. Under Joint Forest management, the VSS are entitled to share of usufructs including entire NTFP gathered from their assigned forest area. The VSS and its members have priority over the Gram Panchayat in the matter of collection and disposal of NTFPs.
2. In the advent of Biodiversity Act and Rule, as per Sec-41(I) every local body (Gram Panchayat) shall constitute a Biodiversity Management Committee for purpose of promoting conservation, sustainable use and documentation of biological diversity. Accordingly, Biodiversity Management Committee has been formed taking each Gram Panchayat as a unit.

As per section 41(3) of Bio diversity Act & Rules Biodiversity Management Committee can levy charges from the persons or company for collecting biological resources for commercial use. It will be kept in local Biodiversity fund. Every executive committee of VSS is a subcommittee of Gram Panchayat. G.P. can take a decision to get assistance from Government for plantation of NTFPs through Forest department or local biodiversity funds so raised can be utilised in value addition of NTFP products.

3. VanaDhanaBikash Kendra through SHGs - The scheme has been launched by Govt. of India through TRIFED to support the collection & processing of NTFPS through SHGs.

The scheme is envisaged to be implemented through a cluster of SHGs(15 to 20) to be named as VanaDhanaBikash Kendra. The total members should be around 300 out of which 60% should be Tribals. Under this Programme each Kendra should be supported through TRIFED with a grant of RS.15Lakhs for Training (Collection, Storing & Value addition). An additional support of Rs.20lakhs will be provided to VanaDhanaBikash Kendra for building Infrastructure. Harichandanpur (part of Brahmanipal Range) having 60% ST population can be included in this scheme.

Forest department should encourage bulk buyers to discourage the entry of middle men for herbal medicines. The list of Registered Pharms underDepartment of Ayush are depicted in Table No.7.7

Table No.7.7 List of Pharmaceutical Companies under Ayush, Odisha.

SL. NO.	COMPANY	ADDRESS
1	AalatiUdyog	Nayasarak, Cuttack
2	Abicee Pharmaceutical	Industrial Estate, Cuttack
3	BalgopalAgro- Vet & Chemical Industries Pvt. Ltd.	D/2/2, New I/E. Jagatpur, Cuttack
4	Bubuna Chemicals	Plot No. A-29,30 &31,I/E Cuttack-10
5	Chemei India	*Not available*
6	Chillika Pharmaceutical Lab	Madhupatna I/E Cuttack
7	Daw Pharmaceuticals & Chemicals	Muradakhan I/E Cuttack
8	Eastern Chemical Industries Pvt. Ltd	Plot No. – B-27, New I/E, Jagatpur
9	Eastern Drug	New I/E, Jagatpur, Cuttack
10	Eastern India Pharmaceuticals Lab	Plot No. – 21 & 22, New I/E, Jagatpur,

		Cuttack
11	Florence Biotech Pvt. Ltd.	Plot No. – B-19, I/E, BBSR
12	Godavri Gas	Mancheswar I/E BBSR
13	Green Waves Pvt. Ltd.	Mancheswar I/E BBSR
14	Harihar Pharmaceuticals Pvt. Ltd.	Mancheswar I/E BBSR
15	IDD Pvt. Ltd.	N.H- 201, SBP Road, Khamarmunda
16	I.F.G.L. Refractories Ltd.	I/E Madhupatna, Cuttack
17	Indole Pharmaceuticals	Plot No. 121(B), New I/E, Jagatpur, Cuttack
18	J.B. S Pvt. Ltd.	1586(P),Fakirpur, Old I/E, Jagatpur, Cuttack
19	Jagannath Chemicals & Pharmaceuticals Pvt. Ltd.	Plot No. – 41, New I/E, Jagatpur, Cuttack
20	Jay Hanuman Industries	Office & Factory, B-36, I/E, Cuttack
21	Jewel International	Plot No. – 49, New I/E, Jagatpur, Cuttack
22	Kingsy Pharmaceutical Works	Mancheswar I/E BBSR
23	Laxmi Chemicals	Chandaka I/E, BBSR
24	Manequin Pharmaceuticals	New I/E, Jagatpur
25	Manner Pharmaceutical Works	Malisahi, Boudhraj, Boudh- 14, Odisha
26	Mother Care PharmaLab.Pvt. Ltd.	Haladipadar, Ganjam
27	Nihar Chemicals	Rasulgarh I/E, BBSR
28	Nilachakra Chemicals	Balasore
29	Nilachal Chemical	Chandaka I/E, Patia, BBSR
30	Noble Pharmacare Ltd.	Kalunga I/E, Rourkela
31	Novo Pharmaceuticals Pvt. Ltd.	Baula, Bali, Gurudijhatia, Cuttack
32	ODCL	Haladipadar, Ganjam
33	Orissa Biological Product Institute	GGP, Rasulgarh, BBSR
34	Oro Pharmaceuticals	Jagatpur, Cuttack
35	Phyto Pharmaceuticals Pvt. Ltd.	Plot No -A/8, Mancheswar I/E, BBSR
36	Polar Pharma Pvt. Ltd.	Injana, Khorda
37	Rohan Pharmaceuticals	Mathsahi, Motiganj, Balasore
38	Seashore Pharmaceuticals	Damodarpur, Motiganj, Balasore
39	Sutar Pharmaceuticals Pvt. Ltd.	Chandaka, I/E BBSR
40	Bharat Salt & Chemical Industries Ltd.	15/2/14, Angul
41	Trimurty Chemical Industries	Brahmani Taranga Vedavyas, Rourkela
42	Universal Chemicals & Pharmaceuticals Industries	Janal I/E, Plot – 3, Khurda
43	Utkal Chemical Pvt. Ltd.	Bhubaneswar

7.11 CONTROL :

All the works undertaken should be entered in the respective compartment history files with the results obtained for further analysis and references.

7.12 MISC. REGULATION:

I. Reasonable restriction on collection of barks, roots, seeds & leaves which damages the growth of trees and affect Bio-diversity

II. No free & indiscriminate grazing to protect the regeneration of NTFP species inside forest

III. Plantations of NTFP species, Medicinal herbs & shrubs can be taken up as per the site-specific scheme

IV. No felling of NTFP yielding species unless dead and uprooted

V. Collection/exploitation of specified NTFPs to be done in a rotational manner to avoid over exploitation.

7.13 RIGHTS & CONCESSION:

Rights & concessions of local people shall be regulated in accordance with relevant Rules in force.

7.14 COST NORM:

The Cost Norm of this Working Circle has been discussed in Chapter – XIV of Part-II

7.15 INTERIM REVISION :

7.15.1 No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans. Any deviation suggested shall be subjected to the sanction of the competent authority.

CHAPTER – VIII
WILD LIFE (OVERLAPPING) WORKING CIRCLE

8.1 GENERAL CONSTITUTION :

8.1.1 Forests and Wildlife are inseparable and two sides of a coin. As forests form the habitat of Wildlife, the richness and diversity of Wildlife depends on wilderness of the forests. In other words the biodiversity of fauna sustains &supports the high density of flora. The rampant destruction of Wildlife habitat in the name of urbanization, industrialization,human greed etc., especially in the last five decades resulted in rapid decline of Wild Animals. Due to decrease in crop density,species diversity of the Wild animals particularly the carnivore population are diminishing from the area day-by-day to the point of no return. During 1980s, Tigers were seen in Rebana R.F, Atei R.F & Santoshpur RF but now they are not sighted in that area. Due tofragmentation of habitat, the elephant corridor has been lost which has been a cause of grave concern.

8.1.2 The National Forest Policy, 1988 emphasizes the need of conservation of Wildlife and their habitat. The legal management of wildlife in all aspects was however placed on a new footing by the enactment of Wildlife (Protection) Act, 1972 and its extension to the State of Odisha with effect from 14.8.1974. The Hadagarh Wildlife Sanctuary has been declared vide G.O. No. 8F(W)-160/78-34113 Dtd. 06.12.1976 covering entire Baula R.F of this Division.The geographical area of Hadagarh Sanctuary is 191.67 Sqr. kms which includes the Boula RF and the Satkosia RF of Karanjia Territorial Division.A separate Wildlife Management Plan is in force for the Sanctuary. The Wildlife Management Plan written by Sri B.K.Parida, OFS is valid till 2011-12 to 2020-21.

8.1.3 In spite of general decline of forest cover and wildlife habitat, the Division continue to have rich wildlife habitat as stated in Part-I. Therefore, to provide adequate protection to the existing wildlife, to improve habitat and to conserve the biodiversity, the Wildlife Overlapping Working Circle is constituted which extends to the entire Working Plan area of the Division.

8.2 GENERAL CHARACTER OF VEGETATION

8.2.1 **Composition** : Sal constitutes the main species, which contributes about 60% of the crop. On most of the hills, it ascends to the top, either pre-dominantly or mixed with associates like *Bija, Ashan, Bandhan, Kurum, Kasi, Dhaura, Sisoo, Kendu, Haldu, Gambhari* etc. The regeneration is purely natural and distributed adequately all over the area. The forest types are mainly Moist and dry peninsular Sal, Northern dry mixed deciduous and Tropical hill valley swampy forest. The growth and quality of the crop have been considerably reduced depending upon the adjoining environmental condition. All classes of trees exist in this zone. The composition of the vegetation is suitable for the wildlife. Detailed description and composition of the diversity of the forest has already been discussed in Chapter – 3 of Part-I of this plan.

8.2.2 **Distribution** : The area allotted to Wildlife Overlapping Working Circle is distributed to all three Ranges, which comprises 100% of the total managed area of the Working Plan over 58610.92 Ha.

8.2.3 **Density :** The density of crop included in this overlapping Working Circle varies from 0.3 to 0.7. The variation in density is due to the environmental influence, fertility of the area and biotic pressures.

8.2.4 **Weed growth** : Unwanted plants are common in the forest floor. During rainy season number of weeds grow in the forest floor in the tract. Mainly *Eupatorium,Ageratum*, *Lantana* and *Cassia* species are found in almost all the forest area, which interfere with the growth of valuable species and plants palatable to herbivores. Annual weeds get dried during month of February. Dry weeds invite forest fire which causes immense damage to wildlife as well as to the habitat.

8.2.5 **Grass Land** : Different species of grasses are seen in patches on the forest floor. Grasses grow faster in small gaps or in open spaces during rainy season, which provide sufficient fodder for the herbivores. The main grasses are *Khas-Khas, Foxtail grass, Chhana grass, Thatch grass, Spear grass, Sabai grass* etc. The grasses have to compete with the weed.

8.2.6 **Habitat** : In the past these areas were very rich in Wildlife. Subsequently due to rapid development work like laying of roads, irrigation projects etc. the compactness of forest changed. The demand on forest produce increased with the increase of population and forest became more open. The free movement of wild animals hampered due to heavy movement of vehicles and the easy access of poachers thereby killing sizable quantity of wild animals.

8.2.7 **Biodiversity Survey** : Continuous biotic pressure over the years resulted in considerable degradation of forest in this zone. The biotic pressures have adversely affected the diversity of flora and fauna. Systematic biodiversity survey has not been done in this Division.

8.3 SPECIAL OBJECTIVES OF WILDLIFE MANAGEMENT :

8.3.1 Special objectives of Management :

The following are the special objectives of management

- To conserve and protect the existing biodiversity of the eco-system as a whole.
- To conserve, protect and improve the existing Wildlife habitat.
- To promote Eco-tourism and people's participation to create awareness.
- To supplement the existing natural vegetation by planting fruit and fodder species with special emphasis on trees that provide shelter to wild animals and birds.
- To create grasslands in open areas with palatable species of suitable grass.
- To prepare scientific data base for the maintenance and development of faunal population.

8.4 ANALYSIS AND VALUATION OF THE WILDLIFE :

8.4.1 Age classes of Wildlife: All age classes of wildlife of different species are present in this tract. The wildlife census has been carried outevery year for elephant and tiger but not for other animals in this Division.

8.4.2 Status of Multiplication: The census report does not reflect the multiplication status of wild animals and the number of wild animals available in this zone.

8.5 ALLOTMENT OF AREA :

8.5.1 This working circle overlaps the entire of working plan area..

8.6 INJURIES TO WHICH FAUNA IS LIABLE :

8.6.1 Poaching, forest fire, foot and mouth disease of livestock, poisoning, electrocution, snaring, trapping of animals disturbing eggs on nests of birds and reptiles are the main injuries to fauna. Also food and water scarcity contribute injury.

8.6.2 **Grazing** :
This Division has few patches of grassy area inside forest. The Wild animal cannot compete with the grazing cattle. Sometimes domestic animals carry infectious diseases, which cause large scale epidemic in the forest. Excessive grazing inside forest is also responsible for damage to the Wildlife.

8.7 METHODS OF TREATMENT :

The protection to wildlife can be afforded by adopting (a) Remedial measures (b) Preventive measures and (c) Control measures.

- Remedial measures: These are (a) Maintenance of habitat (b) Habitat improvement, (c) Creation of water hole/ Wate body, (d) Grass land development,(e) Provision of salt licks and (f) Periodical census of wildlife etc.
- Preventive measures: These are (a)Creation of public awareness (b)Animal Health surveillance & care (c)Strengthening of information system, and (d) Training to the front line staff.
- Control measures: These are (a) Anti-poaching measures through strengthening of infrastructure and communication network, (b) Prevention of forest fire, (c) Restoration of elephant corridor.

8.7.1 Remedial Measures :

8.7.1.1 Maintenance of Habitat : Maintenance of habitat includes special habitat and unique habitats.

i. Maintenance of special wildlife habitat – Special Wildlife habitat which are biological in original and provide habitat for small wild animals should be maintained and protected. They include snags, snag recruits, den trees, down woods, large old trees, trees with fluting boles, buttress, lianas and tangled climbers, roosting and nesting trees etc. These are all discussed in Chapter-III of Part-I.

ii. Maintenance of Unique Habitats : These are geometric in origin and includes caves, over hangs, den, boulder aggregate, sheet rocks, sands spits, cliffs, talus, ledges, earth cuttings etc. these are already discussed in Chapter-III of Part-I.

8.7.1.2 HabitatImprovement :

Habitat especially for the endangered species in the scheduled-I of the Wildlife (Protection) Act, 1972 requires to be protected by all means. Habitat should be developed using proper silvicultural technique with an aim to provide more food, water and shelter to the wildlife. The habitat improvement includes.

i. Improving the cover by planting useful species for wildlife and for camouflaging.

ii. Improving availability of food.

iii. Improving availability of water especially in summer.

iv. Improving natural salt lick and creating artificial salt licks with hawk's eyes on poachers.

v. Corridor development.

i. **Improving the cover :**

Providing adequate forest cover to different wild animals even their habitat is necessary for shelter and protection from weather, predator and poachers. There should be no felling amounting to alteration of crop composition near the water holes and the areas frequented by wild animals. Gap planting with species such as *Harida, Bahada, Amla, Jamun, Ber, Bauhinia, Ficus species, Bridelia, Mallotus* should be carried out in pockets. In case of rehabilitation working circle, it has been prescribed to go for mixed plantation instead of pure plantation, to create ground flora and middle storey to provide camouflaging cover for different types of animals.

ii. **Improving availability of Food** :

As discussed, previously the trees having NTFP values, the fruit bearing trees should not be felled in any means.

Food availability in a habitat change with the season. Herbivores depend on plant materials like leaves, barks, twigs, flowers, fruits and seeds of species like *Mallotusphilippinensis.*

Dendrocalamusstrictus, Adinacordifolia, Albizzialebbek, Aeglemarmelos, Cassia fistula, Ficus bengalensis, Ougeiniaougenensis, Shorearobusta, Syzygiumcumini, Terminalia alata, Terminalia belerica, Zizyphusmauritiana, Bombaxceiba etc.

Deer, Monkey, Langur, Rodents and Hare feed on wild fruits of plant species like *Terminalia belerica, Buchananialanzan, Aeglemarmelos, Syzygiumcumini, Emblicaofficinalis, Zizyphusmauritiana, Diospyrosmelanoxylon, Grewiahirsuta* etc. These animals help in dispersal of seeds in the forest.

Among the plant materials grasses constitute major portion of the feed of herbivores. Grasses, which are highly preferred and consumed by herbivores, are *Axonopuscompresus, Eragrostispilosa, Saccharumspontaneum* etc. These grasses shall be raised in the open land in proximity of wildlife concentrated areas to meet the food requirement of herbivores.

iii. **Improving availability of water** :

Provision of water holes inside forest is an important step towards wildlife management. Though, there is many semi perennial nallahs in the forest area but they are not adequate for the animals during summer. As a result the animals in dry months of summer and winter usually migrate to the farmer's field or nearest habitation to find water. Therefore it is necessary to creates water holes at suitable locations for storage of water in lean months. Such water holes may be in the forms of check dams, ponds, water holes etc and they should be constructed in a manner to allow storage of water for the maximum period. No vertical concrete walls are allowed around the ponds and they should be gradually slanted for easy approach of wild animals. Ramps can also be provided in the pond for approach of elephants. Nala beds which have gone dry being semi perennial nature should be provided with dug out water holes during summer months at reasonable distance. They are cheap, effective and need restoration in the same summer season.

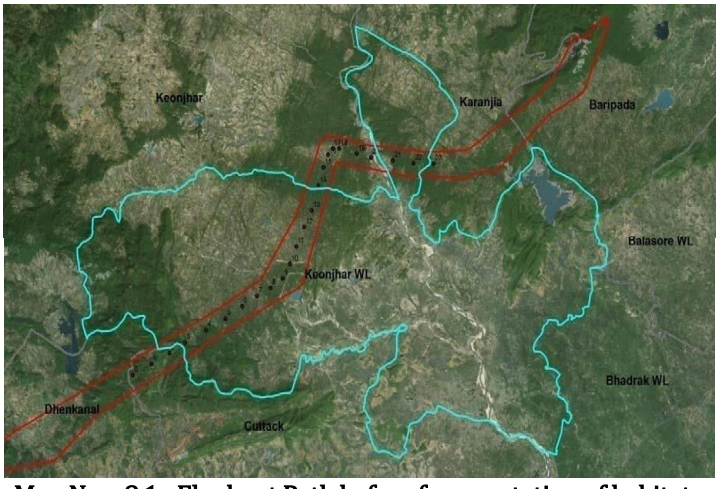
iv. **Development of Natural salt licks** :

Natural salt licks should be maintained and improved upon creating water structures and to be monitored regularly.

v. Corridor development :

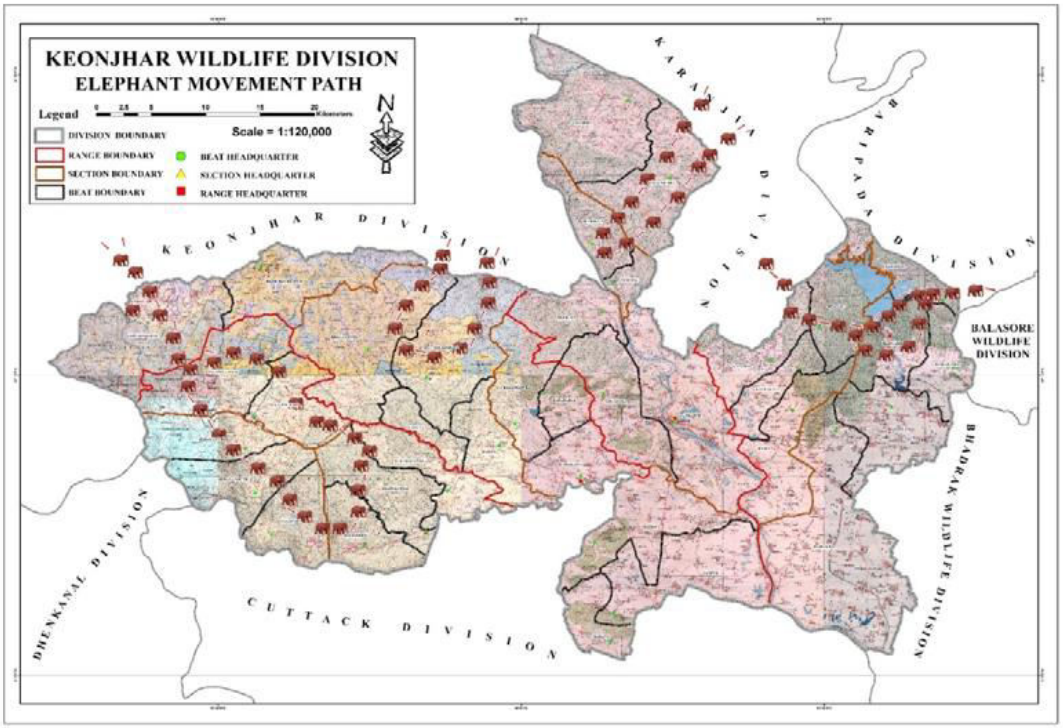
Elephant Corridor

Habitat zone adjoining to the buffer zone to Hadagarh Sanctuary of Keonjhar (W.L) Division is a habitat and migratory corridor of the elephant. The elephant path of this Division shows in the map below depicts the path from Similipal to Dhenkanal through Karanjia and Keonjhar(W.L) Division (Santoshpur, Atei & Rebana) and also follow the same path during their return journey.



Map No. : 8.1 : Elephant Path before fragmentation of habitat

Due to decreasing food base and loss of connectivity and fragmentation of the habitat,the path of movement has been changed and their movement is restricted. One group is restricted to and residential to Rebana R.F. Another group moves within the Atei R.F of Keonjhar (WL) Division and Keonjhar (T) Division. Another group moves from Santoshpur R.F to Karanjia Division and another group moves from Hadagarh Sanctuary to Karanjia Division.



Map No. : 8.2 : Elephant Path after fragmentation of habitat

Elephant the flagship species is a long ranging mega herbivore which requires large areas, enormous quantity of fodder (220Kg of green fodder daily) and plenty of water to drink (80 to 100 ltr.). They also love to bath in river and forest pools and to wallow in the mire. They don't recognize legal boundary, migration of elephant is desirable for intermixing of genes. Hence, its conservation should be regarded as one unit including all the corridors. Allthe migratory path including degraded forest of all sorts need to be restocked with fast growing indigenous fodder & fruit bearing species. The list of fodder species of elephants is furnished in **Appendix XXIX.**

The movement of path used by elephants should be secured and land within the movement path should not be leased out or put to any other non-forest activities. On the other hand corridor improvement activities like plantation or edible species, creation of water body etc may be taken up so that elephant can freely use the movement path without being disturbed. Relevant habitat development along with protection measures for wildlife should be given priority towards corridor development. Camouflaging cover for wildlife movement and migration adds to the security and escape routes from poachers and predators.

Tiger Corridor:

The forest of Hadagarh Wildlife Sanctuary has contiguity in north with Satkosia & Nada RF up to Similipal Reserve Forest & with Satkosia (Karanjia Division) Santoshpur and Atei R.F on the west. Hence, Santoshpur and Atei RF are very important for Tiger and Elephant habitats.

According to 2015-16 census, one adult male and two adult female Tiger are found with total 5 Leopards in Hadagarh (Wildlife) Sanctuary. Hadagarh (Wildlife) Sanctuary is contiguous with Similipal Tiger Reserve and Kuldiha (Wildlife) Sanctuary, Balasore. For long term survival of the Tiger population, the linkages between these habitats should be restored.

8.7.1.3 **Creation of Water holes / Water Body**:

The wild animals very often stay out the forest in search of water during summer season & become the victim of unnatural death. The creation of such water hole/ water bodies are to be done meticulously so as to ensure the desired manipulation of the habitat to cater the felt need of the wild animals.
It is proposed to construct water body at the following sites during this plan.

Table No. 8.1. Proposal for Water Bodies.

Sl. No.	Range	Section	Site	RF
01	Deogaon	Harichandanpur	Ranipada	Rabana
02		Bhagamunda	Bhagamunda	Rebana
03		Deogaon	Rohi	Rebana
04		Bhagamunda	Palabani	Atei
05		Harichandanpur	Maragola	Rabana
06	Brahmanipal	Daitari	Rebana Village	Rabana
07	Anandpur	Gayalmunda	Chandikhaman	Santoshpur

8.7.1.4 **Grassland development**:

Meadows can be developed in foot hills along the stream and reservoirs. Palatable grass species like *ApludaSehima, Themeda&Heteropogon* should be planted along the stream & reservoir sides. Napier grass &Typhaelephanta grass can be raised in moist valleys with proper management of fire during summer. The list of palatable species need to be planted in grass land development is depicted below in Table No. 8.2

Table No.8.2 PALATABLE GRASSES

1.	*Arthraxonlancefolious (Trin.) Hochst.*	30.	*Imperatacyclindrica (L.) Raeusch.*
2.	*Arundinellapumilla (Hochst.) Steud.*	31.	*Isachneglobosa (Thunb.) Kuntze*
3.	*Bothriochloapertusa (L.) A. Camus*	32.	*Leersiahexandra Sw.*
4.	*Brachiariamutica (Forssk.) Stapf.*	33.	*Leptochloachinensis (L.) Nees*
5.	*Brachiariaramosa (L.) Stapf.*	34.	*Leptochloafusca (L.) Kuntz.*
6.	*Chlorisbarbata Sw.*	35.	*Oplismenusburmanni (Retz.) P. Beauv.*
7.	*ChlorismontanaRoxb.*	36.	*Oplismenuscompositus (L.) P. Beauv.*
8.	*Chrysopogonaciculatus (Retz.) Trin.*	37.	*OryzarufipogonGriff.*
9.	*Chrysopogonorientalis (Desv.) A.Camus.*	38.	*PanicumpaludosumRoxb.*
10.	*CoixaquaticaRoxb.*	39.	*Panicumrepens L.*
11.	*Coixlacryma-jobi L.*	40.	*Paspalidiumflavidum (Retz.) A. Camus.*
12.	*Cynodondactylon (L.) Pers.*	41.	*PaspalumdilatatumPoir.*
13.	*Cynodonradiatus Roth.*	42.	*Paspalumscrobiculatum L.*
14.	*Dactylocteniumaegipticum (L.) Willd.*	43.	*PennisetumpurpureumSchumach.*

15.	*Dactylocteniumaristatum Link.*	44.	*Perotisindica (L.) Kuntze.*
16.	*Dichanthiumannulatum (Forssk) Stapf*	45.	*Rottboelliacochinchinensis (Lour.) Clayton.*
17.	*Dichanthiumcaricosum (L.) A. Camus.*	46.	*Saccharumspontaneum L.*
18.	*Digitariaciliaris (Retz.) Koeler.*	47.	*Sacciolepisindica (L.) Chase.*
19.	*Digitarialongiflora (Retz.) Pers.*	48.	*Sacciolepisinterrupta (Willd.) Stapf.*
20.	*Echinocloacolona (L.) Link.*	49.	*Sacciolepismyosuroides (R. Br.) A. Camus.*
21.	*Eleusineindica (Linn.) Geart.*	50.	*SetariaintermediaRoem. &Schult.*
22.	*Eragrostisamabilis (L.) Wight &Arn.*	51.	*Setariapumila (Poir.) Roem. &Schult.*
23.	*Eragrostisaspera (Jacq.) Nees*	52.	*Setariaverticillata (L.) P. Beauv.*
24.	*Eragrostiscilianensis (All.) Janch*	53.	*Sporobolusindicus (L.) R. Br.*
25.	*Eragrostisciliaris (L.) R. Br.*	54.	*Themedatremula (Nees. ex stued.) Hack.*
26.	*Eragrostis japonica (Thunb.) Trin.*	55.	*ThemedatriandraForssk.*
27.	*Hackelochloagranularis (L.) Kuntze*	56.	*TripogonjaquemontiiStapf.*
28.	*Heteropogoncontortus (L.) P. Beauv. ex*	57.	*Urochloapanicoides P. Beauv*
29.	*Hygrorhyzaaristata (Retz.) Nees. Ex Wight &Arn*		

8.7.1.5 **Provision of Salt licks** :

Salt licks should be done meticulously so as to ensure desired manipulation of habitats to cater the felt need of wild animals. There should be provisions for new salt licks at the core site of RF like Baranga, Santoshpur & Rebana under close watch of front line staff.

8.7.1.6 **Maintenance of Water source & wet lands** :

All water sources i.e. perennial and seasonal, artificial and natural need to be protected and maintained. Site specific strategies for their protection and maintenance need to be prescribed. Artificial source may be created if required. Renovation of existing water body, particularly removing weeds from banks and providing ramp for wildlife would be a welcome step.
Now -a -days summer is almost six months in a year. Hence to meet contingent water requirement broad mitigation plan should be prepared for the wildlife.

i. Perennial, seasonal, semi-perennial water sources can be identified and mapped.
ii. A part of main stream can be diverted through a small channel for use of domestic cattle.
iii. Stream improvement can be taken up starting from origin of nala and should include Gully plugging, Loose Boulder Check Dams, Planting Ficus & Jamun along nala banks, staggered trenches, half moon trenches in eroded uphill side.
iv. Run up can be checked by constructing staggered trenches in hill slopes so as to get a natural pull of water on the foot hills for use of wildlife

v. In Khesara& village wood lots water holes can be created for cattle use.

vi. Storage capacity of the water hole is reduced due to silt deposit. Perennial grass species should be planted in series across the width of nala as a vegetative silt traps on the upstream side.

8.7.1.7 **Periodical census of Wildlife :**

Census of wild animals as per govt. instructions is to be undertaken in order to assess the results of the measures taken for further improvement in future.

8.7.2 **Preventives Measures**

8.7.2.1 **Creation of public awareness** :

Poachers usually use the poor & innocent dwellers of forest fringe villages for hunting because of their knowledge of the territory. The importance of conservation of wildlife and also the penal provisions for its offences shall be explained to the local people through leaflets. Periodical meetings alongwith celebration of Wildlife week, Elephant Day & Habitat Day should be done. The Eco clubs established in various schools shall be mobilized to propagate the massage of conservation of Forest & Wildlife. Reward/ prize shall be instituted for the exemplary work done by the local people at Division level to motivate them. VSS/SHGs to be fully associated.

8.7.2.2 **Animal Health surveillance & care** :

Since the wild animals & domestic cattle often share the same water hole, there is every chance of infection. The uncontrolled grazing inside the forest may transmit various diseases. To combat with the above problem following precautions are to be taken up.

i. Regular vaccination of livestock of fringe villages should be carried out with the help of veterinary department to avoid foot & mouth diseases.
ii. Encouraging stall feeding of cattle in the fringe villages.
iii. Provisions for planting of high yielding grass species.
iv. Encouraging people to grow fodder grass through SHGs.

8.7.2.3 **Strengthening of information system** :

In the present situation to build up an intelligence network is of prime importance. The collection of such intelligence data is very vital to contain the wildlife crime. All such information shall be documented secretly and correctly to develop a database at Range & Division level. Such information includes scheduled species available in the Range, list of license holder of gun, pictorial directory of identified poachers, list of traders in cattle and other animals, timely and proper documentation of all incidents of poaching and man animal conflict.

8.7.2.4 **Training of frontline staff on wildlife prosecution/Predation/Census/Habitat manipulation:**

Lack of proper prosecution leads to very low conviction rate in wildlife cases. The success of protection can not only be judged with regard to number and nature of offence cases booked but also the effectiveness with which such wildlife offenders escape due to technical clause i.e faulty prosecution report. Hence appropriate training in wildlife crime investigation methods and technique shall be imparted to the staff. They should have fair knowledge on various sections of Wildlife (Protection) Act, 1972 and also of Orissa Forest Act, 1972. They should have fair updated knowledge on wildlife management.

8.7.3 Control Measures :

8.7.3.1 **Anti PoachingMeasures** :

Poaching is one of the main causes for destruction of wildlife. For effective protection of wildlife, from poaching and hunting, patrolling, establishment of check posts,arming of staff with vehicles and weapons and communication network are being done by the wildlife wing. The staff deployed for anti poaching operation shall be with good health and high

motivation.Foresters and Forest guards should make in wild life fringe villages to ascertain about poaching, death and growth decline in populationand local methods of poaching. Proper dialogue with local villagers during patrolling is important to gain vital information and also to gain their trust. The patrol party must try to obtain information that can be used to prevent further poaching in the area. The identity of informants should be kept secret. They have to be rewarded suitably in case of successful detection. It is proposed to station two numbers of mobile squads having one Forester, three Forest Guards and four contractual staffs at two vulnerable points preferably one at Anandpur and other at Ranipada site of Harichandanpur section. There shall be inventory prepared for all the gun licences within 10 kms radius of blocks rich in wildlife.This inventory should be regularly posted up to date.

8.7.3.2 **Prevention of Forest fire** :

Fire is potentially a deadly enemy both for the forest and wildlife. If it occurs in nesting season of birds breeding stock may be destroyed. The wild animals are easily trapped in thick lantana bushes in case of fire. The rodent and reptiles are usually are more prone as they are holed. Therefore, fire protection measures as prescribed in the protection working circle should be rigidly followed. It should be kept in mind that fire wherever occurs in forest should be promptly arrested, so that minimal damage is occurred. Fire is the single destructive weapon which immenselyharm different species of wildlife. The present day protocol on forest fire management is strictly to be followed.

8.7.3.3 **Restoration of Elephant corridor**:

The fragmented elephant corridors are to be reserved for the smooth movement of this Jumbo. Over the first few decades many developmental activities of humans have severely fragmented the forest. Being wide ranging species, Elephants are more susceptible to loss of natural habitat. More over in the winter and in the hot month of April-June when there is acute scarcity of water and fodder inside the forest. The wild animals especially Elephants move out of the forest and raid the adjoining crop fields of the farmers, thus are in greater conflict than any other animals. Apart from elephant depredation, bear attack, crop damage by chital and wild pigs are also noticed in this Division.

Interventions to mitigate human animal conflicts:

1. Deployment of Anti -depredation squad at susceptible point.
2. Habitat improvement: To ensure green fodder availability, fodder plantation and plantation of fruit bearing trees can be taken up. Besides, mono culture plantation should be stopped .
3. Installation of solar fence at forest fringe villages .
4. Development of communication network : The villagers should be alerted on the presence of Elephant herds in the area .
5. Watch towers may be constructed to get the early information about the movement of herds at strategic points.
6. Compensation amount should be given to the farmers within time limit.
7. Awareness programme should be organised to sensitise the villagers .
8. Training programme for Forest Department staff and people from conflict prone areas should be organised to deal with the problem in a better way.
9. Honey bee boxes be given to farmers to put in the outer plots, so that elephants are kept away from crop fields.
10. Elephants get killed due to poisoning, electrocution by poachers. Every forest official must guard against these factors.
11. Crop insurance scheme should be practised extensively.

8.8 SPECIFIC OBSERVATION:

1. Baranga RF of Anandapur Range need special mention due to presence of more thanapproximal population of spotted deer inside the forest. The villagers of Angarua,Purunabandhagoda, Bilabandha, Nandabara ,Baranga are protecting these species. They come to the villages and raid the crop.

2. Cattle population of nearby villages should be immunised periodically to check the spread of contagious disease among spotted deer.
3. Development of industrial unit should not be allowed.
4. Public awareness is a must for any conservation programme. Hence emphasis should be made for wide publicity in the area.
5. All the open wells in agriculture land use for irrigation purpose shall be covered.
6. Large check dams should be created in the perennial nallas like BhimaAnthuanala, Dhanei pond and Kusumei pond so that water can be stored during summer so also ground water can be recharged or which is essential for growth of the forest
7. There are many swampy areas in the forest near the water bodies .Grasslands should be developed in those areas to avoid crop raid by the spotted deer. Grassland should be developed in closing the area on rotational basis.
8. A watch tower may be constructed near Kusumei pond to protect these animals as well as sighting of animals by tourists.
9. This area should be developed as Ecotourism destination, so that the nearby villagers mainly ST villages of Nankabahali and Kitanpatia earn a good income.
10. Deciduous mixed forest is good for deer in comparison to pure Sal forest. Over an area of about hundred Ha. of encroached land of Baranga RF have been evicted and plantation have been raised on these lands which acts as a shelter for these deer. In no case *Acacia* species should be planted. *Ficus glomerata. Ficus benghalensis*, *Melia* species should be planted in the gap of these plantation as well as in forest . Planting of fruit bearing species should be done by fencing up to 4-5 mtrs, so that deer cannot reach at the initial years of plantations.
11. Compensation amount should be given to the villagers for crop raid by Deer .
12. The practice of departmental cultivation of Ragi, Gram and other leguminous crop should be carried out to improve the habitat, so also to combat crop raid.
13. Eco-tourism destination spots may be developed by villagers as per guideline of Chief Wildlife Warden, Odisha. The villagers will earn more than the crop damages caused by chitals.
14. Small grasslands in the nearby areas of water hole (both natural &artificial) should be created with induction of naturally occurring grass species in that locality.

8.9 MISCELLANEOUS REGULATIONS :

8.9.1 **Grazing** – It should be regulated. The grazing may be controlled as per provisions of the Odisha Forests (Grazing of Cattle) Rules 1980. The local people and the VSS may be motivated to regulate the grazing inside the Forest.

8.9.2 **Fire protection** –Strict protection against fire should be provided. Fireline should be maintained regularly and can be prevented to a large extent by motivating and educating the local people. Eco- clubs and VSS members are to be educated for the purpose.

8.9.3 **Tourism -** The tourism should be encouraged.

8.9.4 **Rewards & Incentives –** There shall be provision for rewards & incentives to th staff and public including the informers whose efforts lead to the detection of wildlife crime and arrest of the offenders. Such persons should be felicitated in ceremonial occasions like Wildlife Week, Vanamahostav Week & World Forestry Day.

8.9.5 **Mining Activities –** Sometimes it is noticed that the mine owners left the mine pit after use. The Wild animals fall inside those pits of the left out mines and face injury and even death. The DFO should see that the entire blank pits are properly filled up after closure of the mines. The dumping of the mines residues in the elephants corridor sometimes changes their path and cause damage. So the DFO should see that the residues are dumped at proper place.

8.10 RIGHTS &CONCESSION :

Rights and Concession under this Working Circle shall be regulated in accordance with the provisions of the OFA – 1972, wild life (Protection) Act- 1972, Rules made their under & the Govt. policies in force.

8.11 COST NORM

The Cost Norm of this Working Circle has been discussed in ChapterXIV of Part II

8.12 NECESSITY FOR INTERMEDIATE REVISION :

Intermediate revision is not anticipated. However, if necessary prescriptions may be reviewed after five years by the RCCF (Territorial) in consultation with Chief Wildlife Warden, the Principal Chief Conservator of Forest, Odisha and Chief Conservator of Forest (Working Plan). Any deviation shall be subjected to the sanction of competent authority.

CHAPTER-IX

ECO – TOURISM

9.1 INTRODUCTION:

Eco-tourism can be defined as tourism programme which is nature based and ecologically sustainable. Education and interpretation is a major constituent of this programme and local people can be benefitted out of it.

9.2 PRINCIPLES OF ECO-TOURISM:

1. It brings environmental and natural awareness and respect.
2. It protects the natural environment and creates social and economic benefit for local communities.
3. Provides positive experiences for both visitors and hosts.
4. Provide direct financial benefit for conservation.

Ecotourism has assumed much significance in recent past. During last 3 years. 40 different landscapes of Odisha have been turned into successful ecotourism destinations and have been successfully managed through communities for scaling the eco-tourism activities in State.

There is a wide scope to extend the ecotourism in this division which has been discussed in **Para 8.6 of Part-I**.
But it is suggested to develop following sites into full fledged community based ecotourism sites within this Working Plan period.

9.3. ECOTOURISM SITES :

9.3.1 1. **Ecotourism Sites at Gadachandi** – Hadagarh Dam site. Thousands of pilgrims come every year to visit "Maa Tarini" Temple at Ghatagaon under Ghatagaon Range. While returning back, they can visit Gadachandi which is 8 Kms away from Chhenapadi Chhak of Anandpur Town.

2. There is an old Gadachandi Temple at that site with rolling and lush green forest. It is also a picnic spot where people are regularly coming. There is a transit two roomed hut with attached toilets, barrack type tourist hall with dining hall. These infrastructures are under the control of Maa Gadachandi VSS. They are only getting the user's fee from the occupants.

Up-gradation required :

1. Drinking water facility for the day tourist visiting Gadachandi temple.
2. Development of parking space.
3. Development of common toilet
4. Development of Pindis for picnic purpose.

Potential activities of the site :

1. There is a path from the temple to the top of the hill. People can use it as trekking.
2. Excellent for bird watching.

Tourist are also coming to visit Hadagarh Dam which is 8 km away from Gadachandi temple. At zero point of Hadagarh Sanctuary, there are 2 rooms including toilet and dining place.

Potential Activities :

1) Pindis can be made for the people who are coming for picnic purpose near the dam.
2) Parking space can be developed.
3) The tourist can be guided to have a chance to see the Hadagarh Sanctuary (Buffer area).
4) Ecotourism site at Barang R.F – Barang R.F is hardly 12 to 15 kms far from Kalinga Nagar- The Steel City can also be approached from Ramachandrapur.

9.3.2 Ecotourism site at Baranga RF :

As discussed in chapter-8, Part-II the spotted deer of Barang RF need special attention. One can see herds of spotted deer here. The villagers of Angarua, Puruna bandhagoda, Bilabandha, Nandabara are protecting these species.

Potential Activity :
There are 3 tribal villages close to Barang R.F namely Nandabar, Purunabandhagoda, Billabandha.

1) Some of there, homes can be developed & changed to home stay cottage.
2) Ethnic cuisine can be served.
3) Tourist can have a night stay there and he can have a guided nature trail through Barang R.F. Herds of Spotted Deer, barking Deer, Porcupine, Rabbits can be seen.
4) A new Watch Tower can be constructed at Purunabandhagada site from where herds of spotted Deer can be seen.
5) Purunabandhagada which suffered a tourist ever Tornado in India is itself an eco-tourist spot.

CHAPTER-X

MISCELLANEOUS REGULATIONS

10.1 GENERAL CONSIDERATIONS :

This Chapter includes prescription on important activities which are not discussed earlier. Some of the prescription given in earlier chapter had been emphasized in this chapter also.

10.2 FOREST CONSOLIDATION :

During the period of outgoing plan 8 numbers of new Protected Forests have been notified. Three numbers of PRFs have already been notified since 1978. Steps should be taken to declare all these Proposed Forest Blocks as Reserve Forests.

Ten numbers of Demarcated Protected Forest should be resurveyed and efforts should be made for its notification as Reserve Forest. Most of the Reserve Forest have been notified since 1958. The last settlement had been carried out during 1975 to 1979 in the Division.Significant variations in the area in the different parts have been observed. The variation has already been discussed in chapter-I of the Part-I of the Working Plan. There is an urgent need for verification and reconciliation of these Forest Blocks with DGPS. Forest Department has taken steps to survey all the Forest Blocks of Forest Divisions in two phases using DGPS. This division is to be included in second phase. Within this Working Plan period discrepancies in the boundary line and area of all the Forest Blocks need to be resolved.

10.2.1 Consolidation of area under Compensatory Afforestation :

Action has already been initiated for declaration of ten numbers of compensatory afforestation areas U/s-4 of Odisha Forest Act, 1972 since long. Till date the proposals is pending for declaration of PRF. The areas have been mutated in favour of Forest Department. Hence, its adequate protection should be ensured. The details of area transferred to Forest Department are given in the Table No. 10.1.

10.1. List of Compensatory Afforestationpending for declaration of PRF

Keonjhar Wildlife Division.						
Sl.No.	Range	Location	Name of Block	Area (In Ha.)	Whether mutated	**Whether proposed for U/s 4**
1	Anandapur	Deojharan	Anandapur	6.7178	Yes	Yes
2	Anandapur	Kantala	Anandapur	19.9065	Yes	Yes
3	Anandapur	Bhalughar	Anandapur	22.0028	Yes	Yes
4	Anandapur	Uleikundi	Anandapur	6.9444	Yes	Yes
5	Anandapur	Patajhari	Anandapur	4.8764	Yes	Yes
6	Anandapur	Haribeda	Anandapur	9.7084	Yes	Yes
7	Brahmanipal	Turkipada	Ghatgaon	100.0000	Yes	Yes
8	Brahmanipal	Kanjiapal	Ghatgaon	91.2000	Yes	Yes
9	Deogaon	Deulahudi	Ghatgaon	16.3860	Yes	Yes
10	Deogaon	Ranipada	Ghatgaon	40.4683	Yes	Yes
11	Hadgarh	Asia	Hatadihi	4.5970	NO	NO

Source : Outgoing working Plan.

10.3 MAINTENANCE OF FOREST BLOCK BOUNDARIES :

The boundaries of all the Forest Blocks are in disarray. The position and condition of the boundary pillar of R.Fs has already been discussed in Chapter-I of Part-I. The boundary pillars are required to be properly maintained. Details of block boundary i.e. length of forest boundary, number of pillars, pillar to pillar bearing and distances and record of maintenance of boundary should be maintained in the Divisional Office.

The inter divisional/inter district forest boundary shall be cleared to the width of 15 mtrs, block boundary to boundaries to 10 mtrs and interior village lying to 5 mtrs. Compartment lying where they do not follow nature features like nallahs etc. should be cut to the width of 6 mtrs. The boundaries shall be inspected regularly by the F.G, Forester and R.O as per Codal provision. The DFO and ACF should annually inspect 10% of boundary lines of the Division.

Borassusflabellifer(Tala) shall be planted along the block boundary. This type of plantation along the block boundary helps for early detection of encroachment.

The annual boundary pillar maintenance programme of Keonjhar Wildlife Division is given in the Table No. 10.2.

Table No.10.2:Boundary pillar maintenance

Year	Range	Forest block	No. of Pillars to be maintained
2021-22	Anandapur	Baigundi	36
		Panasdiha	18
	Brahmanipal	Palaspal	45
	Deogaon	Sapanaposi PRF	30
2022-23	Anandapur	Koldiha	51
		Gayalmunda	10
	Brahmanipal	Palaspal	31
		Turkipada	14
	Deogaon	Tangiriapal PRF	30
2023-24	Anandapur	Gayalmunda	60
	Brahmanipal	Palaspal	32
		Turkipada	13
	Deogaon	Tangiriapal PRF	13
		Kadugotha	17
2024-25	Anandapur	Santoshpur	65
	Brahmanipal	Turkipada	41
	Deogaon	Kadugotha	12
		Atei	23
2025-26	Anandapur	Santoshpur	20
		Nuniapatna	12
		Ostapura	33
	Brahmanipal	Turkipada	41
	Deogaon	Atei	20
		Rebana	20
2026-27	Anandapur	Ostapura	55
	Brahmanipal	Mahulpanga	48
	Deogaon	Atei	20
		Rebana	20
2027-28	Anandapur	Ostapura	29
		Baranga	29

	Brahmanipal	Brahmanipal PRF	40
	Deogaon	Atei	20
		Rebana	23
2028-29	Anandapur	Meghanadpoi	54
	Brahmanipal	Rebana	55
	Deogaon	Atei	30
2029-30	Anandapur	Patilo	19
		Hatibandha	36
	Brahmanipal	Rebana	55
	Deogaon	Atei	30
2030-31	Anandapur	Patilo	52
	Brahmanipal	Rebana	55
	Deogaon	Atei	34
		Total	1391

10.4 IRREGULAR AND PETTY FELLING :

Irregular felling shall be discouraged. All the dead, wind fallen and uprooted trees not favoured by wildlife shall be salvaged departmentally and to be handed over to OFDC Ltd for disposal within the ambit of guideline issued by PCCF, Odisha. However, to carry out these operations, the Range officer shall submit an Annual Plan of Operation to the DFO in advance indicating location, anticipated quantity of timber and firewood, reason of availability, fund required etc. for approval. All timber and firewood shall be removed on the strength of departmental permit.

The following kind of trees may be marked for petty felling.

i) Trees required for scientific investigation.
ii) Trees required for establishing new fire line
iii) Trees required for establishment of new nursery etc.

Prior permission from competent authority is required before carrying petty felling.

10.5 DISPOSAL OF SEIZED PRODUCE UNDER FOREST OFFENCE CASES :

In this context guidelines issued by the Govt. vide their Letter No. 10F(TR)-23/02-15398/F&E dated Bhubaneswar, the 31st August'2005 shall be followed.

10.6 DEVIATION :

Any unusual operation from target, like target for plantation, and other activities provided in control forms of the Working Plans constitutes a deviation. All deviations which permanently altered the basis of management laid down in the working plan will require prior sanction of the PCCF office. All deviations which do not permanently alter the basis of management and with the necessity of which the DFO agrees, may be approved and sanctioned by the Officer in Charge of Working Plan on behalf of the Principal Chief Conservator of Forests. The PCCF or CCF before sanctioning the major deviations of following nature will necessarily take prior approval of the Regional Addl. PCCF of the Ministry of Environment and Forests.

1. Change in Silvicultural system.
2. Formation of new felling series.
3. Large scale felling due to natural calamities which cannot be adjusted against future yield.

For all major deviations with respect to prescriptions sanction of MoEF is mandatory and explanatory note along with the request for regularisation has to be sent by PCCF, HoFF to Regional Chief Conservator of Forests, MoEF. The following format for deviation statement should be used.

Year :…….. Division……..

Sl. No. of deviation	Control book, name, form No. Page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	

Initiation of deviation proposal is to be carried out by DFO (T) and should send typed copies in triplicate.The head dealing with working plan as per situation given above after sanction will return one copy of statement to the DFO, territorial circle and the other copy will be sent to the WPO for record. On major deviations without altering on the basis of management, the prior sanction of the PCCF, HoFF should have been obtained in advance; the sanction number and date should be quoted in the last column.

10.7 CONSTRUCTION OF ROADS/LINK ROADS :

No construction of new roads/link roads passing through the forest shall be allowed without the sanction of the competent authority as they attract the provisions of Forest (Conservation) Act, 1980.

10.8 FIRE PROTECTION :

This subject has been dealt with in Part-I in detail. The following miscellaneous regulations are necessary to combat forest fire.

1. Annual maintenance of fire lines should be done in the month of December each year, clearing of all vegetative materials.
2. Detail instruction should be given by Divisional Forest Officer to the staff depicting preparatory work to be carried out and necessary preventive measures to be taken before the onset of fire season.
3. The meetings of the VSS should be convened by the Range Officer and co-operation should be solicited for detection of fire, reporting and early suppression.
4. Entry of people inside the forest for extraction of MFP should be restricted.
5. Disposal of felling refuse should be done well before the fire season.
   The DFO should visit the fire affected areas immediately after it comes to his knowledge and should submit the report to Conservator of Forests giving all the detail of occurrence of fire, cause of fire and damaged occurred to the crop and remedial measures for future.
6. Forest road should be closed for vehicular traffic as per rule, 284 of Odisha Forest Code.
7. All over the standard operating procedure prescribed by PCCF, Odisha from time to time shall be followed strictly.

10.9 CONTROL OF GRAZING :

The Odisha forests (Grazing of Cattle) Rules,1980 should be strictly enforced. Special care should be taken in the early years of plantation. There is urgent need to check the grazing inside forest area. From social survey it is found the almost all the cattle of forest fringe villages are dependent upon forest for their fodder. This is very alarming situation. Therefore, following prescription has been suggested to lessen this problem.

1) Govt. unproductive land common land or gochar lands should be utilised for fodder plantation. Specifically, the weeds grown in Govt. unproductive land lying between

village boundary and forest would be uprooted to allow grass to come up for cattle consumption.

2) By awareness creation, large unproductive cattle can be replaced with few cross breed high yielding cattle.
3) Lopping of trees for fodder should be discouraged.
4) All plantations shall be closed for grazing at least for a period of 5 years.
5) The areas which have good regeneration should be closed.

10.10 ENCROACHMENT :

The existing encroachments should be marked with geo reference immediately on the field. Their numbers, area shall be recorded in compartment and block wise. The DFO shall review the case of encroachment periodically and shall take steps for eviction of the encroachers. Fresh encroachment shall be prevented at any cost. The Range Officer shall review the new encroachment case in every month and submit the report to the Divisional Forest Officer.

10.11 MAINTENANCE OF BUILDING :

Buildings: Buildings are very important infrastructure for forest management. It is necessary to provide accommodation for the staff who is working in remote areas. The detail position regarding the existence of building and its condition has been furnished in Table No.11.12 of Chapter XI of Part-I.
Considering the condition of buildings, following prescription shall be adopted.

1) All the habitable buildings should be repaired as per requirement.
2) The building which require special maintenance should be undertaken only after analysis of anticipated expenditure and fresh construction.
3) To cater the requirement of additional space, the tile roofs should be replaced with R.C.C ones considering the formation to enhance its longevity above which super structures can be made.
4) In every beat and section, office building should be constructed for accommodationof staff.
5) Drinking water facility, electric facility as well as sanitary facility should be there in all the buildings.

The Divisional Forest Officer shall approve the annual maintenance work of the buildings prepared by the Assistant Conservator of Forests basing on the requisition received from Range officer. The Divisional Forest Officer shall make such assessment and prepare a calendar of action plan to construct new buildings in the plan period by mobilising resource from different quarters. Furthermore, Divisional Forest Officer should ensure the presence of every frontline staff.

10.12 MAINTENANCE OF COMPARTMENT HISTORY AND CONTROL FORMS :

The compartment history of all the compartments has been prepared de novo and given in duplicate to the DFO for use in his Division. The compartment history and control form
shall be maintained as per Chapter-IX & X respectively, of National Working Plan Code,2014. The DFO shall be responsible for maintenance of the compartment history and timely submission of control forms to the appropriate authority, so that the working plan officer do not face problems during the revision of this place

10.13 ESTABLISHMENT OF CENTRAL NURSERY :

At present there is no central nursery in the Division. As priority is given to free distribution of seedlings to increase the tree outside the forest which helps directly to combat climate change, therefore it is important to establish a central nursery or permanent nursery at a suitable location to meet the challenge. Also to maintain seedlings of 2 to 3 years for quality seedlings.

10.14 MAINTENANCE OF MAPS:

Divisional maps of stand and stock etc. should be preserved.

10.15 RIGHTS AND CONCESSION :

The rights and concessions presently available has been described in detail under Para No. 8.9 of Part-I. While reiterating the same, it is further prescribed that the policy/instructions of the Government in the matter from time to time shall be followed scrupulously.

10.16 PROTECTION FROM THEFT :

For protection of forest and wildlife following measures should be scrupulously followed.

a) Maintenance of Forest Road: There are 07 Nos. of forest roads stretching over a distance of 96 Kms in this Division, the details of which has been furnished in Part-I Chapter 11.
b) Maintenance of communication: All the forest staff should be supplied with mobile phones which is necessary for transmission of information. IN interior pockets communication through VHF mode should be strengthened.
c) Forest protection squad: The theft prone areas of the division should be figured out and accordingly position of squads should be stationed.
d) Improvement of Intelligence network.
e) Awareness creation among the VSS members :

10.17 FOREST RIGHT ACT.

10.17.1 FRA'2006 was enacted in India so as to do the justice & help the traditional forest dwellers claim back their land & forest areas. The law provides right and power to conserve community forest resources. Both individual and community right do not give full right or ownership over the forests. That titles issued do not mean that they would just cut down the forest at their will. They are entrusted to protect forest and Wildlife.

The greatest concern in this aspect is misuse of the Forest Right Act. All applications have not been settled as yet although the cut off date was 13th December 2005. Hence, (1) now it is high time to settle all pending applications immediately. (2) There may be some tribals/forest dwellers who are ignorant till date. Their claims should be settled immediately. Fresh clearing of forest area for making their claims should not be allowed at any cost.

10.17.2 **Demarcation of settled areas under FRA'2006** :

Although 1878 numbers of individual titles issued over an area of 1121.71 Ac and 82 nos of community rights have been issued over an area of 62.43 Ac, all these areas have not yet been demarcated in the field.

- As a result of this the actual possession of land is much more than the title issued to them.
- There should not be any ambiguity in the title. That means the name of RF should be properly depicted in the title not just 'Reserve Forest/Sangrakshita Jungle'. It is proposed to write the name of R.F, Compartment number, and location (Lat/Long) in the title issued by the Collector.
- The application form of the claimant claiming forest land should be checked properly at the SDLC committee by the member from forest department.

To overcome all the above difficulties, it is proposed to demarcate all the areas settled under FRA'2006 within coming 3 years as per following plan.

The detail programmes for settlement of FRA is to be taken up as per Table No. 10.3.

10.3. Distribution of FRA area over 3 years

Sl.No.	Year	Forest Block	FRA Area (in Ha.)
1	2020-21	Rebana	21.33
		Atei	153.274
2	2021-22	Atei	153.274
		Baranga	20.574
		Patilo	0.679
3	2022-23	Ostapura	16.531
		Baigundi	6.790
		Santoshpur	106.758
Total			479.210

10.17.3 **Management of FRA Areas** :

1. After demarcation of the titles issued under FRA'2006, the left out areas (encroached) should be planted with trees of indigenous species as per the need of the tribal or forest dweller.
2. Species like *Accacia nilotica*, should be planted in the agricultural bunds of the FRA beneficiaries.
3. At the backyard or front yard wherever possible, horticulture species like Guava, mango Jackfruit, Drum stick, Papaya etc. should be planted.
4. Again after issuing title by the District Magistrate, monthly meeting may be conducted with the dwellers through Gram Sabha for awareness regarding protection of Wildlife, Forest & protection of Biodiversity and adjoining catchment areas.
5. With interdepartmental co-ordination, the financial condition of the dwellers can be uplifted so as to lessen their dependency on forest.
6. Provision of fuel efficient challah, cooking gas facility (under Ujjala Scheme) would help a lot in this regard.

10.18 STUDY ON PRESERVATION PLOT, REGENERATION PLOTS AND PERMANENT SAMPLE PLOTS

Protection should be given to preservation plots, permanent sample plots and regeneration plots, so that studies can be taken up in subsequent years.

CHAPTER-XI
SCIENCE AND RESEARCH

11.1 Keonjhar (WL) Division does not have any experimental wing to access the growth rate & yield of the forest crop on a regular basis. Also Silviculture & research wing of Forest department have not undertaken any research within this division.

Some of the proposals on which the research should be undertaken are as follows:

1. Biodiversity assessment of the forest that would give the clear picture about the total existence of flora, fauna & lower plants.
2. Role of climate change on various types of Forests.
3. Inventory of NTFPs in different Forests& setting the maximum harvesting limit for different products.
4. Biological studies on rare, threatened and endangered species both plant & animal and nesting of Avian species.
5. Migration pattern of wild animals.
6. Research on man animal conflict and alternate cropping by farmers in fringe area.

11.2 **Permanent Sample Point** : Out of 294 sample points provided considering the forest type, density of the crop, site quality etc 30 number of sample point have been selected as permanent sample points. Centring these points 9 pillars had been posted to demarcate the 0.1 Ha of area of each plot. The list of these sample points and its position given in the Table No. 11.1.

Table No. 11.1 : List of Permanent Sample Point of Keonjhar (W.L) Division.

Sl. No.	Permanent Sample Point	Geo-Coordinates	Forest Block	Compartment No	Range	Section/ Beat
1	KN114	N 21.203472* E 85.760647*	MAHULPANGA	-	Brahmanipal	Talapada(Daitari)/ Rebana(N)
2	KN123	N 21.256387* E 85.765147*	PALASPAL	-		Palaspal/ Palaspal(W)
3	KN171	N 21.24753* E 85.727355*	REBANA	10		Palaspal/ Palaspal(W)
4	KN204	N 21.172178* E 85.757576*	REBANA	19		Talapada(Daitari)/ Rebana(S)
5	KN233	N 21.136202* E 85.812259*	REBANA	25		Talapada(Daitari)/ Talapada
6	KN240	N 21.10939* E 85.798731*	REBANA	25		Talapada(Daitari)/ Talapada
7	KN244	N 21.149277* E 85.855045*	REBANA	26		Brahmanipal/ Baliparbat
8	KN279	N 21.168452* E 85.880334*	REBANA	42		Brahmanipal/ Brahmanipal
9	KN355	N 21.173798* E 85.772002*	TURKIPADA	-		Talapada(Daitari)/ Rebana(S)
10	KN17	N 21.305984* E 85.936882*	ATAI	56	Deogaon	Harichandanpur/ Harichandanpur
11	KN266	N 21.214719* E 85.858114*	REBANA	34		Bhagamunda/ Bhagamunda
12	KN46	N 21.284494* E 85.988506*	ATAI	65		Deogaon/ Basantapura
13	KN51	N 21.257569* E 85.966675*	ATAI	68		Deogaon/ Baripal

14	KN155	N 21.27861* E 85.680255*	REBANA	05		Harichandanpur/ Gargadbahal
15	KN167	N 21.303668* E 85.737439*	REBANA	08		Harichandanpur/ Gargadbahal
16	KN359	N 21.2366* E 86.0872*	KADUGOTHA	-		Deogaon/ Basantapura
17	KN118	N 21.229402* E 86.081621*	OSTAPURA	-	Anandapur	Anandapur/ Ostapura
18	KN127	N 21.115561* E 86.073469*	PATILO	-		Ramachandrapur/ Patilo
19	KN29	N 21.296927* E 85.994358*	ATAI	58		Anandapur/ Dhakota
20	KN307	N 21.47387* E 86.001328*	SANTOSHPUR	04		Gayalmunda/ Panasdiha
21	KN315	N 21.428749* E 86.030613*	SANTOSHPUR	07		Gayalmunda/ Panasdiha
22	KN331	N 21.381369* E 86.060006*	SANTOSHPUR	11		Budhikuda/ Taneipal
23	KN352	N 21.346433* E 86.072699*	SANTOSHPUR	20		Budhikuda/ Taneipal
24	KN362	N 21.4887* E 86.0872*	PANASDIHA	-		Gayalmunda/ Panasdiha
25	KN57	N 21.054517* E 86.06423*	BARANGA	-		Ramachandrapur/ Baranga
26	KN113	N 21.395799* E 86.117271*	GAYALMUNDA	-		Gayalmunda/ Gayalmunda
27	KN300	N 21.50301* E 86.032474*	SANTOSHPUR	01		Gayalmunda/ Panasdiha
28	KN305	N 21.464632* E 86.039178*	BAIGUNDI	-		Gayalmunda/ Panasdiha
29	KN360	N 21.184800* E 86.155800*	HATIBANDHA	-		Anandapur/ Anandapur
30	KN39	N 21.280574* E 86.053551*	ATAI	62		Anandapur/ Ostapura

1) The size of each concrete pillar is 2 feet dimension (inside and above ground level)
2) All the trees/saplings have been numbered in species wise with measuring of height and diameter.
3) All other plants like shrub, herb, climber, moss etc are also recorded.
4) The regeneration status of each plot have been studied laying out 1mtx1mt plot at the North-East corner within the main plot.

One Signboard has also been fixed in each permanent sample plot with number, year, name of coupe, compartment number, area, Division, Range, Section& Beat etc.

As per National Working Plan Code, 2014, these permanent sample plots are necessary to study carbon sequestration in future. Accordingly, carbon content of the permanent sample plots have been estimated & the value so obtained have been depicted in the Table No.11.2.

Table No.11.2.Carbon content of Tree mass of Permanent Sample Points

Range	Sl. No.	Sample Point No.	Y=biomass per tree in kg	Carbon Stock for 0.1 Ha	Carbon Stock per Hector in Kg	Carbon Stock per Hector in Ton
BRAHMANIPAL	1	KN 114	6569.6	3828.763	38287.63	38.28763
	2	KN 123	11261.51	6563.208	65632.08	65.63208
	3	KN 171	9618.93	5605.912	56059.12	56.05912
	4	KN 204	8679.166	5058.218	50582.18	50.58218

	5	KN 233	5107.934	2976.904	29769.04	29.76904
	6	KN 240	4398.973	2563.721	25637.21	25.63721
	7	KN 244	6137.614	3577.001	35770.01	35.77001
	8	KN 279	5073.344	2956.745	29567.45	29.56745
	9	KN 355	2778.464	1619.289	16192.89	16.19289
DEOGAON	1	KN 17	4571.458	2664.246	26642.46	26.64246
	2	KN 266	2363.94	1377.704	13777.04	13.77704
	3	KN 46	8058.947	4696.754	46967.54	46.96754
	4	KN 51	4520.676	2634.65	26346.5	26.3465
	5	KN 155	4954.799	2887.657	28876.57	28.87657
	6	KN 167	5518.697	3216.297	32162.97	32.16297
	7	KN 359	7416.89	4322.563	43225.63	43.22563
ANANDAPUR	1	KN118	8335.975	4858.206	48582.06	48.58206
	2	KN 127	2493.797	1453.385	14533.85	14.53385
	3	KN 29	7079.271	4125.799	41257.99	41.25799
	4	KN 307	7847.731	4573.658	45736.58	45.73658
	5	KN 315	6155.669	3587.524	35875.24	35.87524
	6	KN 331	6430.529	3747.712	37477.12	37.47712
	7	KN 352	6862.829	3999.657	39996.57	39.99657
	8	KN 362	7570.654	4412.177	44121.77	44.12177
	9	KN 57	2780.02	1620.196	16201.96	16.20196
	10	KN 113	3009.057	1753.678	17536.78	17.53678
	11	KN 300	11722.35	6831.786	68317.86	68.31786
	12	KN 305	10891.42	6347.52	63475.2	63.4752
	13	KN 360	13501.63	7868.75	78687.5	78.6875
	14	KN 39	6253.491	3644.535	36445.35	36.44535

Table No.11.3.Carbon content of Shrubs & Herbs of Permanent Sample Points

Range	Sl. No.	Sample Point No.	Shrub		Herb	
			Biomass (Kg)	Carbon content (ton)	Biomass (Kg)	Carbon content (ton)
BRAHMANIPAL	1	KN 114	1.87467	0.88109	1.842	0.86574
	2	KN 123	2.30067	1.08131	2.4	1.128
	3	KN 171	1.372	0.644484	0.132	0.06204
	4	KN 204	1.00333	0.47157	0.192	0.09024
	5	KN 233	1.06333	0.49977	0.216	0.10152
	6	KN 240	2.39067	1.12361	0.066	0.03102
	7	KN 244	1.20533	0.56651	2.658	1.24926
	8	KN 279	2.07667	0.97603	0.726	0.34122
	9	KN 355	2.586	1.21542	0.396	0.18612
DEOGAON	1	KN 17	2.6667	1.53533	1.2	0.564
	2	KN 266	4.6	2.162	2.22	1.0434
	3	KN 46	0.4	0.188	0.144	0.06768
	4	KN 51	8.00667	3.76313	0.966	0.45402
	5	KN 155	1.7	0.799	0.6	0.282
	6	KN 167	1.83333	0.86167	0.594	0.27918

	7	KN 359	0.47733	0.22435	0.534	0.25098
ANANDAPUR	1	KN118	15.8753	7.46141	0.354	0.16638
	2	KN 127	0.29667	0.13943	0.576	0.27072
	3	KN 29	2.37133	1.11453	0.3	0.141
	4	KN 307	0.17	0.0799	0.528	0.24816
	5	KN 315	1.48667	0.69873	0.99	0.4653
	6	KN 331	5.52	2.5944	0.93	0.4371
	7	KN 352	12.0	5.64	1.74	0.8178
	8	KN 362	0.43333	0.20367	0.15	0.0705
	9	KN 57	1.03333	0.48567	2.37	1.1139
	10	KN 113	0.30733	0.14445	0.492	0.23124
	11	KN 300	0.22	0.1034	1.044	0.49068
	12	KN 305	6.4	3.008	1.5	0.705
	13	KN 360	0.015..	0.00721	0.3	0.141
	14	KN 39	0.02867	0.01347	0.966	0.45402

All data regarding each sample points have been maintained in a Register. All the registers had been handed over to State Silva, BBSR for taking the data once in every two years.

11.3 REGENERATION PLOT :

Out of above 30 no. of Permanent Sample Points, 5 nos of sample points are selected to study the regeneration status of different species in successive years. Care should be taken to protect these sample points from biotic interference, so that regeneration status can be studied in successive years.

Table No. 11.4 : List of Regeneration Plot of Keonjhar (W.L) Division.

Sl. No	Permanent Sample Point	Geo-Coordinates	Forest Block	Compartment No	Range	Section/ Beat	Regeneration status
1	KN29	N 21.296927* E 85.994358*	ATAI	58	Anandapur	Anandapur/ Dhakota	Fair
2	KN57	N 21.054517* E 86.06423*	BARANGA	-	Anandapur	Ramachandrapur/Baranga	Good
3	KN233	N 21.136202* E 85.812259*	REBANA	25	Brahmanipal	Talapada (Daitari)/ Talapada	Good
4	KN266	N 21.214719* E 85.858114*	REBANA	34	Deogaon	Bhagamunda/ Bhagamunda	Good
5	KN315	N 21.428749* E 86.030613*	SANTOSHPUR	07	Anandapur	Gayalmunda/ Panasdiha	Good

11.4. PRESERVATION PLOT :

Preservation plots are miniature natural reserves to represent ecological models of different forest types. Three preservation plots each area 20 Ha have been identified and demarcated in the field. Their location is as under in the Table No. 11.4.

Table No. 11.5: List of Preservation Plot of Keonjhar (W.L) Division.

Range	Section	Beat	R.F	Compartment	Coupe /WC	Geo Co-ordinate	Species
Brahmanipal	Daitari	Talapada	Rebana	30	APR-VIII/ PRWC	21°08'22.83" N 85°47'31.93" E	Principal sp-Kangada
Brahmanipal	Palaspal	Palaspal (W)	Palaspal	-	DTI-IX/ RWC	21°14'27.67" N 85°44'54.20" E	Principal sp-Dhaura
Anandpur	Ramachandrapur	Ganpur	Barang	-	GLM-VI/ RWC	21°02'32.81"N 86°05'27.14"	Principal sp-Sal

Preservation plots are the representative areas where the growth of the species, carbon sequestration studies and successional pattern studies can be carried out.

Database on growth characteristics of naturally occurring miscellaneous species will help to decide site specific plantation programme.

These preservation plots should fully be secured from biotic pressure. Grazing, forest fire, illicit felling should be checked completely. Suitably the whole area may be provided with barbed wire fencing.

5 Nos of plots of 0.1 ha have been laid down in each preservation plot. The trees, herbs, shrubs present there had been enumerated and maintained in a register. All the registers had been handed over to State Silva, Bhubaneswar for taking data in every 5 years.

CHAPTER-XII
CLIMATE CHANGE AND REDD+

12.1 CLIMATE CHANGE :

Climate is nothing but the weather at a location over a period of time. Within a span of 30 years normal variation may occur. Climate change means more than changes in the weather. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate which is attributed directly or indirectly to human activity and alters the composition of global atmosphere which is in addition to natural climate variability observed over comparable time periods.

Evidence of Global Warming can be observed in global average air & ocean temperatures widespread melting of snow & ice for rising the Sea level. Causes of Global Warming is the increased emission of green house gases with Carbon dioxide ($C0_2$) being the main component.

Some of the main human activities that contribute to global warming are :

1) Increasing atmospheric concentrations of greenhouse gases, for warming effect.
2) Global changes to land surface such as deforestation for a warming effect.

12.2 IMPORTANCE OF FOREST FOR CLIMATE CHANGE :

Forests are linked to climate change in 3 ways.

i. They are source of green house gas (GHC) emissions.
ii. They offer mitigation opportunities to stabilize GHG concentration because they act as both Sink & Pool. Carbon Pools are forest biomass & forest can act as sink through the tree growth & resultant biological carbon sequestration.
iii. They are impacted by climate change.
Changing biodiversity, pattern of growth of species, physiological changes in plant life cycles, changes boundaries of eco systems and other biotic & abiotic response.

As Global community is increasingly concerned about Climate change, attention has been drawn to the role of forest in this regard. Forest plays an important role in the Global carbon Cycle because they store larger quantities of carbon in vegetation and soil.

Studies reveals that 17% of global green house gas emission is only contributed by deforestation. The increase in green house gases is projected to lead 1-3.5° in Global Mean Surface Temperature by the year 2100.

12.3 REDD+

REDD+ Reducing emission from deforestation and degradation, along with conservation of forests has been recognised as a very innovative way to tackle climate change. During REDD+ decision taken in the meeting of conference of parties in Cancun, Govt. of India agreed to boost action to curb emissions from deforestation and forest degradation with the technological and financial support of the developed countries. It has also been decided to incentivize local communities, who are involved in this endeavour.

Pursuant to various decisions taken at the Conference of Parties of UNFCCC on REDD+, following actions are required to be initiated at National level in India.

(i) To develop National REDD+ Strategy and results-based action that should be fully measured, reported, and verified
(ii) To identify drivers of deforestation and forest degradation and also the activities that result in reduced emissions and increased removals, and stabilization of forest carbon stocks

(iii) To estimate anthropogenic forest related Greenhouse gas emissions by sources and removals by sinks, forest carbon stocks and forest area changes
(iv) To develop and implement the Monitoring Reporting and Verification (MRV) protocols and fair benefit sharing mechanisms at National and State levels, and
(v) To protect & safeguard, ensuring the full participation of local people and local communities, and conserving biodiversity.

To implement specific REDD+ action in the Keonjhar (WL) Division following interventions are required to be taken for forest management.

12.3.1. Addressing Drivers of Deforestation & Degradation :

Due to dependence of local people on the forests, the forests of Keonjhar (WL) Division are in various stages of degradation. As per report of ORSAC and NRSC, three is empty-forest syndrome. Following interventions are needed to be implemented to manage the situation.

12.3.2 Provision of alternative Energy Sources :

In VSS meetings the forest personnel should persuade the villagers to use LPG instead of fuelwood.
Energy efficient chullahs should be provided to the household of forest fringe villages.

12.3.3 Enhancement of fodder availability :

Almost all the cattle of villagers of nearby forest areas are dependent on forest for their fodder. Hence, livestock grazing in forests should be effectively addressed by securing enhanced fodder availability beyond across forests, grasslands/agro ecosystem. For this Interdepartmental co-ordination is necessary.

12.3.4 Conservation and Enhancement of Forest Carbon Stocks : There is a wide scope in this Division for enhancing carbon stocks.

I) Enhancing forest carbon stocks in Moderately Dense Forests. Approximately 24,130.90 ha. (as per FSI report,2017) of forests of Keonjhar (W.L) Division are moderately dense forests. Better protection, fire protection and control, regulated grazing, eradication of invasive species, management of insects and other pathogens required soil moisture conservation are the key intervention to increase the stocking density, enhance biomass and carbon stocks.
II) Restoration of open Forests. About 33,471.45 ha (as per FSI report,2017) of forest land is available as open forests, Mostly on the fringes of villages with crown density 10-40%. Such areas are subjected to intense biotic and abiotic pressure and biomass removal.

Following interventions are required to be carried out which has already been discussed in concerned Working Circle.

- ANR plantation of indigenous species.
- Plantation of grasses in Gochar/non-forest land.
- Construction of soil-moisture conservation measures or rain water. harvesting structures.
- Protection from fire.

III) Restoration of Scrub forests : The lands with less than 10% cover amounting to some 1877.69 ha are under Scrub category. These lands can be restored through following methods.

- Plantation of scrub species with palatable grasses.
- Intensive soil moisture conservation methods.

IV) Enhancing carbon stocks in trees of Urban Areas. Trees in urban areas have been

providing Environmental services along with supply of fuel wood to Urban poor. Urban forests emerge as an existing opportunity to mitigate Climate change, ameliorate air pollution, and help in improving water regime & biodiversity in Urban environment.

V) Agro-forestry for creation of carbon sinks outside forests.

To cater to the need of growing population, planting of trees or creation of forest outside traditional forest area is necessary. Trees on non-agriculture rural lands like homesteads, school yards, compounds of various offices, Private/Public establishments, Road side, Canal side etc can be planted.

12.3.5 **Sustainable Management of Forests :**

Sustainable management is the management which is Economically feasible, Socially acceptable & Environmentally sound. If the drivers of REDD would be addressed then it is expected to bring positive change in Environment and Climate change.

12.3.6 **Safeguards under REDD+ :**

As per Cancun agreements, there is a need to ensure social and environmental safeguard for successful implementation of REDD+

Environmental Safeguard :

- In no case natural forests be converted to plantations.
- Land use change should be arrested.
- Native species should be conserved & restored.

Social Safeguard

Committees have already been engaged in protection of forest through JFM. Total 121 nos of VSS have been formed and there is a wide scope to increase this number

CHAPTER - XIII

WATER RESOURCE MANAGEMENT

13.1 INTRODUCTION :-

The availability and quality of water in many regions are now a days more threatened by overuse, misuse and pollution. Forest play an important role in producing and regulating fresh water flows and forested watersheds are essential for sustaining fresh water supply. Provision of water is one of the important ecosystem services given by the forest which is hard to assess and difficult to monetize.

13.2 FOREST & WATER :-

1. Forest recharges the ground water and provide clean drinking water.
2. Forest help in buffering & filtering of pollutants.
3. it regulates the rain fall.
4. It reduces surface run off and discharge that reduce soil erosion and risk of flooding.
5. It acts as habitats for different services and maintains the genetic diversity.

13.3 CLIMATE CHANGE IMPACTS ON FORESTS & HYDROLOGY :-

Globally averaged combined land and ocean surface temperature data as calculated by a linear trend show a warming of 0.85° C in the period 1880 to 2012 (IPCC, 2013). Climate change has directly affected and is predicted to continue to affect the hydrologic cycle. Average precipitation rates are projected to decrease. Unusual precipitation may increase the extent and magnitude of flood. Prolonged dryness due to increase in average temperature may increase the forest mortality and fire. Changes in hydrology regimes will have impacts on forests and the watershed services they provide and affect water quality, aquatic habitats and species as well as soil resources. The interactions between climate, water and forests are complex and difficult to project or foresee.

13.4 MANAGEMENT OF WATER

For Management of water resources of Keonjhar (WL) Division, the topography, soil condition, precipitation etc. are to be considered.

Keonjhar (WL) Division can be divided into highly dissimilar parts i.e. upper Anandpur Sub-Division filled with dense forest having cool climate and lower Anandpur Sub-Division filled with thin forests and mostly cultivated lands. This Division is having chain of mountains on it'swestern and Southern border having distinct slopes towards river Baitarani on the North and Brahmani on the south. In lower

region having plateau and plain areas are well populated. So far as mineral deposits are concerned, this Division is divided into 4 (four) regions :-

1. The Rebana region including Charigarh – Iron ores are found.
2. The central plateau of Kanto including Santoshpur on the east of Baitarani River – Granites are found.
3. The massive alluvial plain of Anandpur – Thick soil with laterite patches.
4. Baula-Nausahi hilly region – Quartzite & Quartz (Not coming under Working Plan area).

The Geological formation and lithology of Keonjhar (WL) Division is such that the ground water potential except small portion of Ghasipura Block, all other parts are low to moderate yield i.e. 3-10 lb.

13.4.1 Temperature and Precipitation:-

The mean summer maximum temperature is 36^0 C and average maximum temperature is 26.4 ^{0}C in winter. The average rainfall in the district is 1534.5 mm. About 75% of the annual rainfall is received during South-West monsoon.

13.4.2 Ground Water Level:-

Data from Central Ground Water Board, Bhubaneswar shows except Ghasipura in which ground water level is 5 mts. (average), the ground water level of Anandpur and Hatadihi is 7 mts. (average) and of Harichandanpur Block is 7.6 mts. (Detail data discussed in para 5.4 of Part – I of Working Plan).

Table No.13.1.Water Budget

Name of the Block	Existing Water availability (BCM)			Water Demand		Water Gap (BCM)	
	Surface water	Ground water	Total BCM	Present	Projected (2020)	Present	Projected (2020)
Anandapur	0.302	0.092	0.394	0.049	0.078	0.345	0.316
Ghasipura	0.193	0.059	0.252	0.193	0.193	0.059	0.059
Harichandanpur	0.431	0.131	0.562	0.093	0.11	0.469	0.452
Hatadihi	0.207	0.063	0.27	0.207	0.207	0.063	0.063
Total	**1.133**	**0.345**	**1.478**	**0.542**	**0.588**	**0.936**	**0.89**

Source :- District Irrigation Plan, Keonjhar

The above report published during 2018 shows there is deficiency in water requirement and it is essential to recharge the ground water by recharging the aquifers.

13.4.5. Management Intervention:-

Action has already been taken by Keonjhar (WL) Division for recharging ground water by creation of water bodies of 53 numbers from the year 2007-08 to 2016-17 (Table-5.6 of Part –I) and by creation of check dams, loose boulder structures, sub-surface dykes etc. Furthermore, site specific soil moisture conservation structures area being undertaken by obtaining advice from Expert Team under OMBADC Fund (Table-5.2A & 5.2B). Also under 'Green Mahanadi

Mission, 140 Ha of AR Plantation and 100 Ha of ANR Plantation in land other than Forests have already been taken up to restore the catchment areas.

Considering all the criteria like slope, topography, geographical features area affected by soil erosion etc. in this Working Plan suitable sites (Hilly and eco fragile areas) have been prescribed to be treated under Protection Working Circle so as to avoid soil erosion, restoration of catchment areas of Musal, Baitarani, Salandi etc. To increase the density of Forest and to increase soil moisture regime suitable prescriptions have already been given under Rehabilitation Working Circle.

CHAPTER-XIV

TREES OUTSIDE FORESTS

14.1 Trees outside forests or TOF can be defined as all trees excluded from the definition of forest and other wooded lands. Trees outside forest are located in other lands like farmlands and built-up areas both in rural and urban areas. Trees outside forest include trees in Agro forestry system, in orchards, in farms, gardens, parks, house hold backyards, fruit tree plantation, Canal bank, along rivers, Roadsides etc.

14.1.1 Significance of TreesOutside Forests:

The significance of the trees outside forest can be observed in several context.

"A tree grown outside the forest is a tree save inside the forest."

1) These trees cover a large proportion of land.
2) It provides food, fodder, fuel wood& small timbers.
3) In agricultural bund act as source of Nitrogen and green manure. It provides shade and sterilizes the soil in canal bank along the river and roads.
4) In urban areas trees provide important aesthetic and environmental services in addition to providing shade.
5) Trees outside forests help to mitigate Climate Change by storing carbon, halting land degradation.
6) It acts as a shelter to avifauna.
7) It influences the micro climates of the locality.

14.1.2 Trees outside forests and Climate Change :

Trees outside forest not only provide income but also provide good eco-system, thus contributing to the food security and poverty alleviation of local people.
Trees outside forest help to mitigate the climate change by sequesting carbon, land degradation and fixing nitrogen inducing soil fertility. Trees in agriculture land represent globally an important carbon stock. Almost half of the World's agricultural land haveat least 10% tree cover. Contribution of tree outside forest to climate change mitigation can be increased by promoting agro forestry system and urban forestry.

14.1.3 Trees outside forest and biodiversity Assessment :

The trees outside forest (TOFs) are important natural resources that contribute substantially to national biomass and carbon stocks and to the livelihood of the people in particular. Recently many Govt. organizations like Soil Conservation Department, Water Shed Department have taken steps for different plantation activities outside forest area which constitute a sizeable amount of wood lot. The Forest Department, Govt. of Odisha is also taking steps for free distribution of seedlings to the local people for plantation in their backyard, farmyard and barren lands. Linear plantations like avenue plantations have also been taken up by Forest Department apart from the plantation of National highway, NGOs and other Line Departments which is responsible to increase the biomass and carbon stock. From FSI report since 2000 till date there is remarkable increase in forest cover of Odisha. In this context, the contribution of trees outside forest can be felt. Hence, assessment of growing stock of tree outside forest which is an important issue to be addressed for sustainable land use management. Assessment of growing stock of tree outside forest has not been carried out in the current Working Plan.

To combat the effect of Climate change and REDD+ there is an urgent need of extension forestry. Forestry should be extended beyond forests. In this aspect commendable work has been carried out by Soil Conservation Department, Horticulture Department. These departments along with interventions carried out by Keonjhar(WL) Division have already been discussed in para 2.7 of chapter -1 of Part-1 of this Working Plan.

The lists of plantations raised by Soil Conservation (Water shed) Department in Anandpur Sub-Division during outgoing plan period are furnished in the Table No.14.1

Table No.14.1 : Plantations carried out by Soil Conservation Department

Year	Location of Plantation	No. of Species planted	Area	Remarks
1	3	4	5	6
2012-13	Panasadiha	Miscellaneous : 7500	3 Rkm.	Avenue Plantation
	Gohira	Miscellaneous : 5000	2 Rkm	Avenue Plantation
2013-14	Panasgadia	Cashew : 3600	18.00 Ha.	Block Plantation
	Baruan	Cashew : 1868	9.34 Ha.	Block Plantation
	Janjali	Cashew :3000	15 Ha.	Block Plantation
	Haradabhol	Cashew :2000	10 Ha.	Block Plantation
	Sikabeda.	Cashew :2800	14 Ha.	Block Plantation
	Banjajodi	Cashew :3000	15 Ha.	Block Plantation
	Jayantibeda	Cashew :2040	10.2 Ha.	Block Plantation
	Panasagadia.	Cashew :600	3 Ha.	Block Plantation
	Andharijhari	Cashew :2340	11.7 Ha.	Block Plantation
	Panasadiha	Cashew :880	4.4 Ha.	Block Plantation
	Manoharpur	Cashew :3200	16 Ha.	Block Plantation
	Dumuridiha	Cashew :2400	12 Ha.	Block Plantation
	Badakusapada	Cashew :2600	13 Ha.	Block Plantation
	Panasijharan	Cashew :1900	9.5 Ha.	Block Plantation
	Podabahali	Cashew :880	4.4 Ha.	Block Plantation
		Total	**5Rkm/ 165.540Ha.**	
Source : Soil Conservation Department, Keonjhar.				

The list of plantations carried out by Horticulture Department in Anandpur Sub-Division during outgoingplan period are furnished in the Table No.14.2

Table No.14.2: Plantations carried out by Horticulture Deptt.

Year	Species planted	Area in Ha.			
		Block			Grand Total
		Ghasipura	Anandapur	Hatadihi	
2012-13	Mango and Cashew	98.8	63.45	58.6	220.85
2013-14	Cashew and mango	157.2	7.4	24.0	188.6
2014-15	Mango and Cashew	145.0	68.0	54.0	267
2015-16	Mango	77.2	29.2	25.2	131.6
2016-17	Mango and Cashew	66.7	69.3	35.7	171.7
2017-18	Mango and Cashew	137.5	80.3	65.3	283.1
Total		**682.40**	**317.65**	**262.80**	**1262.85**

Plantation raised by Keonjhar (WL) Division:

Keonjhar WL Division has taken steps to increase the tree cover by taking up avenue plantations which are given in the Table No.14.3

Table : No.14.3 : Avenue Plantation

	YEAR OF PLANTATION	RANGE	SCHEME	SITE	RKM.
KEONJHAR WILDLIFE DIVISION, ANANDAPUR	2007-2012	NIL			
	2012-13	Hadagarh	22-2406-COL on Forestry & WL - State Plan-District Sector-01-Forestry	Kathakata to Taratara	3
		Anandapur		Salapada to Bhatasira	3
		Deogaon		Billa to Hatikucha	1
				Barabahali to Jhinkiapita	3
	2013-14	Anandapur	22-2406- 01-State Plan-District Sector-2829 IGCS	Rautan to Taneipal	6
		Hadagarh		Taratara to Kathakata	4
				Kathakata to Kantipal	3
		Deogaon		Barabahali to Padanpur	7
		Anandapur	MGNREGS	Barigaon to Purunia	5
		Deogaon		H.C,Pur to Gargadabahali	10
		Hadagarh		Chhenapadi to Hadagarh	10
	2014-15	Deogaon	22-2406-01-State Plan-District Sector-2829 IGCS	H.C.Pur to Taladihi	15
		Brahmanipal		Rasola to Tangiriapal	5
	2015-16	Anandapur	22-2406-01-State Plan-District Sector-2829 IGCS	Patharpada to Haripur	3
		Hadagarh		Salabani to Charinalia	2
		Deogaon		RemalaChhaka to Barigaon	3
		Brahmanipal		Tangiriapal to Railway station	2
		Anandapur	MGNREGS	Deojharan to Panasadiha	8
		Hadagarh		Ana to Isala	10
				Sadha to Dhenka	4
		Deogaon		Taladihi to Dhurudiamba	6
		Brahmanipal		Rebana to Palaspal	10
				Talapada to Daitari	4
				Bareogoda to Bhoka	1

	2016-17	Deogaon	Convergence with MGNREGS	Alughati to Bhagamunda	7
		Brahmanipal		Tangiriapal to Tikarsahi	3
		Anandapur	MGNREGS	Sapuasahi to R.Ch.pur	10
				Belasunduri to Nandabar	6
				NH -20 to Machhalo	1
		Hadagarh	**OMBADC**	Padhiaripalli Village Road	4
				Aturkana Village Road	2
				Dhaneipur Village Road.	3
				Baniapanka Village Road	4
				Kahaligadia Village Road	2
				Karadighasa Village Road	2
				MahulpangaVillage Road	2
				Bangore Village Road	2
				Sankhana Village Road	6
				Dhanurjaypur Village Road	4
				Phuljhar Village Road	4
	2017-18	Anandapur	MGNREGS	NH 20 to Jalaananda, NH -20 to Marshapal	10
		Hadagarh		Kathakata-Taratara	10
		Deogaon		Bhagamunda - Gaunighasa	10
		Deogaon		Basantpura-Asanbahali	10
		Brahmanipal		Bareigoda-Naragangi	5
		Brahmanipal		Palaspal-Chilikidhara	5
	2018-19	Anandapur	MGNREGS	Badaeltali-Haridabahali	5
		Anandapur		Dhakot-Salukdahi	10
		Hadagarh		Chenapadi- Abulpura	10
		Hadagarh		Sulana-Mugupur	5
		Deogaon		Panchugochia-Kadugotha	10
		Deogaon		Mirgimundi-Samukanendi	5

		Brahmanipal		Bareigoda-Sanasiadima	5
		Brahmanipal		Bareigoda-Palaspal	5
		Brahmanipal		BalisahiChhaka-Banagurusuni	5
	2019-20	Anandapur	MGNREGS	Chamunhi-Naduan	5
		Anandapur		Kainipura-Balarampur	10
		Deogaon		Golabandha-Rohi	5
		Deogaon		Bhagamunda-Billa	10
		Hadagarh		Baruan-Baunsagada	7
		Hadagarh		Salabani Chaka-Khadipal	8
		Brahmanipal		Palaspal-Sunapentha	5
		Brahmanipal		Rasolchhaka-alutuma	5
		Brahmanipal		Talapada-Gumudu Talapada-AnantaSahi	5
	2020-21	Anandapur	MGNREGS	Pathargada-Kanpur(Via Madanpur)	8
		Hadagarh		ChetanKendra-Bidyadharpur	7
		Hadagarh		Sadhachka-adachandi Temple	3
		Deogaon		Golabandha-MajhiSahi	5
		Deogaon		Nuagaon-aniabandha	4
		Brahmanipal		Rasol-Alutuma	10
		Brahmanipal		Chilikidhara-opinatpur	5
		Anandapur	MGNREGS (Converged)	Santoshpur-Budhikud	10
				Dahimalia-Gendabasa	4
				Chaumuhin colony chhaka-Bhatisira	4
				Total	***420rkm***
Source: Keonjhar (WL) Division					

State Forest Department has attempted to increase the Tree cover by distributing seedlingsto the common people. In this regard Keonjhar (WL) Division has distributed following seedlings

under different schemes to increase the tree cover outside the forest area.

Table No.14.4: Distribution of Seedling.			
Sl. No	Year	Name of Scheme	No. of seedlings distributed
1.	2003-04 to 2010-11	-	-
2.	2011-12	State Plan-13th FC	100000
3.	2012-13	-do-	100000
4.	2013-14	State Plan-IGCS(ToF)	200000
5.	2014-15	State Plan IGCS-(Agro Forestry)	200000
		Non Plan-13th (ToF)	200000
6.	2015-16	State Plan-District Sector-Agro Forestry	200000
7.	2016-17	State Plan-District Sector-IGCS-Agro Forestry	100000
8.	2017-18	MGNREGS	80000
		OMBADC	200000
9	2018-19	Agro	100000
		TOF	80000
10	2019-20	Agro	100000
		TOF	80000
		IGCS	124700
		GMM	78000
11	2020-21	Agro	100000
		TOF	80000
		CAMPA	200000
		OMBADC	500000
		DMF	520000
		Total	**3342700**

14.2 GREEN MAHANADI MISSION :

In this aspect notable works have been carried out by state government for restoration of catchment areas of major rivers of Odisha.

Under "Green Mahanadi Mission" for successful implementation of this programme, a Block Level Committee where Range officer(s) is the Member Convener has been constituted. Similarly, district level Green Mahanadi Mission Committee including M.P, M.L.A, Zilla Parishad Chairman, Collector of district administration etc. having Divisional Forest Officer (T) as member convenor have been constituted. Massive awareness creation has been carried out at Gram Panchayat, Village level to motivate all the villagers including PRI members, VSS, SHG members etc. To review the progress of implementation of the programme & to co-ordinate among different departments and activities, a State level Green Mahanadi Mission Steering Committee has been constituted.

14.2.1 Implementation :

1. This programme was first of all initiated in Mahanadi river. Subsequently River Baitarani was included under this programme.
2. Forest department has distributed seedlings to the common people to take up plantations in revenue lands and private lands. Also forest department has taken up wide publicity & motivation drive for making the mission successful.
3. Agriculture Department (Horticulture) and Watershed Mission have been taken up

plantation of fruit tree species on private lands and also provide subsidy to farmers under MIDH Mission.

14.2.2 Plantation under Green Mahanadi Mission:Under this scheme massive plantations have been raised within 1km. width from the river bank along both banks of Baitarani River.

Table No.14.5.List of Plantation under Green Mahanadi Mission

Sl. No.	Name of the scheme	Name of the Range	Plantation site	Area (in Ha.)	ANR (In Ha.)	Urban tree pltn (In Nos)
1	Green Mahanadi Mission(2019-20)	Anandapur	Taneipal	05		8000
			Kodapada&Bhogapur	11.64		18624
			Haridapal, Chatra&Mangalpur	18.36		29376
			Tukuna	4		6400
			Sudusudia	2		3200
			Goudadiha	5		8000
			Palaspal	2.5		4000
			Nahaguna	2.5		4000
			Talagaon &Biragobindapur	49		78400
2		Hadagarh	Habaleswar	10		16000
			Gobindapur	10		16000
			Ambo	10		16000
			Bancho	10		16000
3		Deogaon	Garagadabahal		40	8000
			Mudinucha		35	7000
		Anandapur	Sandhiagotha		25	5000
			Singibila			1750
			Rekutia			1750
4		Brahmanipal	Talapada			3500
			Total	140	100	251000

As per the above programme, rejuvenation of Baitarani river by taking up massive plantation in forest, Govt. and private lands and to create a green belt along both the banks.

Table No.14.6- Plantation under different schemes and Urban Plantations

Sl. No.	Year	Name of the scheme	Name of the Range	Plantation site	Area (in Ha.)	No. of Trees
	2009-10	FDA	Anandapur	Sunduria	25	40000
			Deogaon	Golabandha	40	64000
			Hadagarh	Bahia	18	28800
	2010-11	FDA	Deogaon	Harichandan pur	08	12800
				Badapalaspal	05	8000
			Anandapur	Baunsagarh	01	1600
		S.Plan 13th FC		Dhabani	20	32000
	2012-13		Hadagarh	Baniapanka	12	19200
				Chaturisahi	08	12800
		S.plan Fodder	Brahmanipal	Rebana(Near	10	16000

				Rebana RF)		
			Anandapur	Mahinsabahali	10	16000
			Deogaon	Gounighasa	04	6400
1	2013-14	State Plan urban	Anandapur	Tahasil Campus &Jhadeswar Temple		3000
		S.plan 13th FC	Hadagarh	Junabadi	10	16000
2		Fodder	Anandapur	Satatira River	07	9600
3	2014-15	State Plan urban		Dhaneipitha	02	3200
		Campa Interest Money Fodder	Hadagarh	Kathakata	05	8000
4	2015-16	State plan , IGCS URBAN	Anandapur	Anandapur college campus	1.9	3040
		Campa Bald Hill		Patharpada	20	32000
		Campa CAPCA	Deogaon	Nuabaripal	04	6400
	2016-17	S.plan D/S IGCS Urban	Anandapur	DhaneipithaIrigation colony(Salapada)	1.875	3000
		CSR		Dhaneipitha	05	8000
5	2017-18	AR AJY	Deogaon	Gargadbahal	10	16000
				Bhoka	10	16000
		OMBADC	Hadagarh	Mahulpanga	20	32000
		Urban under DMF	Anandapur	Murabali-11600, SDVO office, Salapada-3400		15000
2	2018-19	AR Pvt land MGNREGS pure	Anandapur	KhadikasulaBahali	1.5	2400
				Patharpada	1.5	2400
			Deogaon	Bhagamunda	2	3200
				Ranipada	1.5	2400
			Brahmanipal	Ghutung	1.0	1600
				Talapada	2.5	4000
3	2019-20	CSR	Deogaon	Raghunathpur		32000
		S.Plan IGCS Bald Hill	Anandapur	Patharpada	15	26000
		S.Plan IGCS urban tree plantation		Salapada SDVO office campus		5600
4	2020-21	MGNREGS State Plan GMM (UTP)	Anandapur	Kumunia		6600
			Hadagarh	Gobindapur		5000
			Deogaon	Kolhabeda		3400
			Deogaon	Dhabadi		1600
			Brahmanipal	Gopinathpur		3400
		MGNREGS State Plan IGCS (UTP) Convergence	Anandpur	Purunia		7600
			Hadagarh	Sarala		4000
			Hadagarh	Kuradhighasa		2000
			Deogaon	Raidihi		1800
			Deogaon	Singhibila		3200
			Brahmanipal	Gopinathpur		5000
		MGNREGS Pvt. Land	Anandapur	Taneipal		4000
			Hadagarh	Kaliamba		4000

			Deogaon	Nola		4000
		MGNREGS	Hadagarh	Karagola	6.25	10000
				K.Balipala	6.25	10000
				Total	295.275	584040

IMPACT ASSESSMENT

The result of efforts made has been manifested in creation of additional vegetal cover of different density outside the forest blocks of Keonjhar (WL) Division, As revealed by satellite assessment by ORSAC and the same is given below.

The Beat wise vegetation cover of different density outside the Forest Blocks of Keonjhar (W.L) Division is given below.

Table No.14.7 : Vegetation outside the Forest Block of Keonjhar (W.L) Division (in Sqr.Km)

Sl. No.	Name of Beat	Very dense Forest (Crown Cover>70%)	Moderately Dense Forest (Crowncover 40 to 70%)	Open forest(Crown cover 10 to 40%)	Degraded Forest(Crown cover less <10%)	Total
1	Anandpur			1.381	0.426	1.807
2	Bahia			0.287	1.313	1.600
3	Baidakhia			0.788	0.934	1.722
4	Baliparbata			0.109		0.109
5	Baripal		0.251	7.156		7.407
6	Basantpur		0.413	7.130	0.026	7.569
7	Bhagamunda		1.881	14.184	0.815	16.880
8	Brahmanipal		0.082	1.455		1.537
9	Budhikuda	0.088	0.313	0.76		1.177
10	Baniapanka		0.103	0.888	0.453	1.444
11	Baranga		0.123	0.793	0.121	1.037
12	Barabahali		0.06	2.059	0.231	2.350
13	Deogaon			0.158		0.158
14	Dhakota	0.075	1.004	1.583		2.662
15	Gaduan		0.454	2.171		2.625
16	Ganpur		0.085	0.254		0.339
17	Gargadbahal	10.137	4.614	8.051	0.182	22.984
18	Gayalmunda	0.011	3.435	5.787		9.233
19	Hadagarh	0.181	0.902	1.800	0.021	2.904
20	Harichandanpur		0.465	8.349		8.814
21	Kantipal		0.229	4.840	0.753	5.822
22	Kathakata			0.104	0.352	0.456
23	Ostapura		0.495	2.902		3.397
24	Mahabirapasi		0.512	5.005		5.517
25	Palaspal(E)		0.076	4.302		4.378
26	Palaspal(W)	0.248	0.39	4.084		4.722
27	Panasdia	0.13	4.137	7.370	0.058	11.695
28	Pitanau	0.03	0.693	0.962		1.685
29	Raighati	0.108	3.472	4.497		8.077
30	Patilo		0.027	2.815	0.766	1.608
31	Rebana North	0.031	1.088	3.619		4.738
32	Rebana South	0.422	1.571	5.326		7.329
33	Sagadpata		1.756	6.546	1.334	9.636
34	Sangam			1.147	0.043	1.190
35	Talapada		0.366	0.822		1.699
36	Taneipal		0.866	1.154		2.020
	Total		**29.853**	**120.654**	**7.828**	**170.327**
Source: ORSAC, BBSR						

14.3 SCOPE FOR INCREASING TOF:

Plantation around farm pond :

- People have been benefited out of the "Mo PokhariYojana" of State Govt. The list of beneficiaries of Mo PokhariYojana can be collected from Block offices.
- Seedlings can be distributed to these beneficiaries, so that they can plant these seedlings around their pond.
- Plantations can also be taken up by NREGS mode around community ponds.

Institutional plantations :

Massive plantations can be taken up inside premises of schools, offices, quarters to make greenery which will add a lot towards increase the tree cover outside the forest.

Avenue Plantation:

Massive plantations can be taken up by the road sides which consists primarily of indigenous species like Neem(*Azadirachtaindica*), Arjuna(*Terminalia arjuna*), Jamu(*Sizigiumcumini*),Imli (*Tamarindusindica*), Bahada (*Terminalia belerica*), Mahala (*Ailanthus excelsa*), Chhatian *(Alstoniascholaris*) and *Ficus* species.

The tree outside forest area can be increased by taking up vast avenue plantation by the road sides available in Keonjhar (W.L) Division whose list is given in **Appendix -XXX** .

Agro Forestry:

Time has now come that Forest Department should act in coordination with Agriculture Department & extend the forestry beyond the notified forest blocks. In this aspect agroforestry has proved to be a successful intervention forincreasing the tree cover as well as to generate income for common people so as to decrease the pressure on traditional forest for day to day requirement. Popular based agroforestry model has already been successful in North India so also the Eucalyptus based agro forestry in Koraput district. Intervention of OUAT & various govt. & non govt. agencies have resulted in the development of some improved agro forestry practices in the recent years. Some of the agro forestry practices are *Acacia mangium* based, *Sesbaniagrandiflora* based, *Leusaenaleucocephala* based and commercial block plantation in private lands. These models should be tried in coordination with the agriculture department to make it a success.

Trees outside forest and carbon stock :

In this working plan attempt has been made to estimate the carbon stock of the plantations raised by Keonjhar(WL) Division in the outside Forest areas. For the estimation of biomass regression equations formulated by Brown etal(1989) for the dry forest in India, further modified and published in Food & Agriculture Organization (FAO) paper of UNO during 2006 has been used as

$$Y=\exp\{-1.996+2.32*\ln(D)\}$$

Where *Y- Biomass per tree in kg.*
D-DBH in cm(5cm to 40cm)

Table No.14.8.Estimation of Carbon stock in TOF area

S.I No	Plantation Site	Area in Ha.	Year	Biomass per tree in kg	Carbon Stock for 0.1 Ha in Kg	Carbon Stock per Hector in Kg	Carbon Stock per Hector in Ton	Total Carbon Stock
1	Sunduria	25	2009-10	2064.399	1203.132	12031.32	12.03132	300.7829
2	Golabandha	40	2009-10	2560.587	1492.31	14923.1	14.9231	596.9239
3	Bahia	18	2009-10	1778.853	1036.715	10367.15	10.36715	186.6088
4	Harichandanpur	8	2010-11	852.885	497.0614	4970.614	4.970614	39.76491
5	Badapalaspal	5	2010-11	481.6225	280.6896	2806.896	2.806896	14.03448
6	Baunsagarh	1	2010-11	103.156	60.11932	601.1932	0.601193	0.601193
7	Dhabani	20	2010-11	1515.23	883.0759	8830.759	8.830759	176.6152
8	Baniapank	12	2012-13	1055.32	615.0405	6150.405	6.150405	73.80486
9	Chaturisahi	8	2012-13	684.2157	398.7609	3987.609	3.987609	31.90087
10	Rebana near Rebana	10	2012-13	589.4627	343.5388	3435.388	3.435388	34.35388
11	Mahinsabahali	10	2012-13	665.679	387.9577	3879.577	3.879577	38.79577
12	Gaunighasa	4	2012-13	485.7317	283.0844	2830.844	2.830844	11.32338
13	Jhuniabadi	10	2013-14	1513.767	882.2234	8822.234	8.822234	88.22234
14	Satatira River Site	7	2013-14	540.47	314.9859	3149.859	3.149859	22.04901
15	Dhaneipitha	2	2014-15	167.2568	97.47726	974.7726	0.974773	1.949545
16	Kathakata	5	2014-15	242.0102	141.0435	1410.435	1.410435	7.052177
17	Anandapur College campus	1.9	2015-16	104.0983	60.66849	606.6849	0.606685	1.152701
18	Patharapada	20	2015-16	167.7299	97.75296	977.5296	0.97753	19.55059
19	Nuabaripal	4	2015-16	250.6394	146.0727	1460.727	1.460727	5.842907
20	Dhaneipitha Irrigation Colony	1.875	2016-17	282.2788	164.5121	1645.121	1.645121	3.084602
21	Dhaneipitha.	5	2016-17	354.4408	206.5681	2065.681	2.065681	10.3284
22	Mahulpanga	20	2017-18	450.85	262.7554	2627.554	2.627554	52.55108
23	Gargadabahal	10	2017-18	220.36	128.4258	1284.258	1.284258	12.84258
24	Bhoka	10	2017-18	252.45	147.1279	1471.279	1.471279	14.71279
25	**Total**	**257.775**						**1744.849**

N.B.:

- The biomass has been estimated by counting the actual trees survived per 0.1Ha.

CHAPTER-XV
FINANCIAL FORECAST

15.1 GENERAL CONSIDERATIONS

15.1.1 Tremendous biotic pressure coupled with continuous exploitation without conservation and development of forest leads to degradation of forests. As a result of which Rebana, Santoshpur, Atei which were managed under selection forest has changed to low density forest. Moreover, in today scenario when there is decrease in water regime of the forest and increase of dry spell, there is urgent need for artificial regeneration of forest by taking of massive plantations, creating SMC structures etc. Similarly, augmentation of NTFP species, management of wildlife habitat above all participation of local people is required for overall management of forest. Hence, there is urgency to increase the allotment of forestry sector.

15.2 FINANCIAL FORECAST :

15.2.1 This working plan has been prepared for a period of ten years from 2021-22 to 2030-31. Various suggestions and prescriptions have been made in the plan to achieve the objectives of this plan. In order to implement these suggestions and prescriptions, the requirement of finance is calculated in this chapter giving provision of annual 10% inflation.

15.3 BASIS OF THE CALCULATION FOR KEONJHAR (W.L.) DIVISION

15.3.1 **The establishment expenditure of the Keonjhar (W.L) Division :**

The expenditure under this head includes salary, D.A, T.E and other expenses like electricity charges, rents and uniform articles of staffs of Keonjhar (W.L) Division. The annual expenditure in this head is Rs.321.21 lakhs per annum. Therefore, the annual establishment expenditure is forecasted as per Table No.

15.3.2 **Building:** There are 36 numbers of buildings in Keonjhar (WL) Division which need maintenance/ renovation every year. Accordingly an average requirement per annum is assessed to be 10 lakhs. For construction of new building, there are 5 nos of Forest Guard quarters at Bariha, Deogaon, Gadgadbahal, Koduan and Rebena South and 04 Foresters Quarters at Ramachandrapur, Budhikuda, Brahmanipal and Daitary are to be constructed. Similarly, 02 nos A.C.F quarters to be constructed newly. The total requirement of funds in this head is required around Rs.248 lakhs. 09 nos of tube-wells is also required at different Beats & Sections The annual expenditure forecasted is furnished is Table No.14.3

15.3.3 **Roads**: The total length of the forest roads in Keonjhar (WL) Division is 55 Kms. which need to be maintained regularly. Accordingly, annual maintenance cost has been assessed to be Rs. 20 lakhs including cost of new causeway/culvert. The annual expenditure is forecasted in Table No.14.3

15.3.4 **Treatment of Rehabilitation Working Circle**:

The total area under Rehabilitation Working Circle in Keonjhar (WL) Division is 29721.9894 ha. Considering the vegetation over the total area, it is required to treat the area in ANR mode of 400 plants per ha. The total requirement of funds for implementation of this working circle comes to Rs.13993.98 Lakhs considering the cost norm provided by the Principal Chief Conservator of Forests, Odisha vide office order no 1335/12F (Affn.)-25/2018 dt. 18.12.2018. The detail cost norm per Ha. for ANR

(Without gap), ANR with gap filling of 400 plants per Ha. The cost norm in toto for 0th year Rs. 7,413, 1st year Rs.30,297/-, 2nd year Rs. 11,007/-, 3rd year Rs. 3,881/- and 4th year Rs. 970/- @ present labour rate of Rs. 308 per mandays. The year wise treatment area and their cost is furnished below.

Rehabilitation Working circle

Year	Area (Ha.)	0th year	1st year	2nd year	3rd year	4th year	Total cost in Rs.(Lakh)
2021-22	2958.52	219.31	0	0	0	0	219.31
2022-23	3181.52	235.84	896.34	0	0	0	1132.18
2023-24	2460.07	182.36	963.90	325.64	0	0	1471.91
2024-25	2980.4	220.93	745.32	350.18	114.82	0	1431.27
2025-26	3279.977	243.14	902.97	270.77	123.47	28.69	1569.06
2026-27	2759.848	204.58	993.73	328.05	95.47	30.86	1652.71
2027-28	2796.36	207.29	836.15	361.02	115.66	23.86	1544.00
2028-29	3196.3544	236.94	847.21	303.77	127.29	28.90	1544.14
2029-30	3545.93	262.85	968.39	307.79	107.10	31.81	1677.98
2030-31	2563.01	189.99	107.43	351.82	108.52	26.77	1751.42
Total	29721.9894						13993.98

15.3.5 **Treatment of Plantation Working Circle**:

The total area under Plantation Working Circle is 3233.0754 Ha. which includes 1062 Ha plantable area for pure block plantation and 2171.0754 Ha old plantation area which are to be treated in two categories such as tending series having more than 40% more than survival percentage and restoration series less than 40% survival. The pure block plantation is to be taken up by raising 1 ½ years seedlings.

a) The cost norm for block plantation

Previous year Rs.17,334/-, 0th year Rs. 62,308/-, 1st year Rs.53,767/-, 2nd year Rs. 33,157/-, 3rd year Rs. 19,883/-, & 4th years. 5821/-.

Year wise financial forecast as per treatment area is furnished below.

Plantation Working circle

Year	Area	Previous year	0th year	1st year	2nd year	3rd year	4th year	Total cost in Rs.(Lakh)
2021-22	102	17.68	0	0	0	0	0	17.68
2022-23	107	18.54	63.55	0	0	0	0	82.10
2023-24	82	14.21	66.66	54.84	0	0	0	135.72
2024-25	123	21.32	51.09	57.53	33.82	0	0	163.76
2025-26	99	17.16	76.63	44.08	35.47	20.28	0	193.64
2026-27	128	22.18	61.68	66.13	27.18	21.27	59.37	204.40
2027-28	104	18.02	79.75	53.22	40.78	16.30	62.28	214.32
2028-29	96	16.64	64.80	68.82	32.82	24.45	47.73	212.31
2029-30	116	20.10	59.81	55.91	42.44	19.68	71.59	205.12
2030-31	105	18.20	72.27	51.61	34.48	25.45	57.62	207.79
Total	1062							1636.84

b) Cost norm for tending series : Rs. 4650.80 per ha. The year wise financial requirement is furnished below.

Tending Operation			
Year	Area	Unit Cost/ Ha.	Total cost in Rs.(Lakh)
2021-22	185	4650	8.60
2022-23	177.08	4650	8.23
2023-24	160	4650	7.44
2024-25	140	4650	6.51
2025-26	186	4650	8.65
2026-27	140	4650	6.51
2027-28	140	4650	6.51
2028-29	114.7524	4650	5.34
2029-30	105	4650	4.88
2030-31	120	4650	5.58
Total	1467.8324		

c) Cost norm for restoration series per ha as 800 plants per ha to be planted using 6 months seedlings. The cost norm for 0th year Rs. 11,810/-, 1st year Rs. 45,755/-, 2nd year Rs. 16,315/-, 3rd year Rs. 5,175/- and 4th year Rs. 970/-. The year wise expenditure and treatment area is furnished below.

Restoration Series

Year	Area	0th year	1st year	2nd year	3rd year	4th year	Total cost in Rs.(Lakh)
2021-22	78	0	0	0	0	0	0
2022-23	88.61	48.60	0	0	0	0	48.60
2023-24	56.2	55.21	41.93	0	0	0	97.14
2024-25	54.63	35.01	47.64	25.86	0	0	108.52
2025-26	49.13	34.03	30.21	29.38	15.50	0	109.14
2026-27	77.743	30.61	29.37	18.63	17.61	4.54	100.77
2027-28	41.476	48.44	26.41	18.11	11.17	5.15	109.30
2028-29	71.2	25.84	41.80	16.29	10.86	3.27	98.06
2029-30	106.764	44.36	22.30	25.77	9.76	3.18	105.38
2030-31	79.49	66.52	38.28	13.75	15.45	2.85	136.87
Total	703.243						

15.3.6 **Treatment of Improvement Working Circle**:

The total area under Improvement Working Circle in Keonjhar (WL) Division is 18342.34 ha. Adequate inflations have been calculated for subsequent years.

I.	Total Area		18342.34 Ha
II.	Demarcation of area @10Ha/Day/Labour	Rs.	30.80
III.	Subsidiary Silviculture operation 15md/Ha.	Rs.	4,620.00
	Total	Rs.	4,650.80

The year wise treatment area and financial requirement is furnished below.

Improvement Working circle

Year	Area(In Ha.)	Unit Cost (In Rs.)/ Ha.	Total cost in Rs.(Lakh)
2021-22	1841.17	4650	85.61
2022-23	1912.12	4650	88.91
2023-24	1896.8	4650	88.20
2024-25	1711.35	4650	79.57
2025-26	1659.58	4650	77.17
2026-27	1561.51	4650	72.61
2027-28	1442.57	4650	67.07
2028-29	2478.13	4650	115.23
2029-30	2286.24	4650	106.31
2030-31	1552.87	4650	72.20
Total	18342.34		

15.3.7 **Treatment of N.T.F.P (Overlapping) Working Circle**:

This is an overlapping Working Circle which spreads over all the forest area of Keonjhar (WL) Division i.e. 58610.92 Ha. The treatment includes expenditure on Publicity, Skill upgradation, value addition, Infrastructure development.

Important ingredients of the prescription and funds required for implementation is as under :

Total Area = 58610.92 Ha

Estimated Annual Expenditure

Item of Work	Estimated Expenditure
i) Awareness Campaign	Rs. 1,00,000/-
ii) Skill up-gradation	Rs. 1,00,000/-
iii) Value Addition	Rs. 2,00,000/-
iv) Creation of NTFP "Mandis"	Rs. 4,00,000/-
Total	***Rs.8,00,000/-***

Total financial implication year wise is furnished in Table No.14.3

15.3.8 **Treatment of Wildlife Working Circle (Overlapping)**:

This is an overlapping Working Circle which spreads over all the forest area of Keonjhar (WL) Division i.e. 58610.92 ha. The treatment includes Improvement of Wildlife habitats, Maintenance & Improvement of corridor, Development of Water sources & Salt lick, Formation of Antipoaching squad & Elephant squad, Awareness Campaign, Incentives & Reward, Compassionate amount for crop damage and Human kills/Injury. The total financial requirement is as follows:-

Estimated Annual Expenditure

Item of Work	Estimated Expenditure
i) Improvement of Wildlife habitats	Rs. 3,00,000/-
ii) Maintenance & Improvement of corridor	Rs. 2,00,000/-
iii) Development of Water sources & Salt lick	Rs. 2,00,000/-
iv) Anti poaching squad for 3nos. @ Rs.5,36,400/- each [5nos. each squad]	Rs.16,38,360/-
v) Elephant squad for 3nos.@ Rs.5,36,400/- each [5nos. each squad]	Rs.16,38,360/-
vi) Awareness Campaign	Rs. 1,00,000/-
vii)Incentives & Reward	Rs. 1,00,000/-
Viii) Compassionate amount for crop damage and Human kills/Injury	Rs. 5,00,000/-
Total	***Rs.46,76,720/-*** Or ***Rs.46.7Lakhs***

The year wise expenditure forecast is given in the Table No.15.3

15.3.9 **Treatment of Joint Forest Management Working Circle (Overlapping)**:

The total number of Vana Sarankhshyana Samiti (VSS) in Keonjhar (WL) Division is 121 nos. This is an overlapping Working Circle having with an area of 8916.00ha. Which includes 411.243ha. of Village Forest. The treatment includes Capacity building of VSS, Publicity & awareness campaign, Support for income Generation activity, Incentive & Rewards. The total financial requirement will be as follows:-

Estimated Annual Expenditure

Item of Work	**Estimated Expenditure**
i) Capacity building of VSS	Rs. 5,00,000/-
ii) Publicity & awareness campaign	Rs. 3,00,000/-
iii) Support for income Generation activity	Rs.10,00,000/-
iv) Incentive & Rewards	Rs.2,00,000/-
Total	***Rs.20,00,000/-***

Assuming Rs.20,00,000/- being the estimated expenditure per annum. The total requirements of funds per year is provided in Table No.15.3.

15.3.10: **Treatment of Protection Working Circle**:

The total area under Protection Working Circle in Keonjhar (WL) Division is 7313.51367 ha. This Working Circle aims to provide adequate methods for protection of vulnerable portion of the division. The important ingredients are Engagement of Anti-smuggling Squads, Funds for collection of intelligence and reward, POL & other contingent expenditure for hiring of vehicle. The total financial requirement will be as follows:-

Estimated Annual Expenditure

Item of Work	Estimated Expenditure
i) Anti-smuggling Squad(6 nos.) [5 persons in each squad]	Rs. 32,76,720/-
ii) Hired Vehicle(6nos @ Rs.25000/- per month per vehicle)	Rs. 18,00,000/-
iii) Collection of Intelligence, reward	Rs.2,00,000/-
iv) POL for vehicle(Rs.10000/- per month)	Rs.7,20,000/-
v) Secret Fund (Rs.5000/- per month)	Rs. 60,000/-
Total	*Rs.60,56,720/-*

Assuming Rs.60.5 Lakhs being the estimated expenditure per annum. The total requirements of funds per year is furnished in Table No.15.3.

15.3.11 : Maintenance of Boundary:

The length of Reserve Forest Boundary is 474.7116 Km. in Keonjhar (WL) Division which will be maintained during this plan period along with construction of new pillars as well as maintenance of existing good ones. Thus annually 47.471 Km will be maintained.

The number of R.F Pillars in this division is 2557 and that of PRF is 117 nos. 1095 numbers of pillars will be constructed during the plan period. So, 110 numbers of pillars will be constructed every year.

To achieve the target stated above, the financial requirement during the plan period is Rs.39,64,692/-which is calculated in Table No.15.1

Table No. 15.1 : Calculation for requirement of funds for Boundary maintenance

Sl. No.	Particulars			Amount (in Rs.)
i)	Cost of clearance of the boundary	:	@ 7 man days per Km (i.e. 474.7116 x 7x 303.40)	10,08,192/-
ii)	Posting of 1095 nos masonry Pillars	:	@ Rs. 2700/- per pillar	2956500/-
v)	Total cost	:		39,64,692/-

15.3.12 Forest Consolidation:

There are 3nos. of PRF blocks covering an area of 214.07Ha. has not been notified under section 21 of Odisha Forest Act. 1972 But all PRF have been included in this plan. Hence necessary steps may be taken to ensure the final notification for declaration of Reserve Forest within first 2 years of the plan period.

There are 10nos. of DPF covering 1420.47 Ha. & 08 nos of PF covering 216.8324 ha. area in Keonjhar (WL) Division. In case of DPF & PF it should be properly verified for survey & demarcation in the field. These forest blocks should be digitized. The Divisional Forest Officer shall take appropriate action for declaration of all proposed forest blocks pending at various level to be finally notified under section 21 of Odisha Forest Act'1972 during this plan period. The annual expenditure is projected is Rs.1.00 lakh per annum.

15.3.13 Infrastructure development:

The annual financial requirement for purchase and maintenance of camp equipments, maintenance of VHF sets, computers, G.P.S etc. is estimated to be about Rs. 2 Lakhs. Subsequent requirement with 10% hike in each successive year,

15.3.14 Miscellaneous contingencies:

The annual financial requirement for library books, maps, tools etc. is estimated to be Rs.0.6 lakhs. Subsequent requirement with 10% hike in each successive year, the total requirements of fund comes to Rs.13.9 lakhs during the entire plan period.

15.3.15 Establishment of Central Nursery :

There is no Central Nursery in Keonjhar WL Division. For raising of seedlings of one year age and above, preparation of high quality stumps one Central Nursery having following facilities is to be established. So that good quality planting stock are available for successful plantations.

A. Raising of one lakh seedlings more than one year age of specially NTFP & other endangered species.

B. Root trainer Nursery for 20,000 Seedlings.

C. Sprinkler System of irrigation.

D. Agro net shed.

Estimate of creation and maintenance is given in Table No. 15.2.

Table No. 15.2 : Creation and maintenance of Nursery.

Sl. No	Item of works	Amount (In Rs.)
1	Infrastructure development like construction of Boundary wall, Nursery shed, Road, Inspection path, preparation of mother bed, water source and electrification	45,00,000/-
2	Equipment for Root trainer seedlings, Agro shed net and others	15,00,000/-
3	Cost of poly pot, sheets and raising of seedlings for 1st year.	47,00,000/-
4	Subsequent raising of seedlings, stumps and maintenance for 8 years @ 7.5 lakhs per year	98,00,000/-
(Rupees Two Hundred Five Lakhs)Only	**Total**	**205,00,000/-**

Detailed of financial forecast for this plan for the period 2021-22 to 2031-31.

Table No.15.3.Financial Forecast for the Plan period (Rs. in Lakhs)											
Budget Head	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**TOTAL**
Establishment	323	355	390	429	572.5	520.2	572	629.2	692	761	5243.90
Buildings	31	31	31	31	19	30	30	10	10	10	233.00
Roads	20	20	20	20	20	20	20	20	20	20	200.00
Well (09 Tubewells new)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	15.00
Improvement WC	85.61	88.91	88.2	79.57	77.17	72.61	67.07	115.23	106.31	72.2	852.88
Rehabilitation WC	219.31	1132.18	1471.91	1431.27	1569.06	1652.71	1544	1544.14	1677.98	1751.42	13993.98
Plantation WC	17.68	82.1	135.72	163.76	193.64	204.4	214.32	212.31	205.12	207.79	1636.84
Tending Operation	8.6	8.23	7.44	6.51	8.64	6.51	6.51	5.33	4.88	5.58	68.23
Restotation Operation	0	48.6	97.14	108.52	109.14	100.77	109.3	98.06	105.38	136.87	913.78
Wildlife (O) WC	46	51	56	61	67	74	81.5	90	99	108	733.50
NTFP WC	8	8	8	9	9	9	10	10	10	10	91.00
Protection WC	60	66	73	80	88	97	106	116	127	140	953.00
Boundary & Pillar construction	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	39.50
Consolidation	1	1	1	1	1	1	1	1	1	1	10.00
Infrastructure	2	2.2	2.5	2.75	3	3.3	3.5	3.75	4	4.5	31.50
JFM WC	20	22	24	26	28	31	34	37	40	42	304.00
Miscellaneous Contingency	0.6	0.7	0.8	0.9	1	1.5	1.7	2	2.2	2.5	13.90
Miscellaneous (Establishment of Central Nursery)	30	30	12.5	22.5	12.5	22.5	13	24	13	25	205.00
TOTAL	878.25	1952.37	2424.66	2478.23	2784.1	2851.95	2819.35	2923.47	3123.32	3303.31	**25539.01**

CHAPTER - XVI
SUMMARY OF PRESCRIPTIONS

The summary of prescriptions is given in Table No. 16.1

Table No. 16.1 Summary of Prescriptions

Chapter	Heading		Prescription	Para
Basis of Proposal	General objectives	1	Maintenance of environmental stability through preservation & restoration of ecological balances	1.1
		2	To increase forests & vegetal cover to help soil erosion in hill slopes & denudation of catchments	
		3	To maintain the Hydrological cycle & to regulate water yields	
		4	To conserve the natural heritage by preserving vast variety of Flora & Fauna	
		5	To improve the condition, composition & productivity of forests through appropriate scientific management	
		6	To conserve Bio-diversity	
		7	To meet the bonafide needs of the local people subject to aforesaid environmental inter actives	
		8	To create the massive awareness amongst the people for achieving the objectives & minimizing pressure on forests	
		9	To generate employment opportunities to the rural people through conservation oriented activities.	
	Constitution of Working Circle	1	Improvement Working Circle	1.3
		2	Rehabilitation Working Circle	
		3	Plantation(Overlapping)Working Circle.	
		4	Protection Working Circle	
		5	J.F.M.(Overlapping) Working Circle	
		6	Wild Life (Overlapping) Working Circle	
		7	Non-Timber Forest Produce (Over lapping) Working Circle	
	Allocation of area.		Allocation of area to different working circles	1.39
	Period of plan		2021-22 to 2030-31.	1.6
Improvement Working Circle	General Constitution	1	Forest blocks & compartments having adequate regeneration & having congestion	2.1
		2	Poor diameter growth due to heavy congestion	
	Character of Vegetation	1	The forests under this working circle are even aged & have good natural regeneration	2.2
		2	The major forest types are moist peninsular valley Sal (3C/C2e(iii))	
		3	Dry peninsular Sal forest(5B/C1c)	
		4	Northern dry mixed deciduous forest (5B/C2)	
		5	Lateritic Semi-evergreen forest (E4)	
	Special objectives of management	1	To improve the growing stock & quality of Forest by sound Silvicultural operations.	2.3

		2	To ensure soil & moisture conservation measures, to make the forests productive in future	
		3	To meet the bonafide needs of the local people for fuel wood from thinning & other operations	
		4	To tend the existing crop to get maximum growth	
		5	To improve the density condition & composition of the crop.	
	Allotment of area	1	Area allotted to this Working Circle is 18720.20 ha in 3 improvement series.	2.4
	Analysis & valuation of the crop		The crop to a large extent is middle-aged. So no exploitation of any particular girth class is prescribed	2.5
	Silvicultural system	1	As the crop is immature & is pole stage, it needs adequate protection against illicit felling, fire and grazing is needed.	2.6
		2	Tending of these crop is needed.	
		3	No silvicultural system is prescribed.	
		4	Only removal of uprooted, wind fallen, diseased, defective and clear of congestion is allowed	
		5	Sowing of fodder grasses along with soil conservation structure is prescribed.	
Improvement Working Circle	Choice of species.		Not applicable to this Working Circle	2.7
	Exploitable girth.		No exploitable girth class is fixed for any species.	2.8
	Improvement cycle		Improvement cycle is fixed at 10 years; silvicultural operations can be taken up at shorter intervals to maintain the forest in healthy condition.	2.9
	Calculation of yield		No yield is prescribed.	2.10
	Sequence of Improvement Operation		The improvement of forest area allotted to the improvement working circle has been distributed into different improvement series	2.11
	Soil & Moisture conservation Measures		Appropriate Soil & Moisture Conservation Measures like Gully plugging, Loose Boulder Check Dams, Contour Bonding & Nala Bonding to be taken up to ensure maximum Conservation of Soil & Moisture.	2.12
	Subsidiary Silvicultural operation	1	Cutting back operation, Cleaning, Thinning operation to be Made	2.13
		2	Area to be protected from Biotic interferences	
	Control		Compartment histories, control forms and other records shall be maintained for each improvement coupe/ compartment and improvement series as per National Working Plan Code.	2.14
	Miscellaneous regulation	1	Grazing	2.15
		2	Fire protection	
		3	Collection of NTFP	
		4.	Protection of coups area	

		5	Operation in Coupe Area.	
Improvement Working Circle	Rights & concessions		Rights and concessions shall be regulated as Orissa Forest Act & relevant Government policies in force.	2.16
	Cost norm	.	Cost norm for implementation of the prescriptions for Keonjhar (WL) Division	2.17
	Interim revision		Prescription if necessary may be reviewed after 5 years by the RCCF(T) & CCF(WP).	2.18
Rehabilitation Working Circle.	General constitution		Forests at various stages of degradation due to Biotic interferences are kept in this working circle. These forest blocks/compartments still contain sufficient rootstock & natural regeneration.	3.1
	General character of vegetation	1	The forests are mostly opened mixed Sal forests	3.2
		2	Regeneration is poor due to Biotic interference.	
		3	These forests mainly found in the close proximity by Human habitation & Mines rich areas.	
	Special objectives of Management	1	To restrict the degradation of Forest by reducing biotic interference.	3.3
		2	To restock blank patches with indigenous species.	
		3	To improve micro climate & micro edaphic conditions	
		4	To develop the Forest by site specific Silvicultural treatment.	
		5	To increase the Bio-diversity in the forest crop	
		6	To improve the Soil productivity by suitable Soil & Moisture Conservation measures.	
		7	To meet the bonafide needs of local people for fuel wood, small timber & NTFP.	
	Allotment of area to the treatment series		An area of 32680.17 ha is allotted to Keonjhar(WL) Division in 6 treatment series .	3.4
	Analysis of valuation of crop	1	Most of the areas covered are in various stages of degradation	3.5
		2	The regeneration stages in forest are generally poor.	
	Silvicultural system		No formal silvicultural system is prescribed for this working circle.	3.6
	Rotation & Conversion of Species		The cleaning materials obtained from Silvicultural operation may be distributed to the VSS member as per the MoU	3.7
	Choice of species		For artificial regeneration local indigenous species should be given importance. It varies according to problematic sites	3.8

Rehabilitation Working Circle.				
	Rehabilitation cycle		A 10 year cycle is to be taken.	3.9
	Calculation of yield		No yield is prescribed	3.10
	Rehabilitation treatment	1	Demarcation of annual rehabilitation area	3.11
		2	Preparation of stock & treatment map	
		3	Artificial regeneration through local indigenous species	
		4	Silvicultural treatment like removal of high stump, singling out multiple coppices shoots, Climber cutting etc	
		5	Appropriate Soil & moisture conservation measures.	
	Rehabilitation Measures	1	Silvicultural Operation	3.12
		2	SMC	
		3	Planting	
	Miscellaneous regulation	1	No grazing for 5 years	3.13
		2	Protection from fire & illicit felling.	
		3	Involvement of local people for protection.	
		4	Perimeter barriers	
	Record keeping		Compartment histories, control forms and other records shall be maintained for each Rehabilitation coupe/ compartment & rehabilitation series as per National Working Plan Code & provisions of the Orissa Forest Plantation Manual, 1977.	3.14
	Rights and Concessions		Rights and concessions shall be regulated as per relevant Gazette Notification & Government of Orissa policy with regards to JFM.	3.15
	Cost norm	1.	Cost norm for implementation of the prescriptions for Keonjhar (WL) Division.	3.16
	Interim Revision		Prescription if necessary may be reviewed after 5 years by the RCCF(T) & CCF(WP).	3.17
Plantation(O) Working Circle.	General constitution		Forest blocks having permanent gaps devoid of any rootstock & lack of natural regeneration are included in this working circle.	4.1
	General Observation of Vegetation		The area included in this working circle for plantation have mostly of block plantation have hardly any established forest growth .These are mostly of scrubby growth of miscellaneous species	4.2
	Special objectives of management	1	To restock the permanent blanks.	4.3
		2	To promote growth of exiting plantation through suitable tending operation.	
		3	To provide suitable soil and moisture conservation measures	
		4	To nurture the dominated poles	
		5	To treat the failure blank patch inside old plantations with planting of two years old tall seedlings of fast growing species	
		6	To fulfil the fodder, fuel wood and small timber requirement of local people to possible extent upon planting species suitable for the purpose.	

		7	To harvest the matured plantations raised in the past and replacing the harvested areas with economically valuable species like Sissoo, Piasal, Gambhar etc.	
		8	To recover eco-system biodiversity thereby creating space for small wildlife and aviary population.	
		9	To create space for carbon stocks thereby creating carbon sink.	
	Allotment of area		As it is an overlapping working circle it coincides the area of RWC i.e. 32680.17Ha. However the plantable area is 1112ha. which comprises of blank patches.	4.4
	Silvicultural system		Artificial regeneration including tending operation is prescribed.	4.5
	Choice of species	1	Indigenous species like Bamboo, MFP species preferred.	4.6
		2	Economically important species like Teak, Gambhar, Sissoo etc. may be planted.	
	Rotation		Rotation period	4.7
	Yields & Regulations		The prime objective of the circle is to restock the barren and blank forest areas with artificial regeneration within the plan period of 10 years and also to tend the existing old plantations	4.8
	Plantation cycle		10 years	4.9
	Method of execution of planting operation.	1	Prescription given in the Orissa Plantation Manual, 1977 & other Executive instruction in force shall be followed.	4.10
		2	Demarcation of annual Plantation coupes.	
		3	Nursery work & preparation of site.	
		4	Pitting & planting	
		5	Post planting operation.	
	Control	1	Nursery journals, Plantation journal and other records will be maintained for each plantation	4.11
		2	The provisions of the "Orissa Forest Plantation Mannual,1977 should be followed	
		3	Plantations done should be shown on Topo maps of 1:25000 scale.	
		4	Records of tending operations should be maintained	
Plantation Working Circle	Miscellaneous regulation	1	All the annual coupes/treatment area shall be strictly protected from grazing & fire.	4.12
		2	Villagers of nearby area should be educated about the importance of the plantation	
		3	Plantation journal & Nursery journal shall be maintained as per Orissa Plantation Manual, 1977.	
		4	Participatory rural appraisal shall be under taken	
	Rights & concessions	1	Only such rights & concessions shall be admitted as described in Chapter-I.	4.13
		2	Additional usufructuary rights may be allowed in accordance with provisions of current policies & programs of the Government	

	Cost norm	1.	Cost norm for implementation of the prescriptions for Keonjhar (WL) Division.	4.14
	Interim revision		No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans.	4.15
Protection Working circle	General constitution		The Forest blocks included in this Working Circle are those Forest blocks which have been badly affected by illicit felling, fire, grazing, encroachment, shifting cultivation and poaching etc.	5.1
	General Character of Vegetation		Constant biotic pressure from human and cattle has led to degradation of vegetative cover which is the main cause of rapid soil erosion and high run –off. The forest blocks included here are those which have badly affected by regular removal of biomass and forest blocks having valuable forests which are now the target of timber mafias.	5.2
	Special objectives of management	1	To keep the eco-fragile areas intact by maintaining adequate vegetative cover	5.3
		2	To check over degradation and augmentation of natural regeneration by strong protection measures and minimizing biotic interferences like illicit felling, encroachment & other biotic factors.	
		3	To protect these forest from fire and provide strict vigil against the same	
		4	To check the soil erosion by suitable soil conservation measures.	
	Allotment of area		The area allotted to this working circle is 7689.76 ha	5.4
	Analysis and valuation of crop		With proper protection and stoppage of illegal removal of biomass from the forest blocks the area with regain its original statues.	5.5
	Silvicultural system		As the forest included in this working Circle are to be protected without any scientific working. There is no need to prescribe any silvicultural system.	5.6
	Protection Cycle		Since the protection is to be given around the clock, there is no need for any cycle. However, adequate soil and moisture conservation measures shall be taken up year wise to check the soil erosion as well as to increase the water regime of the soil.	5.8
	Method of execution of protection operation	1	Engagement of anti- smuggling squad	5.9
		2	Strengthening of infrastructure	
		3	Fire protection measures	
		4	Strengthening of communication system	
		5	Strengthening of intelligence network	
		6	Incentives & rewards	

		7	Adequate soil & moisture conservation measures to be taken up to reduce the erosion and to retain the top soil measures like gully plugging, loose boulder check dams, contour bonds, vegetative bonds, staggered trenches, nala bonding & percolation tanks are prescribed in soil erosion prone areas.	
	Control		All the works undertaken should be entered in the respective compartment history files with the results obtained for further analysis and references.	5.10
	Misc. regulation	1	Monitoring & evaluation	5.11
		2	Peoples participation	
	Cost norm		Cost norm for implementation of prescription for Keonjhar (WL) Division.	5.12
	Interim revision		No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans.	5.13
Joint Forest Management (overlapping) Working circle.	General constitution.		JFM is conceptualized for protection, conservation and management of natural forest by forest department and local people combindly.	6.1
	General character of vegetation		The vegetation in general is in degraded condition due to excessive biotic pressure on forests. With formation of VSS and assignment of these degraded forest to village most of the biotic pressure will be reduced and encourage rejuvenation of crop.	6.2
	Special objectives	1	To restock the under stocked forest through ANR & afforestation	6.3
		2	To protect the forest from fire, grazing and illicit quarrying with active supervision of villagers	
		3	To enhance productivity rough proper SMC measures	
		4	To treat communities as stake holder in forest production and management.	
		5	To recreate green cover over barren area with peoples participation.	
		6	To create formidable condition for habitat and multiplication of Wildlife	
		7	To create income generation of villagers upon protection of Forest	
	Analysis & valuation of crop		The concept of JFM has vast impact on the social life of the people.	6.4
	Allotment of area		A total area of 9717.24 ha. has been allotted to this Working Circle which includes 121 no. VSS area of 9306 ha. and 56no. VF area of 411.24Ha.	6.5

	Silvicultural system		As this Working circle is a over lapping working circle, hence the Silvicultural system to be followed depends on the prescription outlined for the main working circle to which the block is primarily allotted. The system of working in these particular areas are to be guided by the micro-plan prepared in conformity with the prescription of the main working circle jointly by Forest department and VSS.	6.6
	Choice and species		Choice of species in the plantation of JFM areas should be as per need of local people and as per VSS resolution.	6.7
	Calculation of yield		As felling of exploitable Green trees are prohibited in JFM working circle, only uprooted, deed and illicit felled trees are to be marked for felling. Hence, yield calculation is not applicable to this working circle.	6.8
Joint Forest Management (overlapping) Working circle.	Method of execution	1	Preparation of micro-plan as per PRA exercises	6.9
		2	Protection mechanism	
		3	Rejuvenation & development process	
		4	Benefits & usufruits	
		5	Motivation	
		6	Capacity building	
		7	Supportive activities	
		8	Expansion of JFM	
	Status of JFM		Though report says positive impact on forest after enforcement of JFM policies, but still performance of the most of the VSS is not up to mark.	6.10
	Method of Treatment		Weed Eradication,Plantation, Fire Protection, NTFP Value addition and linkage,Establishment of Self Help Groups and promoting Micro Credits Encouraging Corporate Investments in Forestry,Provision of Energy Efficient Chullas/LPG Gas,social sector schemes, Regular health camp	6.11
	Control		All the areas assigned to VSS should be marked in Topo Sheets. The works taken up in the VSS area should be entered in the compartment history.	6.12
	Miscellaneous regulation	1	Monitoring & evaluation	6.13
		2	Review	
		3	Reward	
		4	Conflict resolution	
		5	Convergence with other rural development activities.	

		6	Publicity	
	Rights & concession		Rights & concessions in this working circle shall be regulated in accordance with the provisions of relevant Gazette Notification of the respective Forest blocks and the Govt. of Odisha policy with regard to JFM.	6.14
	Cost norm	1.	Cost norm for Keonjhar (WL) Division	6.15
	Interim Revision		No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans	6.16
Non Timber Forest Produce (overlapping) Working circle.	General constitution.		This working circle overlaps the entire working plan area.	7.1
	General character of vegetation		Detailed description of vegetation is provided in chapter –II of Part-I	7.2
	Special objectives of management	1	To nurture the crop having NTFP potentiality through suitable silvicultural technique	7.3
		2	To protect and plant NTFP trees	
		3	To promote value addition to the raw materials collected.	
		4	To ensure fair price to the primary collectors.	
		5	To ensure peoples participation in all activities relating to propagation and regeneration	
		6	To explore scientific utility of NTFP & medicinal herbs found abundant	
		7	To develop skills for sustainable collection, extraction and utilization of various NTFP	
	Allotment of area		Since the circle covers the entire working plan area, no separate brake up given.	7.4
	Analysis and valuation of crop.		No systematic study has been done till now to assess the potential of various NTFP items and its importance in the rural life	7.5
	Method of treatment for major NTFP		The detailed method of treatment of NTFP species like Bel, Char, Harida, Bahada, Amla, Sal seed, Tamarind, Kusum, Karanja seed, Sal leaf, Mahula flower, Siali fibre, Dhatki, Hillbroom, Neem has been discussed	7.7
	Management of NTFP		Active management of NTFP collection and utilization can help to maintain Eco system complexity & also play an important role in restoring biodiversity	7.8
	Present status of exploitation		NTFPs are still being extracted from the natural forest haphazardly.	7.9
	Method of execution	1	Plantation of NTFP species	7.10
		2	Augmentation of regeneration of NTFP species in compartment having good regeneration	

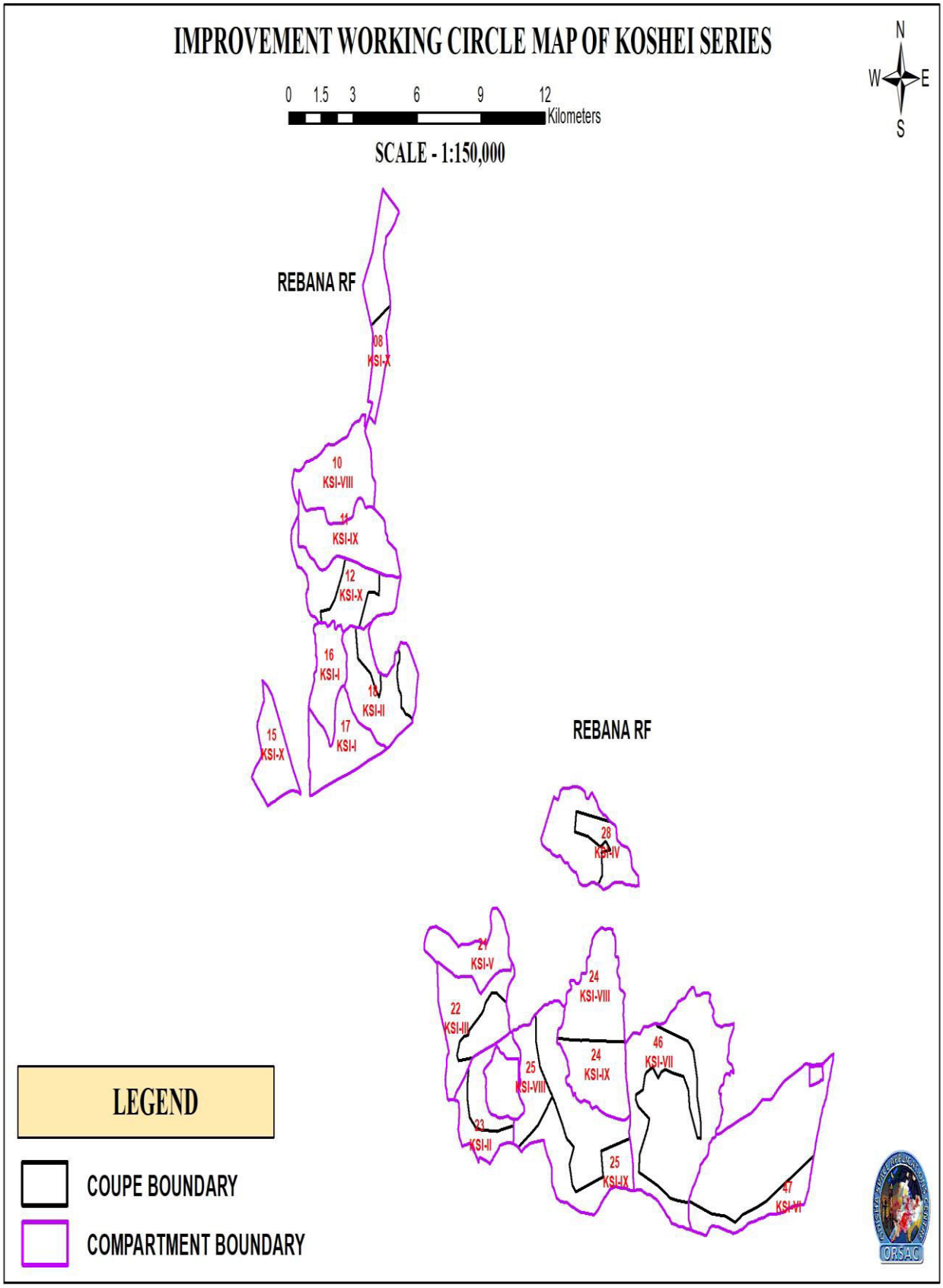
		3	Awareness- People should be well aware about the scientific harvesting procedure, grading, storage, value addition and marketing.	
		4	Market linkage to different institutions	
	Control		All the works undertaken should be entered in the respective compartment history files with the results obtained for further analysis and references.	7.11
	Miscellaneous regulation	1	Reasonable restriction on collection of barks, roots, seeds & leaves which damages the growth of trees and affect Bio-diversity	7.12
		2	No free & indiscriminate grazing	
		3	Plantations of NTFP species, Medicinal herbs & shrubs can be taken up as per the site-specific scheme.	
		4	No felling of NTFP yielding species unless dead and uprooted	
		5	Collection/exploitation of specified NTFPs to be done in a rotational manner to avoid over exploitation.	
	Rights & Concessions		Rights & concessions of local people shall be regulated in accordance with relevant Rules in force.	7.13
	Cost norm		Cost norm for implementation of prescription for Keonjhar (WL) Division	7.14
	Interim Revision		. No major change in the prescription is anticipated. However, prescriptions may be reviewed after 5 years jointly by the Regional Chief Conservator of Forests, Baripada Circle and the Chief Conservator of Forests, Working Plans.	7.15
Wildlife Overlapping Working circle.	General constitution		This is an over lapping working circle & covers the entire area in this plan	8.1
	Character of vegetation		The Bio-diversity of Flora & Fauna has been adversely affected due to considerable degradation of forests over the years.	8.2
	Special objectives of management	1	To conserve, protect & improve wildlife habitat with special emphasis on proposed Elephant corridor.	8.3
		2	To promote wild life in general & endangered species of Fauna in particular.	
		3	To create awareness among local people about protection of wild life	
		4	To conserve/develop important habitat for eco-tourism	
		5	To increase in Bio-diversity wildlife population in the Divisions	
		6	To prevent wildlife related crimes	
	Analysis &	1	All Age classes of Wildlife are seen	8.4

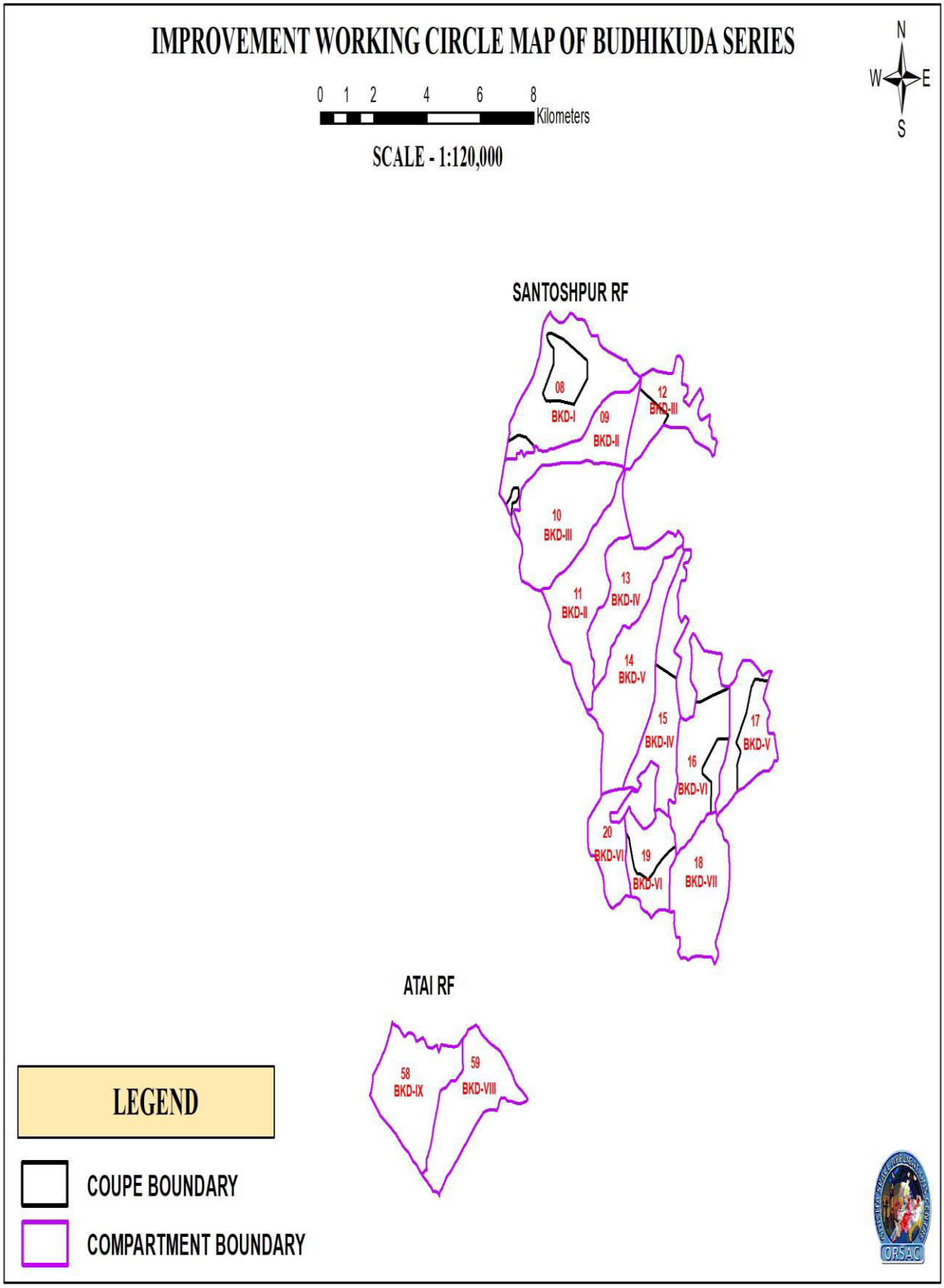
	Valuation of Crop	2	Status of Multiplication not reflected by census report	
	Area allotment		All the forest block included in this plan have been allotted to this working circle	8.5
	Injuries to which fauna is liable		Poaching, forest fire, foot and mouth disease of livestock, poisoning, electrocution, snaring, trapping of animals disturbing eggs on nests of birds and reptiles are the main injuries to faunas	8.6
	Method of treatment	1.	Preventive Measures : i. Creation of public awareness ii. Immunization of cattle iii. Strengthening of information system iv. Training to front line staff	8.7
		2.	Remedial Measures : i. Maintenance of habitat ii. Habitat improvement iii. Creation of waterholes iv. Grassland development v. Provision of saltlicks vi. Periodical census of wildlife	
		3.	Control Measures : i. Anti poaching measures ii. Prevention of Forest fire iii. Enforcement of legal provisions of WPA - 1972 iv. Mitigation of man animal conflict	
	Specific Observation		Spotted deer are seen in large numbers in Baranga RF	8.8
	Miscellaneous regulation	1	Grazing	8.9
		2	Fire protection	
		3	Tourism	
		4	Rewards & Incentives	
		5	Mining Activities	
	Rights & concession		Rights & concessions under this working circle shall be regulated in accordance with the provisions of the OFA -1972, Wildlife (Protection) Act -1972 & Rules made there under and the Govt. policies in force.	8.10
	Cost norm		Working cost for Keonjhar WL Division.	8.11
	Interim Revision		Intermediate revision is not anticipated. However, if necessary prescriptions may be reviewed after five years by the RCCF (Territorial) in consultation with Chief Wildlife Warden, the Principal Chief Conservator of Forest, Odisha and Chief Conservator of Forest (Working Plan)	8.12
Ecotourism	Introduction		Tourism programme which is nature based and ecologically sustainable	9.1

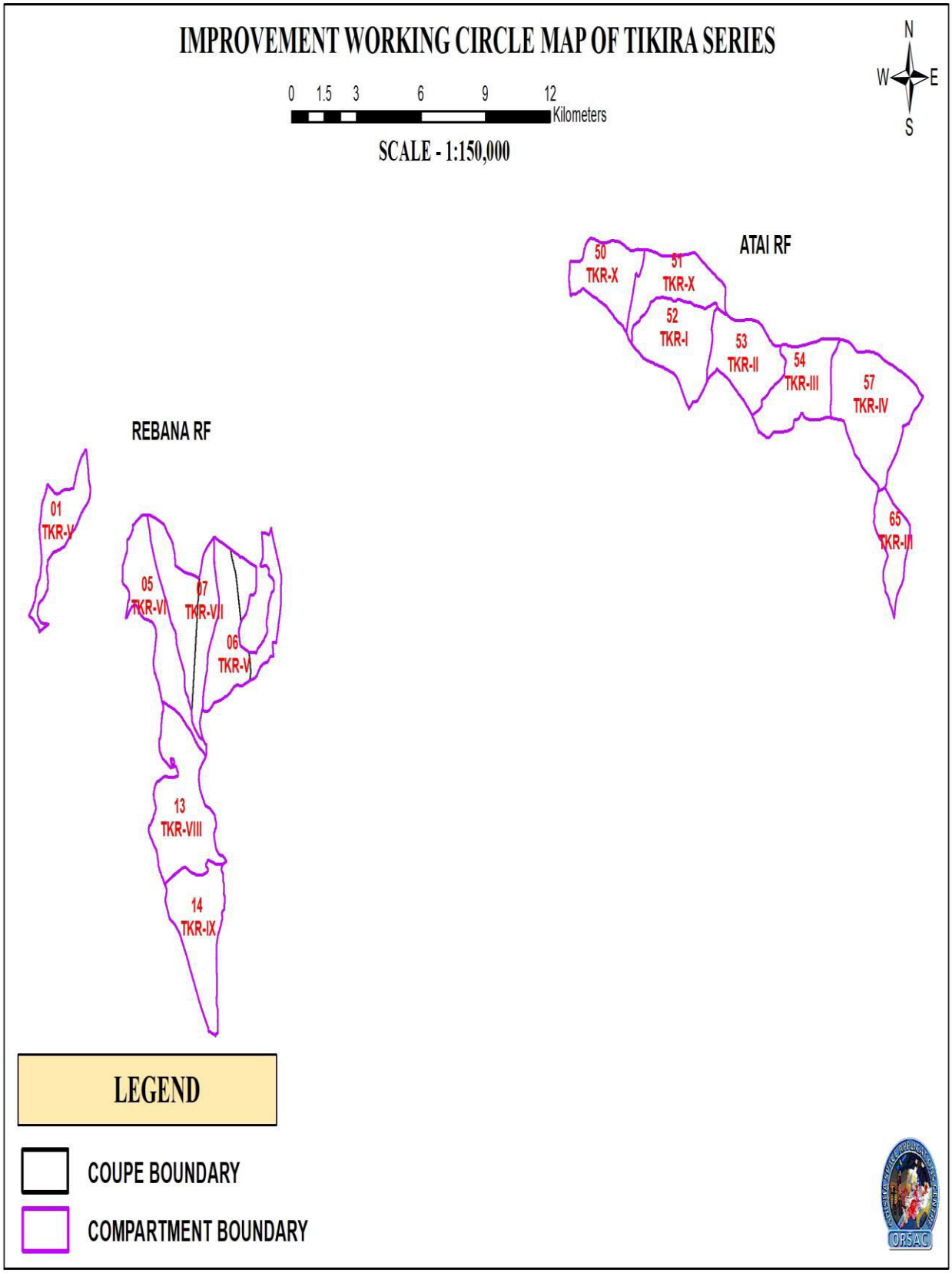
	Principle of Eco-tourism		1. It brings environmental and natural awareness and respect. 2. It protects the natural environment and creates social and economic benefit for local communities. 3. Provides positive experiences for both visitors and hosts. 4. Provide direct financial benefit for conservation	9.2
	Ecotourism sites		Ecotourism Sites at Gadachandi &Baranga RF	9.3
Miscellaneous Regulation	General considerations		Prescriptions given in different chapters has been emphasised.	10.1
	Forest consolidation		Consolidation of area under Compensatory Afforestation	10.2
	Maintenance of Forest Block Boundaries		The boundary pillars are required to be properly maintained in all forest blocks	10.3
	Irregular and petty felling		Irregular felling shall be discouraged & petty felling for scientific investigation, creation of new fire lines & preparation of new nursery sites should be allowed	10.4
	Disposal of seized produce		guidelines issued by the Govt. vide their Letter No. 10F(TR)-23/02-15398/F&E dt. Bhubaneswar, the 31st August'2005 shall be followed	10.5
	Deviation		Any unusual operation from target, like target for plantation, and other activities provided in control forms of the Working Plans constitutes a deviation	10.6
	Construction of Roads/Link Roads		Construction of roads/link roads passing through the forest shall not be allowed prior to the approval of competent authority	10.7
	Forest fire Protection		Annual maintenance of fire line, meeting with VSS, entry of people for MFP should be restricted.	10.8
	Grazing regulation		Lopping should be discouraged. Plantations shall be closed for grazing for 5 years. Awareness creation amongst villagers for high yielding cattles, stall feeding encouraged.	10.9
	Encroachment		The existing encroachments should be marked immediately on the field	10.10
	Maintenance of buildings		Buildings should be maintained properly	10.11
	Maintenance of Compartment History & Control Forms		The compartment history of all the compartments has been prepared de novo and given in duplicate to the DFO for use in his Division	10.12
	Establishment of Central Nursery		Central nursery should be established.	10.13
	Maintenance of Maps		Divisional maps of stand and stock etc. should be preserved	10.14
	Protection from Illegal Theft		1. Maintenance of Forest Road 2. Maintenance of communication 3. Forest protection squad 4. Improvement of Intelligence network 5. Awareness creation among the VSS	10.16
	Forest Right Act		To overcome various difficulties, it is proposed to demarcate all the areas settled under FRA'2006 within coming 3 years	10.17

Science & Research	Permanent Sample Point		Out of 294 sample points 30nos. of Permanent Sample points are maintained.	11.2
	Regeneration Plot		Out of 30 permanent sample points 5 nos of plots having good regeneration selected as regeneration plots	11.3
	Preservation plot		Preservation plots for Kangada at Comp.no.30 of Rebana RF, for Dhaura at Palaspal RF, for Sal at Baranga RF are selected.	11.4
Climate Change & REDD+	Climate Change		Climate Change is defined as a change of climate which is attributed directly or indirectly to human activity and alters the composition of global atmosphere so which is in addition to natural climate variability observed over comparable time periods'.	12.1
	Importance of Forest for Climate change		Stabilise GHG concentration, act as sink for carbon	12.2
	REDD+		Reducing emission from deforestation and degradation along with conservation of forests has been recognised as a very innovative way to tackle climate change	12.3
Water Resource Management	Introduction		The availability and quality of water in many regions are now a days more threatened by overuse, misuse and pollution. Forest play an important role in producing and regulating fresh water flows	13.1
	Forest & Water		1. Forest recharges the ground water and provide clean drinking water. 2. Forest help in buffering & filtering of pollutants. 3. it regulates the rain fall.	13.2
	Climate change impact on forest & hydrology		Globally averaged combined land and ocean surface temperature data as calculated by a linear trend show a warming of 0.85° C in the period 1880 to 2012 (IPCC, 2013). Climate change has directly affected and is predicted to continue to affect the hydrologic cycle. Average precipitation rates are projected to decrease.	13.3
	Management of water		1.Temperature & Precipitation 2.Ground water level 3.Management Intervention	13.4
Tree outside forest	Introduction		All trees excluded from the definition of forest and other wooded lands.	14.1
	Green Mahanadi Mission		"Green Mahanadi Mission"- a flagship programme of the State Govt. to rejuvenate the catchment area and watershed area of four major rivers of the State namely Brahmani, Baitarani, Rushikulya and Banshadhara.	14.2
	Scope for Increasing TOF		Plantation around Farm pond: Distribution of seedlings for plantation in the embankment of pond	14.3
			Institutional Plantation : Plantation in the campus of offices, buildings, community centres.	

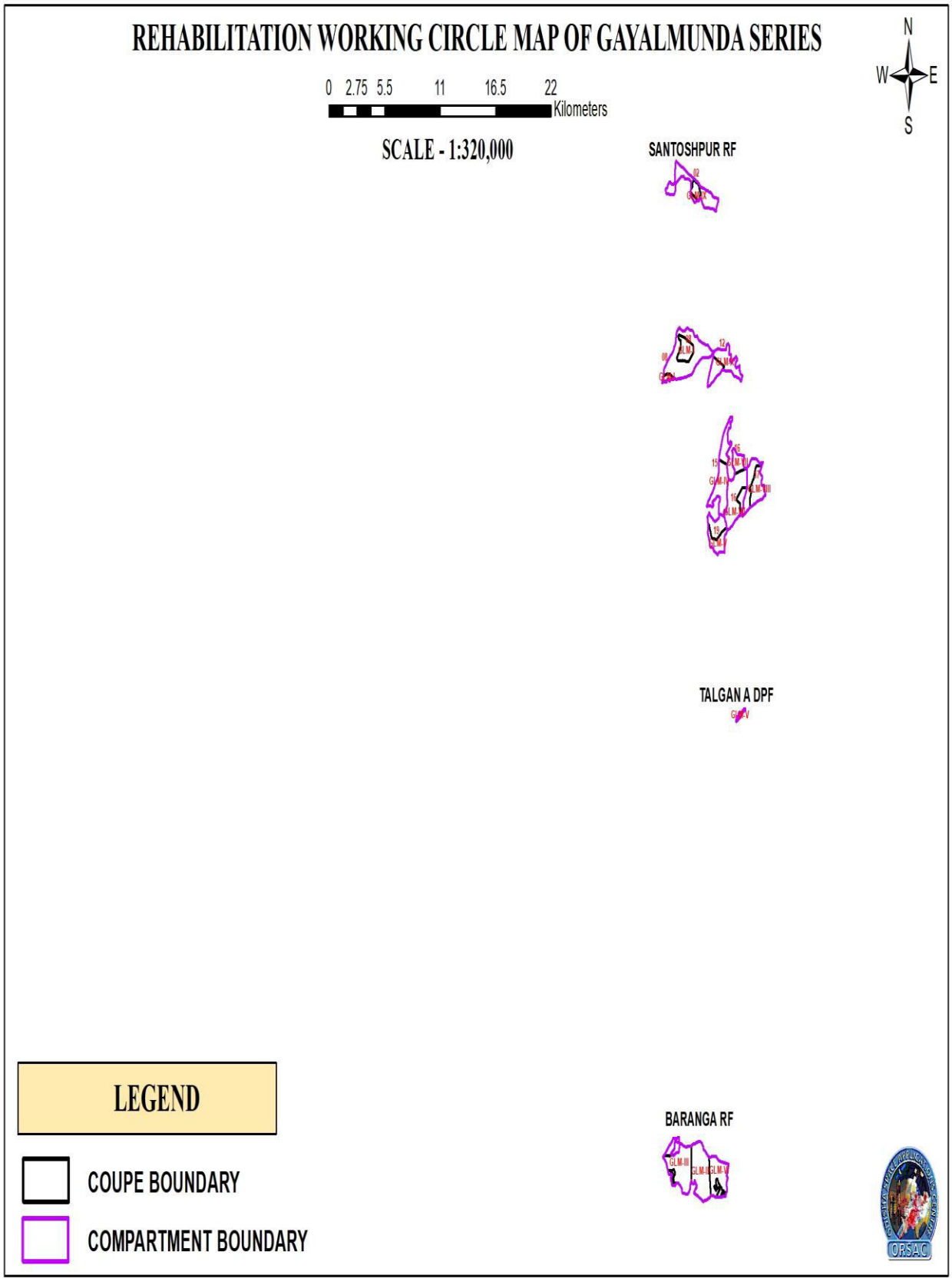
			Avenue Plantation : The tree outside forest area can be increased by taking up vast avenue plantation by the road sides available in Keonjhar (W.L) Division	
Financial Forecast and cost of the plan	General consideration		Tremendous biotic pressure coupled with continuous exploitation without conservation and development of forest leads to degradation of forests. As a result of which Rebana, Santoshpur, Atei which were managed under selection forest has changed to low density forest. Moreover, in today scenario when there is decrease in water regime of the forest and increase of dry spell, there is urgent need for artificial regeneration of forest by taking of massive plantations, creating SMC structures etc. Similarly, augmentation NTFP species, management of wildlife habitat above all participation of local people is required for overall management of forest. Hence, there is urgent to increase the allotment of forestry sector	15.1
	Basis of calculation		I. Building. II. Road. III. Rehabilitation working circle. IV. Plantation (O)working circle. V. Improvement working circle. VI. NTFP (O)working circle. VII. Wildlife (O)working circle. VIII. JFM (O) working circle. IX. Protection working circle. X. Boundary maintenance. XI. Forest consolidation. XII. Infrastructure development XIII. Misc. contingencies. XIV. Establishment of central nursery The total cost of plan comes to Rs.179.1Cr.	15.3

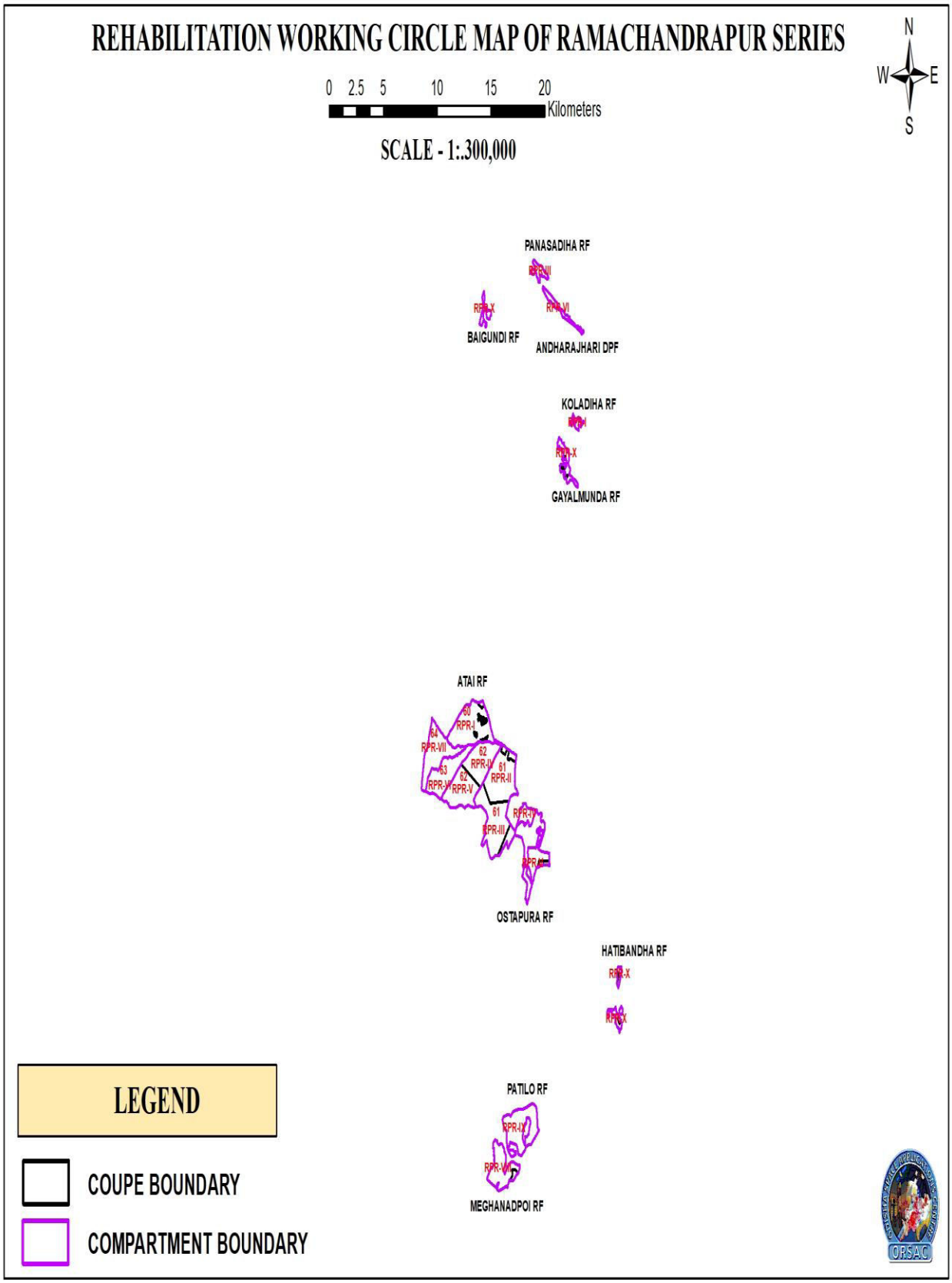

IMPROVEMENT WORKING CIRCLE MAP OF KOSHEI SERIES
0 1.5 3 6 9 12
Kilometers
SCALE - 1:150,000
N
W
E
S
REBANA RF
08 KSI-X
10 KSI-VIII
11 KSI-IX
12 KSI-X
16 KSI-I
18 KSI-II
17 KSI-I
15 KSI-X
REBANA RF
28 KSI-IV
21 KSI-V
22 KSI-III
24 KSI-VIII
24 KSI-IX
46 KSI-VII
25 KSI-VIII
23 KSI-II
25 KSI-IX
47 KSI-VI
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

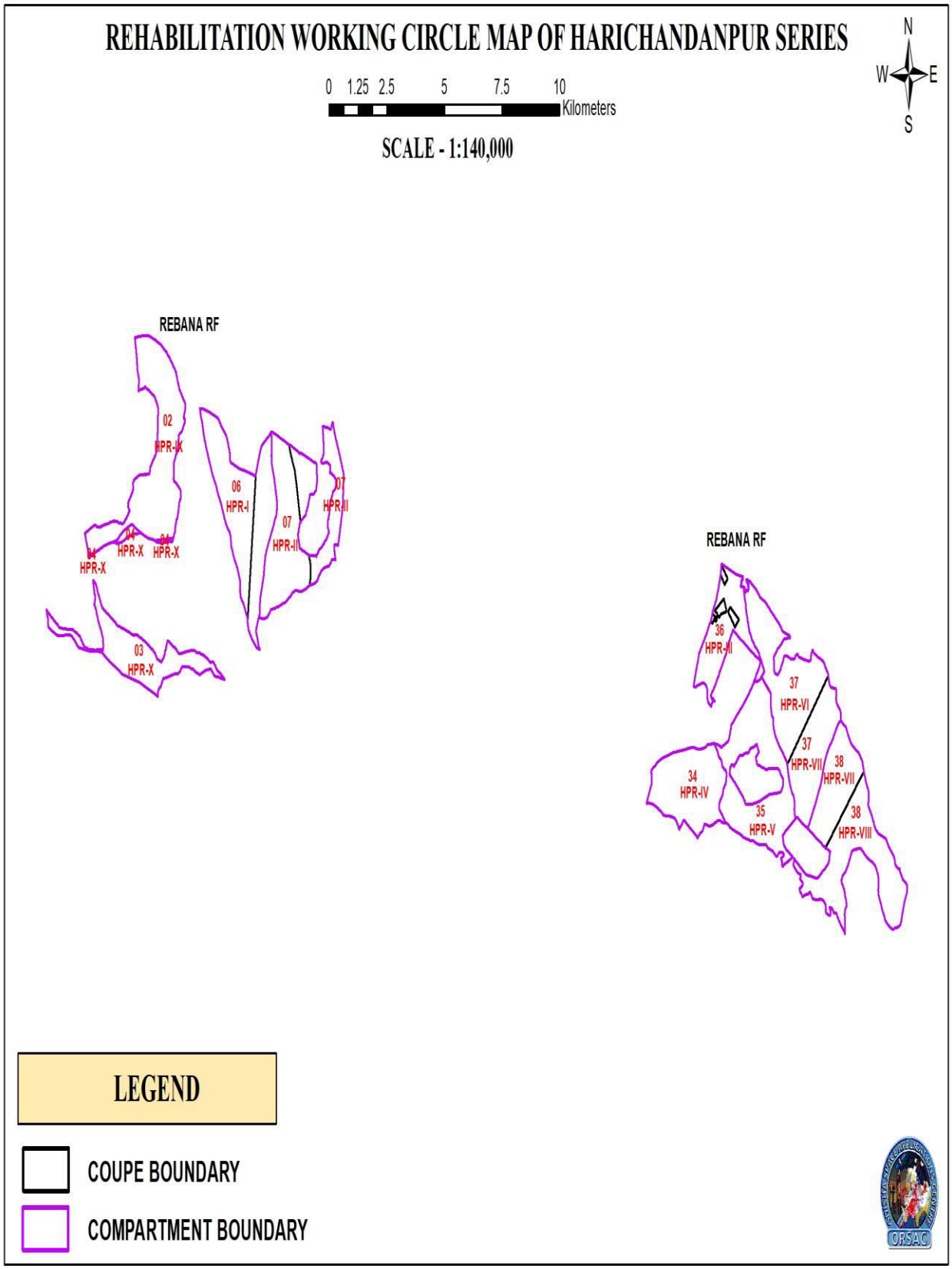

IMPROVEMENT WORKING CIRCLE MAP OF BUDHIKUDA SERIES
N
W
E
S
0 1 2 4 6 8
Kilometers
SCALE - 1:120,000
SANTOSHPUR RF
08
BKD-I
09
BKD-II
12
BKD-III
10
BKD-III
11
BKD-II
13
BKD-IV
14
BKD-V
15
BKD-IV
16
BKD-VI
17
BKD-V
20
BKD-VI
19
BKD-VI
18
BKD-VII
ATAI RF
58
BKD-IX
59
BKD-VIII
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

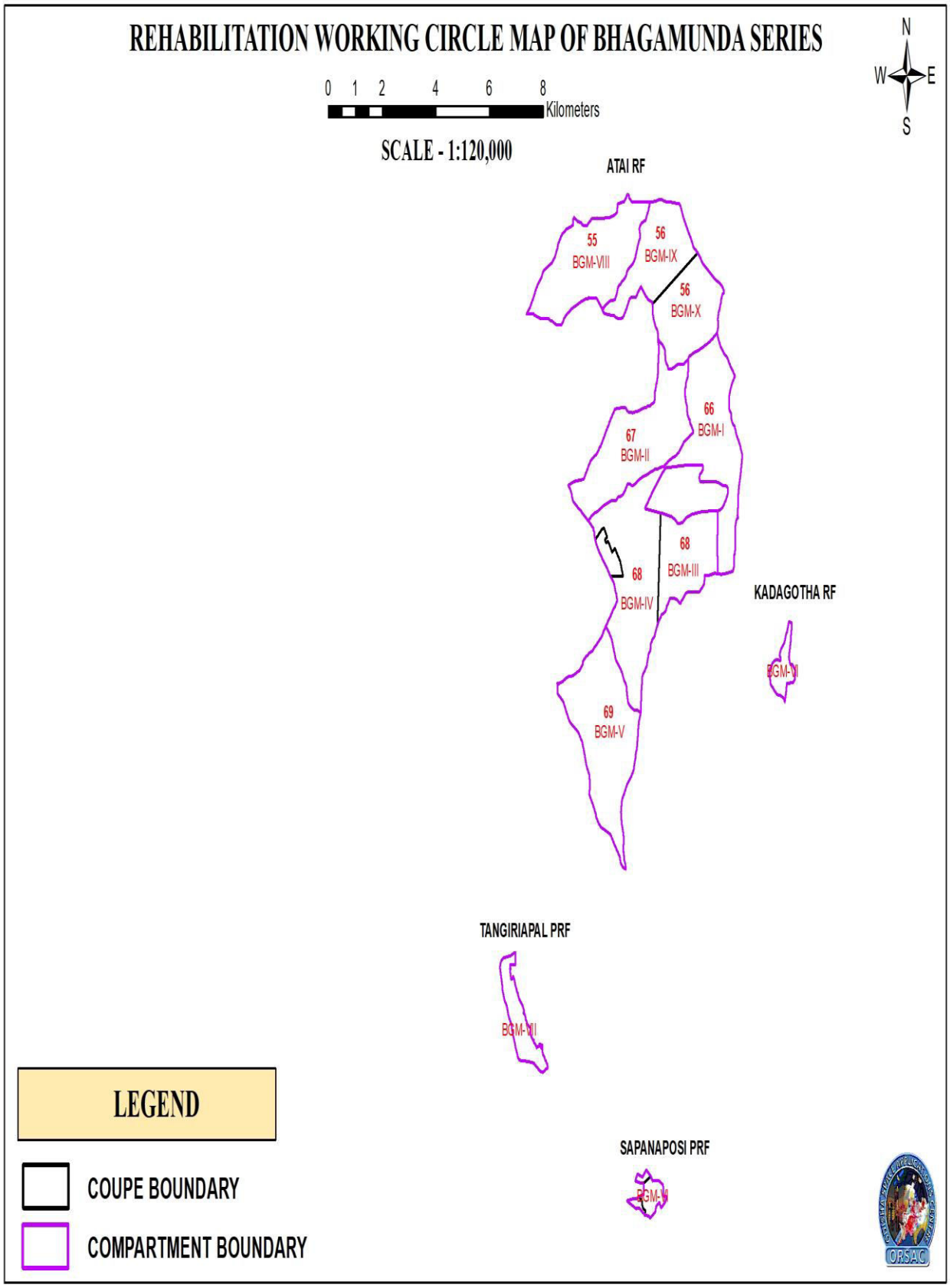

IMPROVEMENT WORKING CIRCLE MAP OF TIKIRA SERIES
0 1.5 3 6 9 12
Kilometers
SCALE - 1:150,000
N
W
E
S
ATAI RF
50 TKR-X
51 TKR-X
52 TKR-I
53 TKR-II
54 TKR-III
57 TKR-IV
65 TKR-I/I
REBANA RF
01 TKR-V
05 TKR-VI
07 TKR-VII
06 TKR-V
13 TKR-VIII
14 TKR-IX
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

REHABILITATION WORKING CIRCLE MAP OF GAYALMUNDA SERIES

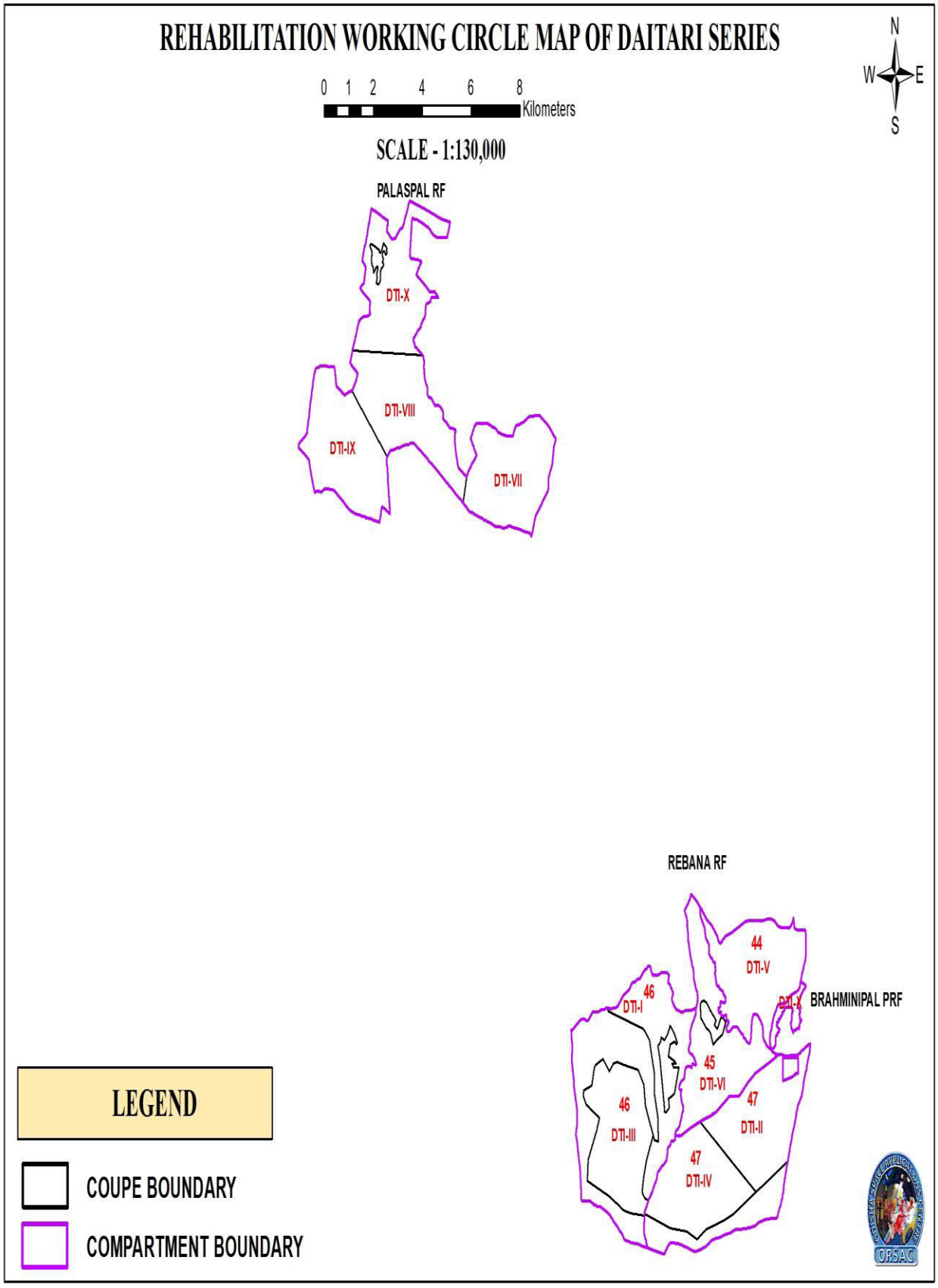


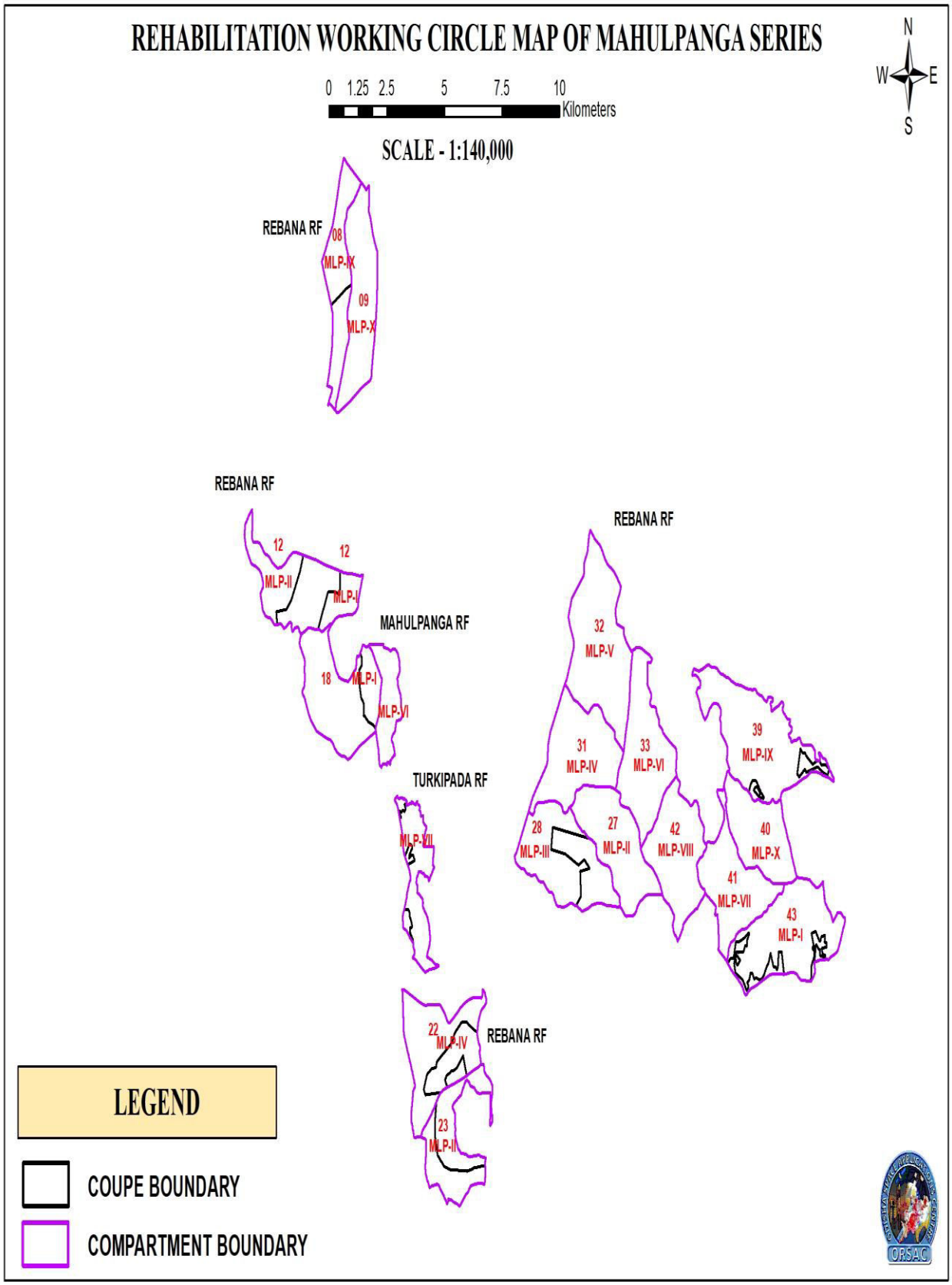

REHABILITATION WORKING CIRCLE MAP OF RAMACHANDRAPUR SERIES
N
W
E
S
0 2.5 5 10 15 20
Kilometers
SCALE - 1:.300,000
PANASADIHA RF
BAIGUNDI RF
ANDHARAJHARI DPF
KOLADIHA RF
GAYALMUNDA RF
ATAI RF
OSTAPURA RF
HATIBANDHA RF
PATILO RF
MEGHANADPOI RF
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

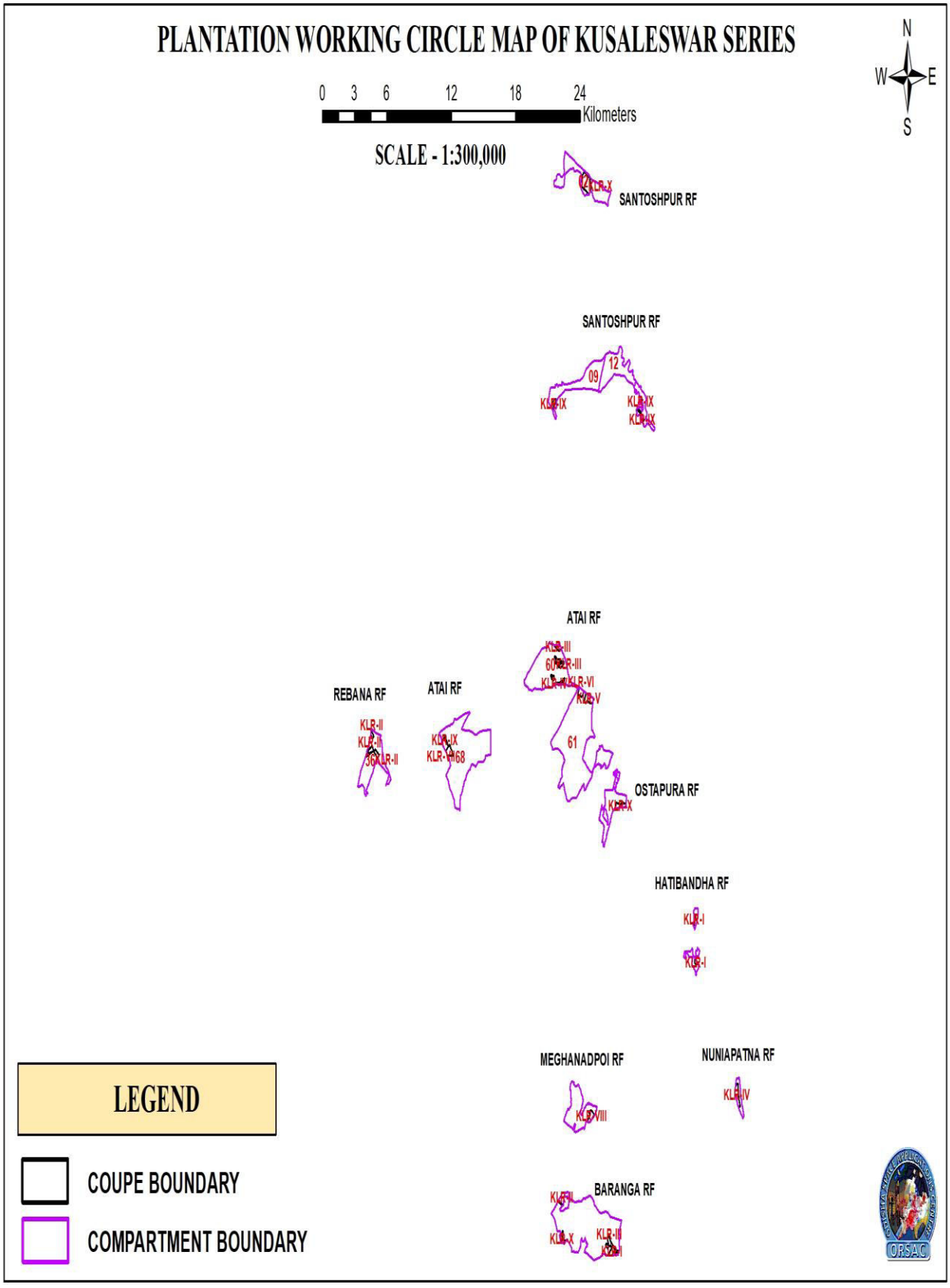

REHABILITATION WORKING CIRCLE MAP OF HARICHANDANPUR SERIES
N
W
E
S
0 1.25 2.5 5 7.5 10
Kilometers
SCALE - 1:140,000
REBANA RF
02
HPR-IX
06
HPR-I
07
HPR-II
07
HPR-II
04
HPR-X
04
HPR-X
04
HPR-X
03
HPR-X
REBANA RF
36
HPR-III
37
HPR-VI
37
HPR-VII
38
HPR-VII
34
HPR-IV
35
HPR-V
38
HPR-VIII
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

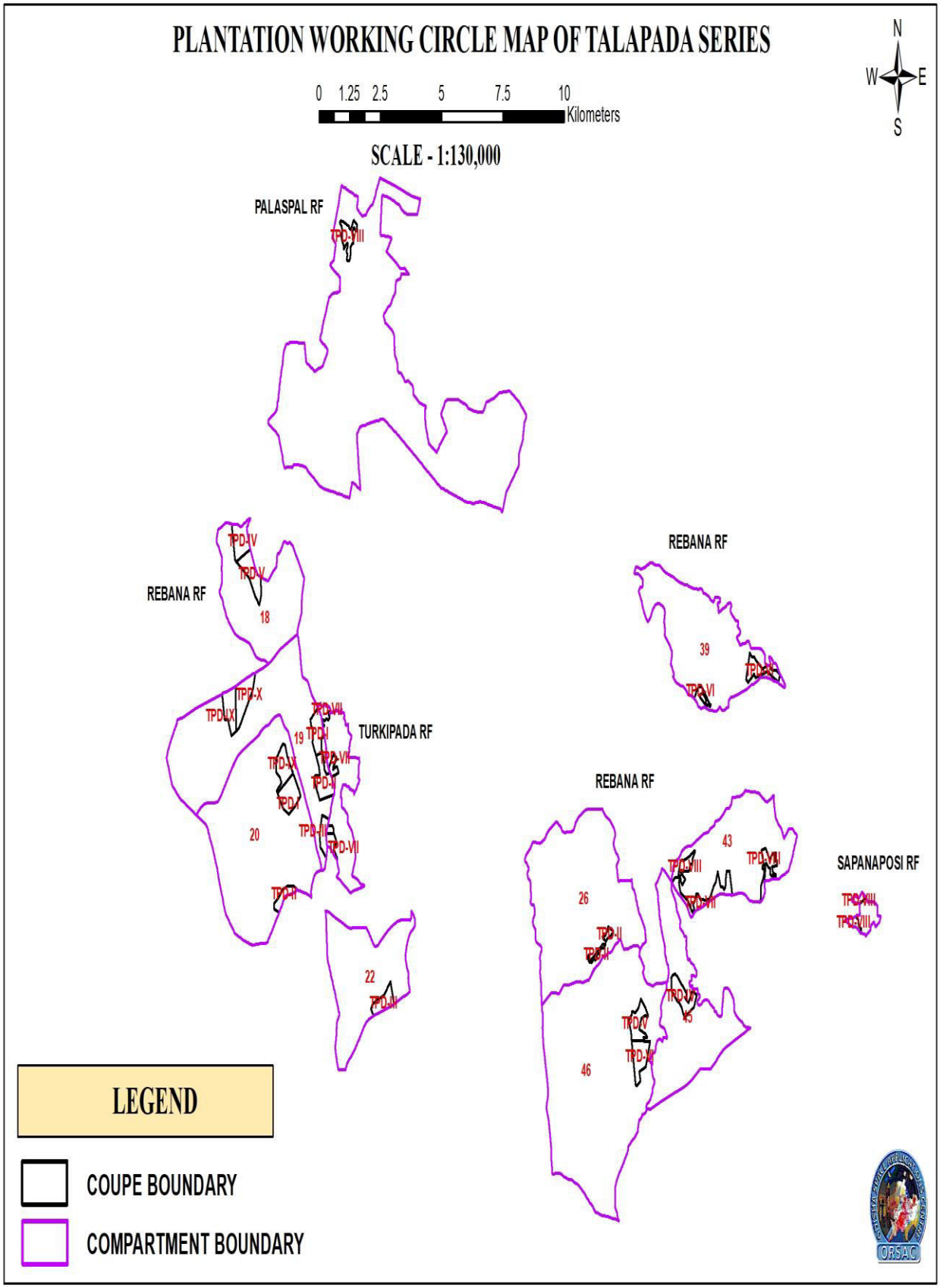

REHABILITATION WORKING CIRCLE MAP OF BHAGAMUNDA SERIES
0 1 2 4 6 8
Kilometers
SCALE - 1:120,000
N
W
E
S
ATAI RF
55
BGM-VIII
56
BGM-IX
56
BGM-X
66
BGM-I
67
BGM-II
68
BGM-III
68
BGM-IV
69
BGM-V
KADAGOTHA RF
TANGIRIAPAL PRF
SAPANAPOSI PRF
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

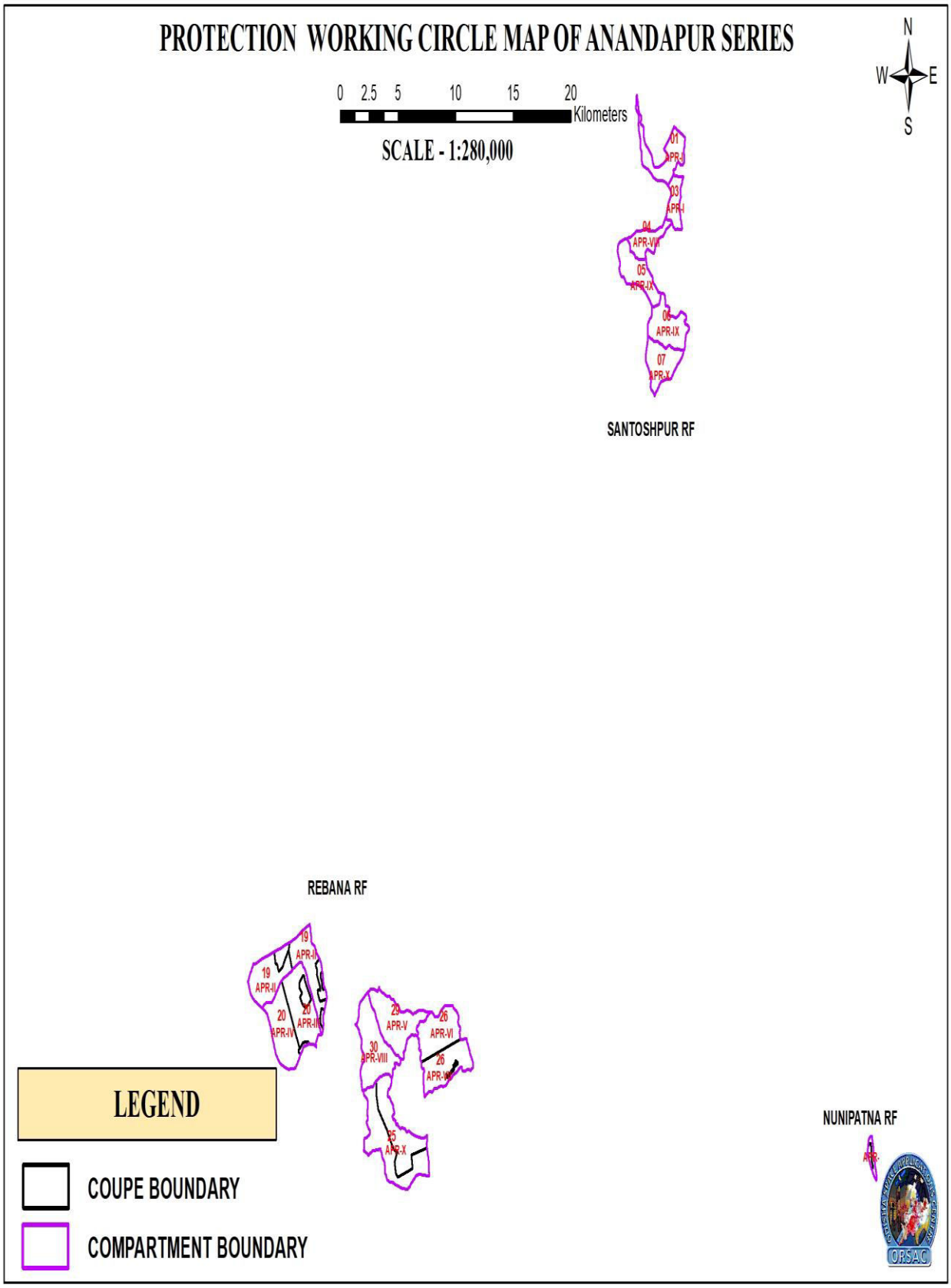
REHABILITATION WORKING CIRCLE MAP OF DAITARI SERIES




REHABILITATION WORKING CIRCLE MAP OF MAHULPANGA SERIES
N
W
E
S
0 1.25 2.5 5 7.5 10
Kilometers
SCALE - 1:140,000
REBANA RF
08
MLP-IX
09
MLP-X
REBANA RF
12
MLP-II
12
MLP-I
MAHULPANGA RF
18
MLP-I
MLP-VI
TURKIPADA RF
MLP-VII
REBANA RF
22
MLP-IV
23
MLP-II
REBANA RF
32
MLP-V
31
MLP-IV
33
MLP-VI
39
MLP-IX
28
MLP-III
27
MLP-II
42
MLP-VIII
40
MLP-X
41
MLP-VII
43
MLP-I
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC


PLANTATION WORKING CIRCLE MAP OF KUSALESWAR SERIES
N
W
E
S
0 3 6 12 18 24
Kilometers
SCALE - 1:300,000
SANTOSHPUR RF
SANTOSHPUR RF
09
12
ATAI RF
REBANA RF
ATAI RF
61
OSTAPURA RF
HATIBANDHA RF
MEGHANADPOI RF
NUNIAPATNA RF
BARANGA RF
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC


PLANTATION WORKING CIRCLE MAP OF TALAPADA SERIES
N
W
E
S
0 1.25 2.5 5 7.5 10
Kilometers
SCALE - 1:130,000
PALASPAL RF
TPD-VIII
REBANA RF
TPD-IV
TPD-V
18
TPD-X
TPD-IX
TPD-VII
19
TPD-I
TURKIPADA RF
TPD-IX
TPD-VII
TPD-I
TPD-I
20
TPD-II
TPD-VII
TPD-II
22
TPD-III
REBANA RF
39
TPD-VI
REBANA RF
43
TPD-VIII
TPD-VII
TPD-VII
SAPANAPOSI RF
TPD-XIII
TPD-VIII
26
TPD-II
TPD-II
TPD-VI
45
TPD-I
TPD-IV
46
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC


PROTECTION WORKING CIRCLE MAP OF ANANDAPUR SERIES
N
W
E
S
0 2.5 5 10 15 20
Kilometers
SCALE - 1:280,000
01 APR-I
03 APR-I
04 APR-VII
05 APR-IX
06 APR-IX
07 APR-X
SANTOSHPUR RF
REBANA RF
19 APR-I
19 APR-II
20 APR-IV
20 APR-III
29 APR-V
26 APR-VI
30 APR-VIII
26 APR-VII
25 APR-X
NUNIPATNA RF
LEGEND
COUPE BOUNDARY
COMPARTMENT BOUNDARY
ORSAC

VOLUME – II

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VOL-II

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Appendix-I

Details of Soil Sample Analysis in respect of 294 sample points									
Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
1	Rebana	1	KN	128	6	0.33	0.45	9	105
			KN	129	6	0.39	0.48	12	97
			KN	130	6.6	0.44	0.37	12	105
			KN	131	6.2	0.33	0.52	18	118
		2	KN	133	6	0.37	0.64	12	112
			KN	135	6.4	0.47	0.29	12	78
			KN	137	6.6	0.29	0.48	12	96
		3	KN	138	6.1	0.44	0.36	12	215
			KN	139	6.6	0.47	0.43	9	101
			KN	143	6.3	0.39	0.57	12	105
		4	NA						
		5	KN	152	5.6	0.44	0.62		
			KN	153	6	0.27	0.42	18	112
			KN	154	6.6	0.33	0.51	9	65
			KN	155	6.2	0.44	0.79	12	100
			KN	156	6.4	0.37	0.37	6	115
		6	KN	157	6	0.39	0.42	3	88
			KN	158	6.6	0.44	0.54	12	102
			KN	159	6.1	0.47	0.63	12	111
			KN	160	6	0.39	0.49	9	109
		7	KN	161	6.6	0.29	0.42	12	195
			KN	162	6.2	0.33	0.39	21	141
			KN	163	6.1	0.44	0.53	12	97
			KN	164	6	0.29	0.38	12	115
		8	KN	165	6.4	0.39	0.47	12	92
			KN	166	6.6	0.47	0.42	6	108
			KN	167	6.4	0.44	0.43	12	116
		9	KN	168	6.2	0.33	0.74	12	76
			KN	169	6.3	0.29	0.42	12	103
		10	KN	170	6.6	0.44	0.44	12	111
			KN	171	6	0.39	0.28	12	96
			KN	172	6.4	0.47	0.81	15	102
		11	KN	173	6.2	0.33	0.54	36	113
			KN	174	6	0.37	0.73	12	93
			KN	175	6.4	0.39	0.49	9	86
			KN	176	6.1	0.33	0.38	21	101

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
		12	KN	177	6.6	0.27	0.47	15	105
			KN	178	6.4	0.39	0.43	12	137
			KN	179	6.2	0.44	0.56	9	143
			KN	180	6.1	0.39	0.48	12	78
		13	KN	181	6.4	0.47	0.23	6	131
			KN	182	6.6	0.33	0.31	12	97
			KN	183	6.2	0.29	0.46	6	105
		14	KN	184	6	0.44	0.36	3	228
			KN	185	6.4	0.33	0.39	6	109
			KN	186	6.6	0.47	0.28	12	131
			KN	187	6.1	0.44	0.43	9	143
			KN	188	6.6	0.29	0.51	12	119
		15	KN	189	6.3	0.47	0.32	6	133
			KN	190	6	0.33	0.22	27	215
			KN	191	6.4	0.37	0.41	39	89
		16	KN	192	6.6	0.44	0.38	24	103
			KN	193	6	0.39	0.43	12	109
			KN	194	6.4	0.27	0.23	21	228
			KN	195	6.6	0.44	0.47	15	147
		17	KN	196	6	0.29	0.74	12	98
			KN	197	6.4	0.33	0.28	9	76
			KN	198	6	0.27	0.53	12	105
		18	KN	199	6.4	0.39	0.38	12	113
			KN	200	6.6	0.44	0.62	9	217
			KN	201	6.1	0.37	0.29	27	137
			KN	202	6.7	0.29	0.33	9	229
		19	KN	203	6.1	0.33	0.62	12	105
			KN	204	6.4	0.47	0.49	9	86
			KN	205	6.6	0.39	0.52	12	65
			KN	206	6.1	0.44	0.46	9	92
			KN	207	6.4	0.33	0.54	12	107
			KN	208	6	0.27	0.57	12	68
			KN	209	6.6	0.39	0.63	12	221
		20	KN	210	6.1	0.47	0.43	9	89
			KN	211	6	0.33	0.59	6	137
			KN	212	6.4	0.37	0.62	12	97
			KN	213	6.6	0.44	0.51	12	103
			KN	214	6.2	0.29	0.54	9	211

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
			KN	215	6	0.33	0.63	9	138
			KN	216	6.4	0.39	0.31	12	112
		21	KN	217	6.1	0.47	0.42	3	105
			KN	218	6.6	0.39	0.63	6	95
			KN	219	6.4	0.44	0.24	9	218
		22	KN	220	6.2	0.33	0.28	6	325
			KN	221	6.6	0.27	0.32	6	105
			KN	222	6	0.44	0.26	12	97
			KN	223	6.1	0.33	0.49	12	88
		23	KN	224	6.6	0.47	0.63	12	75
			KN	225	6.4	0.29	0.81	15	102
		24	KN	227	6.1	0.37	0.54	9	52
			KN	228	6.2	0.47	0.63	12	83
			KN	229	6	0.33	0.33	12	75
			KN	230	6.6	0.37	0.29	12	106
			KN	231	6.4	0.44	0.47	9	112
			KN	232	6.6	0.29	0.53	12	96
		25	KN	233	6.2	0.44	0.49	9	77
			KN	234	6.6	0.29	0.32	9	89
			KN	235	6.2	0.39	0.34	9	92
			KN	236	6	0.47	0.49	12	295
			KN	237	6.4	0.47	0.54	15	171
			KN	238	6.6	0.44	0.38	9	105
			KN	239	6	0.29	0.45	12	108
			KN	240	6.3	0.44	0.29	12	100
		26	KN	241	6.1	0.37	0.42	12	92
			KN	242	6.4	0.47	0.38	21	210
			KN	243	6	0.38	0.31	15	106
			KN	244	6.4	0.44	0.29	9	95
			KN	245	6.6	0.39	0.46	12	86
		27	KN	365	6.3	0.44	0.48	27	96
			KN	366	6.4	0.43	0.46	24	99
		28	KN	246	6.4	0.37	0.52	12	101
			KN	247	6.1	0.27	0.43	12	112
			KN	248	6.3	0.33	0.37	15	112
			KN	249	6.6	0.27	0.28	12	93
		29	KN	250	6.2	0.39	0.23	12	105
			KN	251	6	0.29	0.37	3	318
			KN	252	6.4	0.47	0.64	2	146
			KN	253	6.6	0.29	0.39	18	73

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
		30	KN	254	6	0.44	0.26	12	90
			KN	255	6.2	0.47	0.43	12	105
			KN	256	6.4	0.39	0.59	12	115
			KN	257	6	0.44	0.71	12	141
			KN	258	6.6	0.27	0.54	3	78
		31	KN	259	6	0.44	0.43	21	99
			KN	260	6.2	0.39	0.29	36	148
		32	KN	261	6.4	0.39	0.61	12	86
			KN	262	6.6	0.29	0.58	9	75
		33	KN	263	6.4	0.44	0.51	12	63
			KN	264	6.2	0.33	0.37	12	98
			KN	265	6.6	0.37	0.28	6	101
		34	KN	266	6.4	0.47	0.59	12	95
			KN	267	6.6	0.44	0.32	6	79
		35	KN	268	6.4	0.27	0.59	12	86
			KN	269	6.6	0.37	0.42	9	141
		36	KN	271	6.2	0.39	0.71	12	79
		37	KN	272	6.4	0.29	0.36	21	108
			KN	273	6	0.44	0.47	9	93
		38	KN	274	6.4	0.39	0.38	15	89
			KN	275	6.1	0.29	0.57	27	78
		39	KN	276	6.4	0.39	0.29	9	101
			KN	277	6.4	0.44	0.28	9	100
		40	KN	278	6.6	0.27	0.68	15	98
		41	KN	279	6.6	0.29	0.67	12	141
		42	KN	280	6	0.47	0.58	15	189
			KN	281	6.4	0.27	0.42	12	121
		43	KN	282	6.4	0.27	0.34	9	108
			KN	283	6.2	0.39	0.29	6	205
		44	KN	284	6.4	0.37	0.68	9	98
		45	KN	285	6.1	0.33	0.28	6	201
			KN	364	6.1	0.47	0.53	15	187
			KN	367	6.1	0.42	0.49	12	194
		46	KN	286	6.1	0.44	0.21	6	115
			KN	287	6.4	0.33	0.41	6	96
			KN	288	6.6	0.47	0.49	12	86
			KN	289	6.6	0.37	0.67	12	95
			KN	290	6.4	0.29	0.56	3	104
			KN	291	6.7	0.27	0.39	9	115
		47	KN	292	6	0.39	0.43	6	93
			KN	293	6.4	0.47	0.54	9	88

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
			KN	294	6.2	0.33	0.63	18	105
			KN	295	6.4	0.39	0.34	12	105
			KN	296	6.4	0.47	0.29	18	86
2	Atei	50	KN	1	6.3	0.37	0.68	9	109
			KN	2	6.5	0.33	0.71	15	98
		51	KN	3	6.1	0.27	0.29	24	148
			KN	4	6.3	0.44	0.43	27	217
		52	KN	5	6.1	0.29	0.41	9	102
			KN	6	6	0.47	0.57	9	93
			KN	7	6.1	0.33	0.69	9	167
			KN	8	6	0.27	0.32	18	221
		53	KN	9	6.4	0.44	0.45	24	109
			KN	10	6.2	0.39	0.57	15	211
			KN	11	6.6	0.47	0.69	9	185
		54	KN	12	6	0.27	0.29	18	64
			KN	13	6.4	0.27	0.34	6	105
			KN	14	6.3	0.39	0.48	6	98
		55	KN	15	6	0.47	0.61	12	209
			KN	16	6.2	0.27	0.29	9	77
			KN	17	6.1	0.47	0.42	15	102
		56	KN	18	6.6	0.44	0.45	9	133
			KN	19	6.6	0.29	0.38	21	115
			KN	20	6.2	0.29	0.36	36	145
		57	KN	21	6.4	0.47	0.47	9	78
			KN	22	6.6	0.39	0.68	6	87
			KN	23	6.3	0.27	0.29	12	226
			KN	24	6	0.44	0.26	15	113
			KN	25	6.1	0.39	0.33	15	210
		58	KN	26	6.4	0.47	0.3	12	119
			KN	28	6	0.29	0.41	12	78
			KN	29	6.6	0.37	0.4	12	120
		59	KN	30	6.2	0.44	0.28	3	215
			KN	31	6.4	0.33	0.62	12	163
			KN	32	6	0.27	0.77	12	104
		60	KN	33	6.6	0.29	0.56	9	98
			KN	34	6.1	0.27	0.95	12	95
			KN	35	6.5	0.33	0.28	6	86
		61	KN	36	6.3	0.29	0.42	6	103
			KN	37	6.6	0.33	0.36	3	113
			KN	38	6.1	0.44	0.54	6	142

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
		62	KN	39	6.5	0.39	0.63	9	105
			KN	40	6.2	0.47	0.29	12	116
			KN	41	6.6	0.39	0.68	6	77
		63	KN	42	6.4	0.44	0.37	3	108
			KN	43	6.5	0.39	0.54	21	97
		64	KN	44	6.1	0.44	0.92	36	114
			KN	45	6.4	0.37	0.36	54	230
		65	KN	46	6	0.29	0.84	21	76
		66	KN	47	6.4	0.33	0.29	12	105
			KN	48	6.6	0.27	0.43	12	92
		67	KN	49	6.2	0.44	0.53	9	95
			KN	50	6.6	0.27	0.43	9	134
		68	KN	51	6	0.39	0.69	9	205
			KN	52	6.7	0.29	0.36	12	147
		69	KN	53	6	0.33	0.43	3	89
			KN	54	6.4	0.44	0.52	9	113
3	**Santoshpur**	1	KN	297	6.6	0.44	0.43	12	95
			KN	298	6	0.39	0.69	9	99
			KN	299	6.4	0.44	0.48	9	101
			KN	300	6.4	0.37	0.39	12	77
		2	KN	301	6.2	0.27	0.57	12	131
			KN	302	6.4	0.39	0.38	12	103
		3	**KN**	**303**	**6**	**0.37**	**0.52**	**3**	**81**
			KN	304	6	0.44	0.42	12	**118**
		4	KN	306	6.4	0.39	0.57	12	**246**
			KN	307	6	0.27	0.65	3	**93**
		5	KN	308	6.2	0.33	0.28	9	**105**
			KN	309	6	0.29	0.21	9	**116**
			KN	310	6.4	0.33	0.32	12	**72**
		6	**KN**	**311**	**6.2**	**0.47**	**0.38**	**12**	**227**
			KN	312	6.4	0.47	0.38	9	102
			KN	313	6.4	0.44	0.67	12	93
			KN	314	6.6	0.27	0.44	9	105
		7	KN	315	6.6	0.47	0.37	12	96
			KN	316	6.1	0.39	0.4	15	97
			KN	317	6.4	0.27	0.32	9	56
		8	KN	318	6	0.29	0.61	12	86
			KN	319	6.6	0.44	0.36	9	99
			KN	320	6.4	0.37	0.67	9	103
			KN	321	6	0.39	0.49	9	212
		9	KN	322	6.6	0.33	0.42	6	103

Sl. No.	RF	Compartment No.	Soil Sample No.		PH	EC	OC	P	K
			KN	323	6	0.39	0.38	12	96
			KN	324	6.4	0.47	0.46	12	112
		10	KN	325	6	0.33	0.58	27	178
			KN	326	6.6	0.27	0.49	9	71
			KN	327	6.6	0.27	0.44	9	111
		11	KN	328	6.2	0.33	0.41	9	102
			KN	329	6.4	0.44	0.38	6	104
			KN	330	6.4	0.29	0.37	9	68
			KN	331	6.2	0.47	0.43	12	89
		12	KN	332	6.6	0.37	0.61	9	104
		13	KN	334	6.6	0.39	0.57	12	102
			KN	335	6.6	0.37	0.37	9	76
			KN	336	6	0.4	0.68	9	99
		14	KN	337	6	0.29	0.42	12	97
			KN	338	6.1	0.47	0.57	9	98
			KN	339	6	0.39	0.69	9	109
			KN	340	6.4	0.37	0.56	3	86
		15	KN	341	6.6	0.39	0.38	9	79
			KN	342	6.2	0.39	0.29	12	74
		16	KN	343	6.2	0.27	0.29	6	127
			KN	344	6.1	0.39	0.29	9	86
			KN	345	6.4	0.33	0.57	9	109
			KN	346	6.6	0.44	0.36	15	77
		17	KN	347	6.1	0.39	0.44	9	83
			KN	348	6.4	0.47	0.48	12	95
		18	KN	349	6.2	0.33	0.36	12	89
		19	KN	350	6.1	0.44	0.45	6	90
		20	KN	351	6.2	0.37	0.29	9	88
			KN	352	6.4	0.39	0.27	12	152
4	Baranga		KN	56	6.6	0.47	0.34	6	86
			KN	57	6.4	0.44	0.28	12	107
			KN	58	6.6	0.47	0.36	12	92
			KN	59	6	0.27	0.48	12	86
			KN	60	6	0.29	0.43	9	93
5	Gayalmunda		KN	113	6.4	0.44	0.32	9	95
6	Mahulpanga		KN	114	5.9	0.39	0.67		
			KN	115	5.5	0.23	0.72		
7	Meghanadpahi		KN	116	6.4	0.29	0.32	12	104
8	Ostapura		KN	117	6	0.39	0.41	12	218
			KN	118	6.2	0.47	0.37	12	95
9	Palashpal		KN	119	5.8	0.42	0.62		

Sl. No.	RF	Soil Sample No.		PH	EC	OC	P	K
		KN	120	6.2	0.22	0.73		
		KN	121	6	0.47	0.71		
		KN	122	5.7	0.45	0.69		
		KN	123	6.3	0.37	0.58		
		KN	124	6	0.33	0.84		
		KN	125	5.9	0.25	0.79		
10	Patilo	KN	126	6.6	0.39	0.39	18	98
		KN	127	6.2	0.27	0.63	12	77
11	Baigundi	KN	305	6	0.24	0.61	3	105
12	Tangriapal PRF	KN	353	6.2	0.39	0.67	12	75
13	Turkipada	KN	354	6	0.44	0.62	12	109
		KN	355	6.6	0.39	0.41	3	211
		KN	357	6.4	0.44	0.53	9	329
		KN	358	6.6	0.33	0.29	9	83
14	Kadugotha	KN	359	6.1	0.27	0.37	9	125
15	Hatibandha	KN	360	6	0.44	0.66	12	96
		KN	361	6.2	0.29	0.43	12	78
16	Panasdiha	KN	362	6.4	0.33	0.61	21	221

Source: Soil Chemist, Keonjhar

NOTIFICATION : Appendix – II

The 28th March 1958

No. 10721—12-F.-(F.)/58-D.—In pursuance of sub-section (3) of section [illegible] of the Indian Forest Act, 1927 (XVI of 1927), as applied in its application to the State of Orissa the State Government do hereby certify that the documents mentioned in the schedule hereto annexed had been prepared under the authority of the Ruler of Keonjhar State before the date of merger and have been under the authority of the State Government continued to be recognised, maintained and acted upon thereafter.

SCHEDULE

(1) Revised Working Plan for the Reserved Forests of Keonjhar State for the years 1945—1965.

By order of the Governor
S. S MURTY
Secretary to Government

LABOUR DEPARTMENT

NOTIFICATION

The 28th March 1958

No. 2053—IF-39/57-Lab.—The following draft of certain amendments to the Orissa, Factories Rules, 1950 which the Government of Orissa propose to make in exercise of the powers conferred by section 112 of the Factories Act, 1948 (LXIII of 1948) is hereby published as required by section 115 of the said Act for the information of all persons likely to be affected thereby, and notice is hereby given that the draft will be taken into consideration on or after 7th July 1958.

Any objection or suggestion which may be received from any person in respect of the draft before the date specified will be considered by the State Government.

DRAFT AMENDMENT

In the proviso to rule 13 of the said Rules—

(*i*) after the words " that the powers " the following words shall be inserted, namely :—

" under this rule "

(*ii*) the words " the inspection of factories in respect of " shall be omitted.

By order of the Governor
B. B. BABU
Deputy Secretary to Government

ERRATUM

The 31st March 1958

No. 2123—IF.-42/56-Lab.—In the schedule to notification of Government of Orissa in the Labour Department No. 4542-Lab., dated the 24th July 1957 the passage occurring in column (5) beginning with "In the absence of a worker" and ending with "male adult worker" shall be read as occurring immediately below item (4) in the said column against 64 (2) (*d*) and 64 (3) " occurring in column (1) thereof.

The section 64 (2) (*d*) and 64 (3) appearing immediately below the section 64 (2) (*j*) and above the section 64 (2) (*l*) shall be deleted.

B. B. BABU
Deputy Secretary to Government

TRANSPORT DEPARTMENT

NOTIFICATION

The 22nd March 1958

No. 1738—TAR.-22/57-T.—In pursuance of sub-section (1) of section 44 of the Motor Vehicles Act, 1939 (IV of 1939), as subsequently amended, read with clause (*a*) [illegible] Orissa Motor Vehicles Rules, 1940, the further amendment shall be made in the notification of Government of Orissa in the Department of Transport No. 1890-TAR.-21/57-T., dated the 20th April 1957 subsequently amended, namely :—

AMENDMENT

In the said notification—

1. For the name " Pandit Lingaraj Misra, M. appearing in serial 4, the following namaes shall be substituted, namely :—

" Shri Karunakar Panigrhi of Balasore. "

By order of the Gove
K. SINGH
Secretary to Govern

HOME DEPARTMENT

NOTIFICATION

The 20th March 1958

No. 7611 Poll.—In exercise of the powers conferred section 9 of the Orissa Cinemas (Regulation) Act, Orissa Act 2 of 1954), read with sub-section (3) of se 5 thereof, the State Government do hereby make following amendments to the Orissa Cinemas (Regulat Appeal Rules, 1956, namely:—

AMENDMENTS

1. In rule 3 of said Rules the words and brac "Member (Excise) Board of Revenue, Cuttack" she substituted by the words "the Revenue Divis Commissioner, having jurisdiction".

2. For rule 4 of the said Rules the following rule be substituted, namely :—

4. All such appeals pending with the Member "Board of Revenue, Cuttack, on the date of this notification shall stand transferred to the Reve Revenue Divisional Commissioners, having jurisd and they shall dispose of them in such manner as think fit."

By order of the Go
P. N. MOHA
Secretary to Gover

POLITICAL AND SERVICES DEPARTME

NOTIFICATIONS

The 31st March 1958

No. 4610-Gen.—In exercise of the powers conferr clause (3) of Article 166 of the Constitution of Indi Governor of Orissa is pleased to direct that the f amendments shall be made in the Rules of B namely :—

AMENDMENTS

The existing first proviso to Rule 5 shall be subs by the following :—

"Provided that different Branches of a Departm different subjects under a Branch may be as different Ministers ".

The 31st March 1958

No. 4632—2R I-34/57-Gen.—In pursuance of the to Article 309 of the Constitution of India, the Gov Orissa is pleased to direct that the following am shall be made in the Orissa Administrative, Fina Police Services (Direct Recruitment) Rules, 1950.

The following should be added at the end Educational qualification of the said Rules :—

"Training in Territorial Army in addition dered as a desirable qualification for recruitm

By order o
N. M
Additional Sec

Appendix-III

Survival Report of Village Forest of Keonjhar (WL) Division :

Sl. No	Name of the Range	Village Forest	Area (In Ha.)	Gram Panchyat	Khata No.	Plot No.	Survival %	Remarks
1		Suan Pada	7.6	Ramachandrapur	58	885	4%	
2		Hasanpur	5	Hasanpur	226	1647, 1678	5%	
3		Bailo	5	Bailo	138, 140	473, 427	2%	
4		Tampo	5	Batto	218	178	5%	
5		Salapada (B)	102				38%	
6		Madanpur	7.52, 11.50	Madanpur	157	2480, 2481	35%	
7		Saladei	1.45	Saladei	415	2000	3%	
8		Godipatna	5	Madanpur	222	540, 23, 63	4%	
9		Sarei	5.04	Balarampur	42,226	2856,2863	35%	
10		Satatira	5.4	Madanpur	621,618, 620	2,192,197	40%	
11		Haridapal	5.43	Panchupali	102 10	80,82,195,196,197,206,214,215,218,198,234	30%	
12		KalaraGadia	0.44	Gohira	265	621	39%	
13		Golabandha	0.96	Codpada	147	709	35%	
14		Kundibahali	6	Gohira	228	247	35%	
15		Amranga	0.3	Dhokata	237	1314	10%	
16	Anandapur	Talagaon	8.64	Gohira	2,195, 266, 269, 253	395,138,2939, 2940,2873,139, 2921,140,3032, 3041,2821,174, 145,147,148, 144	40%	
17		Khadibil	4.93	Bailo	222	558,557,363, 360,	2%	
18		Fakirpur	13.19	Anandapur	364,367	1109,1125, 1357	40%	
19		Panchupali	0.7	Panchupali	1114	6210	40%	
20		Bailo	10.28	Bailo	138,140	473,427	40%	
21		Khalana	10.3	Khalana	630	279,291	39%	
22		Anjara	3.68	Batto	215,218	893, 894	2%	
23		Lanuhar	7.59	Rama chandrapur	215,219	6671,879,70	33%	
24		Khailo	5				5%	
25		Patapal	5				7%	
26		Kalimati	11.46				25%	
27		Barigaon	4.43				17%	
28		Patapada	5				10%	
29		Madanpur	11.5				12%	
30		Panchiora	0.57				40%	
31		Salapada	5				18%	

S.L. No	Name of Range	Village Forest	Area in Ha.	Gram Panchayat	Khata No.	Plot No.	Survival %	Remarks
1	Deogaon	Hatisila	5.3	Deogaon	165	1194, 1187	10%	
					162	1397,1364, 1363,365,364		
2		Kantipada	71.19	Harichandanpur	11	121,790,759,	30%	
3		Kathapal	11.25	Kesadurapal	343	204,151,152,153,154,1615	10%	
					346	155		
4		Raidiha	5	Khailo	213	438,134	10%	
					215	435,437,434		
5		Raidiha	10	Harichandanpur	195	350,333	39%	
6		Singibilla	6	Harichandanpur	-	-	38%	
7		Aonlajodi	5	Harichandanpur	7,8	121,82,135	35%	
8		Chasatangara	5.074	Badapalasapal	153	1296,1692	25%	
9		Bayapita	5.5	Biapita	55,53	391,393,394,406,421,330	30%	
10		Singibila	10	Harichandanpur	88,90, 8,7	184,168,180,196,197,78,82,121,78	40%	
11		Rekutia	10	Deogaon	195	252,5426	4%	
					197	1202,1252		
12		Kainipura	10				15%	
13		Kainipura	1.94				10%	
14		Pitatangara	5.0				5%	

S.L. No	Name of Range	Village Forest	Area in Ha.	Survival %	Remarks
1	Hadagarh	Saramanga	1.4	2%	
2		Ambo	6.5	2%	
3		Tarava	10.08	3%	
4		Bancho	3.496	5%	
5		Jambhara	13.5	2%	
6		Jambhara(Majhisahi)	5.85	3%	
7		Ambrutpur	1.85	6%	
8		Aitpur	5.0	4%	
9		Angiria	5.0	3%	
10		Gobindpur	10.0	2%	
11		Balipada	10.0	2%	

Source: **DFO, Keonjhar (WL) Division**

Appendix-IV

D.L.C Report

Name of Tahasil	Mouza	Khata No.	Plot No.	Area in ha.	Ownership	Kissam	Remarks
Forest Area (CHAMPUA)							
ANANDAPUR	Salpada	224	381	4.2000	Government		
	Talgaon	266	602	15.0000	Government		
	Tampo	218	178	19.7700	Government		
			180	5.5000	Government		
	Pandua	479	659	108.3000	Government		
	Pancham	223	4	113.0000	Government		
	Nuapada	98	884	9.6000	Government		
			895	1.5800	Government		
	Kanto	173/7	571	4.1700	Government		
			579	0.6700	Government		
			582	1.7400	Government		
			589	0.5400	Government		
		173/8	577/886	0.3100	Government		
			517	0.7600	Government		
			592/904	0.2200	Government		
			598/187	0.6400	Government		
	Kamdanda	139	39	22.5000	Government		
			133	35.6300	Government		
			161	15.5800	Government		
			155	4.0300	Government		
			158	4.7800	Government		
			25	6.7500	Government		
			18	5.3800	Government		
			28	9.8500	Government		
		192	19	46.7300	Government		
	Tikarpada	35	2	41.6500	Government		
		32	5	11.8000	Government		
			11	20.0800	Government		
		34	267	4.6100	Government		
			271	7.0300	Government		
			277	2.8200	Government		
			284	3.9600	Government		
	Daraghotisila	45	134	6.2800	Government		
			143	14.4000	Government		
			357	17.3000	Government		
	Arjunbania	105	419	36.3700	Government		
			603	17.9000	Government		
			614	15.5500	Government		
	Kadabahati	81	136	11.7600	Government		
	Kalimati	267	398	3.3600	Government		
			413	3.7300	Government		
			1129	2.6800	Government		
	Gatinandu	76	487	52.5000	Government		
			542	7.3000	Government		
			566	1.3900	Government		
	Badedati		1116	6.3000	Government		
			1120	3.3700	Government		
	Marsapal	147	1083	20.9000	Government		
	Bandha	76	54	30.9900	Government		
	Gopalpur	37	316	28.4500	Government		
			317	39.1500	Government		
ANANDAPUR			318	37.9000	Government		
			319	25.0200	Government		
			320	40.0000	Government		
			321	35.8000	Government		

Name of Tahasil	Mouza	Khata No.	Plot No.	Area in ha.	Ownership	Kissam	Remarks
			322	34.8200	Government		
			325	36.6000	Government		
	Jhinkipita	26	514	158.4000	Government		
			515	64.0300	Government		
			517	49.5300	Government		
HATADIHI	Purunapani	2	468	0.2300	Private		
			469	0.2900	Private		
		3	457	0.5900	Private		
		5	500	9.9300	Private		
		6	477	0.4000	Private		
			481	0.2100	Private		
			482	0.2200	Private		
		7	474	0.5300	Private		
		8	462	0.1900	Private		
		9	505	0.9400	Private		
			509	0.2200	Private		
		11	456	0.4400	Private		
		13	455	0.7300	Private		
		15	466	0.6700	Private		
		16	470	0.2800	Private		
			471	0.3900	Private		
		18	515	0.3900	Private		
			516	0.7300	Private		
		24	453	0.7400	Private		
		25	459	0.5000	Private		
		26	464	0.2500	Private		
			465	0.3600	Private		
		31	517	0.9700	Private		
		32	478	0.3800	Private		
			479	0.1800	Private		
			480	0.2000	Private		
		35	50	0.7400	Private		
			507	0.2100	Private		
		36	498	0.7500	Private		
		37	499	1.5300	Private		
		39	454	0.8200	Private		
		40	461	0.5300	Private		
		41	496	0.7500	Private		
		42	510	0.3600	Private		
			511	0.4300	Private		
			512	0.3600	Private		
		43	451	0.3400	Private		
			465	0.3400	Private		
		44	448	0.4100	Private		
			460	0.8700	Private		
		45	483	0.4800	Private		
			497	0.2700	Private		
		46	472	0.2800	Private		
			473	0.2500	Private		
		48	452	0.5500	Private		
		49	513	0.8900	Private		
			514	0.2100	Private		
		50	503	1.1100	Private		
		51	506	0.7400	Private		
		52	502	1.2500	Private		
		54	458	0.5800	Private		
			499	0.9100	Private		
		56	299	17.3200	Government		

Name of Tahasil	Mouza	Khata No.	Plot No.	Area in ha.	Ownership	Kissam	Remarks
	Ragudi	112	399	31.8800	Government		
			300/409	1.1400	Government		
			299/410	0.4300	Government		
			299/466	11.2500	Government		
	Bancho	131	9667	5.5200	Government		
			9663	0.3000	Government		
			9664	3.9600	Government		
			9645	20.7500	Government		
	Samana	342	369	5.0000	Government		
	Jambhara	236	1471	10.0000	Government		
	Balipada	29	35	20.0000	Government		
	Agina	195	681	10.0000	Government		
			684	3.0000	Government		
	Ambratpur	100	796	0.4700	Government		
			798	0.2800	Government		
		148	792	9.6000	Government		
		156	794	2.2100	Government		
		159	795	4.5400	Government		
			801	4.8000	Government	Patharbani	
			Total=	1530.3300			

Source: Outgoing Working Plan

UNCLASS FOREST

Appendix - V

Sl. No.	Name of the Range	Name of Building/ Permanent nursery	Khata No	Plot No.	Area in Acre	Name of Place	Remarks
1		2	3	4	5	6	7
1	Deogaon	Forest Qtr. Deogaon	351	279	0.2	Deogaon	
2		Range Office Deogaon	351	312	0.6	Deogaon	
3		Forester Qtr. Harichandanpur	158	1388	0.21	Harichandanpur	
4		S.F.S. Qtr. Singhbilla	88	2143	0.9	Singhbilla	
5		V.F.W. Qtr. Singhbilla	88	2143	0.9	Singhbilla	
6		Forest Guard Qtr. Basantapura	622	3937	0.65	Basantpura	
7		Forest Guard Qtr. Sagadapata	244	1739	0.48	Sagadpata	
8		Forest Guard Qtr. Gaduan	57	100	0.12	Gaduan	
9		Forest Guard Qtr. Bhagamunda	345	3441	0.17	Bhagamunda	
10		Forest Guard Qtr. Gargadabahal	69	1200	0.4	Gargadabahal	
11		Forest Guard Qtr. Baripal	1133	1385	0.09	Baripal	
12		Forest Guard Qtr. Harichandanpur	158	1388	0.21	Harichandanpur	
13		Barrack Deogaon	351	312	2.38	Deogaon	
14		Malkhana Deogaon	351	312	2.73	Deogaon	
15		Watcher Shed Deogaon	351	279	1.25	Deogaon	
16	Hadagarh	Kathakata Beat House	25	12,1/1	0.03	Kathakata	
17		Bahia Beat House		88	0.43	Bahia	
18		Hadagarh Fg Beat		1/3/2	0.06	Hadagarh	
19		Hadagarh Forest Qtr.		1/3/1	0.03	Hadagarh	
20		Baidakhia Fg Beat	34	36	0.18	Baidakhia	
21		Kantipal Beat House		135	0.36	Kantipal	
22		Kathakata Forest Qtr.	25	22	0.04	Kathakata	
23	Anandapur	Range Office , Anandapur	618	24/33,36	0.13	Murabali	
24		Range office-cum-Qtr		568	0.47	Murabali	
25		Check Gate rest shed		574	0.06	Murabali	
26		Salapada Fg Beat	62	1193/1, 1193/2	0.37	Salapada	
27		Dihasahi Beat House		7216	-	Dihasahi	
28		Baranga Fg Beat		10/1, 12/2	0.43	Baranga	
29		Patilo Fg Beat		3/1, 748/1, 2	1.25	Patilo	
30		Budhikud Fg Beat		133/1, 133/2, 133/3	5		
31		Budhikud Forest Qtr.					
32		Ostapura Fg Beat		27	0.3	Ostapura	
33		Gayalmunda Fg Beat	54	519,520	0.44	Gayalmunda	
				Total-	**20.87**	**acre or 8.452 ha.**	

Appendix-VI-A

The RF, PRF, DPF, PF, VF and their notifications-Working Plan Area

Name of the RF	Area in Acre (Original noti-fication)	Notification No. and date	Area de-reserved	Notification of de-reservation	Balance area after de-reservation (if any)	Balance Area in Ha.	GIS computed area	Under FRA	Under FC Act	Area under this plan
1	2	3	4	5	6	7	8	9	10	11
Reserved Forests										
Atei	80050	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			80050.000	**12522.31 ***	11902.25	309.879	2.7166	11589.6544
Baigundi	105	S.R.O. No. 599/82 dt. 26.8.82			105	42.49	49.31	6.79	-	42.52
Barang	3286	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			3286	1329.84	1203.61	21.48	1.76	1180.37
Gayalmunda	265.45	FS 293/79 78146 dt 5.11.79			265.45	107.42	120.44	-	-	120.44
Hatibandha	206	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			206	83.36	82.93	-	-	82.93
Kadagotha	150.5	SRO No. 428/83 dt. 10.8.83			150.5	60.9	62.48	0.252	-	62.228
Koldiha	99.2	FS 290/79 63729 dt. 31.8.79			99.2	40.14	32.57	-	-	32.57
Mahulpanga	507	SRO No. 193/80 dt. 4.2.81			507	205.18	207.62	-	-	207.62
Meghanadapoi	812.5	FS 377/81 81831 dt. 31.12.82			812.5	328.81	332.86	-	-	332.86
Nuniapatna	164	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			164	66.37	67.25	-	-	67.25
Ostapura	1697.55	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958	391.95	4320/D-12F-51(d)/ 58 dt. 6.2.58	1305.6	528.38	244.04	16.53	7.353	220.157
Palaspal	6226	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			6226	2519.66	2584.57	-	-	2584.57
Panasdiha	152.8	FS 291/79 77038 dt. 31.10.79			152.1	61.55	62.39	-	-	62.39
Patilo	1145	SRO No. 317/83 dt. 13.6.83			1145	463.38	466.95	0.68	-	466.27
Rebana	80455	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958	12.83	10F(L) 99/80-17950 dt. 27.7.80	80194.968	32292.83	31438.28	25.82712	315.42171	31097.03117
			60.00	21713-10/(L)477/82 dt. 4.8.82						
			164.932	14015/10F(L) 69/80 dt. 106.80						
			22.27	14011-10F(L)-69/80 dt. 10.6.80						
			400.50	10F (E) 158/82-1713/FF AH dt. 04.08.82						

Name of the RF	Area in Acre (Original noti-fication)	Notification No. and date	Area de-reserved	Notification of de-reservation	Balance area after de-reservation (if any)	Balance Area in Ha.	GIS computed area	Under FRA	Under FC Act	Area under this plan
1	2	3	4	5	6	7	8	9	10	11
Salapada**	3838	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958	254.00	10F(D) 20/75 24316/FAH dt. 15.12.75	00.00	00.00	00.0			
			1048.00	10F(D) 26/75 24319/FAH dt. 16.12.75						
			61.86	1664/CF dt. 30.8.67						
			15.00	21804/CF dt. 28.11.66						
			391.95	4320/D-12F-51(D)/58 dt.06.02.58						
			100.00	2/80/CF dt. 28.11.66						
			1967.19	Notification not available**						
Santoshpur	23211	No. 10721-12F(M/2)/58-D dt. 26 & 27.3.1958			23211	9393.49	8243.19	107.1736	10.2239	8125.7925
Turkipada	753.64	SRO No. 437/85 dt. 28.6.85			753.64	304.99	306.95	-	-	306.95
*Boula RF***	*28355*	*No.10721-12F(M/2)/58-D dt.26 & 27.3.1958*	*2601.2496*		*25753.7504*	*00.0*	***Not included in this revision*			
Total	203124.64 Or 82236.696ha		4890.482 or 1979.952ha.		198633.96 or 80418.607 Ha.	60.351.1	57407.69	488.61172	337.47521	56581.60307
Proposed reserved Forests (Area in Ha.)										
Brahmanipal	45.08 (in Ha.	No. FS 69/78 35092/R dt. 29.5.78			45.08	45.08	53.99			53.99
Sapanaposi	57.29 (In Ha.	No. FS 67/78 30529/R dt. 5.5.78			57.29	57.29	57.95			57.95
Tangiriapal	111.7 (In Ha.)	No. FS 48/78 12302/R dt. 20.2.78			111.7	111.7	124.16			124.16
Total	214.07				214.07	214.07	236.1			236.1
Demarcated Protected Forests(Area in Ha.)										
Talagaon A	213.68				213.68	213.68	14.18			14.18
Andharajhari	131.93				131.93	131.93	76.1			76.1
Baniajodi	80.94				80.94	80.94	80.94			80.94
Biragobindpur A	388.51				388.51	388.51	388.51			388.51
Biragobindpur B	20.23				20.23	20.23	20.23			20.23

Name of the RF	Area in Acre (Original noti-fication)	Notification No. and date	Area de-reserved	Notification of de-reservation	Balance area after de-reservation (if any)	Balance Area in Ha.	GIS computed area	Under FRA	Under FC Act	Area under this plan
1	2	3	4	5	6	7	8	9	10	11
Sanapurunapani	127.48				127.48	127.48	127.48			127.48
Talagaon B	186.56				186.56	186.56	186.56			186.56
Alughati	48.56				48.56	48.56	48.56			48.56
Madhubhandar	64.75				64.75	64.75	64.75			64.75
Champapal	157.83				157.83	157.83	157.83			157.83
Total	1420.47				1420.47	1420.47	1165.14			1165.14
Protected Forest(Area in Ha.)										
Arjunbania	12.08				12.08	12.08	12.08			12.08
Matha	32.9981				32.9981	32.9981	32.9981			32.9981
Asanbahali	90				90	90	90			90
Bahabaradanda	32.763				32.763	32.763	32.763			32.763
Asia	12.9985				12.9985	12.9985	12.9985			12.9985
Thunigaon	3.9983				3.9983	3.9983	3.9983			3.9983
NuaRugidi	15.9973				15.9973	15.9973	15.9973			15.9973
PadhiarPalli	15.9972				15.9972	15.9972	15.9972			15.9972
	216.8324				216.8324	216.8324	216.8324			216.8324
Village Forest(Area in ha.)										
Panchupalli	0.7				0.7	0.7	0.7	0.297		0.403
Other VFs	410.84				410.84	410.84	410.84			410.84
	411.54				411.54	411.54	411.54	0.297		411.243
All Total	84499.6084				82681.5194	62614.0124	59437.3024	488.90872	337.47521	58610.91847 Or 58610.92

*Atei (Part) under Keonjhar (WL) Division

** For 1967.09 Acre of Salapada RF, no supporting notification or entry in Reserve Forest Register is found.

** Boula RF (sanctuary area) is not included in this Working Plan.

Salapada RF and Boula RF were excluded in the outgoing approved working plan.

The above computed area is calculated taking into consideration the settlement, survey work and field condition.

The difference in Notified Area and GIS computed area is due to the settlement of peripheral villages after the notification of Forest Block and due to difference in method of map projection.

Appendix – VI-B

RF and Compartment wise area.				
Sl. No.	Range	Name of R.F.	Comp. No.	Area in ha.
1	Anandapur	Baigundi	-	49.31
2		Baranga	-	1200.94
3		Gayalmunda	-	120.44
4		Hatibandha	-	82.93
5		Koldiha	-	32.57
6		Meghanadpoi	-	332.86
7		Nuniapatna	-	67.25
8		Ostapura	-	236.687
9		Pansadiha	-	62.39
10		Patilo	-	466.95
11	Deogaon	Kadogotha	-	62.23
12	Brahmanipal	Mahulapanga	-	207.62
13		Palaspal	-	2584.57
14		Turkipada	-	306.95
15	Anandpur	Santoshpur	1	462.64
			2	336.36
			3	217.77
			4	274.00
			5	447.19
			6	495.67
			7	413.03
			8	687.2
			9	358.59
			10	593.51
			11	486.88
			12	301.63

			13	374.80
			14	586.69
			15	407.37
			16	511.19
			17	348.46
			18	436.13
			19	271.07
			20	222.40
16	Deogaon	Rebana	1	344.78
			2	689.27
			3	388.15
			4	21.20
	Brahmanipal &Deogaon		5	578.14
			6	682.95
			7	743.85
17	Deogaon		8	368.06
	Brahmanipal &Deogaon		9	501.63
	Bahmanipal		10	552.67
			11	508.94
			12	579.09
18	Brahmanipal &Deogaon		13	791.53
19	Brahmanipal		14	601.33
			15	306.62
			16	308.41
			17	419.75
			18	607.03
			19	1168.11
			20	1300.66
			21	359.10
			22	610.55
			23	413.84
			24	954.21
			25	1197.91
			26	1138.93

			27	512.48
			28	619.45
			29	686.20
			30	745.64
			31	575.23
	Brahmanipal & Deogaon		32	759.17
	Brahmanipal		33	564.50
20	Deogaon		34	460.88
			35	629.25
			36	329.17
			37	878.94
			38	861.74
21	Brahmanipal		39	781.3
			40	417.43
			41	484.17
			42	517.64
			43	713.01
			44	637.72
			45	693.26
			46	1693.78
			47	1420.66
22	Deogaon& Anandapur	Atei(Part)	50	415.55
			51	450.48
			52	593.70
			53	512.32
			54	521.05
			55	524.81
			56	668.84
			57	836.31
			58	493.97
			59	451.34
			60	602.17
			61	1262.44
			62	814.07

			63	404.92
23	Deogaon& Anandapur	Atei (Part)	64	434.28
			65	258.45
			66	524.44
			67	565.54
			68	954.81
			69	606.71

Area of RF & PRF in previous Working Plan

Sl No.	Name of RF/PRF	Notified Area (Ha)	Lal Plan(Ha.)	Prasad Plan(Ha.)	Mohapatra Plan(Ha.)	N.Samal Plan(Ha.)	GIS computed Area(Ha.)
1	Rebana	32292.83	32561.01	32561.01	32600.92	35527.66	31438.28
2	Atei	12522.31			11922.31	12003.36	11902.25
3	Santoshpur	9393.49	9393.743	8893.925	8320.005	9283.16	8243.19
4	Palaspal	2519.66	2519.73	2519.73	2519.815	2494.91	2584.57
5	Turkipada	304.99				396.96	306.95
5	Mahulpanga	205.18			205.1924	261.28	207.62
7	Baranga	1329.84	1329.88	1264.317	1141.661	1135.67	1203.61
8	Patilo	463.38			463.398	449.66	466.95
9	Meghanadpoi	328.81			328.8316	314.59	332.86
10	Gayalmunda	107.42			107.4345	70.76	120.44
11	Panasdiha	61.55			61.552	92.69	62.39
12	Baigundi	42.49			57.044	65.1	49.31
13	Koldiha	40.14		732.931	40.151	44.94	32.57
14	Ostapura	528.38		706.19	687.041	660.59	244.04
15	Hatibandha	83.36	80.942	87.822	87.814	75.97	82.93
16	Kadugotha	60.9			60.904	95.3	62.48
17	Nuniapatna	66.37	66.372	68.8	68.792	81.73	67.25
1	Tangriapal PRF	111.7				185.12	124.16
2	Brahmanipal PRF	45.08				88.99	53.99
3	Sapanposi PRF	57.29				68.55	57.95

** **In case of Santoshpur as per Mohapatra Plan some area has been dereserved, though the data is not available**

Appendix-VIII-A

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS, ODISHA, BHUBANESWAR

Memo No. 15931/10F(Cons.)8/07
Dated, the bhubaneswar3rd Aug.2007-11-06

To, All Conservator of Forests

Sub:- **Survey & demarcation with construction of pillars.**

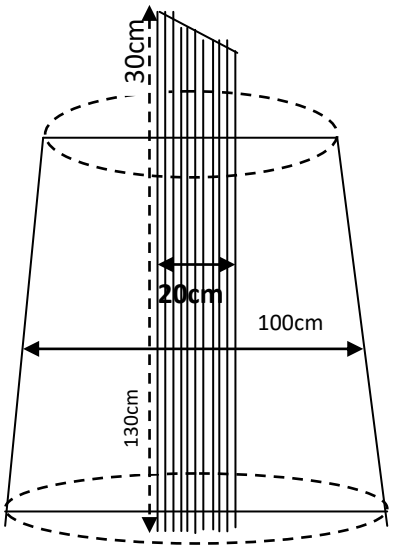
Ref:- This office letter no. 7487(70/7F(misc.)301/02 dt. 9.4.2004

Instruction has been given for construction of boundary pillars on the (1) Reserve Forest Boundary vides this office letter under reference. It has been clarified in the said letter that the pillars shall be constructed in size of 100cm. Diameter and 130 cm. Height having a pole of first 60-75cm (using locally available stones and boulders) The pole of 100 cm. Length to be fixed in the centre shall be 70 cm inside pillar and 30cm above. The visible portion of pole shall be dressed and it will face towards outside, with the pillar number written on it. The outer surface of the pillar shall be cemented.

However in execution of the work hence forward , certain modifications are allowed as per details given below to ensure stability.

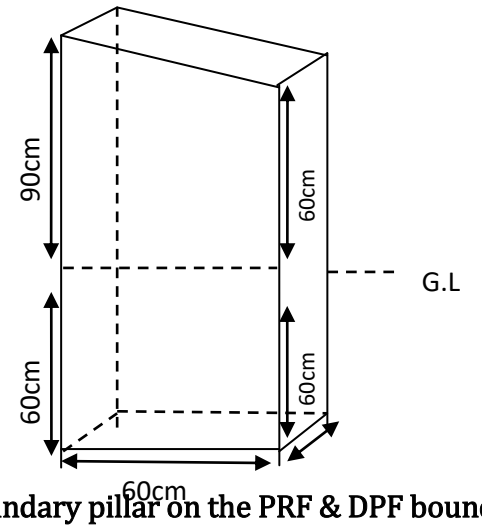
(a) **Stone Pillar (figure I a):**

1. The ground shall be levelled before construction of pillar.
2. The diameter at the base of the pillar shall be kept 120 cm and that at the top 80 cm so that the diameter at the centre will be 100 cm. Height of pillar shall be 130 cm. Locally available stones and boulders shall be fixed using mud mortar.
3. The pole of 160 cm. Length (Duly painted with coal tar) to be fixed in the centre shall be130cm. Inside pillar and 30cm. above, i.e. one end of pole shall be embedded in ground.
4. The visible portion of pole shall be flattened with face towards outside and the pillar number written on it. The pillar number shall also be written at the base of the pillar.
5. The voids on the outer surface of the pillar should invariably be cemented.



(b) Masonry Pillar (Figure I b)

Masonry pillars may also be constructed on the RF boundary line where adequate curing is possible. The foundation of such pillar shall be 60cmX60cmX60cm. The size of the pillar above foundation(ground) shall be 60cmX60cmX60cm (ht)on back side and 60cmX60cmX60cm(ht) on front side with face slanting outside. This will have a volume of 18 cft.

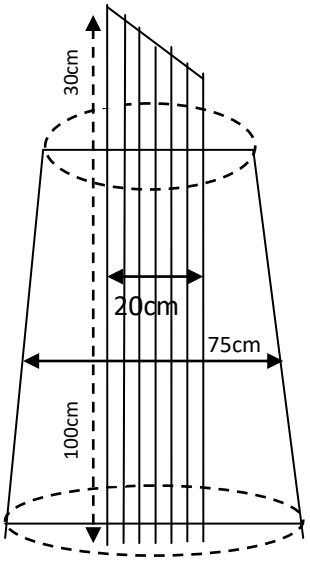


(II) Boundary pillar on the PRF & DPF boundary

(a) Stone cairns (Figure II a)

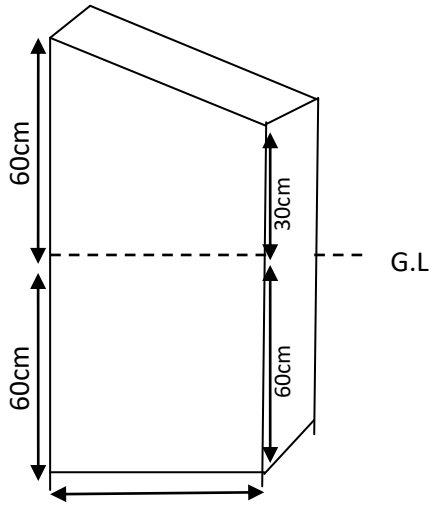
1. The ground shall be levelled before construction of the pillar
2. The diameter at the base of the pillar shall be 90 cm while that at top 60 cm. Thus diameter at centre will be 75 cm. Height of pillar shall be 100 cm. Locally available stones and boulders shall be used and made stable before filling up voids with mud mortar.

3. The pole of 130 cm. Length (duly painted with coal tar) to be fixed in the centre shall be 100 cm inside pillar and 30 cm above, i.e one end of pole shall be embedded in ground.
4. The visible portion of pole shall be flattened with face towards outside and pillar number written on it. The pillar number shall also be written at the base of pillar.



(b) Masonry Pillar (Figure II b)

Masonry pillar may also be constructed on the PRF/DPF boundary at places where adequate curing is possible. The foundation of such pillar shall be 60cmX60cmX60cm. The size of the pillar above foundation (ground) shall be 60cmX60cmX60cm(ht) on back side and 60cmX30cm(ht) on front side with the slanting surface outside. The pillar shall be plastered and duly numbered with name of PRF/DPF written on the slanting portion. This will have a volume of 14Cft.

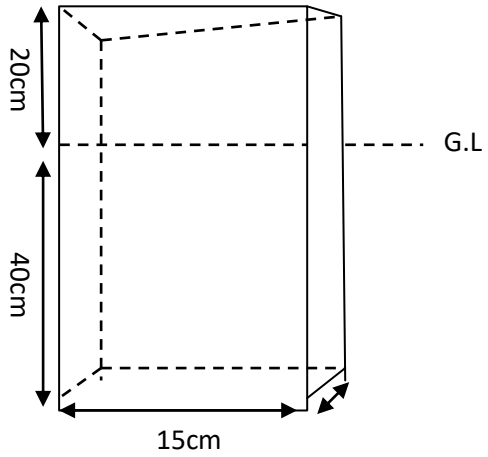


(III) Other Pillar:

Pillar posting along other demarcation lines is also required in the field, such as demarcation of VSS areas. ANR areas, plantation areas and other treatment areas. This demarcation pillar shall be of different size and shape. To bring uniformity in the construction of pillar, following type of pillars along demarcation shall be ensured for different type of areas.

(a) VSS area (Figure III a)

VSS area shall be demarcation using concrete/cut stone pillar of 15cmX15cm cross-section and of 60cm length of which 40cm shall be below the found and 20cm above the ground. The name of VSS on the side & pillar number on the top shall be written.



(b) Demarcation of ANR/Plantation/other treatment area :

The pillar for the purpose shall be similar to that of VSS area but instead of VSS, words lime ANR (Assisted Natural Regeneration), BP (Block Plantation) can be written.

The above is being attempted to ensure uniformity in the shape, size and look of various pillar, cairns etc. used in boundary delineation of various forest areas and are crucial from management point of view. Thus due importance to the above instruction is required to be attached in all Divisions, for which the respective officers are directly responsible.

Principal Chief Conservator of Forest
Orissa, Bhubaneswar

BEATWISE FOREST COVER CHANGE MATRIX OF KEONJHAR (WL) FOREST DIVISION - 2011 & 2013 (in Hect.)

	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	ANANDAPUR	ANANDAPUR	ANANDAPUR	1						**0.00**
	ANANDAPUR	ANANDAPUR	ANANDAPUR	2		26.34			2.59	**28.93**
	ANANDAPUR	ANANDAPUR	ANANDAPUR	3			484.61			**484.61**
	ANANDAPUR	ANANDAPUR	ANANDAPUR	4			27.58	100.67		**128.25**
	ANANDAPUR	ANANDAPUR	ANANDAPUR	5			65.87		18222.72	**18288.60**
				Total 2013	**0.00**	**26.34**	**578.06**	**100.67**	**18225.32**	**18930.38**
				Net Change	0.00	-2.59	93.45	-27.58	-63.28	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	ANANDAPUR	DHAKOTA	1						**0.00**
	ANANDAPUR	ANANDAPUR	DHAKOTA	2		14.32				**14.32**
	ANANDAPUR	ANANDAPUR	DHAKOTA	3			98.94			**98.94**
	ANANDAPUR	ANANDAPUR	DHAKOTA	4				21.28		**21.28**
	ANANDAPUR	ANANDAPUR	DHAKOTA	5			2.53		3220.67	**3223.20**
				Total 2013	0.00	14.32	101.47	21.28	3220.67	**3357.73**
				Net Change	0.00	0.00	2.53	0.00	-2.53	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	ANANDAPUR	OSTAPURA	1						**0.00**
	ANANDAPUR	ANANDAPUR	OSTAPURA	2		45.29				**45.29**
	ANANDAPUR	ANANDAPUR	OSTAPURA	3			404.13			**404.13**
	ANANDAPUR	ANANDAPUR	OSTAPURA	4						**0.00**
	ANANDAPUR	ANANDAPUR	OSTAPURA	5			3.67		6207.49	**6211.17**
				Total 2013	0.00	45.29	407.80	0.00	6207.49	**6660.58**
				Net Change	0.00	0.00	3.67	0.00	-3.67	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	BUDHIKUD	BUDHIKUD	1	62.44					**62.44**
	ANANDAPUR	BUDHIKUD	BUDHIKUD	2		733.62				**733.62**
	ANANDAPUR	BUDHIKUD	BUDHIKUD	3			305.50			**305.50**
	ANANDAPUR	BUDHIKUD	BUDHIKUD	4						**0.00**
	ANANDAPUR	BUDHIKUD	BUDHIKUD	5					532.39	**532.39**
				Total 2013	62.44	733.62	305.50	0.00	532.39	**1633.96**
				Net Change	0.00	0.00	0.00	0.00	0.00	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	BUDHIKUD	TANEIPAL	1						**0.00**
	ANANDAPUR	BUDHIKUD	TANEIPAL	2		1047.98				**1047.98**
	ANANDAPUR	BUDHIKUD	TANEIPAL	3			294.67			**294.67**
	ANANDAPUR	BUDHIKUD	TANEIPAL	4						**0.00**
	ANANDAPUR	BUDHIKUD	TANEIPAL	5					1280.51	**1280.51**
				Total 2013	0.00	1047.98	294.67	0.00	1280.51	**2623.16**
				Net Change	0.00	0.00	0.00	0.00	0.00	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	GAYALMUNDA	GAYALMUNDA	1	3.05					**3.05**
	ANANDAPUR	GAYALMUNDA	GAYALMUNDA	2		2074.79				**2074.79**
	ANANDAPUR	GAYALMUNDA	GAYALMUNDA	3		2.59	721.26			**723.85**
	ANANDAPUR	GAYALMUNDA	GAYALMUNDA	4						**0.00**
	ANANDAPUR	GAYALMUNDA	GAYALMUNDA	5		16.96	46.25		3824.09	**3887.29**
				Total 2013	3.05	2094.34	767.50	0.00	3824.09	**6688.98**
				Net Change	0.00	19.55	43.65	0.00	-63.20	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	GAYALMUNDA	PANASDIHA	1	237.93	2.59			5.23	**245.75**
	ANANDAPUR	GAYALMUNDA	PANASDIHA	2	4.83	3109.25	4.56	31.43	20.09	**3170.16**
	ANANDAPUR	GAYALMUNDA	PANASDIHA	3			685.92	24.46	3.63	**714.00**
	ANANDAPUR	GAYALMUNDA	PANASDIHA	4						**0.00**
	ANANDAPUR	GAYALMUNDA	PANASDIHA	5		5.53	114.53		6786.08	**6906.14**
				Total 2013	242.76	3117.36	805.01	55.89	6815.03	**11036.05**
				Net Change	-2.99	-52.80	91.01	55.89	-91.11	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	Ramachandrapur	BARANGA	1						**0.00**
	ANANDAPUR	Ramachandrapur	BARANGA	2		5.06				**5.06**
	ANANDAPUR	Ramachandrapur	BARANGA	3			15.55			**15.55**
	ANANDAPUR	Ramachandrapur	BARANGA	4						**0.00**
	ANANDAPUR	Ramachandrapur	BARANGA	5			4.47		506.61	**511.09**
				Total 2013	0.00	5.06	20.02	0.00	506.61	**531.70**
				Net Change	0.00	0.00	4.47	0.00	-4.47	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	ANANDAPUR	Ramachandrapur	GANPUR	1						**0.00**
	ANANDAPUR	Ramachandrapur	GANPUR	2		54.23				**54.23**
	ANANDAPUR	Ramachandrapur	GANPUR	3			225.78			**225.78**
	ANANDAPUR	Ramachandrapur	GANPUR	4				9.79		**9.79**
	ANANDAPUR	Ramachandrapur	GANPUR	5					1810.95	**1810.95**
				Total 2013	0.00	54.23	225.78	9.79	1810.95	**2100.76**
				Net Change	0.00	0.00	0.00	0.00	0.00	
	RANGE_NAME	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	

	ANANDAPUR	Ramachandrapur	PATILO	1						0.00
	ANANDAPUR	Ramachandrapur	PATILO	2		3.63				3.63
	ANANDAPUR	Ramachandrapur	PATILO	3			819.95			819.95
	ANANDAPUR	Ramachandrapur	PATILO	4			244.10	38.95	28.91	311.96
	ANANDAPUR	Ramachandrapur	PATILO	5			45.46		2854.91	2900.36
				Total 2013	0.00	3.63	1109.50	38.95	2883.82	4035.90
				Net Change	0.00	0.00	289.55	-273.01	-16.54	
11	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	BRAHMANIPAL	BALIPAL	1	979.74					979.74
	BRAHMANIPAL	BRAHMANIPAL	BALIPAL	2		479.86				479.86
	BRAHMANIPAL	BRAHMANIPAL	BALIPAL	3			1644.99		20.87	1665.86
	BRAHMANIPAL	BRAHMANIPAL	BALIPAL	4						0.00
	BRAHMANIPAL	BRAHMANIPAL	BALIPAL	5			2.59		844.41	847.00
				Total 2013	979.74	479.86	1647.58	0.00	865.29	3972.46
				Net Change	0.00	0.00	-18.28	0.00	18.28	
12	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	BRAHMANIPAL	BRAHMANIPAL	1	58.04					58.04
	BRAHMANIPAL	BRAHMANIPAL	BRAHMANIPAL	2		1365.77	2.59			1368.36
	BRAHMANIPAL	BRAHMANIPAL	BRAHMANIPAL	3		4.15	2193.91		70.22	2268.27
	BRAHMANIPAL	BRAHMANIPAL	BRAHMANIPAL	4						0.00
	BRAHMANIPAL	BRAHMANIPAL	BRAHMANIPAL	5			3.11		1764.80	1767.91
				Total 2013	58.04	1369.92	2199.61	0.00	1835.01	5462.59
				Net Change	0.00	1.56	-68.66	0.00	67.11	
13	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	BRAHMANIPAL	MAHABIRPOSI	1						0.00
	BRAHMANIPAL	BRAHMANIPAL	MAHABIRPOSI	2		344.68				344.68
	BRAHMANIPAL	BRAHMANIPAL	MAHABIRPOSI	3			1181.85			1181.85
	BRAHMANIPAL	BRAHMANIPAL	MAHABIRPOSI	4						0.00
	BRAHMANIPAL	BRAHMANIPAL	MAHABIRPOSI	5			3.63		2577.48	2581.11
				Total 2013	0.00	344.68	1185.48	0.00	2577.48	4107.64
				Net Change	0.00	0.00	3.63	0.00	-3.63	
14	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	PALASPAL	PALASPAL(E)	1						0.00
	BRAHMANIPAL	PALASPAL	PALASPAL(E)	2		3.83				3.83
	BRAHMANIPAL	PALASPAL	PALASPAL(E)	3			155.54		27.78	183.32
	BRAHMANIPAL	PALASPAL	PALASPAL(E)	4						0.00
	BRAHMANIPAL	PALASPAL	PALASPAL(E)	5					1596.07	1596.07
				Total 2013	0.00	3.83	155.54	0.00	1623.85	1783.22
				Net Change	0.00	0.00	-27.78	0.00	27.78	
15	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	PALASPAL	PALASPAL(W)	1	1731.29					1731.29
	BRAHMANIPAL	PALASPAL	PALASPAL(W)	2		608.81			3.63	612.44
	BRAHMANIPAL	PALASPAL	PALASPAL(W)	3			1352.90		68.77	1421.67
	BRAHMANIPAL	PALASPAL	PALASPAL(W)	4						0.00
	BRAHMANIPAL	PALASPAL	PALASPAL(W)	5			6.22		3047.10	3053.33
				Total 2013	1731.29	608.81	1359.13	0.00	3119.50	6818.73
				Net Change	0.00	-3.63	-62.55	0.00	66.18	
16	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	TALAPADA	REBENA(N)	1						0.00
	BRAHMANIPAL	TALAPADA	REBENA(N)	2		140.25				140.25
	BRAHMANIPAL	TALAPADA	REBENA(N)	3			990.03		41.90	1031.93
	BRAHMANIPAL	TALAPADA	REBENA(N)	4						0.00
	BRAHMANIPAL	TALAPADA	REBENA(N)	5			3.73		1856.10	1859.84
				Total 2013	0.00	140.25	993.77	0.00	1898.00	3032.02
				Net Change	0.00	0.00	-38.17	0.00	38.17	
17	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	TALAPADA	REBENA(S)	1	2362.73	3.47			8.99	2375.19
	BRAHMANIPAL	TALAPADA	REBENA(S)	2		1123.45	7.26		30.31	1161.02
	BRAHMANIPAL	TALAPADA	REBENA(S)	3	3.72		1923.86		30.15	1957.73
	BRAHMANIPAL	TALAPADA	REBENA(S)	4						0.00
	BRAHMANIPAL	TALAPADA	REBENA(S)	5			15.57		1461.90	1477.48
				Total 2013	2366.45	1126.92	1946.69	0.00	1531.36	6971.42
				Net Change	-8.74	-34.10	-11.04	0.00	53.88	
18	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	BRAHMANIPAL	TALAPADA	TALAPADA	1	2632.73				29.88	2662.61
	BRAHMANIPAL	TALAPADA	TALAPADA	2		413.59			12.21	425.80
	BRAHMANIPAL	TALAPADA	TALAPADA	3	3.80		1000.02		104.82	1108.65
	BRAHMANIPAL	TALAPADA	TALAPADA	4						0.00
	BRAHMANIPAL	TALAPADA	TALAPADA	5					193.57	193.57
				Total 2013	2636.54	413.59	1000.02	0.00	340.48	4390.62
				Net Change	-26.07	-12.21	-108.62	0.00	146.91	
19	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	DEOGAON	BHAGAMUNDA	BARIPAL	1						0.00
	DEOGAON	BHAGAMUNDA	BARIPAL	2		3.11				3.11
	DEOGAON	BHAGAMUNDA	BARIPAL	3			963.78		31.75	995.52
	DEOGAON	BHAGAMUNDA	BARIPAL	4						0.00

	DEOGAON	BHAGAMUNDA	BARIPAL	5			7.74		3440.42	**3448.16**
				Total 2013	**0.00**	**3.11**	**971.51**	**0.00**	**3472.17**	**4446.79**
				Net Change	0.00	0.00	-24.01	0.00	24.01	
20	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	BHAGAMUNDA	BHAGAMUNDA	1						**0.00**
	DEOGAON	BHAGAMUNDA	BHAGAMUNDA	2		1782.38				**1782.38**
	DEOGAON	BHAGAMUNDA	BHAGAMUNDA	3			675.71		4.15	**679.86**
	DEOGAON	BHAGAMUNDA	BHAGAMUNDA	4				75.91		**75.91**
	DEOGAON	BHAGAMUNDA	BHAGAMUNDA	5			14.87		1778.44	**1793.31**
				Total 2013	**0.00**	**1782.38**	**690.58**	**75.91**	**1782.59**	**4331.47**
				Net Change	0.00	0.00	10.72	0.00	-10.72	
21	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	BHAGAMUNDA	GADUAN	1						**0.00**
	DEOGAON	BHAGAMUNDA	GADUAN	2		549.83				**549.83**
	DEOGAON	BHAGAMUNDA	GADUAN	3		3.11	1187.50		60.88	**1251.50**
	DEOGAON	BHAGAMUNDA	GADUAN	4						**0.00**
	DEOGAON	BHAGAMUNDA	GADUAN	5			2.59		972.86	**975.45**
				Total 2013	**0.00**	**552.94**	**1190.09**	**0.00**	**1033.75**	**2776.78**
				Net Change	0.00	3.11	-61.40	0.00	58.29	
22	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	BHAGAMUNDA	SAGADAPATA	1	13.04					**13.04**
	DEOGAON	BHAGAMUNDA	SAGADAPATA	2		4174.58	25.17			**4199.75**
	DEOGAON	BHAGAMUNDA	SAGADAPATA	3		18.14	3936.38		175.43	**4129.95**
	DEOGAON	BHAGAMUNDA	SAGADAPATA	4				160.14	2.78	**162.92**
	DEOGAON	BHAGAMUNDA	SAGADAPATA	5			6.94		3744.36	**3751.30**
				Total 2013	**13.04**	**4192.73**	**3968.49**	**160.14**	**3922.57**	**12256.97**
				Net Change	0.00	-7.03	-161.46	-2.78	171.27	
23	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	DEOGAON	BARBAHALI	1						**0.00**
	DEOGAON	DEOGAON	BARBAHALI	2		14.50				**14.50**
	DEOGAON	DEOGAON	BARBAHALI	3			923.87			**923.87**
	DEOGAON	DEOGAON	BARBAHALI	4				37.16		**37.16**
	DEOGAON	DEOGAON	BARBAHALI	5			3.51		2573.42	**2576.94**
				Total 2013	**0.00**	**14.50**	**927.38**	**37.16**	**2573.42**	**3552.46**
				Net Change	0.00	0.00	3.51	0.00	-3.51	
24	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	DEOGAON	BASANTAPUR	1						**0.00**
	DEOGAON	DEOGAON	BASANTAPUR	2		31.56				**31.56**
	DEOGAON	DEOGAON	BASANTAPUR	3			730.98		8.65	**739.63**
	DEOGAON	DEOGAON	BASANTAPUR	4						**0.00**
	DEOGAON	DEOGAON	BASANTAPUR	5			39.62		2565.94	**2605.56**
				Total 2013	**0.00**	**31.56**	**770.59**	**0.00**	**2574.60**	**3376.75**
				Net Change	0.00	0.00	30.96	0.00	-30.96	
25	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	DEOGAON	DEOGAON	1						**0.00**
	DEOGAON	DEOGAON	DEOGAON	2						**0.00**
	DEOGAON	DEOGAON	DEOGAON	3						**0.00**
	DEOGAON	DEOGAON	DEOGAON	4						**0.00**
	DEOGAON	DEOGAON	DEOGAON	5			2.81		3654.29	**3657.11**
				Total 2013	**0.00**	**0.00**	**2.81**	**0.00**	**3654.29**	**3657.11**
				Net Change	0.00	0.00	2.81	0.00	-2.81	
26	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	HARI CHANDANPU	GARGARBAHAL	1						**0.00**
	DEOGAON	HARI CHANDANPU	GARGARBAHAL	2		108.88				**108.88**
	DEOGAON	HARI CHANDANPU	GARGARBAHAL	3			1784.48		68.67	**1853.15**
	DEOGAON	HARI CHANDANPU	GARGARBAHAL	4						**0.00**
	DEOGAON	HARI CHANDANPU	GARGARBAHAL	5			43.84		10968.12	**11011.95**
				Total 2013	**0.00**	**108.88**	**1828.32**	**0.00**	**11036.79**	**12973.98**
				Net Change	0.00	0.00	-24.83	0.00	24.83	
27	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	DEOGAON	HARI CHANDANPU	HARI CHANDANPU	1	5458.72				33.88	**5492.60**
	DEOGAON	HARI CHANDANPU	HARI CHANDANPU	2	4.15	1110.39	4.29		18.05	**1136.88**
	DEOGAON	HARI CHANDANPU	HARI CHANDANPU	3	8.29		1972.45		85.64	**2066.39**

	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	DEOGAON	Harichandanpur	Harichandanpur	4						**0.00**
	DEOGAON	Harichandanpur	Harichandanpur	5					3375.54	**3375.54**
				Total 2013	**5471.16**	**1110.39**	**1976.74**	**0.00**	**3513.11**	**12071.41**
				Net Change	-21.44	-26.49	-89.65	0.00	137.57	
28	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	HADAGARH	BAIDAKHIA	1						**0.00**
	HADAGARH	HADAGARH	BAIDAKHIA	2						**0.00**
	HADAGARH	HADAGARH	BAIDAKHIA	3			45.26			**45.26**
	HADAGARH	HADAGARH	BAIDAKHIA	4				439.59		**439.59**
	HADAGARH	HADAGARH	BAIDAKHIA	5			53.91		15197.34	**15251.25**
				Total 2013	**0.00**	**0.00**	**99.17**	**439.59**	**15197.34**	**15736.10**
				Net Change	0.00	0.00	53.91	0.00	-53.91	
29	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	HADAGARH	BANIAPANKA	1						**0.00**
	HADAGARH	HADAGARH	BANIAPANKA	2		129.89				**129.89**
	HADAGARH	HADAGARH	BANIAPANKA	3		4.42	540.26		7.04	**551.72**
	HADAGARH	HADAGARH	BANIAPANKA	4				41.47		**41.47**
	HADAGARH	HADAGARH	BANIAPANKA	5			119.83		3009.12	**3128.95**
				Total 2013	**0.00**	**134.32**	**660.08**	**41.47**	**3016.16**	**3852.03**
				Net Change	0.00	4.42	108.37	0.00	-112.79	
30	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	HADAGARH	HADAGARH	1	132.40					**132.40**
	HADAGARH	HADAGARH	HADAGARH	2		866.30				**866.30**
	HADAGARH	HADAGARH	HADAGARH	3			1202.75			**1202.75**
	HADAGARH	HADAGARH	HADAGARH	4				38.65		**38.65**
	HADAGARH	HADAGARH	HADAGARH	5			25.31		3810.68	**3835.99**
				Total 2013	**132.40**	**866.30**	**1228.06**	**38.65**	**3810.68**	**6076.09**
				Net Change	0.00	0.00	25.31	0.00	-25.31	
31	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	HADAGARH	RAIGHATI	1	11.55					**11.55**
	HADAGARH	HADAGARH	RAIGHATI	2		364.43				**364.43**
	HADAGARH	HADAGARH	RAIGHATI	3			399.36		22.81	**422.16**
	HADAGARH	HADAGARH	RAIGHATI	4						**0.00**
	HADAGARH	HADAGARH	RAIGHATI	5			2.59		1625.61	**1628.20**
				Total 2013	**11.55**	**364.43**	**401.95**	**0.00**	**1648.41**	**2426.35**
				Net Change	0.00	0.00	-20.21	0.00	20.21	
32	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	HADAGARH	SANGAM	1						**0.00**
	HADAGARH	HADAGARH	SANGAM	2		50.52				**50.52**
	HADAGARH	HADAGARH	SANGAM	3			315.26			**315.26**
	HADAGARH	HADAGARH	SANGAM	4				155.39		**155.39**
	HADAGARH	HADAGARH	SANGAM	5			44.74		5243.80	**5288.53**
				Total 2013	**0.00**	**50.52**	**360.00**	**155.39**	**5243.80**	**5809.70**
				Net Change	0.00	0.00	44.74	0.00	-44.74	
33	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	KATHAKATA	BAHIA	1						**0.00**
	HADAGARH	KATHAKATA	BAHIA	2		52.15				**52.15**
	HADAGARH	KATHAKATA	BAHIA	3			324.17			**324.17**
	HADAGARH	KATHAKATA	BAHIA	4				574.15		**574.15**
	HADAGARH	KATHAKATA	BAHIA	5			18.13	2.59	5132.81	**5153.53**
				Total 2013	**0.00**	**52.15**	**342.30**	**576.74**	**5132.81**	**6104.00**
				Net Change	0.00	0.00	18.13	2.59	-20.72	

	RANGE_NAME	SEC_NAME	BEAT_NAME	2011Assessment	2013 Assessment					Total 2011
					1	2	3	4	5	
	HADAGARH	KATHAKATA	KANTIPAL	1						**0.00**
	HADAGARH	KATHAKATA	KANTIPAL	2		360.37	5.89			**366.27**
	HADAGARH	KATHAKATA	KANTIPAL	3			201.43			**201.43**
	HADAGARH	KATHAKATA	KANTIPAL	4				21.31		**21.31**
	HADAGARH	KATHAKATA	KANTIPAL	5			5.21		1479.86	**1485.07**
				Total 2013	**0.00**	**360.37**	**212.53**	**21.31**	**1479.86**	**2074.07**
				Net Change	0.00	-5.89	11.10	0.00	-5.21	
35	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	KATHAKATA	KATHAKATA	1						**0.00**
	HADAGARH	KATHAKATA	KATHAKATA	2						**0.00**
	HADAGARH	KATHAKATA	KATHAKATA	3			16.24			**16.24**
	HADAGARH	KATHAKATA	KATHAKATA	4				50.68		**50.68**
	HADAGARH	KATHAKATA	KATHAKATA	5				2.59	2469.12	**2471.72**
				Total 2013	**0.00**	**0.00**	**16.24**	**53.27**	**2469.12**	**2538.63**
				Net Change	0.00	0.00	0.00	2.59	-2.59	
36	**RANGE_NAME**	**SEC_NAME**	**BEAT_NAME**	**2011Assessment**	**2013 Assessment**					**Total 2011**
					1	2	3	4	5	
	HADAGARH	KATHAKATA	PITANAU	1	6.88					**6.88**
	HADAGARH	KATHAKATA	PITANAU	2		2143.03			9.32	**2152.35**
	HADAGARH	KATHAKATA	PITANAU	3			1524.55		50.53	**1575.09**
	HADAGARH	KATHAKATA	PITANAU	4				24.57		**24.57**
	HADAGARH	KATHAKATA	PITANAU	5			5.18		970.49	**975.67**
				Total 2013	**6.88**	**2143.03**	**1529.74**	**24.57**	**1030.34**	**4734.55**
				Net Change	0.00	-9.32	-45.35	0.00	54.67	

*** Note :**

Forest Code	Description
1	Very Dense Forest
2	Moderately Dense Forest
3	Open Forest
4	Scrub Forest
5	Non Forest

Source: GIS Cell, O/o PCCF(O), Odisha

Appendix-VIII-C

BEAT WISE FOREST COVER CHANGE OF KEONJHAR WL DIVISION AS PER SFR 2017 & 2019												
Beat	VDF (Area in ha)			MDF (Area in ha)			OF (Area in ha)			SCRUB (Area in ha)		
	2017	2019	Change	2017	2019	Change	2017	2019	Change	2017	2019	Change
Forest Cover Change for Anandapur Range												
DHAKOTA	19.04	27.07	8.03	804.88	886.43	81.55	979.92	942.74	-37.18	8.12	8.12	0.00
ANANDAPUR	0.00	0.00	0.00	0.00	0.00	0.00	140.52	166.02	25.50	42.26	63.20	20.94
OSTAPURA	0.00	0.00	0.00	100.65	96.65	-4.00	1044.43	1057.82	13.39	0.00	0.00	0.00
BUDHIKUD	95.80	109.27	13.47	767.01	753.55	-13.46	310.06	299.02	-11.04	0.00	0.00	0.00
TANEIPAL	11.47	10.66	-0.81	1505.45	1526.66	21.21	528.12	521.41	-6.71	0.00	0.00	0.00
PANASDIHA	290.33	281.76	-8.57	2901.50	2915.38	13.88	1203.24	1175.93	-27.31	62.32	67.16	4.84
GAYALMUNDA	6.68	26.62	19.94	1632.05	1624.04	-8.01	867.99	895.42	27.43	0.00	0.00	0.00
GANPUR	0.00	0.00	0.00	38.78	22.50	-16.28	226.56	214.39	-12.17	0.00	0.00	0.00
BARANGA	0.00	0.00	0.00	35.51	41.88	6.37	644.28	648.77	4.49	21.00	43.92	22.92
PATILO	0.00	0.00	0.00	5.70	6.83	1.13	577.18	581.37	4.19	76.00	50.34	-25.66
Forest Cover Change for Brahmanipal Range												
MAHABIRPOSI	0.00	0.00	0.00	397.94	401.79	3.85	1177.09	1186.30	9.21	0.00	0.00	0.00
BRAHMANIPAL	32.36	40.02	7.66	1385.02	1405.20	20.18	2137.95	2139.48	1.53	0.00	0.00	0.00
BALIPARBAT	939.17	969.23	30.06	544.36	550.29	5.93	1762.80	1749.48	-13.32	0.00	0.00	0.00
REBENA(S)	1652.67	1651.07	-1.60	1131.59	1125.90	-5.69	1319.73	1310.64	-9.09	0.00	21.84	21.84
TALAPADA	2418.31	2402.53	-15.78	539.41	527.79	-11.62	1084.88	1076.03	-8.85	0.00	20.17	20.17
REBENA(N)	1987.55	1998.29	10.74	759.70	771.18	11.48	722.60	688.45	-34.15	13.96	14.55	0.59
PALASPAL(W)	1555.81	1580.09	24.28	672.09	682.47	10.38	1551.90	1548.86	-3.04	0.00	0.00	0.00
PALASPAL(E)	0.00	0.00	0.00	136.41	138.06	1.65	1062.51	1058.21	-4.30	0.00	0.00	0.00
Forest Cover Change for Deogaon Range												
BHAGAMUNDA	0.00	0.00	0.00	1348.27	1321.47	-26.80	1991.43	1990.52	-0.91	82.50	83.02	0.52
SAGADAPATA	3.98	0.01	-3.97	2685.01	2653.95	-31.06	2650.11	2646.02	-4.09	172.23	156.96	-15.27
BARIPAL	0.00	0.00	0.00	38.84	40.18	1.34	976.49	967.76	-8.73	0.00	0.00	0.00
GADUAN	0.00	0.00	0.00	366.55	384.27	17.72	824.51	815.24	-9.27	0.00	0.00	0.00
BARBAHALI	0.00	0.00	0.00	6.80	7.78	0.98	305.94	327.91	21.97	23.08	19.81	-3.27
BASANTAPUR	0.00	0.00	0.00	615.58	599.71	-15.87	1274.74	1352.04	77.30	2.65	4.90	2.25
DEOGAON	0.00	0.00	0.00	0.00	0.00	0.00	15.96	10.80	-5.16	0.00	0.00	0.00
GARGADBAHAL	3531.45	3461.32	-70.13	1063.94	1064.37	0.43	1484.17	1487.29	3.12	18.25	18.26	0.01

HARICHANDANPUR	0.00	0.00	0.00	654.02	664.15	10.13	1046.62	1030.75	-15.87	0.00	0.00	0.00
Forest Cover Change for Hadagarh Range												
RAIGHATI	10.85	15.29	4.44	372.68	398.27	25.59	574.57	671.80	97.23	0.00	0.00	0.00
HADAGARH	137.05	137.38	0.33	835.79	870.48	34.69	1277.25	1272.07	-5.18	34.14	32.26	-1.88
BANIAPANKA	4.21	4.32	0.11	85.18	91.41	6.23	411.54	428.32	16.78	45.04	46.33	1.29
SANGAM	0.00	0.00	0.00	63.74	95.14	31.40	384.19	417.40	33.21	133.68	135.33	1.65
BAIDAKHIA	0.00	0.00	0.00	0.00	0.00	0.00	140.10	143.08	2.98	483.03	454.31	-28.72
PITANAU	3.34	3.28	-0.06	1746.18	1756.57	10.39	1077.39	1031.48	-45.91	0.00	0.00	0.00
KANTIPAL	7.69	10.31	2.62	541.54	489.37	-52.17	877.85	952.48	74.63	85.35	76.34	-9.01
KATHAKATA	0.00	0.00	0.00	177.17	173.39	-3.78	407.19	424.79	17.60	41.28	40.34	-0.94
BAHIA	0.00	0.00	0.00	171.55	154.13	-17.42	409.65	421.24	11.59	549.29	461.26	-88.03

RANGE WISE FOREST COVER CHANGE OF KEONJHAR WL DIVISION												
Range	**VDF (Area in ha)**			**MDF (Area in ha)**			**OF (Area in ha)**			**SCRUB (Area in ha)**		
	2017	**2019**	**Change**	**2017**	**2019**	**Change**	**2017**	**2019**	**Change**	**2017**	**2019**	**Change**
ANANDAPUR	423.31	455.38	32.07	7791.54	7873.92	82.38	6522.29	6502.89	-19.40	210.52	232.74	22.22
BRAHMANIPAL	8585.86	8641.22	55.36	5566.52	5602.69	36.17	10819.45	10757.45	-62.00	13.96	56.56	42.60
DEOGAON	3535.43	3461.32	-74.11	6779.01	6735.88	-43.13	10569.97	10628.32	58.35	298.71	282.94	-15.77
HADAGARH	163.14	170.57	7.43	3993.83	4028.76	34.93	5559.74	5762.65	202.91	1371.81	1246.17	-125.64

Appendix-IX

The medicinal Plants of Anandapur wildlife Division, Keonjhar

S.I No.	Local Name	Botanical Name	Family	Habit
1.	Aaisa	*Crinum asiticum*	Amaryllidaceae	Herb
2.	Agara	*Argemone Mexicana*	Papaveraceae	Grass
3.	Agibathu	*Premna seratifolia*	Verbenaceae	Tree
4.	Agnijhala	*Clausema excavata*	Rutaceae	Herb
5.	Agnipatri	*Ammannia baccifera*	Lyteraceae	Herb
6.	Ajamoda	*Apium graveolens*	Apiaceae	Herb
7.	Akanabindhi	*Cissampelos pareira*	Meliaceae	Climber
8.	Akashmalli	*Cassytha filiformis*	Fabaceae	Tree
9.	Amarpoe	*Kalanchoe pinnata*	Crassulaea	Herb
10.	Amba	*Mangifera indica*	Moracaea	Tree
11.	Ambada	*Spondias pinnata*	Anacardiaceae	Tree
12.	Ambaliti	*Oxalis corniculata*	Oxilidaceae	Grass
13.	Amla	*Phyllanthus emblica*	Euphorbiacea	Tree
14.	Anantamula	*Hemidesmus indicus*	Asclepiadaceae	Climber
15.	Ankol	*Alangium salvifolium*	Alangiaceae	Tree
16.	Apamarga	*Achyranthes aspera*	Amaranthaceae	Tree
17.	Aparajita	*Clitoria ternatea*	Fabaceae	Climber
18.	Araguna	*Cycas cioroinalis*	Cycadaceae	Tree
19.	Arakha	*Calotrophis procera*	Asclepiadaceae	Shrub
20.	Arjun	*Terminalia arjuna*	Combretacea	Tree
21.	Asistaka	*Sapindus emarginata*		
22.	Aswatha	*Ficus religiosa*	Moracaea	Tree
23.	Baburi	*Acacia nilotica*	Fabaceae	Tree
24.	Badiamla	*Phyllanthus foaternus*	Euphorbiaceae	Herb
25.	Baghanakhi	*Martynia annua*	Pedaliaceae	Shrub
26.	Bahada	*Terminalia bellirica*	Combrewcetea	Tree
27.	Baidanka	*Mucuna*	fabaceae	Climber
28.	Baincha	*Flacourtia indica*	Flacourtiaceae	Herb
29.	Bana kolatha	*Atylosia scarabaeoides*	fabaceae	Climber
30.	Banaharada	*Atylosia cajanifolia*	Fabaceae	Herb
31.	Banamalli	*Jasmium arborescens*	malpighiaceae	Herb
32.	Banapiasa	*Urginea indica*	Liliaceae	Herb
33.	Banasorisa	*Cleome gynandra*	Capparaceae	Herb
34.	Bara	*Ficus bengalensis*	Moracaea	Tree
35.	Barakoli	*Ziziphus mauritiana*	Rhamnaceae	Tree
36.	Baruna	*Cratavamegna*	Capparadaceae	Tree
37.	Basanga	*Adhatoda vasica*	Acanthaceae	Herb
38.	Baula	*Mimusops elingi*	sapotaceae	Tree
39.	Behenta	*Limonia acidissima*	Rutaceae	Shrub
40.	Bela	*Aegle mermelos*	Rutacea	Tree
41.	Bena	*Vetiveria zizanioides*	poaceae	Grass
42.	Bhalia	*Semicarpus anacardium*	Anacardiacea	Tree
43.	Bhegi baigan	*Solanum xanthocarpum*	Solanaceae	Herb
44.	Bheru	*Chloroxylon swetiana*	Rutaceae	Tree
45.	Bhrungraj	*Eclipta prostrate*	Compositeae	Herb
46.	Bhuikadamba	*Sphaeranthus indicus*	Compsiteae	Herb
47.	Bhuikhajuri	*Pheonix acaulis*	Arecaceae	Herb
48.	Bhuineem	*Andrographis paniculata*	Acanthaceae	Herb
49.	Bhurukunda	*Hymenodictyon excelsum*	Rubiaceae	Tree

S.I No.	Local Name	Botanical Name	Family	Habit
50.	Bichuati	*Laportea interrupta*	Urticaceae	Grass
51.	Bilyakesar	*Crinum defixum*	Amaryllidaceae	Herb
52.	Bisakpuri	*Sida cordifolia*	Malvaceae	Shrub
53.	Bislyakarani	*Tridax procumbers*	Asteraceae	Herb
54.	Borojhanjhi	*Pistia stratiotes*	Aracaceae	Climber
55.	Brahmajasthi	*Clerodendrum serratum*	Verbanaceae	Herb
56.	Brahmi	*Bacopa monnieri*	Scrophulariaceae	Climber
57.	Brajamuli	*Sida acuta*	Malvaceae	Herb
58.	Bruhati	*Solanum violaceum*	Solanaceae	Herb
59.	Brusikali	*Pergularia daemia*	Asclepiadaceae	Climber
60.	Chakramarda	*Cassia tora*	Caesalpiniaceae	Herb
61.	Champa	*Michelia champaca*	Magnoliaceae	Tree
62.	Chara	*Buchania lanzan*	Anacardiaceae	Tree
63.	Chaula dhua	*Aerva sanguinolerta*	Amarathanceae	Herb
64.	Chitakuti	*Euphorbia hirta*	Euphorbiaceae	Herb
65.	Chitrak	*Plumbago zeylanica*	Plumbaginaceae	Shrub
66.	Dakhinakabada	*Althanthus excels*	Sinaroubaceae	Tree
67.	Dankari	*Cleodendrum multiflorum*	Verbenaceae	Shrub
68.	Danti	*Baliospermum montanum*	Euphorbia	Herb
69.	Daskerenda	*Barleria cristata*	Acanthaceae	Herb
70.	Debadaru	*Cedrus deodaru*	Rubiaceae	Tree
71.	Dhalabacha	*Acorus calamus*	Araceae	Herb
72.	Dhanwatara	*Cymbopogan martini*	Poaceae	Grass
73.	Dharanja	*Holoptela interifolia*	Ulmacea	Tree
74.	Dhatuki	*Woodfordia fruticosa*	Lythraceae	Shrub
75.	Dimiri	*Ficus racemosa*	Moracaea	Tree
76.	Duba	*Cynodon dactylon*	Poaceae	Grass
77.	Dudura	*Datura metel*	Solanaceae	Herb
78.	Durlava	*Ocimum basilicum*	Lamiaceae	Herb
79.	Gaisa	*Lucas aspera*	Labiaceae	Herb
80.	Gajapipali	*Schindapsus officinalis*	Spiphytic	Climber
81.	Gambhari	*Gmelina arborea*	Verbenacea	Tree
82.	Gangasiuli	*Nycthus arbortristis*	Oleaceae	Treee
83.	Garagada	*Coix lacrymajobi*	Poaceae	Grass
84.	Gharapodia	*Hedyotis corymbosa*	Rubinaceae	
85.	Gila	*Caesalpinia bonduc*	Caesalpiniaceae	Climber
86.	Gopakanhu	*Cryptolepis buchanani*	Asclepiadaceae	Climber
87.	Gudamari	*Gmnema sylvestre*	Asclepiadaceae	Climber
88.	Guluchi	*Tinospora cardifolia*	Memispermacea	Climber
89.	Gunja	*Abrus precatorious*	Fabaceae	Climber
90.	Hadajoda	*Cissus quadrangularis*	Vitaceae	Herb
91.	Harida	*Terminalia chebula*	Combretacea	Tree
92.	Hastikarna palasa	*Leeamacrophylla*	Leeacea	Shrub
93.	Hetamundia	*Trichodesma indicum*	Boraginaceae	Herb
94.	Hidimicha	*Enydra fluctuans*	Compsitae	Grass
95.	Hinjal	*Barringtonia acutangula*	Lecythidaceae	Tree
96.	Indramarisa	*Acalypha indica*	Euphorbiaceae	Grass
97.	Jamu	*Syzigium cumini*	Myrtaceae	Tree
98.	Jasthimadhu	*Glycyrrhiza glabra*	Fabaceae	Herb

S.I No.	Local Name	Botanical Name	Family	Habit
99.	jatasalaparni	*Uraria lagopodioides*	Fabaceae	Grass
100.	Juala	*Cordia oblique*	Boraginaceae	
101.	Kadamba	*Anthocephalus chinensis*	Rubiaceae	Tree
102.	Kai	*Nymphaea pubescens*	Nymphaceae	Herb
103.	Kaitha	*Limonia acidissima*	Rutaceae	Tree
104.	Kakamachi	*Solanum nigrum*	Solanaceae	Solanaceae
105.	Kanchana	*Bahunia variegata*	Caesalpiniaceae	Tree
106.	Kaniera	*Cascabela thevetia*	Apocynaceae	Tree
107.	Kankada	*Momordica dioica*	Curcurbitaceae	Climbers
108.	Kantamarisa	*Amaranthus spinosus*	Amaranthaceae	Grass
109.	Kantikapali	*Capparis sepiaria*	Capparaceae	
110.	Karada	*Cleistanthus collinus*	Euphorbiaceae	Tree
111.	Karala	*Dolichandrone falcate*	Bignoniaceae	Tree
112.	Karanja	*Pongamia pinnata*	Fabaceae	Tree
113.	Kasa	*Saccharum spotraneum*	Poaceae	Grass
114.	Kasundi	*Cassia occidentalis*	Fabaceae	Shrub
115.	Katak	*Strychnos potatorum*	Logaginaceae	Tree
116.	Kathachampa	*Plumeria rubra*	Apocynaceae	Tree
117.	Kathia siju	*Pedilanthus tithymaloides*	Euphorbiaceae	Herb
118.	Katutumbi	*Lagenaria siceraria*	Cucurbitaceae	Climber
119.	Kendu	*Diospyros melanoxylon*	Ebenaceae	Tree
120.	Kesadra	*Eclipta alba*	Asteraceae	Herb
121.	Kesar	*Scirpus grossus*	Cyperceae	Grass
122.	Keu	*Costus speciosus*	Zingiberaceae	Shrub
123.	Khira kanchana	*Euphorbia fusiformis*	Euphorbiaceae	Shrub
124.	Khirakoli	*Manikara hexandra*	Apocynaceae	Herb
125.	Kia	*Pandanus fascicularis*	Pandanaceae	Shrub
126.	Kochila	*Strychnus nox-vomica*	Loganiaceae	Tree
127.	Koilekha	*Hygrophila auriculata*	Acanthaceae	Grass
128.	Kukudra	*Blumea lacera*	Asteraceae	Weed
129.	Kumbhi	*Careya arborea*	Lecythidaceae	Tree
130.	Kusa	*Desmostachya bipinnata*	Poaceae	Grass
131.	Kusuma	*Schleichera oleosa*	Sapindaceae	Tree
132.	Kutaja	*Halarrhena antidysentrica*	apocynaceae	Tree
133.	Lajakuli	*Mimosa pudica*	Mirnosaceae	Grass
134.	Landabaguli	*Ocimum canum*	Lamiaceae	Herb
135.	Lodha	*Symplocos racemosa*	Symplocaceae	Tree
136.	Lunakaranja	*Caesalpinia digyna*	Caesalpiniaceae	Climber
137.	Lunlunia	*Solanum nigrum*	Solanaceae	Grass
138.	Madanaphala	*Catunaregam spinosa*	Rubiaceae	Tree
139.	Madanmastak	*Hybanthus enneaspermus*	Violaceae	Grass
140.	Mahakala	*Trichosanthes tricuspidata*	Cucurbitaceae	Climber
141.	Mahaneem	*Melia azedarach*	Meliaceae	Tree
142.	Mahula	*Madhuca indica*	Sapotaceae	Tree
143.	Masaparni	*Vigna sublobata*	Papilionaceae	Twiner
144.	Mayurachulia	*Elephantopus scaber*	Compositae	Herb
145.	Modimodika	*Helicters isora*	Helicteres isora	Herb

S.I No.	Local Name	Botanical Name	Family	Habit
146.	Mouran arakha	*Holostema annulara*	Asclepiadaceae	Climber
147.	Muchukunda	*Pterocarpus acerifolium*	Sterculiaceae	Tree
148.	Mudagparni	*Vigna umbellate*	Papilionaceae	Twinere
149.	Murga	*Sansevieria roxburghiana*	Agavaceae	Herb
150.	Musakani	*Coculus hirsutus*	Convolvulaceae	
151.	Mutha	*Cyperus rotundus*	fabaceae	Grass
152.	Muturi	*Smilax zeylanica*	Liliaceae	Climber
153.	Nadahingu	*Gardenia gummifera*	Rubiceae	Shrub
154.	Nagadanti	*Heliotropium indicum*	Boraginaceae	Grass
155.	Nakaairi	*Lippia javanica*	Verbenaceae	Herb
156.	Nakasingha	*Centipeda minima*	Asteraceae	Herb
157.	Naraguni	*Atalantia malabarica*	Rutaceae	Tree
158.	Neem	*Azadirachta indica*	Meliaceae	Tree
159.	Nilotpala	*Nymphea nouchali*	Nymphaceae	Herb
160.	Nirgundi	*Vitex negundo*	Verbenaceae	Shrub
161.	Nirmuli lata	*Cuscuta reflexa*	Convolvulaceae	Climber
162.	Padma	*Nelumbo nucifera*	Nymphaceae	Herb
163.	Padmaguluchi	*Tinospora chinensis*	Memispermacea	Climber
164.	Paladhua	*Erythrina variegata*	Shrub	Shrub
165.	Palasa	*Butea monosperma*		Tree
166.	Palua	*Curcuma aromatic*	Zingziberaceae	Grass
167.	Panaairi	*Aristolochia indica*	Aristolochiaacea	Climber
168.	Panasa	*Atrocarpus heterophyllus*	Moraceae	Tree
169.	Panisingada	*Trapa bispinosa*	Onagraceae	Climber
170.	Paraspipal	*Thespesia populnea*	Malvaceae	Shrub
171.	Pasaruni	*Paedaria foetida*	Fabaceae	Climber
172.	Pataphulia	*Spharanthus indicus*	Compsitae	
173.	Patranga	*Caesalpinia seppan*	Caesalpiniaceae	Shrub
174.	Patuli	*Sterospermum chelonoides*	Bignoniacea	Tree
175.	Paunsia	*Aerva lanata*	Amararthanceae	Grass
176.	Petara	*Abutilon indicum*	Malvaceae	Climber
177.	Phanaphana	*Orxylum indicum*	Bignoniacea	Shrub
178.	Piasal	*Pterocarpus marsupium*	Fabaceae	Tree
179.	Pingu	*Celastrus paniculata*	Celastraceae	Herb
180.	Pitaalu	*Dioscorea bulbifera*	Dioscoreaceae	Climber
181.	Rakta punarschaba	*Boerhavia diffusa*	Nyctaginaceae	Herb
182.	Raktapingali	*Gouania leptostachya*	Rhamnaceae	Shrub
183.	Rama phala	*Annona reticulata*	Annonaceae	Tree
184.	Rasna	*Vanda tessellate*	Orchidiaceae	Climber
185.	Rohini	*Soyamida fabrifuga*	Meliaceae	Tree
186.	Sadabihari	*Catharanthus roseus*	Apocynaceae	Grass
187.	Sahada	*Streblus asper*	Moraceae	Tree
188.	Sal	*Shorea robusta*	Dipterocarpaceae	Tree
189.	Salaparni	*Desmodium gangetium*	Fabaceae	Herb
190.	Sami	*Acacia polycantha*	Mimisaceae	Tree
191.	Sana agarakara	*Spilanthes acmella*	Asteraceae	
192.	Sankhapuspi	*Evolvulus alsinoides*	Convolvulaceae	
193.	Saptaparni	*Alstonia scholaris*	Apocynaceae	Twiner
194.	Sarapunkha	*Tephrosia purpuria*	Fabaceae	Herb/Shrub

S.I No.	Local Name	Botanical Name	Family	Habit
195.	Satabari	*Asparagus racemosus*	Liliaceae	Climber
196.	Shadeba	*Sida rhombifolia*	Malvaceae	Grass
197.	Sibalingi	*Gloriosa superba*	Colchicaceae	Climber
198.	Simuli	*Bombax ceiba*	Bignoniaceae	Tree
199.	Sinduri	*Bixa orellana*	Bixaceae	Shrub
200.	Sirisa	*Albizia lebbeck*	Mimisaceae	Tree
201.	Sisoo	*Dalbergia sisoo*	Fabaceae	Tree
202.	Sitaphal	*Annona squamosa*	Annonaceae	Shrub
203.	Snuhi	*Euphorbia ligularia*	Euphorbiaceae	Herb
204.	Somaraja	*Vernonia anthelmintica*	Compositae	Grass
205.	Suanal	*Ichnocarpus frutescens*	Apocynaceae	Climber
206.	Sunari	*Cassia fistula*	Fabaceae	Tree
207.	Sunsunia	*Marsidea minuta*	Marsileaceae	Hydrophytic plant/Grass
208.	Sweta arakha	*Calotrophis gigantean*	Asclepiadaceae	Shrub
209.	Tagarpada	*Nymphoides indica*	Nymphaceae	Herb
210.	Tala	*Borassus flabellifer*	Palmae	Tree
211.	Talamuli	*Curculigo orchioides*	Amarylidaceae	Grass
212.	Tankara	*Physatis minima*	Solanaceae	Herb
213.	Tentuli	*Tamarandus indica*	Caelalpiniaceae	Tree
214.	Thalakudi	*Centella asiatica*	Apiaceal	Climber
215.	Trayamasa	*Ficus hetrophylla*	Moraceae	Shrub
216.	Tulasi	*Ocimum sanctum*	Labiatae	Shrub
217.	Tundapoda	*Toddalia asiatica*	Rutaceae	Herb

Appendix-X

List of NTFP Species

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
1	2	3	4	5	6	7	8
1.	Amla	Emblica officinalis	Emblic myrobolan	Amla	Fruit rind	Ayurvedic medicine	Dec-Jan
2.	Anantamula	Hemidesmus indicus	Indian sarsaparilla	Anantamula	Roots	Ayurvedic medicines , Skin diseases ,Impurity of blood ,diuretic ,urinary ,rheumatism .	Feb-Mar
3.	Ankaranti	Solanum xanthocarpum	Wild egg plant	Ankaranti	Fruit	Cough	November
4.	Antamula	Tylophora indica	Indian sarsaparilla	Antamula	Leaf	Asthma	Once a year
5.	Antia rope	Heticteres isora	East Indian screw tree	Modimodica	Bark	Used to expectorant ,astringent , anti gallacto gogue .diarrhea ,Dysentry .	Feb-Mar
6.	Apamaranga	Achyranthes aspara	Prickly Chaff flower	Apamaranga	Whole Plant	Piles, Dental Disease	October
7.	Aparajita	Clitoria ternatea	Butterfly pea	Aparajita	Root	Memory enhancer, Anti Stress, Anti depression, Tranquiliser	
8.	Ashok	Saraca asoca	Ashok	Ashok	Leaf, Bark, Root	Gynic disorder	July-October
9.	Atundi fruit	Cumbretum roxburghii	-	Atundi	Fruit	Making for ornamental articles .	May-Jun
10.	Atundi lai	Cumbretum roxburghii	-	Atundi /Denulaha	Creeper	Used for basket making .	Oct-Jun
11.	Babool seed	Acacia nilotica	Babool tree	Bamur	Seeds	Used as cattle feed .Pods used in uri negenito disorders .	Mar-Apr
12.	Bachha	Acrous calamus	Sweet flag	Bachha	Root	Throat disease	Feb-March
13.	Baghanakhi seeds	Martynia annua	Tiger claw,Devel claw	Baghanakhi	Seeds	Anti-inflammatory ,Seeds yield oil .	Dec-Jan
14.	Bahada	Terminalia belerica	Beleric myrobolan	Bahada	Fruit rind	Ayurvedic medicine	Dec-Jan
15.	Baidanka seeds	Mucuna pruriens	Cowhage, Common cow itch .	Baikhujen ,Baidanka .	Seeds	Used as nervine tonic aphrodisiac ,anthelmintic , The active ingredient L-DOPA used for parkinsonism .	Jan-Apr
16.	Baigaba	Jatropha gossypyfolia	Delllyache bush	Baigaba	Branches	Dental problem	After plantation of 2 to 3 years

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
17.	Bana haladi	Curcuma aromaticsa	Wild turmeric .	Bana haladi	Rhizome	Bruises & sprain .Aromatic adjunct .	Jan –Feb
18.	Bana khajuri	Phoenix acualis	Flute	Bana khajuri ,bhui khajuri	Leaves	Leaves used for thatching & making mats ,broom ropes etc .	Dec-Jan
19.	Bana kolatha	Tephrosia purpurea	Wild indigo	Bana kolatha	Roots & seeds.	Used as insecticide ,laxative , diuretic , dyspepsia , rheumatism , elephantiasis , asthma , scabies , piles . plant used as green manure .	Oct-Jun
20.	Basanga	Justica adhatoda	Malbar Nut	Basanga	Flower, Leaf	Cough & Asthma	Dec-January
21.	Basil	Ocimum basilicum	Tulsi	Van tulasi ,ganga tulasi	Seeds	Seeds yield fatty oil , which is anti microbial .	Dec-jan
22.	Baula	Mimusops elengi	Spanish cherry	Baula	Fruit	Dysentry, Dental disease	Late spring /earlysummer
23.	Bela	Aegle marmelos	Bael tree	Bael	Fruits	Unripe or halfripe fruit pulp used for ayurvedic medicines ,used as digestive ,stomachic and laxative . gummy substances around seeds used as adhesive for paint and watercolour paint .	Mar-Apr
24.	Bena chera	Vetiveria zizanioides	Vetiver /Khaskhas	Bena	Roots	Roots essentials oil ,used in perfumery & cosmetics .roots used in doors & windows screen .	Dec-Feb
25.	Bhalia fruit	Semecarpus anacardium	Mark ing nut tree	Bhalia	Fruit	Wood preservative	Nov-Dec
26.	Bhuneem	Andrographis paniculate	Creat King of bitters	Bhuineem	All parts	Tonic for liver and fefrifuge & anthelmintic also used in preparation of ayurvedic medicines .	Oct-Dec
27.	Bhursunga	Murraya koenigi	Curry leaf tree	Bhursunga	Leaves	Used as a flavouring agent for preparation of food . it is also a common condiment ,Essential oil used for soap perfume .	October-Jun
28.	Bidanga	Embelia ribes	False Black pipper	Vidanga	Seeds	Used as stomachic ,anthelmintic ,tonic ,astringent . Dried food used in preparation of ayurvedic medicines .	Oct-Nov

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
29.	Bramhi	Centella asiatica	Indian Penniwort	Bramhi	Leaf	Anodyne disease	Aug-September
30.	Broom grass	Arundinella setose trin	Broom grass	Jhadu ghasa	Grass	For making brooms .	Jan-Feb
31.	Chakunda seed	Casia tora	Ringworm plant	Chakunda	Seeds	Substitute for coffee and as a mordant in dyeing .Used in skin diseases specially ringworm and scabies etc .	Nov-Dec
32.	Chara seed	Buchanania lanzan	Almondette	Char	Seeds	Kernel eaten, substitute of almond in confectionery . Substitute for olive and almond oil and used for glandular swelling of neck .	Apr-May
33.	Chhana grass	Imperata cylindrica	Boehmeria nivea	Thatch grass	Chhana grass	Ropes ,mats ,baskets ,bag, packing materials .	Dec-Feb
34.	Clearing nut	Strychnos potatorum	Clearing nut tree	Nirmuli	Seeds	Tonic ,cleaning dirt from water .	Jan-Mar
35.	Dhatuki	Woodfordia fruticose	Fire flame bush	Dhataki	Flowers	Ayrvedic Medicines,flowers yield red dye,also cotain tannin, astringent & stimulant	Feb-Mar
36.	Eksira fruit	Schrebera swietenioides	Weavers beam tree	Makha	Fruit	Medicine for hydrocele .	Feb-Mar
37.	Gaba	Ricinus communis	Castor	Jada	Seeds	Castor oil used as a cathartic lubricants , illumination , hair oil ,soap making and type writer ink .	Most part of the year .
38.	Gila	Caesalpinia bonduc	Boduc nut ,Fever nut.	Gilo	Seeds	Antipyretic ,used as cosmetics ,malaria fever .	Jan-Mar
39.	Gudmari	Gymnema sylvestre	Gymnema (Cow plant)	Gudmari	Leaf, Root	Diabetic	In every three month
40.	Guluchi	Tinospora cordifolia	Heart leaved moonseed	Guluchi	Leaf, Root & Whole plant	Tonic/ Fever	Winter
41.	Harida	Terminalia chebula	Chebulic myrobolan	Harida	Fruit ,rind	Ayurvedic medicine	Jan-Mar
42.	Hill broom	Thysanolaena maxima	Broom grass/Tiger grass	Phula jhadu	Stem	Reed pen	Dec-Jan
43.	Honey	Product of Honey bees	Honey	Mahu	Honey	Aryurvedic medicines	Oct-Jun
44.	Indrajaba	Holarrhena pubescens	Conessi bark tree	Kure	Seeds	Ayurvedic medicines like decentry ,intenstinal worms ,stomach disorders	Dec-Feb.

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
45.	Jangle Jada	Jatropha curcas	Physic nut purging nut	Jungle judda, jahagy gab	Seeds	Bio diesel, manufacture of candles. Lubricants,	Dec-Jan
46.	Kamalagundii	Mallotus philippensis	Kamala tree ,monkey face tree	Kamalagundi	Fruits .	Grandular hairs from fruits yield a dye called Kamala powder .seeds yield a fatty oil used in paints & varnishes . Seeds are also anthelmintic .	Feb-Mar
47.	Kanta padma	Euryale ferox	Fox nut , Gorgaon nut	Kantapadma ,makhana seeds	Seeds	Seeds are roasted & eaten .Known as Makhana seeds . The flour used as the substitute of arrowroot .it is used as tonic .	May-Jun
48.	Karanja seed	Pongamia pinnata	Pongam oil tree	Karanja	Seeds	Biodisel mproduction ,used in tanning industry ,preparation of soap sand candles ,lubricants for engine .	Mar-Apr
49.	Katha chattu	Mushroom grown	-	Katha chatu	Mushroom	Edible mushroom	Oct
50.	Khatalai	Pentapetes phoenicea	-	Khatalai Satghodia	Capsule	Used in bowels & as an emollient .	Nov-Dec
51.	Khelua lai	Ichnocarpus fruitescens	-	Thapalaha sunani	Branches	Fishing net & basket making .	Oct-Jun
52.	Kochila seeds	Strychnos nux-vomica	Nux-vomica	Kochila	Seeds	Ayurvedic medicines	Dec-Jan
53.	Kusuma seeds	Schleichera oleosa	Lac tree	Kusuma	Seeds	Fatty oil ,used for culinary lighting purposes ,lubricant for mechinary and skin diseases .	Jun
54.	Landa baguli	Ocimum canum	Hoary basil	Landa baguli /Ghoda tulsi .	Seeds	Seeds oil used in soap and cosmetics .seeds are diuretic ,tonic & preparation of cooling drink .	Feb-Mar
55.	Mahua flower	Madhuca indica	Mowra buttertree	Mahula	Flower	Liquor & vinegar .	Mar-Apr
56.	Mahua seeds	Madhuca indica	Mohua tree	Mahula	Seeds	Edible purposes ,soap manufacturing ,rheumatism ,mahua cake used as manure and biopestiside .	May-Jun
57.	Mango kernel	Magnifera indica	Mango	Amba	Kernel	Used as food & feed .	May-Jun .
58.	Mankadakendu	Diospyros malbaric	Goub persimmon	Mankadakendu	Fruits	Ripe fruit ,edible ,raw fruit contain tannin ,preservatives for fishing nets .	Mar-Apr

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
59.	Nageswar flower	Mesua ferrea	Mesua tree/Iron wood .	Nagewar	Flower .	Ayurvedic medicine ,Gyanaecological disorder ,dysentery .anaaemia ,expectorant rheumatism .	Mar-Jun
60.	Neem seed	Azadirachta indica	Neem tree ,margosa tree.	Neem	Seeds	Seeds oil used as biopestiside ,fungicide and for soap soap making .Also suitable for biodiesel production. Oil used for skin diseases. Kernel used for preparation of ayurvedic medicine .	May-Jun
61.	Palasa Seeds	Butea monosperma	Flame of the forest/ bastard teak	Palasa	Seeds	Anthelmintic	May-June
62.	Palua	Curcuma angustifolia	East Indian arrow root	Palua	Tuber	Used as food commodity	Jan-Feb
63.	hanaphana	Oroxylum indicum	Indian trumpet flower ,Midnight horror .	Phanaphana / Phaphen	Fruits	Preparation of ornamental articles .Tender fruits are stomachic and expectorant .Seeds used as purgative .	Feb-Mar
64.	Phula jhadu	Thysanolaena maxima	Broom grass,tiger grass	Phul jhadu	Panicles	Panicles made into soft broom.stems used for making reed pens for writing	Dec-Jan
65.	Putrani	.Premna herbacea	-	Putrani	Roots	Asthma,Reumatism,Dropsy	Dec-Jan
66.	Rasna root	Vanda tessellate	Thai ginger	Rasna	Roots	Roots used in manufacturing ayurvedic medicines for rheumatism ,inflammation nervous disorder and liver tonic .	June
67.	Ritha fruit	Sapindus emarginatus	Soap nut tree	Ritha	Fruit	Soap manufacturer	Nov-Dec
68.	Rohini fruit	Soymida febrifuga	Indian red wood , bastard cidar	Rohini	Fruits	Used for preparation of ornamental 7 artistic materials .	May-June
69.	Sabai grass	Eulaliopsis binnata	Sabai grass	Sabai	Grass	Used for ropes ,mats & paper .	Dec-Jan
70.	Sal seed	Sorea robusta	Sal tree	Rengal ,Sargi ,Sal	Seeds	Seed oil used for cooking ,lighting ,manufacture of chocolate .Seed cake used as cattle & pultry feed .	May-Jun

S.I No.	Trade name of NTFP	Botanical Name	English Name	Local Name	Parts used	Uses`	Collection Period
71.	Salaparni	Desmodium gangeticum	Sweet bitter	Salaparni	Root & Whole plant	Stomach disorder	Nov-December
72.	Sapa masina grass	Typhaangustata bory	Cat tail	Sapa masina grass	Leafs & Stem	Thatching ,Screen ,mats ,Ropes ,stuffing .Fishing .	Dec-Feb
73.	Satabari	Asparagus racemosus	Asparagus	Satabari/Debadhun	Roots	Used as tonic, galactagogue, nervous & rheumatic complaints .	Feb-Mar
74.	Shikakai	Acacia sinuate	Shikakai	Bana Ritha	Pods	Detergent,hair washing and soap manufacture	Feb-Mar
75.	Siali leaf	Bauhinia vahlii	Siali	Siali	Leafs	Preparing of leaflet and umbrella .	Oct-Dec
76.	Siali seeds	Bauhiniu vahlii	Siali	Siali	Seeds	Seeds eaten raw or fried when ripe they taste like cashew nuts	Feb-March
77.	Sidha fruit	Lagerstroemia parviflora	Crape myrtle	Sihina /Sidha	Fruits	Used in making ornamental making .	Nov-Dec
78.	Simili tula	Bombax ceiba	Silk cotton tree	Simuli	Cotton	Preparing pillows	Mar-April
79.	Suama lai	Ichnocarpus frutescens	Black creeper	Suama lai/khetua nai	Roots	Tonic ,diuretic for fever dyspepsia ,diabetes .	Dec-Jan
80.	Tal makhana seeds /Koilekha seeds	Hygrophylla auriculata	Temple plant	Tal makhana /Koilekha seeds	Seeds	Ayurvedic medicine for arthritis ,tonic and other ailments .Aphrodisiac property .	Jan-Feb
81.	Tamarind	Tamarindus indica	Tamarind	Tentuli	Fruits, Pulp, Seed	Food preparation, Adhesive book binding ,cardboard manufacture .	Mar-Apr
82.	Thorn broom	Aristida setacea	Thorn broom	Kantajhadu	Culms	Making brooms & brushes .	Jan-Feb

Appendix - XI-A

Regeneration status Rebena RF							
S.I No.	**UID No.**	**Compt.No.**	**Seedling**	**Sapling**	**Adault**	**Status**	**RF**
1	128	1	20	6	3	Good	Rebena
2	129	1	109	9	9	Fair	Rebena
3	130	1	86	0	1	New	Rebena
4	131	1	18	10	2	Good	Rebena
5	133	2	9	1	1	Fair	Rebena
6	135	2	19	7	7	Fair	Rebena
7	137	2	16	6	7	Fair	Rebena
8	138	3	34	0	2	fair	Rebena
9	139	3	30	6	3	Good	Rebena
10	143	3	26	0	0	fair	Rebena
11	152	5	16	4	0	New	Rebena
12	153	5	17	4	2	Good	Rebena
13	154	5	16	7	4	Good	Rebena
14	155	5	17	6	4	Good	Rebena
15	156	5	24	0	2	Fair	Rebena
16	157	6	15	6	3	Good	Rebena
17	158	6	46	27	10	Good	Rebena
18	159	6	18	8	3	Good	Rebena
19	160	6	35	18	13	Good	Rebena
20	161	7	23	11	8	Good	Rebena
21	162	7	31	18	13	Good	Rebena
22	163	7	42	13	6	Good	Rebena
23	164	7	29	13	11	Good	Rebena
24	165	8	46	10	9	Good	Rebena
25	166	8	52	32	14	Good	Rebena
26	167	8	39	21	13	Good	Rebena
27	168	9	10	14	2	Poor	Rebena
28	169	9	66	6	13	Fair	Rebena
29	170	10	3	0	1	Fair	Rebena
30	171	10	79	14	0	New	Rebena
31	172	10	37	2	7	Fair	Rebena
32	173	11	70	3	2	Good	Rebena
33	174	11	28	12	3	Good	Rebena
34	175	11	27	9	4	Good	Rebena
35	176	11	32	23	5	Good	Rebena
36	177	12	2	4	5	poor	Rebena
37	178	12	34	2	0	New	Rebena
38	179	12	24	9	8	Good	Rebena
39	180	12	42	5	0	New	Rebena
40	181	13	36	4	5	Fair	Rebena
41	182	13	32	15	14	Good	Rebena
42	183	13	38	5	0	New	Rebena
43	184	14	32	8	7	Good	Rebena
44	185	14	24	2	1	Good	Rebena
45	186	14	41	0	0	New	Rebena
46	187	14	39	0	1	Fair	Rebena
47	188	14	49	0	1	Fair	Rebena
48	189	15	56	8	9	Fair	Rebena
49	190	15	41	0	6	Fair	Rebena
50	191	15	18	14	1	Good	Rebena
51	192	16	20	7	5	Good	Rebena
52	193	16	65	5	8	Fair	Rebena
53	194	16	19	6	0	New	Rebena
54	195	16	70	4	8	Fair	Rebena
55	196	17	10	7	2	Good	Rebena
56	197	17	54	20	14	Good	Rebena

S.I No.	UID No.	Compt.No.	Seedling	Sapling	Adault	Status	RF
57	198	17	35	12	1	Good	Rebena
58	199	18	63	0	6	Fair	Rebena
59	200	18	58	3	0	New	Rebena
60	201	18	24	6	3	Good	Rebena
61	202	18	41	7	1	Good	Rebena
62	203	19	53	14	20	Fair	Rebena
63	204	19	24	14	6	Good	Rebena
64	205	19	12	6	2	Good	Rebena
65	206	19	9	0	0	New	Rebena
66	207	19	12	2	1	Good	Rebena
67	208	19	52	26	13	Good	Rebena
68	209	19	7	5	1	Good	Rebena
69	210	20	16	8	3	Good	Rebena
70	211	20	46	13	16	Fair	Rebena
71	212	20	51	7	24	Fair	Rebena
72	213	20	71	2	7	Fair	Rebena
73	214	20	18	11	13	fair	Rebena
74	215	20	28	9	3	Good	Rebena
75	216	20	34	14	5	Good	Rebena
76	217	21	19	16	0	New	Rebena
77	218	21	13	2	1	Good	Rebena
78	219	21	6	3	0	New	Rebena
79	220	22	50	5	0	New	Rebena
80	221	22	32	3	3	Fair	Rebena
81	222	22	103	2	9	Fair	Rebena
82	223	22	51	10	3	Good	Rebena
83	224	23	4	0	0	New	Rebena
84	225	23	45	0	0	New	Rebena
85	227	24	3	8	3	Poor	Rebena
86	228	24	9	21	6	Poor	Rebena
87	229	24	68	20	22	Fair	Rebena
88	230	24	22	26	9	Good	Rebena
89	231	24	29	23	11	Good	Rebena
90	232	24	83	21	28	Fair	Rebena
91	233	25	62	14	12	Good	Rebena
92	234	25	63	14	10	Good	Rebena
93	235	25	24	1	3	Fair	Rebena
94	236	25	5	7	4	Fair	Rebena
95	237	25	22	18	8	Good	Rebena
96	238	25	22	32	13	Fair	Rebena
97	239	25	23	18	5	Good	Rebena
98	240	25	51	1	14	Fair	Rebena
99	241	26	24	2	3	Fair	Rebena
100	242	26	103	15	9	Good	Rebena
101	243	26	21	5	2	Good	Rebena
102	244	26	101	3	6	Fair	Rebena
103	245	26	116	17	11	Good	Rebena
104	365	27	27	0	0	New	Rebena
105	366	27	94	4	5	Fair	Rebena
106	246	28	45	5	2	Good	Rebena
107	247	28	71	1	6	Fair	Rebena
108	248	28	110	10	5	Good	Rebena
109	249	28	43	2	2	Fair	Rebena
110	250	29	144	4	6	Fair	Rebena
111	251	29	73	0	3	Fair	Rebena
112	252	29	63	2	3	Fair	Rebena
113	253	29	74	4	10	Fair	Rebena
114	254	30	74	2	9	Fair	Rebena
115	255	30	148	2	6	Fair	Rebena

S.I No.	UID No.	Compt.No.	Seedling	Sapling	Adault	Status	RF
116	256	30	80	7	2	Good	Rebena
117	257	30	77	25	28	Fair	Rebena
118	258	30	56	17	1	Good	Rebena
119	259	31	45	0	0	New	Rebena
120	260	31	47	0	6	fair	Rebena
121	261	32	45	12	12	Fair	Rebena
122	262	32	35	1	0	New	Rebena
123	263	33	38	9	4	Good	Rebena
124	264	33	47	3	2	Good	Rebena
125	265	33	64	0	2	Fair	Rebena
126	266	34	16	14	6	Good	Rebena
127	267	34	11	9	4	Good	Rebena
128	268	35	16	15	6	Good	Rebena
129	269	35	15	17	8	Good	Rebena
130	271	36	0	0	0	No	Rebena
131	272	37	46	14	6	Good	Rebena
132	273	37	20	7	4	Good	Rebena
133	274	38	46	12	10	Good	Rebena
134	275	38	27	8	12	Fair	Rebena
135	276	39	41	15	6	Good	Rebena
136	277	39	21	11	6	Good	Rebena
137	278	40	28	12	8	Good	Rebena
138	279	41	26	8	6	Good	Rebena
139	280	42	32	7	8	Fair	Rebena
140	281	42	20	10	4	Good	Rebena
141	282	43	18	9	4	Good	Rebena
142	283	43	22	11	9	Good	Rebena
143	284	44	22	9	6	Good	Rebena
144	285	45	63	12	13	Fair	Rebena
145	364	45	60	1	18	Fair	Rebena
146	367	45	125	27	17	Good	Rebena
147	286	46	41	1	3	Fair	Rebena
148	287	46	39	3	2	Good	Rebena
149	288	46	19	20	5	Fair	Rebena
150	289	46	19	21	6	Fair	Rebena
151	290	46	15	14	5	Good	Rebena
152	291	46	14	19	7	Fair	Rebena
153	292	47	16	6	1	Good	Rebena
154	293	47	73	3	3	Fair	Rebena
155	294	47	54	5	5	Fair	Rebena
156	295	47	0	0	0	No	Rebena
157	296	47	70	16	16	Fair	Rebena

Appendix - XI (B)

Regeneration status Atei RF							
S.I No.	**UID No.**	**Compt.No.**	**Seedling**	**Sapling**	**Adault**	**Status**	**RF**
1	1	50	4	0	0	New	Atei
2	2	50	39	6	1	Good	Atei
3	3	51	64	5	2	Good	Atei
4	4	51	17	6	0	New	Atei
5	5	52	22	0	0	New	Atei
6	6	52	16	11	4	Good	Atei
7	7	52	23	5	2	Good	Atei
8	8	52	15	5	2	Good	Atei
9	9	53	20	8	10	Fair	Atei
10	10	53	13	5	3	Good	Atei
11	11	53	24	7	12	Fair	Atei
12	12	54	25	5	6	Fair	Atei
13	13	54	20	6	0	New	Atei
14	14	54	35	4	1	Good	Atei
15	15	55	22	10	12	Fair	Atei
16	16	55	23	13	8	Good	Atei
17	17	55	37	11	14	Fair	Atei
18	18	56	30	11	10	Good	Atei
19	19	56	67	1	1	Fair	Atei
20	20	56	30	14	13	Good	Atei
21	21	56	77	7	3	Good	Atei
22	22	57	42	0	1	Fair	Atei
23	23	57	50	0	1	Fair	Atei
24	24	57	49	1	3	Fair	Atei
25	25	57	52	8	6	Good	Atei
26	26	58	8	6	2	Good	Atei
27	28	58	21	2	1	Good	Atei
28	29	58	92	6	8	fair	Atei
29	30	59	71	0	8	Fair	Atei
30	31	59	24	5	1	Good	Atei
31	32	59	16	0	4	Fair	Atei
32	33	60	51	2	7	Fair	Atei
33	34	60	20	0	3	Fair	Atei
34	35	60	82	6	6	Fair	Atei
35	36	61	40	0	1	fair	Atei
36	37	61	22	0	3	fair	Atei
37	38	61	56	12	9	Good	Atei
38	39	62	50	0	1	fair	Atei
39	40	62	63	3	15	Fair	Atei
40	41	62	18	0	4	Fair	Atei

S.I No.	UID No.	Compt.No.	Seedling	Sapling	Adault	Status	RF
41	42	63	19	2	0	New	Atei
42	43	63	19	2	3	fair	Atei
43	44	64	50	0	1	fair	Atei
44	45	64	60	3	8	Fair	Atei
45	46	65	24	1	0	New	Atei
46	47	66	49	10	7	Good	Atei
47	48	66	13	6	0	New	Atei
48	49	67	25	14	13	Good	Atei
49	50	67	31	21	14	Good	Atei
50	51	68	31	16	10	Good	Atei
51	52	68	30	14	6	Good	Atei
52	53	69	28	13	3	Good	Atei
53	54	69	21	5	3	Good	Atei

Appendix -XI (C)

Regeneration Santoshpur status							
S.I No.	**UID No.**	**Compt.No.**	**Seedling**	**Sapling**	**Adault**	**Status**	**RF**
1	297	1	10	7	1	Good	Santoshpur
2	298	1	11	10	3	Good	Santoshpur
3	299	1	9	11	4	Fair	Santoshpur
4	300	1	26	12	6	Good	Santoshpur
5	301	2	4	5	5	Fair	Santoshpur
6	302	2	2	1	1	Fair	Santoshpur
7	303	3	2	1	2	Fair	Santoshpur
8	304	3	109	27	17	Good	Santoshpur
9	306	4	122	1	1	Fair	Santoshpur
10	307	4	88	3	7	Fair	Santoshpur
11	308	5	65	11	3	Good	Santoshpur
12	309	5	37	2	4	Fair	Santoshpur
13	310	5	88	5	3	Good	Santoshpur
14	311	6	4	3	3	Fair	Santoshpur
15	312	6	9	7	4	Good	Santoshpur
16	313	6	11	4	4	Fair	Santoshpur
17	314	6	8	4	4	Fair	Santoshpur
18	315	7	90	6	2	Good	Santoshpur
19	316	7	59	8	3	Good	Santoshpur
20	317	7	109	2	2	Fair	Santoshpur
21	318	8	9	4	5	Fair	Santoshpur
22	319	8	36	12	8	Good	Santoshpur
23	320	8	81	28	6	Good	Santoshpur
24	321	8	55	37	26	Good	Santoshpur
25	322	9	34	5	5	Fair	Santoshpur
26	323	9	64	5	4	Good	Santoshpur
27	324	9	24	1	2	Fair	Santoshpur
28	325	10	58	2	0	New	Santoshpur
29	326	10	13	8	2	Good	Santoshpur
30	327	10	13	9	4	Good	Santoshpur
31	328	11	63	36	13	Good	Santoshpur
32	329	11	10	9	1	Good	Santoshpur
33	330	11	25	16	12	Good	Santoshpur
34	331	11	13	6	7	Fair	Santoshpur
35	332	12	14	7	2	Good	Santoshpur
36	334	13	15	11	4	Good	Santoshpur
37	335	13	11	6	3	Good	Santoshpur
38	336	13	14	8	5	Good	Santoshpur
39	337	14	10	13	4	Fair	Santoshpur
40	338	14	24	20	9	Good	Santoshpur
41	339	14	20	16	3	Good	Santoshpur
42	340	14	12	18	4	Fair	Santoshpur
43	341	15	10	`12	3	Fair	Santoshpur
44	342	15	14	11	4	Good	Santoshpur
45	343	16	7	11	2	Fair	Santoshpur
46	344	16	123	21	15	Good	Santoshpur
47	345	16	10	12	4	Fair	Santoshpur
48	346	16	10	12	4	Good	Santoshpur
49	347	17	16	14	3	Good	Santoshpur
50	348	17	124	12	14	Fair	Santoshpur
51	349	18	9	14	3	Fair	Santoshpur
52	350	19	12	11	4	Fair	Santoshpur
53	351	20	12	9	4	Good	Santoshpur
54	352	20	75	22	7	Good	Santoshpur

Appendix -XI (D)

Regeneration status Other RF							
S.I No.	**UID No.**	**Compt.No.**	**Seedling**	**Sapling**	**Adault**	**Status**	**RF**
1	354	0	27	17	0	New	Turkipada
2	355	0	21	17	1	Good	Turkipada
3	357	0	38	28	0	New	Turkipada
4	358	0	38	18	6	Good	Turkipada
5	359	0	50	8	14	Fair	Kadugotha
6	360	0	4	0	0	New	Hatibandha
7	361	0	6	0	1	Fair	Hatibandha
8	362	0	39	0	3	Fair	Panasadiha
9	305	0	8	3	3	Fair	Baigundi
10	56	0	16	4	3	Good	Baranga
11	57	0	13	6	8	Good	Baranga
12	58	0	19	12	11	Good	Baranga
13	59	0	32	8	15	Fair	Baranga
14	60	0	13	1	4	Fair	Baranga
15	113	0	2	11	3	Poor	Gayalmunda
16	114	0	6	5	2	Good	Mahulpanga
17	115	0	18	5	6	Fair	Mahulpanga
18	116	0	6	12		New	Meghanadapoi
19	117	0	10	5	6	Fair	Ostopura
20	118	0	11	7	7	Fair	Ostopura
21	119	0	11	6	6	Fair	Palaspal
22	120	32	11	6	6	Fair	Palaspal
23	121	0	0	0	0	No	Palaspal
24	122	0	9	8	5	Good	Palaspal
25	123	0	2	3	1	Poor	Palaspal
26	124	0	10	6	4	Good	Palaspal
27	125	0	5	4	4	fair	Palaspal
28	126	0	7	4	4	Fair	Patilo
29	127	0	7	4	5	Fair	Patilo
30	353	0	11	12	5	Fair	Tangiriapal

Appendix - XII

GWL data of four blocks in Keonjhar district (2007 to 2016)

Sl.No.	Block	Location of observation wells	2007-Pre Mon	2007-Mid Mon	2007-Post Mon	2008-Pre Mon	2008-Mid Mon	2008-Post Mon
1.	Anandapur	T.Anandapur ,Inside Sanskrit Mahavidyalaya	7.10	2.20	5.40	7.60	2.00	5.30
2.	Anandapur	Deogaon ,Inside Kusaleswar Mahadev temple campus	5.65	2.40	4.10	6.00	2.40	4.10
3.	Anandapur	Anandapur , Boys mess ,Anandapur .	7.30	1.80	5.50	7.55	1.80	5.50
4.	Anandapur	Gayalmunda ,Inside village .	6.30	1.80	3.60	7.20	1.80	3.50
5.	Ghasipura	Kesodurapal, UP school campus	4.60	4.90	2.40	4.80	4.90	2.30
6.	Ghasipura	Khaliamanta, High school campus	3.85	4.60	2.60	4.30	4.20	2.50
7.	Ghasipura	Sai chhak , In the campus of sub collectors residence	5.40	2.20	3.60	5.80	2.00	3.40
8.	Ghasipura	Tarava , Infront of High school ,tarava	5.10	1.70	3.25	5.30	1.40	3.20
9.	Ghatagaon	Dhenkikote , PWD IB(Now NH) campus , Dhenkikote	7.80	2.90	5.50	8.10	3.00	5.70
10	Ghatagaon	Ghatagaon ,PWD IB Now NH campus ,Ghatagaon .	8.40	6.20	5.20	8.60	6.40	5.25
11	Ghatagaon	Patilo ,Infront of shiva Temple	7.10	1.40	4.60	7.40	1.40	4.60
12	Ghatagaon	Rutisila , ME school campus	6.70	2.40	4.50	7.00	2.30	4.80
13	Ghatagaon	Bholabeda ,Inside village (Badasahi)	8.00	3.10	5.00	8.30	3.10	5.00
14	Harichandan pur	Harichandanpur , Block colony campus	5.30	4.00	3.20	5.50	4.10	3.20
15	Harichandan pur	Badasiadimal ,Roadside village	7.15	4.70	4.10	7.30	6.20	4.50
16	Harichandan pur	R. palaspal ,Near UP school	8.10	1.40	5.50	8.20	1.40	5.80
17	Harichandan pur	Pithagola , Inside village (Sri K.M 4.40paikray)	8.40	2.40	4.70	8.70	2.40	5.00
18	Harichandan pur	Jung6.40a ,Inside village (Sri Bhagabat naik)	8.35	1.70	4.20	8.50	1.40	4.50
19	Hatadihi	Hatadihi,OLIC section office campus ,Hatadihi	5.20	4.40	3.40	5.60	4.40	3.40

Sl.No.	Block	Location of observation wells	2007-Pre Mon	2007-Mid Mon	2007-Post Mon	2008-Pre Mon	2008-Mid Mon	2008-Post Mon
20	Hatadihi	Mareigaon ,PWD IB campus ,Mareigaon	6.10	6.20	4.00	6.20	6.40	4.00
21	Hatadihi	Dadhibamanpur ,Near Ambagadia ,Roadside	6.50	2.30	4.20	6.70	2.00	4.40
22	Hatadihi	Bancho ,Barahi H.S campus						
23	Hatadihi	Soso,Inside village	5.10	1.20	2.90	5.30	1.80	3.20
24	Hatadihi	Hatadihi ,Inside village	6.20	1.40	3.10	6.30	1.40	3.05
25	Hatadihi	Hatadihi , H.S campus						
26	Hatadihi	Mathadai ,Irr. Section office	5.50	1.10	2.80	5.60	1.10	2.85
27	Hatadihi	Sasanga ,near the pond	9.80	3.70	5.60	10.80	3.50	5.90

2009-Pre Mon	2009-Mid Mon	2009-Post Mon	2010-Pre Mon	2010-Mid Mon	2010-Post Mon	2011-Pre Mon	2011-Mid Mon	2011-Post Mon
7.30	2.20	5.50	7.50	2.60	5.45	7.40	1.00	1.90
5.80	2.55	4.20	5.90	3.00	4.25	5.70	1.30	2.20
7.40	2.10	5.60	7.55	2.60	5.40	7.35	1.10	1.80
6.55	1.90	3.70	7.10	2.30	3.70	6.60	1.60	2.00
4.70	5.10	2.50	4.85	5.50	2.50	4.80	1.60	2.20
4.05	4.30	2.70	4.20	4.50	2.70	4.15	2.90	3.50
5.55	2.10	3.70	5.75	2.50	3.50	5.20	1.05	1.70
5.30	1.55	3.35	5.40	2.10	3.40	5.50	1.35	1.80
7.05	3.20	5.60	8.20	3.50	5.90	8.10	2.00	2.50
8.50	6.30	5.30	8.70	6.40	5.45	8.30	2.40	2.90
7.25	1.60	4.70	7.50	2.30	4.70	7.10	0.90	1.60
6.80	2.55	4.60	7.10	3.10	5.00	6.80	1.20	1.80
8.25	3.15	5.15	8.40	3.50	4.90	8.15	2.10	2.70
5.50	4.20	3.30	5.60	4.40	3.50	5.40	2.20	2.60
7.25	6.35	4.20	7.40	6.70	4.60	7.40	3.10	3.50
8.25	1.70	5.60	8.30	2.00	5.90	8.10	1.10	1.80
8.50	2.50	4.80	8.80	2.70	4.85	8.60	1.40	1.90
8.45	1.65	4.30	8.60	2.30	4.60	7.95	1.30	1.50
5.50	4.50	3.50	5.70	4.70	3.50			
6.30	6.30	4.10	6.50	6.50	4.10	6.20	1.10	1.80
6.75	2.10	4.30	6.80	2.60				
5.25	1.95	3.00	5.40	2.50	3.30	5.15	1.05	1.80
6.40	1.50	3.20	6.60	2.10	3.15	6.25	1.70	1.65
5.75	1.20	2.90	5.90	1.50	2.90	5.90	1.00	1.50
11.00	3.45	5.70	11.10	4.10	6.00	10.80	1.10	1.70

2012-Pre Mon	2012-Mid Mon	2012-Post Mon	2013-Pre Mon	2013-Mid Mon	2013-Post Mon	2014-Pre Mon	2014-Mid Mon	2014-Post Mon
7.60	1.10	2.80	7.80	1.00	1.50	8.10	0.90	2.44
5.80	1.35	3.10	6.10	1.25	1.65	6.40	1.35	2.20
6.80	1.50	2.60	6.90	1.65	2.20	7.10	1.75	2.44
4.90	1.65	2.65	5.20	1.45	1.90	5.70	1.40	2.26
5.15	3.10	4.10	5.50	2.75	3.15	5.80	2.20	3.88
5.32	1.10	2.20	5.80	1.35	1.85	6.20	1.30	1.92
5.70	1.45	2.30	5.90	1.60	2.10	6.10	1.50	2.15
2.25	2.20	3.10	10.80	2.50	2.80	10.55	2.40	3.30
8.45	2.60	3.40	9.20	2.70	3.20	9.40	2.60	3.12
7.30	1.10	2.10	7.40	1.20	1.70	7.50	1.10	1.99
6.90	1.30	2.20	6.60	1.40	1.95	6.90	1.40	2.14
8.35	2.25	2.90	8.60	2.35	2.90	8.30	2.25	2.44
5.60	2.20	3.10	5.90	2.40	2.95	6.30	2.30	2.97
7.60	2.90	3.90	7.80	3.10	3.50	7.50	3.00	3.89
8.25	1.20	2.30	8.50	1.40	2.20	8.60	1.35	1.92
8.75	1.60	2.50	8.40	1.80	2.30	8.45	1.70	2.16
7.90	1.40	2.10	7.60	1.55	2.10	7.90	1.65	1.93
6.50	1.20	2.35	6.80	1.25	1.80	7.25	1.45	2.29
7.10	1.15	2.85	7.20	1.40	1.90	7.30	1.50	2.65
5.25	1.10	2.30	5.40	1.20	1.70	5.50	1.10	2.15
6.35	1.80	2.15	6.30	1.65	2.25	5.50	1.60	1.82
6.20	1.20	2.00	6.40	1.10	1.70	6.80	1.20	1.50
11.25	1.35	2.20	10.60	1.50	2.50	10.70	1.60	1.87

2015-Pre Mon	2015-Mid Mon	2015-Post Mon	2016-Pre Mon	2016-Mid Mon	2016-Post Mon
4.84	3.04	2.74	6.74	0.64	2.24
4.50	3.50	3.10	6.20	0.05	1.90
4.16	3.24	2.94	6.04	1.14	2.29
4.36	2.21	1.91	6.26	0.61	2.51
3.88	2.03	1.88	6.03	1.48	3.68
4.02	1.82	1.57	5.62	0.98	1.82
4.61	2.61	2.46	6.41	1.41	2.31
5.30	3.50	3.20	5.90	1.80	2.85
5.52	3.82	3.72	7.42	2.42	3.22
5.79	4.09	3.99	7.69	0.79	2.09
4.74	3.04	2.89	4.84	1.14	2.34
4.75	2.85	2.55	6.60	1.50	2.85
5.27	3.17	2.87	7.27	1.77	2.77
5.94	4.04	3.79	7.89	1.89	3.79
5.92	4.02	3.67	7.57	0.92	2.12
4.26	2.36	2.16	5.71	0.86	2.06
4.78	2.98	2.78	6.68	0.78	1.73
5.14	3.18	3.04	7.04	1.44	2.44
4.85	3.20	3.00	4.80	0.90	2.80
4.50	2.30	2.00	6.00	1.45	2.25
4.42	2.52	2.32	6.42	0.92	1.92
4.30	2.45	2.30	5.35	1.05	1.30
3.62	1.62	1.37	5.47	2.07	1.77

Source: Central Ground Water Board, Bhubaneswar

Appendix-XIII

LIST OF SAMPLE POINTS WITH GEOGRAPHYCAL CO-ORDINATES

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN1	21.35322972	85.86217791	ATAI	ATAI 50
KEONJHAR_WL	KN2	21.35274306	85.86452734	ATAI	ATAI 50
KEONJHAR_WL	KN3	21.35092414	85.90268502	ATAI	ATAI 51
KEONJHAR_WL	KN4	21.34147691	85.88805974	ATAI	ATAI 51
KEONJHAR_WL	KN5	21.34021463	85.89096122	ATAI	ATAI 52
KEONJHAR_WL	KN6	21.33031967	85.9094047	ATAI	ATAI 52
KEONJHAR_WL	KN7	21.33650547	85.90913184	ATAI	ATAI 52
KEONJHAR_WL	KN8	21.33549809	85.90319808	ATAI	ATAI 52
KEONJHAR_WL	KN9	21.34005003	85.91770432	ATAI	ATAI 53
KEONJHAR_WL	KN10	21.3297143	85.93359026	ATAI	ATAI 53
KEONJHAR_WL	KN11	21.32421478	85.93566517	ATAI	ATAI 53
KEONJHAR_WL	KN12	21.3281348	85.95815816	ATAI	ATAI 54
KEONJHAR_WL	KN13	21.33312909	85.96702466	ATAI	ATAI 54
KEONJHAR_WL	KN14	21.32797725	85.9546289	ATAI	ATAI 54
KEONJHAR_WL	KN15	21.31294826	85.95347237	ATAI	ATAI 55
KEONJHAR_WL	KN16	21.31448388	85.95533549	ATAI	ATAI 55
KEONJHAR_WL	KN17	21.30598416	85.93688222	ATAI	ATAI 55
KEONJHAR_WL	KN18	21.31499906	85.96630071	ATAI	ATAI 56
KEONJHAR_WL	KN19	21.29224354	85.97655262	ATAI	ATAI 56
KEONJHAR_WL	KN20	21.30434207	85.96372643	ATAI	ATAI 56
KEONJHAR_WL	KN21	21.33272235	85.97109784	ATAI	ATAI 57
KEONJHAR_WL	KN22	21.3222562	85.98203033	ATAI	ATAI 57
KEONJHAR_WL	KN23	21.32573776	85.98135489	ATAI	ATAI 57
KEONJHAR_WL	KN24	21.31256655	85.97469825	ATAI	ATAI 57
KEONJHAR_WL	KN25	21.30788416	85.97843157	ATAI	ATAI 57
KEONJHAR_WL	KN26	21.30554327	86.0111521	ATAI	ATAI 58
KEONJHAR_WL	KN28	21.30825298	86.01533244	ATAI	ATAI 58
KEONJHAR_WL	KN29	21.29692695	85.99435775	ATAI	ATAI 58
KEONJHAR_WL	KN30	21.29754426	86.01865192	ATAI	ATAI 59
KEONJHAR_WL	KN31	21.30791518	86.02984276	ATAI	ATAI 59
KEONJHAR_WL	KN32	21.29056033	86.00891059	ATAI	ATAI 59
KEONJHAR_WL	KN33	21.29486411	86.0350054	ATAI	ATAI 60
KEONJHAR_WL	KN34	21.29233968	86.02878694	ATAI	ATAI 60
KEONJHAR_WL	KN35	21.28326006	86.01472783	ATAI	ATAI 60
KEONJHAR_WL	KN36	21.24380286	86.05846212	ATAI	ATAI 61
KEONJHAR_WL	KN37	21.25818229	86.05180833	ATAI	ATAI 61
KEONJHAR_WL	KN38	21.25548163	86.04599561	ATAI	ATAI 61
KEONJHAR_WL	KN39	21.28057373	86.05355072	ATAI	ATAI 62
KEONJHAR_WL	KN40	21.26797276	86.02025255	ATAI	ATAI 62
KEONJHAR_WL	KN41	21.27105442	86.03780399	ATAI	ATAI 62
KEONJHAR_WL	KN42	21.27394315	86.01473958	ATAI	ATAI 63
KEONJHAR_WL	KN43	21.26998276	86.0055605	ATAI	ATAI 63
KEONJHAR_WL	KN44	21.27948725	86.009409	ATAI	ATAI 64
KEONJHAR_WL	KN45	21.2792998	86.00691629	ATAI	ATAI 64
KEONJHAR_WL	KN46	21.28449402	85.988506	ATAI	ATAI 65
KEONJHAR_WL	KN47	21.28247945	85.9796287	ATAI	ATAI 66
KEONJHAR_WL	KN48	21.2848678	85.97574459	ATAI	ATAI 66

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN49	21.27108244	85.95948966	ATAI	ATAI 67
KEONJHAR_WL	KN50	21.27643224	85.95875752	ATAI	ATAI 67
KEONJHAR_WL	KN51	21.25756915	85.96667501	ATAI	ATAI 68
KEONJHAR_WL	KN52	21.24695979	85.95292113	ATAI	ATAI 68
KEONJHAR_WL	KN53	21.22937974	85.9422397	ATAI	ATAI 69
KEONJHAR_WL	KN54	21.21362078	85.9418086	ATAI	ATAI 69
KEONJHAR_WL	KN56	21.05214835	86.05833399	BARANGA	BARANGA NRSC-28
KEONJHAR_WL	KN57	21.05451686	86.06423042	BARANGA	BARANGA NRSC-28
KEONJHAR_WL	KN58	21.04766639	86.07590619	BARANGA	BARANGA NRSC-29
KEONJHAR_WL	KN59	21.04407468	86.08759893	BARANGA	BARANGA NRSC-29
KEONJHAR_WL	KN60	21.04308942	86.076228	BARANGA	BARANGA NRSC-29
KEONJHAR_WL	KN113	21.39579921	86.11727136	GAYALMUNDA	GAYALMUNDA NRSC-4
KEONJHAR_WL	KN114	21.20347168	85.76064721	MAHULPANGA	MAHULPANGA NRSC-14
KEONJHAR_WL	KN115	21.20825018	85.7592121	MAHULPANGA	MAHULPANGA NRSC-14
KEONJHAR_WL	KN116	21.09561003	86.05051072	MEGHANADPAHI	MEGHANADPAHI NRSC-27
KEONJHAR_WL	KN117	21.23087192	86.07936849	OSTAPURA	OSTAPURA NRSC-7
KEONJHAR_WL	KN118	21.22940231	86.0816214	OSTAPURA	OSTAPURA NRSC-7
KEONJHAR_WL	KN119	21.23433576	85.75707189	PALASPALA	PALASPALA NRSC-11
KEONJHAR_WL	KN120	21.23530968	85.81972962	PALASPALA	PALASPALA NRSC-12
KEONJHAR_WL	KN121	21.2325679	85.81053212	PALASPALA	PALASPALA NRSC-13
KEONJHAR_WL	KN122	21.27628264	85.78047205	PALASPALA	PALASPALA NRSC-5
KEONJHAR_WL	KN123	21.25638688	85.76514661	PALASPALA	PALASPALA NRSC-6
KEONJHAR_WL	KN124	21.24815287	85.78133861	PALASPALA	PALASPALA NRSC-8
KEONJHAR_WL	KN125	21.23601	85.75116551	PALASPALA	PALASPALA NRSC-9
KEONJHAR_WL	KN126	21.12146996	86.06988077	PATILO	PATILO NRSC-25
KEONJHAR_WL	KN127	21.11556071	86.07346909	PATILO	PATILO NRSC-25
KEONJHAR_WL	KN128	21.29705666	85.64203171	REBANA	REBANA 01
KEONJHAR_WL	KN129	21.28695755	85.63751006	REBANA	REBANA 01
KEONJHAR_WL	KN130	21.28916201	85.64073381	REBANA	REBANA 01
KEONJHAR_WL	KN131	21.29833769	85.64570822	REBANA	REBANA 01
KEONJHAR_WL	KN133	21.27222053	85.64406451	REBANA	REBANA 02
KEONJHAR_WL	KN135	21.29733926	85.66870856	REBANA	REBANA 02
KEONJHAR_WL	KN137	21.2790917	85.65972431	REBANA	REBANA 02
KEONJHAR_WL	KN138	21.24274484	85.66265229	REBANA	REBANA 03
KEONJHAR_WL	KN139	21.24348777	85.672916	REBANA	REBANA 03
KEONJHAR_WL	KN143	21.24362886	85.65390993	REBANA	REBANA 03
KEONJHAR_WL	KN152	21.27936227	85.6724618	REBANA	REBANA 05
KEONJHAR_WL	KN153	21.28338321	85.67393749	REBANA	REBANA 05
KEONJHAR_WL	KN154	21.26281629	85.68556714	REBANA	REBANA 05
KEONJHAR_WL	KN155	21.27861017	85.68025538	REBANA	REBANA 05
KEONJHAR_WL	KN156	21.25878839	85.68947593	REBANA	REBANA 05
KEONJHAR_WL	KN157	21.27854973	85.69476726	REBANA	REBANA 06
KEONJHAR_WL	KN158	21.29128377	85.68344018	REBANA	REBANA 06
KEONJHAR_WL	KN159	21.26858433	85.70166173	REBANA	REBANA 06
KEONJHAR_WL	KN160	21.27748277	85.70652135	REBANA	REBANA 06
KEONJHAR_WL	KN161	21.2625445	85.70654574	REBANA	REBANA 07
KEONJHAR_WL	KN162	21.26954752	85.73244024	REBANA	REBANA 07

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN163	21.25803222	85.71166634	REBANA	REBANA 07
KEONJHAR_WL	KN164	21.28437299	85.7121037	REBANA	REBANA 07
KEONJHAR_WL	KN165	21.29139351	85.73896691	REBANA	REBANA 08
KEONJHAR_WL	KN166	21.27736391	85.73754229	REBANA	REBANA 08
KEONJHAR_WL	KN167	21.30366761	85.73743912	REBANA	REBANA 08
KEONJHAR_WL	KN168	21.30307699	85.74344242	REBANA	REBANA 09
KEONJHAR_WL	KN169	21.29149174	85.74773613	REBANA	REBANA 09
KEONJHAR_WL	KN170	21.24320841	85.72109639	REBANA	REBANA 10
KEONJHAR_WL	KN171	21.24753015	85.72735509	REBANA	REBANA 10
KEONJHAR_WL	KN172	21.25721433	85.72551929	REBANA	REBANA 10
KEONJHAR_WL	KN173	21.2374288	85.73524403	REBANA	REBANA 11
KEONJHAR_WL	KN174	21.23313168	85.72668959	REBANA	REBANA 11
KEONJHAR_WL	KN175	21.23294243	85.71746624	REBANA	REBANA 11
KEONJHAR_WL	KN176	21.23457112	85.71496273	REBANA	REBANA 11
KEONJHAR_WL	KN177	21.22441796	85.73377031	REBANA	REBANA 12
KEONJHAR_WL	KN178	21.22799535	85.74168117	REBANA	REBANA 12
KEONJHAR_WL	KN179	21.22358506	85.72514558	REBANA	REBANA 12
KEONJHAR_WL	KN180	21.22695176	85.71370516	REBANA	REBANA 12
KEONJHAR_WL	KN181	21.23024472	85.70121992	REBANA	REBANA 13
KEONJHAR_WL	KN182	21.23425369	85.7005521	REBANA	REBANA 13
KEONJHAR_WL	KN183	21.22442003	85.68839922	REBANA	REBANA 13
KEONJHAR_WL	KN184	21.20366157	85.69383287	REBANA	REBANA 14
KEONJHAR_WL	KN185	21.211485	85.68821814	REBANA	REBANA 14
KEONJHAR_WL	KN186	21.18736656	85.70612009	REBANA	REBANA 14
KEONJHAR_WL	KN187	21.20168342	85.7012877	REBANA	REBANA 14
KEONJHAR_WL	KN188	21.21080087	85.70171696	REBANA	REBANA 14
KEONJHAR_WL	KN189	21.2026376	85.69135342	REBANA	REBANA 15
KEONJHAR_WL	KN190	21.1949271	85.69588237	REBANA	REBANA 15
KEONJHAR_WL	KN191	21.18932837	85.69282128	REBANA	REBANA 15
KEONJHAR_WL	KN192	21.19924782	85.71762375	REBANA	REBANA 16
KEONJHAR_WL	KN193	21.2091936	85.71660907	REBANA	REBANA 16
KEONJHAR_WL	KN194	21.19914846	85.71521808	REBANA	REBANA 16
KEONJHAR_WL	KN195	21.20584828	85.717575	REBANA	REBANA 16
KEONJHAR_WL	KN196	21.19590813	85.73008603	REBANA	REBANA 17
KEONJHAR_WL	KN197	21.19672662	85.72055896	REBANA	REBANA 17
KEONJHAR_WL	KN198	21.19462621	85.70908578	REBANA	REBANA 17
KEONJHAR_WL	KN199	21.20384361	85.74316758	REBANA	REBANA 18
KEONJHAR_WL	KN200	21.20258759	85.75151121	REBANA	REBANA 18
KEONJHAR_WL	KN201	21.20860142	85.74831945	REBANA	REBANA 18
KEONJHAR_WL	KN202	21.20837048	85.72602519	REBANA	REBANA 18
KEONJHAR_WL	KN203	21.1841132	85.73680805	REBANA	REBANA 19
KEONJHAR_WL	KN204	21.17217806	85.75757598	REBANA	REBANA 19
KEONJHAR_WL	KN205	21.19309013	85.74671044	REBANA	REBANA 19
KEONJHAR_WL	KN206	21.17605293	85.73147725	REBANA	REBANA 19
KEONJHAR_WL	KN207	21.17412121	85.71464958	REBANA	REBANA 19
KEONJHAR_WL	KN208	21.18401986	85.74836457	REBANA	REBANA 19
KEONJHAR_WL	KN209	21.17338686	85.70948774	REBANA	REBANA 19
KEONJHAR_WL	KN210	21.15656287	85.73052994	REBANA	REBANA 20
KEONJHAR_WL	KN211	21.17940188	85.73901232	REBANA	REBANA 20
KEONJHAR_WL	KN212	21.15476575	85.75437424	REBANA	REBANA 20

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN213	21.15352672	85.72672567	REBANA	REBANA 20
KEONJHAR_WL	KN214	21.15885011	85.74322098	REBANA	REBANA 20
KEONJHAR_WL	KN215	21.17489324	85.74554927	REBANA	REBANA 20
KEONJHAR_WL	KN216	21.16067821	85.75397422	REBANA	REBANA 20
KEONJHAR_WL	KN217	21.1473716	85.78968248	REBANA	REBANA 21
KEONJHAR_WL	KN218	21.15062473	85.76339124	REBANA	REBANA 21
KEONJHAR_WL	KN219	21.14493915	85.78395741	REBANA	REBANA 21
KEONJHAR_WL	KN220	21.13926226	85.76704859	REBANA	REBANA 22
KEONJHAR_WL	KN221	21.13819863	85.77197309	REBANA	REBANA 22
KEONJHAR_WL	KN222	21.13535372	85.77893114	REBANA	REBANA 22
KEONJHAR_WL	KN223	21.14145617	85.78803364	REBANA	REBANA 22
KEONJHAR_WL	KN224	21.11971706	85.77736668	REBANA	REBANA 23
KEONJHAR_WL	KN225	21.105104	85.77934922	REBANA	REBANA 23
KEONJHAR_WL	KN227	21.13198627	85.83531733	REBANA	REBANA 24
KEONJHAR_WL	KN228	21.14497009	85.8256189	REBANA	REBANA 24
KEONJHAR_WL	KN229	21.12967395	85.82802968	REBANA	REBANA 24
KEONJHAR_WL	KN230	21.12308392	85.83345703	REBANA	REBANA 24
KEONJHAR_WL	KN231	21.12160534	85.83566873	REBANA	REBANA 24
KEONJHAR_WL	KN232	21.11928041	85.82324392	REBANA	REBANA 24
KEONJHAR_WL	KN233	21.13620181	85.8122595	REBANA	REBANA 25
KEONJHAR_WL	KN234	21.11576578	85.80299124	REBANA	REBANA 25
KEONJHAR_WL	KN235	21.09235871	85.82758082	REBANA	REBANA 25
KEONJHAR_WL	KN236	21.11746545	85.80786005	REBANA	REBANA 25
KEONJHAR_WL	KN237	21.1079958	85.801595	REBANA	REBANA 25
KEONJHAR_WL	KN238	21.12139778	85.80677022	REBANA	REBANA 25
KEONJHAR_WL	KN239	21.12477796	85.80562799	REBANA	REBANA 25
KEONJHAR_WL	KN240	21.10939002	85.79873077	REBANA	REBANA 25
KEONJHAR_WL	KN241	21.15690642	85.85456602	REBANA	REBANA 26
KEONJHAR_WL	KN242	21.13613934	85.85294278	REBANA	REBANA 26
KEONJHAR_WL	KN243	21.13609787	85.84750444	REBANA	REBANA 26
KEONJHAR_WL	KN244	21.14927729	85.85504544	REBANA	REBANA 26
KEONJHAR_WL	KN245	21.14698027	85.85934652	REBANA	REBANA 26
KEONJHAR_WL	KN246	21.16697152	85.82739774	REBANA	REBANA 28
KEONJHAR_WL	KN247	21.16543261	85.82302868	REBANA	REBANA 28
KEONJHAR_WL	KN248	21.16431424	85.839909	REBANA	REBANA 28
KEONJHAR_WL	KN249	21.1788694	85.81433856	REBANA	REBANA 28
KEONJHAR_WL	KN250	21.16148427	85.81269846	REBANA	REBANA 29
KEONJHAR_WL	KN251	21.16478024	85.80487754	REBANA	REBANA 29
KEONJHAR_WL	KN252	21.16692685	85.8076286	REBANA	REBANA 29
KEONJHAR_WL	KN253	21.15564282	85.83316912	REBANA	REBANA 29
KEONJHAR_WL	KN254	21.15488322	85.79494142	REBANA	REBANA 30
KEONJHAR_WL	KN255	21.15657791	85.79138472	REBANA	REBANA 30
KEONJHAR_WL	KN256	21.15593502	85.80095313	REBANA	REBANA 30
KEONJHAR_WL	KN257	21.14220008	85.79609315	REBANA	REBANA 30
KEONJHAR_WL	KN258	21.1373315	85.79444248	REBANA	REBANA 30
KEONJHAR_WL	KN259	21.19533394	85.82578307	REBANA	REBANA 31
KEONJHAR_WL	KN260	21.18714037	85.81681097	REBANA	REBANA 31
KEONJHAR_WL	KN261	21.23656669	85.83348339	REBANA	REBANA 32
KEONJHAR_WL	KN262	21.20846593	85.83742391	REBANA	REBANA 32
KEONJHAR_WL	KN263	21.20940541	85.85395636	REBANA	REBANA 33

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN264	21.20177441	85.85269777	REBANA	REBANA 33
KEONJHAR_WL	KN265	21.19794859	85.85857801	REBANA	REBANA 33
KEONJHAR_WL	KN266	21.21471941	85.85811423	REBANA	REBANA 34
KEONJHAR_WL	KN267	21.21289332	85.86908937	REBANA	REBANA 34
KEONJHAR_WL	KN268	21.21589384	85.88572046	REBANA	REBANA 35
KEONJHAR_WL	KN269	21.22893608	85.9007179	REBANA	REBANA 35
KEONJHAR_WL	KN271	21.23593476	85.87807112	REBANA	REBANA 36
KEONJHAR_WL	KN272	21.22766788	85.9081516	REBANA	REBANA 37
KEONJHAR_WL	KN273	21.21774618	85.9150969	REBANA	REBANA 37
KEONJHAR_WL	KN274	21.21717494	85.9218305	REBANA	REBANA 38
KEONJHAR_WL	KN275	21.20827654	85.93715168	REBANA	REBANA 38
KEONJHAR_WL	KN276	21.19807267	85.90392481	REBANA	REBANA 39
KEONJHAR_WL	KN277	21.19947599	85.89729534	REBANA	REBANA 39
KEONJHAR_WL	KN278	21.18522231	85.89661496	REBANA	REBANA 40
KEONJHAR_WL	KN279	21.16845217	85.8803342	REBANA	REBANA 41
KEONJHAR_WL	KN280	21.16438432	85.87607136	REBANA	REBANA 42
KEONJHAR_WL	KN281	21.16902314	85.87595101	REBANA	REBANA 42
KEONJHAR_WL	KN282	21.16586338	85.91521039	REBANA	REBANA 43
KEONJHAR_WL	KN283	21.16194398	85.9262688	REBANA	REBANA 43
KEONJHAR_WL	KN284	21.14287605	85.90883917	REBANA	REBANA 44
KEONJHAR_WL	KN285	21.11540898	85.88709901	REBANA	REBANA 45
KEONJHAR_WL	KN286	21.09143133	85.8616253	REBANA	REBANA 46
KEONJHAR_WL	KN287	21.1314323	85.85479964	REBANA	REBANA 46
KEONJHAR_WL	KN288	21.11370693	85.87244705	REBANA	REBANA 46
KEONJHAR_WL	KN289	21.12018423	85.85708243	REBANA	REBANA 46
KEONJHAR_WL	KN290	21.12090422	85.84946453	REBANA	REBANA 46
KEONJHAR_WL	KN291	21.12299571	85.86237366	REBANA	REBANA 46
KEONJHAR_WL	KN292	21.0889419	85.87402117	REBANA	REBANA 47
KEONJHAR_WL	KN293	21.09568168	85.91649604	REBANA	REBANA 47
KEONJHAR_WL	KN294	21.09106427	85.89617106	REBANA	REBANA 47
KEONJHAR_WL	KN295	21.09397201	85.88784424	REBANA	REBANA 47
KEONJHAR_WL	KN296	21.10039264	85.90375691	REBANA	REBANA 47
KEONJHAR_WL	KN297	21.50188367	86.02984016	SANTOSHPUR	SANTOSHPUR 01
KEONJHAR_WL	KN298	21.5123888	86.03206837	SANTOSHPUR	SANTOSHPUR 01
KEONJHAR_WL	KN299	21.51421178	86.04251187	SANTOSHPUR	SANTOSHPUR 01
KEONJHAR_WL	KN300	21.50300993	86.03247399	SANTOSHPUR	SANTOSHPUR 01
KEONJHAR_WL	KN301	21.51054576	86.04496593	SANTOSHPUR	SANTOSHPUR 02
KEONJHAR_WL	KN302	21.49824526	86.07772004	SANTOSHPUR	SANTOSHPUR 02
KEONJHAR_WL	KN303	21.49686597	86.03411335	SANTOSHPUR	SANTOSHPUR 03
KEONJHAR_WL	KN304	21.50075079	86.03813025	SANTOSHPUR	SANTOSHPUR 03
KEONJHAR_WL	KN305	21.46463242	86.03917845	SANTOSHPUR	SANTOSHPUR 03
KEONJHAR_WL	KN306	21.47814151	86.01812457	SANTOSHPUR	SANTOSHPUR 04
KEONJHAR_WL	KN307	21.47387029	86.0013276	SANTOSHPUR	SANTOSHPUR 04
KEONJHAR_WL	KN308	21.46591487	85.99680067	SANTOSHPUR	SANTOSHPUR 05
KEONJHAR_WL	KN309	21.45811961	86.01538465	SANTOSHPUR	SANTOSHPUR 05
KEONJHAR_WL	KN310	21.45081214	86.01943684	SANTOSHPUR	SANTOSHPUR 05

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN311	21.44234172	86.02265231	SANTOSHPUR	SANTOSHPUR 06
KEONJHAR_WL	KN312	21.44093374	86.03944056	SANTOSHPUR	SANTOSHPUR 06
KEONJHAR_WL	KN313	21.4472452	86.02287925	SANTOSHPUR	SANTOSHPUR 06
KEONJHAR_WL	KN314	21.43424142	86.02717575	SANTOSHPUR	SANTOSHPUR 06
KEONJHAR_WL	KN315	21.4287486	86.03061322	SANTOSHPUR	SANTOSHPUR 07
KEONJHAR_WL	KN316	21.43120943	86.0175143	SANTOSHPUR	SANTOSHPUR 07
KEONJHAR_WL	KN317	21.41866595	86.02593835	SANTOSHPUR	SANTOSHPUR 07
KEONJHAR_WL	KN318	21.43704397	86.04674883	SANTOSHPUR	SANTOSHPUR 08
KEONJHAR_WL	KN319	21.424027	86.05060527	SANTOSHPUR	SANTOSHPUR 08
KEONJHAR_WL	KN320	21.41834343	86.04037401	SANTOSHPUR	SANTOSHPUR 08
KEONJHAR_WL	KN321	21.42023473	86.03785695	SANTOSHPUR	SANTOSHPUR 08
KEONJHAR_WL	KN322	21.41019372	86.03857538	SANTOSHPUR	SANTOSHPUR 09
KEONJHAR_WL	KN323	21.41207224	86.033635	SANTOSHPUR	SANTOSHPUR 09
KEONJHAR_WL	KN324	21.41287933	86.04817948	SANTOSHPUR	SANTOSHPUR 09
KEONJHAR_WL	KN325	21.40958256	86.04454776	SANTOSHPUR	SANTOSHPUR 10
KEONJHAR_WL	KN326	21.39513092	86.05430014	SANTOSHPUR	SANTOSHPUR 10
KEONJHAR_WL	KN327	21.39604526	86.04515571	SANTOSHPUR	SANTOSHPUR 10
KEONJHAR_WL	KN328	21.38909892	86.05680004	SANTOSHPUR	SANTOSHPUR 11
KEONJHAR_WL	KN329	21.39289207	86.05590027	SANTOSHPUR	SANTOSHPUR 11
KEONJHAR_WL	KN330	21.38157206	86.05632951	SANTOSHPUR	SANTOSHPUR 11
KEONJHAR_WL	KN331	21.38136942	86.06000647	SANTOSHPUR	SANTOSHPUR 11
KEONJHAR_WL	KN332	21.41765542	86.0951249	SANTOSHPUR	SANTOSHPUR 12
KEONJHAR_WL	KN334	21.38169292	86.06239427	SANTOSHPUR	SANTOSHPUR 13
KEONJHAR_WL	KN335	21.40014948	86.09129471	SANTOSHPUR	SANTOSHPUR 13
KEONJHAR_WL	KN336	21.37796512	86.06335407	SANTOSHPUR	SANTOSHPUR 13
KEONJHAR_WL	KN337	21.36156103	86.06935001	SANTOSHPUR	SANTOSHPUR 14
KEONJHAR_WL	KN338	21.35536819	86.06855666	SANTOSHPUR	SANTOSHPUR 14
KEONJHAR_WL	KN339	21.37466727	86.06651938	SANTOSHPUR	SANTOSHPUR 14
KEONJHAR_WL	KN340	21.35920782	86.06630661	SANTOSHPUR	SANTOSHPUR 14
KEONJHAR_WL	KN341	21.35296384	86.08676889	SANTOSHPUR	SANTOSHPUR 15
KEONJHAR_WL	KN342	21.36085001	86.08343085	SANTOSHPUR	SANTOSHPUR 15
KEONJHAR_WL	KN343	21.36771219	86.10173861	SANTOSHPUR	SANTOSHPUR 16
KEONJHAR_WL	KN344	21.35938606	86.09233948	SANTOSHPUR	SANTOSHPUR 16
KEONJHAR_WL	KN345	21.3640265	86.10248616	SANTOSHPUR	SANTOSHPUR 16
KEONJHAR_WL	KN346	21.35067219	86.09946163	SANTOSHPUR	SANTOSHPUR 16
KEONJHAR_WL	KN347	21.3648499	86.11522554	SANTOSHPUR	SANTOSHPUR 17
KEONJHAR_WL	KN348	21.36068982	86.11524808	SANTOSHPUR	SANTOSHPUR 17
KEONJHAR_WL	KN349	21.33584563	86.10328285	SANTOSHPUR	SANTOSHPUR 18

DIVISION	UNID	LAT	LONG	BLKNAME	COMP
KEONJHAR_WL	KN350	21.34762236	86.08306997	SANTOSHPUR	SANTOSHPUR 19
KEONJHAR_WL	KN351	21.33912738	86.06979322	SANTOSHPUR	SANTOSHPUR 20
KEONJHAR_WL	KN352	21.34643268	86.07269852	SANTOSHPUR	SANTOSHPUR 20
KEONJHAR_WL	KN353	21.17797773	85.91364357	TANGIRIAPAL	TANGIRIAPAL NRSC-15
KEONJHAR_WL	KN354	21.18070836	85.76639312	TURKIPADA	TURKIPADA NRSC-16
KEONJHAR_WL	KN355	21.1737983	85.77200201	TURKIPADA	TURKIPADA NRSC-17
KEONJHAR_WL	KN357	21.16481298	85.764321	TURKIPADA	TURKIPADA NRSC-20
KEONJHAR_WL	KN358	21.15669279	85.77094392	TURKIPADA	TURKIPADA NRSC-21
KEONJHAR Wl	KN359	86.0041	21.2366	KADAGOTHA	NRSC-10
KEONJHAR Wl	KN360	86.1558	21.1848	HATIBANDHA	NRSC-30
KEONJHAR Wl	KN361	86.1539	21.1608	HATIBANDHA	NRSC-19
KEONJHAR Wl	KN362	86.0872	21.4887	PANASDIHA	NRSC-1
KEONJHAR Wl	KN364	85.8925	21.1323	REBENA	45
KEONJHAR Wl	KN365	85.8376	21.1821	REBENA	27
KEONJHAR Wl	KN366	85.8487	21.1699	REBENA	27
KEONJHAR Wl	KN367	85.8921	21.1185	REBENA	45

Appendix-XIV

Block Wise Stand Table Estimated Number of Stems

RANGE	BLOCK	MAJOR SPECIES	GIRTH CLASS (cm)					Total
			30-60	60-90	90-120	120-150	> 150	
	ANDHARAJHARI	All Trees	7,622	2,641	1,278	454	280	12,275
		(all)	7,622	2,641	1,278	454	280	12,275
	ATAI	All Trees	462,110	167,043	80,173	28,958	18,250	756,532
		(all)	462,110	167,043	80,173	28,958	18,250	756,532
	BAIGUNDI	All Trees	8,566	3,206	1,567	534	298	14,170
		(all)	8,566	3,206	1,567	534	298	14,170
	BARANGA	All Trees	156,968	59,510	30,169	11,374	7,598	265,617
		(all)	156,968	59,510	30,169	11,374	7,598	265,617
	GAYALMUNDA	All Trees	18,640	6,703	3,279	1,153	678	30,452
		(all)	18,640	6,703	3,279	1,153	678	30,452
	HATIBANDHA	All Trees	8,857	2,946	1,390	483	390	14,066
		(all)	8,857	2,946	1,390	483	390	14,066
	KOLADIHA	All Trees	4,225	1,464	687	248	152	6,776
		(all)	4,225	1,464	687	248	152	6,776
	MEGHANADPOI	All Trees	33,166	10,548	4,992	1,660	2,082	52,448
		(all)	33,166	10,548	4,992	1,660	2,082	52,448
	NUNIAPATNA	All Trees	203	59	27	8	13	310
		(all)	203	59	27	8	13	310
	OSTAPURA	All Trees	22,315	9,215	5,013	2,331	1,204	40,079
		(all)	22,315	9,215	5,013	2,331	1,204	40,079
	PANASADIHA	All Trees	9,469	3,308	1,570	551	413	15,311
		(all)	9,469	3,308	1,570	551	413	15,311
		All Trees	61,279	22,024	10,475	3,655	2,813	100,246

			GIRTH CLASS (cm)					Total
RANGE	BLOCK	MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
	PATILO	(all)	61,279	22,024	10,475	3,655	2,813	100,246
		All Trees	1,358,141	562,822	298,537	113,821	53,590	2,386,911
	SANTOSHPUR	(all)	1,358,141	562,822	298,537	113,821	53,590	2,386,911
		All Trees	1,570	1,023	709	315	128	3,745
	TALGAN A		1,570	1,023	709	315	128	3,745
ANANDAPUR	(all)	(all)	2,153,131	852,512	439,865	165,543	87,888	3,698,940
		All Trees	1,264	400	183	62	104	2,013
	BRAHMINIPAL	(all)	1,264	400	183	62	104	2,013
		All Trees	24,999	9,401	4,936	2,290	1,727	43,354
	MAHULPANGA	(all)	24,999	9,401	4,936	2,290	1,727	43,354
		All Trees	163,710	59,698	28,600	9,422	10,824	272,255
	PALASPAL	(all)	163,710	59,698	28,600	9,422	10,824	272,255
		All Trees	2,869,175	1,193,480	640,178	268,672	184,556	5,156,061
	REBANA	(all)	2,869,175	1,193,480	640,178	268,672	184,556	5,156,061
		All Trees	2,836	920	423	146	222	4,547
	SAPANAPOSI	(all)	2,836	920	423	146	222	4,547
		All Trees	12,301	4,841	2,381	981	701	21,204
	TANGIRIAPAL	(all)	12,301	4,841	2,381	981	701	21,204
		All Trees	39,876	14,082	6,802	2,506	2,558	65,824
	TURKIPADA		39,876	14,082	6,802	2,506	2,558	65,824
BRAHMANIPAL	(all)	(all)	3,114,161	1,282,822	683,503	284,081	200,691	5,565,258
		All Trees	1,231,528	421,275	183,519	60,572	45,485	1,942,378

RANGE	BLOCK	MAJOR SPECIES	GIRTH CLASS (cm)					Total
			30-60	60-90	90-120	120-150	> 150	
	ATAI	(all)	1,231,528	421,275	183,519	60,572	45,485	1,942,378
	KADAGOTHA	All Trees	8,186	2,707	1,233	449	417	12,992
		(all)	8,186	2,707	1,233	449	417	12,992
	PALASPAL	All Trees	11,440	5,424	2,369	172	895	20,299
		(all)	11,440	5,424	2,369	172	895	20,299
	REBANA	All Trees	828,069	342,095	179,691	70,553	40,887	1,461,296
			828,069	342,095	179,691	70,553	40,887	1,461,296
DEOGAON			2,079,223	771,501	366,811	131,746	87,683	3,436,965
(all)	(all)	(all)	7,346,515	2,906,836	1,490,179	581,371	376,262	12,701,163

Stand Table, Compartment Wise Estimated Number of Stems (NON-SFC)

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			58	BKD-IX	All Trees	67,814	25,682	12,524	4,583	2,356	112,959
			59	BKD-VIII	All Trees	78,731	30,122	14,776	5,380	2,880	131,888
		ATAI	(all)	(all)	(all)	146,545	55,804	27,300	9,963	5,235	244,847
			10	BKD-III	All Trees	96,471	41,190	23,352	9,093	3,946	174,053
			11	BKD-II	All Trees	85,546	35,586	18,723	7,036	3,298	150,189
			12	BKD-III	All Trees	17,873	6,992	3,597	1,388	709	30,559
			13	BKD-IV	All Trees	63,535	27,558	14,429	5,422	2,541	113,484
			14	BKD-V	All Trees	105,946	44,543	22,941	8,373	4,071	185,873
			15	BKD-IV	All Trees	47,658	19,136	10,001	4,052	2,047	82,894
			16	BKD-VI	All Trees	60,044	24,949	13,389	5,426	2,597	106,405
			17	BKD-V	All Trees	30,823	13,875	7,733	2,975	1,323	56,729
			18	BKD-VII	All Trees	75,270	28,952	14,178	5,162	2,527	126,089
			19		All Trees	27,833	10,660	5,360	1,981	953	46,787
			20	BKD-VI	All Trees	38,205	14,994	7,904	3,133	1,670	65,905
			8	BKD-I	All Trees	92,259	35,753	18,110	6,816	3,225	156,163
			9	BKD-II	All Trees	59,214	24,723	13,966	5,515	2,455	105,872
		SANTOSHPUR			(all)	800,678	328,909	173,683	66,371	31,362	1,401,003
	ANANDAPUR	(all)	(all)	(all)	(all)	947,223	384,713	200,983	76,334	36,597	1,645,850
			10	KSI-VIII	All Trees	83,093	35,561	19,674	8,203	5,045	151,576
			11	KSI-IX	All Trees	73,131	30,977	16,450	7,343	4,766	132,667
			12	KSI-X	All Trees	36,624	13,479	6,965	3,075	2,677	62,820
			13	TKR-VIII	All Trees	107,397	46,247	25,886	10,970	6,856	197,357
			14	TKR-IX	All Trees	69,151	39,412	30,613	9,840	5,192	154,207
			15	KSI-X	All Trees	34,586	18,448	10,139	4,565	2,680	70,418
			16		All Trees	40,132	20,258	11,499	5,669	3,280	80,838

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			17	KSI-I	All Trees	56,145	27,104	14,933	6,334	3,605	108,121
			18	KSI-II	All Trees	60,095	23,793	13,120	6,141	4,182	107,331
			21	KSI-V	All Trees	47,521	23,739	14,191	5,931	3,192	94,574
			22	KSI-III	All Trees	52,053	24,913	15,939	11,332	5,628	109,864
			23	KSI-II	All Trees	23,120	12,706	7,853	3,478	1,789	48,946
				KSI-IX	All Trees	60,393	23,990	12,811	5,417	4,065	106,677
			24	KSI-VIII	All Trees	77,041	34,005	17,646	7,303	4,655	140,650
				KSI-IX	All Trees	68,166	29,151	15,390	6,647	4,586	123,940
			25	KSI-VIII	All Trees	43,594	18,622	9,813	4,202	2,742	78,972
			28	KSI-IV	All Trees	34,012	14,556	7,236	2,752	1,576	60,132
			46	KSI-VII	All Trees	88,361	36,583	19,011	7,897	5,882	157,733
			47	KSI-VI	All Trees	40,289	18,639	8,826	3,503	2,201	73,459
			5	TKR-VI	All Trees	3,842	2,108	1,257	523	262	7,991
			6	TKR-V	All Trees	2,360	1,331	833	350	164	5,037
		REBANA			(all)	1,101,103	495,622	280,083	121,474	75,026	2,073,308
	BRAHMANIPAL	(all)	(all)	(all)	(all)	1,101,103	495,622	280,083	121,474	75,026	2,073,308
			50		All Trees	74,541	27,282	12,588	4,265	2,762	121,438
			51	TKR-X	All Trees	77,183	27,342	12,078	4,111	2,632	123,347
			52	TKR-I	All Trees	97,396	34,481	15,776	5,489	3,753	156,895
			53	TKR-II	All Trees	83,784	31,280	14,375	4,888	3,239	137,565
			54	TKR-III	All Trees	87,929	32,045	14,226	4,895	3,320	142,416
			57	TKR-IV	All Trees	133,402	48,825	21,703	7,585	5,232	216,746
			65	TKR-III	All Trees	36,379	12,227	5,290	1,709	1,342	56,946
		ATAI	(all)	(all)	(all)	590,615	213,481	96,035	32,941	22,280	955,352
			1	TKR-V	All Trees	52,711	24,703	13,947	5,592	2,834	99,788

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm)					Total
						30-60	60-90	90-120	120-150	> 150	
			13	TKR-VIII	All Trees	2,230	801	375	125	73	3,605
			5	TKR-VI	All Trees	56,640	31,209	20,898	8,673	3,446	120,866
			6	TKR-V	All Trees	37,804	16,423	9,333	3,592	1,796	68,947
			7	TKR-VII	All Trees	63,223	30,566	16,814	7,743	4,112	122,458
			8	KSI-X	All Trees	15,859	9,428	5,821	2,746	1,261	35,116
		REBANA			(all)	228,466	113,131	67,189	28,471	13,523	450,780
	DEOGAON				(all)	819,081	326,612	163,224	61,412	35,803	1,406,132
IWC	(all)	(all)	(all)	(all)	(all)	2,867,408	1,206,947	644,290	259,220	147,426	5,125,290
			60	KLR-III	All Trees	371	108	49	15	25	569
				KLR-V	All Trees	935	273	124	38	62	1,433
			61	KLR-VI	All Trees	505	147	67	21	34	774
		ATAI	(all)	(all)	(all)	1,812	528	241	74	121	2,776
			NRSC-49	KLR-X	All Trees	587	171	78	24	39	900
			NRSC-50	KLR-IX	All Trees	196	57	26	8	13	300
			NRSC-51	KLR-II	All Trees	234	68	31	10	16	359
			NRSC-63	KLR-III	All Trees	125	52	32	24	11	245
		BARANGA	(all)	(all)	(all)	1,143	349	168	66	79	1,804
			NRSC-39		All Trees	402	117	53	17	27	616
			NRSC-40	KLR-IX	All Trees	223	77	44	15	9	367
		GAYALMUNDA	(all)	(all)	(all)	625	194	97	31	36	983
			NRSC-70	KLR-I	All Trees	563	202	100	36	17	918
		HATIBANDHA	(all)	(all)	(all)	563	202	100	36	17	918
			NRSC-42	KLR-X	All Trees	203	59	27	8	13	311
		OSTAPURA	(all)	(all)	(all)	203	59	27	8	13	311
				KLR-VI	All Trees	299	87	40	12	20	459

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			2	KLR-X	All Trees	409	119	54	17	27	626
			9	KLR-IX	All Trees	1,034	327	148	50	54	1,613
		SANTOSHPUR			(all)	1,742	533	242	79	102	2,698
	ANANDAPUR	(all)	(all)	(all)	(all)	6,087	1,866	875	295	367	9,490
			NRSC-59	TPD-VIII	All Trees	256	81	37	13	21	408
		PALASPAL	(all)	(all)	(all)	256	81	37	13	21	408
				TPD-IV	All Trees	6,710	2,186	1,028	381	540	10,845
			18	TPD-V	All Trees	6,179	2,078	1,068	499	540	10,363
				TPD-I	All Trees	2,026	670	310	109	152	3,267
				TPD-II	All Trees	3,411	1,195	557	206	259	5,627
				TPD-III	All Trees	1,345	446	228	105	120	2,244
				TPD-IX	All Trees	1,596	1,040	629	286	142	3,693
			19	TPD-X	All Trees	5,990	2,236	1,157	423	340	10,146
				TPD-I	All Trees	5,541	1,856	872	307	398	8,974
				TPD-II	All Trees	1,572	547	257	93	105	2,574
			20	TPD-IX	All Trees	5,426	1,757	808	279	427	8,696
			22	TPD-III	All Trees	1,297	461	224	81	77	2,141
			26	TPD-II	All Trees	253	80	37	12	21	403
			39	TPD-VI	All Trees	1,847	585	267	91	151	2,942
				TPD-VII	All Trees	1,032	327	149	51	85	1,643
			43	TPD-VIII	All Trees	2,057	652	298	101	169	3,277
			45	TPD-IV	All Trees	1,554	492	225	76	127	2,475
				TPD-V	All Trees	1,030	326	149	51	84	1,641
			46	TPD-VI	All Trees	506	160	73	25	41	806
		REBANA	(all)	(all)	(all)	49,371	17,095	8,336	3,176	3,777	81,755

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			NRSC-53		All Trees	216	68	31	11	18	344
			NRSC-54	KLR-VIII	All Trees	200	63	29	10	16	318
		SAPANAPOSI	(all)	(all)	(all)	416	132	60	20	34	662
			NRSC-55		All Trees	752	288	139	53	38	1,270
			NRSC-56		All Trees	480	166	78	28	33	784
			NRSC-57	TPD-VII	All Trees	1,389	493	232	85	88	2,288
		TURKIPADA			(all)	2,622	947	449	166	159	4,342
	BRAHMANIPAL	(all)	(all)	(all)	(all)	52,665	18,255	8,882	3,375	3,991	87,168
				KLR-IX	All Trees	1,015	310	151	48	61	1,584
			68	KLR-VII	All Trees	668	211	108	35	36	1,058
		ATAI			(all)	1,683	521	258	82	98	2,642
	DEOGAON				(all)	1,683	521	258	82	98	2,642
PLWC	(all)	(all)	(all)	(all)	(all)	60,435	20,641	10,016	3,752	4,456	99,300
			NRSC-64	APR-I	All Trees	203	59	27	8	13	310
		NUNIAPATNA	(all)	(all)	(all)	203	59	27	8	13	310
			1		All Trees	84,697	37,355	18,974	6,817	3,090	150,933
			3	APR-I	All Trees	31,932	15,287	9,009	3,619	1,574	61,420
			4	APR-VIII	All Trees	44,408	18,180	9,904	3,693	1,736	77,920
			5		All Trees	69,167	29,884	16,748	6,691	2,921	125,411
			6	APR-IX	All Trees	78,176	33,928	18,263	6,972	3,022	140,360
			7	APR-X	All Trees	65,763	28,532	16,761	6,718	2,880	120,654
		SANTOSHPUR			(all)	374,142	163,165	89,659	34,509	15,223	676,699
	ANANDAPUR	(all)	(all)	(all)	(all)	374,345	163,224	89,686	34,517	15,237	677,009
			19	APR-II	All Trees	128,723	58,220	32,187	15,388	9,798	244,315
				APR-III	All Trees	77,525	36,358	19,638	8,847	5,995	148,363

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm)					Total
						30-60	60-90	90-120	120-150	> 150	
			20	APR-IV	All Trees	86,480	39,189	21,656	9,753	6,509	163,587
			25	APR-X	All Trees	84,518	32,792	16,833	6,451	4,420	145,013
				APR-VI	All Trees	71,824	29,171	15,113	5,839	3,582	125,528
			26	APR-VII	All Trees	71,793	27,849	13,789	5,171	3,703	122,305
			29	APR-V	All Trees	98,284	42,033	21,440	9,108	6,205	177,069
			30	APR-VIII	All Trees	103,621	43,728	23,057	10,315	7,376	188,097
		REBANA			(all)	722,766	309,341	163,712	70,871	47,588	1,314,278
	BRAHMANIPAL				(all)	722,766	309,341	163,712	70,871	47,588	1,314,278
PRWC	(all)	(all)	(all)	(all)	(all)	1,097,111	472,565	253,398	105,388	62,824	1,991,287
			NRSC-68	RPR-VI	All Trees	7,622	2,641	1,278	454	280	12,275
		ANDHARAJHARI	(all)	(all)	(all)	7,622	2,641	1,278	454	280	12,275
			60	RPR-I	All Trees	78,557	27,855	13,196	4,836	3,128	127,571
				RPR-II	All Trees	68,559	23,705	11,083	3,910	2,686	109,944
				RPR-III	All Trees	45,968	15,669	7,367	2,551	1,965	73,521
			61		All Trees	20,199	7,343	3,701	1,412	901	33,555
				RPR-IV	All Trees	35,705	12,240	5,721	2,006	1,547	57,219
			62	RPR-V	All Trees	35,576	12,224	5,692	2,026	1,528	57,047
			63	RPR-VI	All Trees	29,189	11,675	5,871	2,179	1,138	50,052
		ATAI	(all)	(all)	(all)	313,753	110,710	52,631	18,921	12,894	508,910
			NRSC-23	RPR-X	All Trees	8,566	3,206	1,567	534	298	14,170
		BAIGUNDI	(all)	(all)	(all)	8,566	3,206	1,567	534	298	14,170
			NRSC-20	GLM-III	All Trees	52,536	19,993	10,250	3,946	2,588	89,313
			NRSC-21	GLM-II	All Trees	60,466	21,343	10,648	3,828	3,105	99,391
			NRSC-52	GLM-VI	All Trees	42,822	17,824	9,104	3,534	1,825	75,109
		BARANGA	(all)	(all)	(all)	155,825	59,161	30,001	11,308	7,519	263,813

COUPETYPE RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm)					Total
					30-60	60-90	90-120	120-150	> 150	
		NRSC-2	RPR-X	All Trees	18,015	6,508	3,181	1,122	642	29,469
	GAYALMUNDA	(all)	(all)	(all)	18,015	6,508	3,181	1,122	642	29,469
		NRSC-14		All Trees	7,168	2,382	1,127	391	317	11,384
		NRSC-22	RPR-X	All Trees	1,126	362	164	56	56	1,764
	HATIBANDHA	(all)	(all)	(all)	8,294	2,744	1,291	447	373	13,148
		NRSC-24	RPR-I	All Trees	4,225	1,464	687	248	152	6,776
	KOLADIHA	(all)	(all)	(all)	4,225	1,464	687	248	152	6,776
		NRSC-19	RPR-VIII	All Trees	33,166	10,548	4,992	1,660	2,082	52,448
	MEGHANADPOI	(all)	(all)	(all)	33,166	10,548	4,992	1,660	2,082	52,448
		NRSC-71	RPR-V	All Trees	22,113	9,156	4,986	2,322	1,191	39,768
	OSTAPURA	(all)	(all)	(all)	22,113	9,156	4,986	2,322	1,191	39,768
		NRSC-1	RPR-III	All Trees	9,469	3,308	1,570	551	413	15,311
	PANASADIHA	(all)	(all)	(all)	9,469	3,308	1,570	551	413	15,311
		NRSC-18	RPR-IX	All Trees	61,279	22,024	10,475	3,655	2,813	100,246
	PATILO	(all)	(all)	(all)	61,279	22,024	10,475	3,655	2,813	100,246
		12	GLM-X	All Trees	29,800	11,532	5,783	2,140	1,151	50,405
		15	GLM-IV	All Trees	18,286	7,637	4,092	1,593	780	32,388
		16	GLM-VII	All Trees	20,783	8,619	4,403	1,660	882	36,346
		17	GLM-VIII	All Trees	26,213	9,580	4,690	1,712	998	43,193
		19	GLM-V	All Trees	20,343	7,337	3,458	1,251	696	33,085
		2	GLM-IX	All Trees	48,025	18,436	9,062	3,248	1,702	80,473
		8	GLM-I	All Trees	18,128	7,074	3,465	1,259	693	30,619
	SANTOSHPUR	(all)	(all)	(all)	181,578	70,214	34,953	12,862	6,903	306,511
		NRSC-69	GLM-V	All Trees	1,570	1,023	709	315	128	3,745
	TALGAN A			(all)	1,570	1,023	709	315	128	3,745

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
	ANANDAPUR	(all)	(all)	(all)	(all)	825,476	302,709	148,321	54,398	35,687	1,366,591
			NRSC-17	DTI-X	All Trees	1,264	400	183	62	104	2,013
		BRAHMINIPAL	(all)	(all)	(all)	1,264	400	183	62	104	2,013
			NRSC-9	MLP-VI	All Trees	24,999	9,401	4,936	2,290	1,727	43,354
		MAHULPANGA	(all)	(all)	(all)	24,999	9,401	4,936	2,290	1,727	43,354
			NRSC-5	DTI-VII	All Trees	18,653	8,882	4,168	539	1,432	33,675
			NRSC-60	DTI-VIII	All Trees	48,241	16,372	7,835	2,763	3,262	78,473
			NRSC-61	DTI-IX	All Trees	43,135	15,433	7,570	2,822	2,750	71,710
			NRSC-62	DTI-X	All Trees	53,425	18,930	8,989	3,286	3,359	87,989
		PALASPAL	(all)	(all)	(all)	163,454	59,617	28,563	9,410	10,803	271,847
				MLP-I	All Trees	17,283	6,261	3,467	1,854	1,504	30,369
			12	MLP-II	All Trees	28,542	11,745	6,252	2,543	1,853	50,935
			18	MLP-I	All Trees	12,004	4,790	2,656	1,400	897	21,746
			22	MLP-IV	All Trees	21,337	9,093	5,225	3,360	2,011	41,026
			23		All Trees	23,117	10,853	5,997	2,568	1,649	44,184
			27	MLP-II	All Trees	46,406	17,768	9,074	3,285	2,094	78,626
			28	MLP-III	All Trees	52,375	20,165	10,254	3,735	2,535	89,065
			31	MLP-IV	All Trees	57,877	21,285	10,667	3,862	3,106	96,796
			32	MLP-V	All Trees	61,396	21,073	10,343	3,636	3,856	100,305
			33	MLP-VI	All Trees	56,491	21,228	10,969	4,017	2,709	95,415
			39	MLP-IX	All Trees	81,550	30,623	15,200	5,773	4,334	137,480
			40	MLP-X	All Trees	43,805	15,966	7,991	2,906	2,259	72,928
			41	MLP-VII	All Trees	43,032	15,720	7,934	2,873	2,163	71,722
			42	MLP-VIII	All Trees	51,303	19,135	9,835	3,535	2,364	86,172
			43	MLP-I	All Trees	49,868	18,393	8,953	3,313	2,714	83,241

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COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			44	DTI-V	All Trees	35,134	12,294	5,831	2,113	2,275	57,647
			45	DTI-VI	All Trees	61,842	21,237	10,272	3,638	3,997	100,985
				DTI-I	All Trees	44,026	16,304	8,198	3,056	2,672	74,255
			46	DTI-III	All Trees	67,513	24,727	12,378	4,567	3,847	113,032
				DTI-II	All Trees	50,666	17,878	8,530	3,102	3,182	83,358
			47	DTI-IV	All Trees	56,059	20,968	10,185	3,805	3,331	94,347
			9	MLP-X	All Trees	34,308	13,917	7,836	4,210	2,815	63,085
		REBANA	(all)	(all)	(all)	995,934	371,421	188,047	73,151	58,165	1,686,719
			NRSC-16	BGM-VI	All Trees	2,420	788	363	126	188	3,885
		SAPANAPOSI	(all)	(all)	(all)	2,420	788	363	126	188	3,885
			NRSC-12	BGM-VII	All Trees	12,301	4,841	2,381	981	701	21,204
		TANGIRIAPAL	(all)	(all)	(all)	12,301	4,841	2,381	981	701	21,204
			NRSC-13	MLP-VII	All Trees	37,254	13,136	6,353	2,340	2,399	61,482
		TURKIPADA			(all)	37,254	13,136	6,353	2,340	2,399	61,482
	BRAHMANIPAL	(all)	(all)	(all)	(all)	1,237,627	459,604	230,826	88,361	74,086	2,090,504
			55	BGM-VIII	All Trees	81,021	27,623	12,188	3,991	2,924	127,746
				BGM-IX	All Trees	50,246	17,097	7,566	2,507	1,827	79,244
			56	BGM-X	All Trees	41,573	13,829	5,585	1,761	1,308	64,057
			61	RPR-III	All Trees	21,869	6,719	2,729	872	917	33,105
			62	RPR-V	All Trees	15,873	4,814	1,869	558	636	23,749
			63	RPR-VI	All Trees	26,203	8,085	3,054	947	883	39,172
			64	RPR-VII	All Trees	60,999	19,672	7,886	2,483	2,192	93,232
			66	BGM-I	All Trees	72,591	23,667	10,317	3,239	2,525	112,339
			67	BGM-II	All Trees	80,694	26,407	11,712	3,731	2,917	125,463
				BGM-III	All Trees	35,148	10,762	4,095	1,218	1,243	52,466

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			68	BGM-IV	All Trees	74,375	23,686	10,266	3,200	2,929	114,457
			69	BGM-V	All Trees	78,636	24,912	9,958	3,042	2,805	119,353
		ATAI	(all)	(all)	(all)	639,229	207,273	87,225	27,549	23,108	984,384
			NRSC-7	BGM-VI	All Trees	8,186	2,707	1,233	449	417	12,992
		KADAGOTHA	(all)	(all)	(all)	8,186	2,707	1,233	449	417	12,992
			NRSC-5	DTI-VII	All Trees	11,440	5,424	2,369	172	895	20,299
		PALASPAL	(all)	(all)	(all)	11,440	5,424	2,369	172	895	20,299
			2	HPR-IX	All Trees	96,441	44,395	23,745	9,706	5,746	180,033
			3	HPR-X	All Trees	43,657	25,085	17,130	8,002	3,341	97,215
			32	MLP-V	All Trees	8,525	2,666	962	283	205	12,642
			34	HPR-IV	All Trees	58,516	20,421	9,452	3,157	2,459	94,005
			35	HPR-V	All Trees	96,980	32,027	13,640	4,382	3,434	150,463
			36	HPR-III	All Trees	18,615	5,634	2,327	706	860	28,142
				HPR-VI	All Trees	58,664	18,540	7,352	2,233	1,942	88,731
			37		All Trees	42,713	13,676	5,391	1,644	1,342	64,767
				HPR-VII	All Trees	30,260	9,640	3,821	1,166	1,036	45,922
			38	HPR-VIII	All Trees	33,455	10,270	3,990	1,195	1,326	50,236
			4	HPR-X	All Trees	1,747	991	521	233	133	3,624
			6	HPR-I	All Trees	45,693	19,761	11,158	4,345	2,148	83,105
			7	HPR-II	All Trees	31,077	12,497	6,590	2,541	1,732	54,438
			8	MLP-IX	All Trees	28,051	11,629	5,819	2,306	1,539	49,344
			9	MLP-X	All Trees	5,208	1,730	604	184	121	7,849
		REBANA			(all)	599,603	228,964	112,502	42,083	27,364	1,010,516
	DEOGAON				(all)	1,258,459	444,368	203,328	70,252	51,783	2,028,191
RWC					(all)	3,321,561	1,206,682	582,476	213,010	161,556	5,485,285

Block Wise Stock Table

COUPE	RANGE	BLOCK	COMPARTMENTCOUPE	MAJOR SPECIES	GIRTH CLASS (cm) (Volume in Cu. m)					Total
	RANGE	BLOCK		MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
				All Trees	637	784	853	523	696	3,493
		ANDHARAJHARI		(all)	637	784	853	523	696	3,493
				All Trees	38,639	47,541	52,958	33,447	44,669	217,254
		ATAI		(all)	38,639	47,541	52,958	33,447	44,669	217,254
				All Trees	694	937	1,048	627	698	4,003
		BAIGUNDI		(all)	694	937	1,048	627	698	4,003
				All Trees	13,434	16,761	19,842	13,428	18,160	81,625
		BARANGA		(all)	13,434	16,761	19,842	13,428	18,160	81,625
				All Trees	1,535	1,978	2,185	1,336	1,649	8,683
		GAYALMUNDA		(all)	1,535	1,978	2,185	1,336	1,649	8,683
				All Trees	788	834	929	553	993	4,096
		HATIBANDHA		(all)	788	834	929	553	993	4,096
				All Trees	351	425	454	282	382	1,894
		KOLADIHA		(all)	351	425	454	282	382	1,894
				All Trees	3,333	2,699	3,358	1,934	5,330	16,654
		MEGHANADPOI		(all)	3,333	2,699	3,358	1,934	5,330	16,654
				All Trees	21	15	18	9	35	99
		NUNIAPATNA		(all)	21	15	18	9	35	99
				All Trees	1,851	2,754	3,338	2,950	2,593	13,485
		OSTAPURA		(all)	1,851	2,754	3,338	2,950	2,593	13,485
				All Trees	823	922	1,037	629	1,034	4,446
		PANASADIHA		(all)	823	922	1,037	629	1,034	4,446

			(Volume in Cu. m)					
			GIRTH CLASS (cm)					Total
RANGE	BLOCK	MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
		All Trees	5,370	6,008	6,927	4,241	6,920	29,464
	PATILO	(all)	5,370	6,008	6,927	4,241	6,920	29,464
		All Trees	106,982	163,970	197,452	134,214	123,142	725,760
	SANTOSHPUR	(all)	106,982	163,970	197,452	134,214	123,142	725,760
		All Trees	155	314	498	393	326	1,686
	TALGAN A		155	314	498	393	326	1,686
ANANDAPUR	(all)	(all)	174,614	245,939	290,898	194,565	206,628	1,112,644
		All Trees	142	101	128	69	279	719
	BRAHMINIPAL	(all)	142	101	128	69	279	719
		All Trees	2,506	2,922	3,404	2,879	4,124	15,834
	MAHULPANGA	(all)	2,506	2,922	3,404	2,879	4,124	15,834
		All Trees	16,482	17,127	19,393	10,649	26,893	90,545
	PALASPAL	(all)	16,482	17,127	19,393	10,649	26,893	90,545
		All Trees	283,238	365,557	444,119	329,938	459,884	1,882,737
	REBANA	(all)	283,238	365,557	444,119	329,938	459,884	1,882,737
		All Trees	316	239	293	162	596	1,606
	SAPANAPOSI	(all)	316	239	293	162	596	1,606
		All Trees	1,219	1,519	1,607	1,138	1,754	7,237
	TANGIRIAPAL	(all)	1,219	1,519	1,607	1,138	1,754	7,237
		All Trees	4,148	4,129	4,626	2,834	6,629	22,366
	TURKIPADA		4,148	4,129	4,626	2,834	6,629	22,366

			(Volume in Cu. m)					
			GIRTH CLASS (cm)					Total
RANGE	BLOCK	MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
BRAHMANIPAL	(all)	(all)	308,051	391,595	473,570	347,669	500,160	2,021,044
		All Trees	104,371	123,699	124,019	72,586	106,815	531,490
	ATAI	(all)	104,371	123,699	124,019	72,586	106,815	531,490
		All Trees	753	751	824	544	1,015	3,887
	KADAGOTHA	(all)	753	751	824	544	1,015	3,887
		All Trees	754	1,360	1,575	206	1,528	5,423
	PALASPAL	(all)	754	1,360	1,575	206	1,528	5,423
		All Trees	74,124	102,334	123,546	87,602	99,434	487,041
	REBANA		74,124	102,334	123,546	87,602	99,434	487,041
DEOGAON			180,002	228,144	249,965	160,938	208,792	1,027,840
(all)	(all)	(all)	662,668	865,677	1,014,432	703,172	915,579	4,161,529

Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC)

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			58	BKD-IX	All Trees	5,410	7,391	8,281	5,302	5,600	31,984
			59	BKD-VIII	All Trees	6,283	8,674	9,698	6,239	6,805	37,699
		ATAI	(all)	(all)	(all)	11,693	16,065	17,979	11,541	12,406	69,683
			10	BKD-III	All Trees	7,834	12,246	15,709	10,761	9,484	56,033
			11	BKD-II	All Trees	6,674	10,274	12,378	8,264	7,490	45,079
			12	BKD-III	All Trees	1,418	2,064	2,358	1,632	1,649	9,121
			13	BKD-IV	All Trees	4,823	7,923	9,402	6,433	5,527	34,108
			14	BKD-V	All Trees	8,155	12,780	15,002	9,852	9,055	54,845
			15	BKD-IV	All Trees	3,805	5,658	6,594	4,896	4,595	25,549
			16	BKD-VI	All Trees	4,695	7,451	8,803	6,556	5,726	33,231
			17	BKD-V	All Trees	2,292	4,132	5,034	3,541	2,841	17,841
			18	BKD-VII	All Trees	5,871	8,425	9,289	5,957	5,940	35,482
			19		All Trees	2,167	3,172	3,515	2,287	2,251	13,392
			20	BKD-VI	All Trees	3,190	4,381	5,257	3,735	3,999	20,562
			8	BKD-I	All Trees	7,265	10,533	11,969	7,934	7,615	45,317
			9	BKD-II	All Trees	4,695	7,297	9,372	6,453	5,712	33,530
		SANTOSHPUR			(all)	62,885	96,336	114,681	78,301	71,885	424,088
	ANANDAPUR	(all)	(all)	(all)	(all)	74,579	112,401	132,660	89,842	84,290	493,772
			10	KSI-VIII	All Trees	7,989	11,196	13,656	10,069	12,460	55,370
			11	KSI-IX	All Trees	7,124	9,713	11,426	9,176	11,597	49,035
			12	KSI-X	All Trees	3,795	4,031	4,826	3,814	6,604	23,069
			13	TKR-VIII	All Trees	10,230	14,596	18,231	13,707	16,775	73,538
			14	TKR-IX	All Trees	7,375	11,362	21,691	15,318	16,186	71,933
			15	KSI-X	All Trees	3,446	5,709	7,258	5,804	6,775	28,992

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			16		All Trees	3,920	6,348	8,241	7,371	7,837	33,716
			17	KSI-I	All Trees	5,463	8,610	10,476	7,906	9,037	41,493
			18	KSI-II	All Trees	5,934	7,467	9,104	7,839	9,815	40,159
			21	KSI-V	All Trees	4,675	7,346	9,907	7,333	8,185	37,446
			22	KSI-III	All Trees	4,990	7,095	11,581	13,630	12,891	50,187
			23	KSI-II	All Trees	2,279	3,910	5,566	4,351	4,539	20,645
				KSI-IX	All Trees	6,112	7,259	8,826	6,619	10,123	38,938
			24	KSI-VIII	All Trees	7,408	10,248	12,187	8,799	11,588	50,231
				KSI-IX	All Trees	6,720	8,663	10,678	8,150	11,280	45,491
			25	KSI-VIII	All Trees	4,257	5,687	6,760	5,082	6,814	28,600
			28	KSI-IV	All Trees	3,186	4,568	4,877	3,196	3,833	19,659
			46	KSI-VII	All Trees	8,900	10,821	13,106	9,476	14,795	57,099
			47	KSI-VI	All Trees	3,751	5,454	6,089	4,227	5,310	24,831
			5	TKR-VI	All Trees	392	662	872	669	690	3,284
			6	TKR-V	All Trees	233	419	583	448	427	2,109
		REBANA			(all)	108,178	151,164	195,941	152,984	187,560	795,826
	BRAHMANIPAL	(all)	(all)	(all)	(all)	108,178	151,164	195,941	152,984	187,560	795,826
			50		All Trees	6,249	8,163	8,566	5,128	6,397	34,502
			51	TKR-X	All Trees	6,352	8,064	8,189	4,909	6,025	33,539
			52	TKR-I	All Trees	8,213	10,263	10,632	6,653	8,698	44,459
			53	TKR-II	All Trees	7,074	9,278	9,727	5,890	7,518	39,487
			54	TKR-III	All Trees	7,408	9,444	9,622	5,934	7,650	40,058
			57	TKR-IV	All Trees	11,261	14,171	14,526	9,159	12,101	61,218
			65	TKR-III	All Trees	3,101	3,594	3,583	2,042	3,176	15,496

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
		ATAI	(all)	(all)	(all)	49,657	62,977	64,846	39,716	51,564	268,760
			1	TKR-V	All Trees	4,586	7,322	9,496	6,808	6,626	34,838
			13	TKR-VIII	All Trees	189	249	254	157	178	1,027
			5	TKR-VI	All Trees	5,397	9,690	14,276	10,934	8,831	49,128
			6	TKR-V	All Trees	3,317	4,973	6,372	4,402	4,348	23,413
			7	TKR-VII	All Trees	5,848	9,440	11,796	9,959	9,731	46,774
			8	KSI-X	All Trees	1,614	2,954	4,048	3,607	3,118	15,341
		REBANA			(all)	20,952	34,628	46,242	35,867	32,831	170,521
	DEOGAON				(all)	70,609	97,605	111,088	75,583	84,396	439,280
IWC	(all)	(all)	(all)	(all)	(all)	253,365	361,170	439,688	318,409	356,246	1,728,878
			60	KLR-III	All Trees	39	27	34	17	65	182
				KLR-V	All Trees	99	67	85	44	163	458
			61	KLR-VI	All Trees	53	36	46	24	88	247
		ATAI	(all)	(all)	(all)	191	130	164	85	316	886
			NRSC-49	KLR-X	All Trees	62	42	53	28	102	287
			NRSC-50	KLR-IX	All Trees	21	14	18	9	34	96
			NRSC-51	KLR-II	All Trees	25	17	21	11	41	115
			NRSC-63	KLR-III	All Trees	12	18	23	34	21	108
		BARANGA	(all)	(all)	(all)	119	91	115	81	199	605
			NRSC-39		All Trees	42	29	36	19	70	197
			NRSC-40	KLR-IX	All Trees	19	26	30	18	21	114
		GAYALMUNDA	(all)	(all)	(all)	61	55	67	37	91	311
			NRSC-70	KLR-I	All Trees	44	62	67	42	41	256
		HATIBANDHA	(all)	(all)	(all)	44	62	67	42	41	256

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			NRSC-42	KLR-X	All Trees	21	15	18	10	35	99
		OSTAPURA	(all)	(all)	(all)	21	15	18	10	35	99
				KLR-VI	All Trees	32	22	27	14	52	146
			2	KLR-X	All Trees	43	29	37	19	71	200
			9	KLR-IX	All Trees	99	86	99	56	141	481
		SANTOSHPUR			(all)	173	137	163	90	265	828
	ANANDAPUR	(all)	(all)	(all)	(all)	610	490	593	344	948	2,985
			NRSC-59	TPD-VIII	All Trees	29	20	26	14	57	146
		PALASPAL	(all)	(all)	(all)	29	20	26	14	57	146
				TPD-IV	All Trees	746	574	715	439	1,428	3,902
			18	TPD-V	All Trees	675	576	752	636	1,344	3,983
				TPD-I	All Trees	223	179	213	120	406	1,142
				TPD-II	All Trees	372	328	388	233	685	2,005
				TPD-III	All Trees	148	121	161	134	300	865
				TPD-IX	All Trees	162	321	452	367	370	1,672
			19	TPD-X	All Trees	582	694	801	502	863	3,442
				TPD-I	All Trees	600	511	598	341	1,052	3,102
				TPD-II	All Trees	168	157	173	103	274	875
			20	TPD-IX	All Trees	605	456	560	308	1,145	3,074
			22	TPD-III	All Trees	133	139	151	91	196	710
			26	TPD-II	All Trees	28	20	26	14	56	144
			39	TPD-VI	All Trees	208	147	187	100	408	1,051
				TPD-VII	All Trees	116	82	104	56	228	587
			43	TPD-VIII	All Trees	232	164	208	112	455	1,171

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			45	TPD-IV	All Trees	175	124	157	84	344	884
				TPD-V	All Trees	116	82	104	56	228	586
			46	TPD-VI	All Trees	57	40	51	28	112	288
		REBANA	(all)	(all)	(all)	5,349	4,715	5,802	3,723	9,893	29,482
			NRSC-53		All Trees	24	17	22	12	48	123
			NRSC-54	KLR-VIII	All Trees	23	16	20	11	44	114
		SAPANAPOSI	(all)	(all)	(all)	47	33	42	23	92	237
			NRSC-55		All Trees	76	92	91	58	92	409
			NRSC-56		All Trees	52	47	53	31	86	268
			NRSC-57	TPD-VII	All Trees	147	144	156	94	229	770
		TURKIPADA			(all)	275	283	299	183	407	1,447
	BRAHMANIPAL	(all)	(all)	(all)	(all)	5,699	5,051	6,169	3,943	10,449	31,311
				KLR-IX	All Trees	102	84	103	56	158	503
			68	KLR-VII	All Trees	64	61	74	41	93	334
		ATAI			(all)	167	145	177	97	251	836
	DEOGAON				(all)	167	145	177	97	251	836
PLWC	(all)	(all)	(all)	(all)	(all)	6,476	5,687	6,939	4,383	11,648	35,133
			NRSC-64	APR-I	All Trees	21	15	18	9	35	99
		NUNIAPATNA	(all)	(all)	(all)	21	15	18	9	35	99
			1		All Trees	6,317	10,431	12,328	7,995	6,642	43,713
			3	APR-I	All Trees	2,553	4,493	6,009	4,372	3,567	20,995
			4	APR-VIII	All Trees	3,529	5,328	6,641	4,314	4,030	23,843
			5		All Trees	5,553	8,705	11,196	7,912	6,884	40,250
			6	APR-IX	All Trees	6,086	9,744	12,081	8,198	6,941	43,050

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

						(Volume in Cu. m)					
						GIRTH CLASS (cm)					Total
COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
			7	APR-X	All Trees	5,326	8,473	11,320	7,925	6,840	39,884
		SANTOSHPUR			(all)	29,365	47,175	59,575	40,716	34,904	211,735
	ANANDAPUR	(all)	(all)	(all)	(all)	29,386	47,190	59,593	40,725	34,939	211,834
			19	APR-II	All Trees	12,589	18,343	22,963	19,890	23,405	97,190
				APR-III	All Trees	7,837	11,182	14,007	11,300	15,023	59,349
			20	APR-IV	All Trees	8,621	11,980	15,367	12,239	16,181	64,388
			25	APR-X	All Trees	8,135	10,334	11,415	7,541	10,928	48,353
				APR-VI	All Trees	6,837	9,240	10,216	6,781	8,782	41,857
			26	APR-VII	All Trees	6,940	8,679	9,324	5,953	9,157	40,052
			29	APR-V	All Trees	9,639	12,705	14,784	11,050	15,396	63,574
			30	APR-VIII	All Trees	10,467	13,198	16,004	12,832	18,386	70,887
		REBANA			(all)	71,064	95,662	114,079	87,586	117,260	485,651
	BRAHMANIPAL				(all)	71,064	95,662	114,079	87,586	117,260	485,651
PRWC	(all)	(all)	(all)	(all)	(all)	100,450	142,851	173,672	128,312	152,199	697,485
			NRSC-68	RPR-VI	All Trees	637	784	853	523	696	3,493
		ANDHARAJHARI	(all)	(all)	(all)	637	784	853	523	696	3,493
			60	RPR-I	All Trees	6,610	7,906	8,683	5,550	7,759	36,507
				RPR-II	All Trees	5,841	6,734	7,345	4,468	6,740	31,128
				RPR-III	All Trees	4,030	4,405	4,905	2,925	4,953	21,218
			61		All Trees	1,725	2,147	2,469	1,686	2,156	10,182
				RPR-IV	All Trees	3,135	3,410	3,804	2,310	3,883	16,542
			62	RPR-V	All Trees	3,101	3,394	3,757	2,311	3,857	16,420
			63	RPR-VI	All Trees	2,313	3,350	3,853	2,570	2,600	14,686
		ATAI	(all)	(all)	(all)	26,755	31,346	34,816	21,821	31,947	146,684

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
		NRSC-23	RPR-X	All Trees	694	937	1,048	627	698	4,003
	BAIGUNDI	(all)	(all)	(all)	694	937	1,048	627	698	4,003
		NRSC-20	GLM-III	All Trees	4,497	5,678	6,750	4,691	6,150	27,766
		NRSC-21	GLM-II	All Trees	5,436	5,937	7,033	4,433	7,738	30,578
		NRSC-52	GLM-VI	All Trees	3,382	5,054	5,945	4,223	4,072	22,676
	BARANGA	(all)	(all)	(all)	13,315	16,669	19,727	13,346	17,961	81,020
		NRSC-2	RPR-X	All Trees	1,474	1,923	2,118	1,299	1,558	8,372
	GAYALMUNDA	(all)	(all)	(all)	1,474	1,923	2,118	1,299	1,558	8,372
		NRSC-14		All Trees	639	675	753	448	808	3,322
		NRSC-22	RPR-X	All Trees	105	97	109	63	145	518
	HATIBANDHA	(all)	(all)	(all)	744	772	862	511	952	3,840
		NRSC-24	RPR-I	All Trees	351	425	454	282	382	1,894
	KOLADIHA	(all)	(all)	(all)	351	425	454	282	382	1,894
		NRSC-19	RPR-VIII	All Trees	3,333	2,699	3,358	1,934	5,330	16,654
	MEGHANADPOI	(all)	(all)	(all)	3,333	2,699	3,358	1,934	5,330	16,654
		NRSC-71	RPR-V	All Trees	1,829	2,739	3,319	2,941	2,557	13,386
	OSTAPURA	(all)	(all)	(all)	1,829	2,739	3,319	2,941	2,557	13,386
		NRSC-1	RPR-III	All Trees	823	922	1,037	629	1,034	4,446
	PANASADIHA	(all)	(all)	(all)	823	922	1,037	629	1,034	4,446
		NRSC-18	RPR-IX	All Trees	5,370	6,008	6,927	4,241	6,920	29,464
	PATILO	(all)	(all)	(all)	5,370	6,008	6,927	4,241	6,920	29,464
		12	GLM-X	All Trees	2,389	3,347	3,805	2,509	2,689	14,739
		15	GLM-IV	All Trees	1,433	2,269	2,700	1,924	1,713	10,040
		16	GLM-VII	All Trees	1,655	2,445	2,892	1,989	1,965	10,945

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			17	GLM-VIII	All Trees	2,156	2,793	3,105	1,992	2,411	12,457
			19	GLM-V	All Trees	1,645	2,117	2,272	1,427	1,712	9,174
			2	GLM-IX	All Trees	3,812	5,337	5,967	3,772	3,996	22,884
			8	GLM-I	All Trees	1,468	2,014	2,292	1,495	1,602	8,871
		SANTOSHPUR	(all)	(all)	(all)	14,559	20,321	23,034	15,107	16,089	89,110
			NRSC-69	GLM-V	All Trees	155	314	498	393	326	1,686
		TALGAN A			(all)	155	314	498	393	326	1,686
	ANANDAPUR	(all)	(all)	(all)	(all)	70,039	85,858	98,052	63,654	86,450	404,053
			NRSC-17	DTI-X	All Trees	142	101	128	69	279	719
		BRAHMINIPAL	(all)	(all)	(all)	142	101	128	69	279	719
			NRSC-9	MLP-VI	All Trees	2,506	2,922	3,404	2,879	4,124	15,834
		MAHULPANGA	(all)	(all)	(all)	2,506	2,922	3,404	2,879	4,124	15,834
			NRSC-5	DTI-VII	All Trees	1,319	2,362	2,774	631	2,534	9,621
			NRSC-60	DTI-VIII	All Trees	5,113	4,642	5,358	3,092	8,559	26,763
			NRSC-61	DTI-IX	All Trees	4,395	4,535	5,200	3,280	7,060	24,469
			NRSC-62	DTI-X	All Trees	5,627	5,568	6,035	3,633	8,684	29,547
		PALASPAL	(all)	(all)	(all)	16,453	17,107	19,367	10,635	26,837	90,399
				MLP-I	All Trees	1,799	1,890	2,442	2,473	3,494	12,098
			12	MLP-II	All Trees	2,821	3,632	4,380	3,122	4,662	18,617
			18	MLP-I	All Trees	1,162	1,542	1,858	1,838	2,042	8,443
			22	MLP-IV	All Trees	2,144	2,576	3,739	3,999	4,758	17,215
			23		All Trees	2,323	3,318	4,223	3,130	4,182	17,176
			27	MLP-II	All Trees	4,274	5,697	6,161	3,841	5,049	25,022
			28	MLP-III	All Trees	4,900	6,358	6,987	4,367	6,245	28,857

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
			31	MLP-IV	All Trees	5,615	6,570	7,271	4,465	7,812	31,732
			32	MLP-V	All Trees	6,314	6,173	7,074	4,117	10,014	33,691
			33	MLP-VI	All Trees	5,229	6,776	7,499	4,746	6,602	30,851
			39	MLP-IX	All Trees	8,024	9,597	10,217	6,625	10,735	45,199
			40	MLP-X	All Trees	4,301	5,026	5,366	3,288	5,638	23,619
			41	MLP-VII	All Trees	4,174	4,979	5,341	3,268	5,381	23,143
			42	MLP-VIII	All Trees	4,780	6,145	6,665	4,112	5,727	27,429
			43	MLP-I	All Trees	5,028	5,694	5,973	3,698	6,840	27,233
			44	DTI-V	All Trees	3,720	3,568	3,933	2,340	5,913	19,475
			45	DTI-VI	All Trees	6,458	6,151	7,003	4,085	10,410	34,107
				DTI-I	All Trees	4,448	4,846	5,590	3,491	6,804	25,180
			46	DTI-III	All Trees	6,752	7,548	8,384	5,231	9,729	37,643
				DTI-II	All Trees	5,318	5,258	5,741	3,441	8,228	27,985
			47	DTI-IV	All Trees	5,606	6,265	6,956	4,395	8,489	31,710
			9	MLP-X	All Trees	3,459	4,409	5,494	5,574	6,418	25,354
		REBANA	(all)	(all)	(all)	98,648	114,017	128,298	85,645	145,171	571,779
			NRSC-16	BGM-VI	All Trees	269	206	251	139	504	1,369
		SAPANAPOSI	(all)	(all)	(all)	269	206	251	139	504	1,369
			NRSC-12	BGM-VII	All Trees	1,219	1,519	1,607	1,138	1,754	7,237
		TANGIRIAPAL	(all)	(all)	(all)	1,219	1,519	1,607	1,138	1,754	7,237
			NRSC-13	MLP-VII	All Trees	3,873	3,846	4,327	2,651	6,222	20,919
		TURKIPADA			(all)	3,873	3,846	4,327	2,651	6,222	20,919
	BRAHMANIPAL	(all)	(all)	(all)	(all)	123,110	139,718	157,382	103,156	184,891	708,256
			55	BGM-VIII	All Trees	6,813	8,190	8,220	4,774	6,854	34,850

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	(Volume in Cu. m) GIRTH CLASS (cm) 30-60	60-90	90-120	120-150	> 150	Total
				BGM-IX	All Trees	4,235	5,089	5,119	3,016	4,272	21,730
			56	BGM-X	All Trees	3,424	4,065	3,765	2,103	3,009	16,366
			61	RPR-III	All Trees	1,959	1,883	1,848	1,038	2,244	8,971
			62	RPR-V	All Trees	1,414	1,330	1,260	650	1,567	6,221
			63	RPR-VI	All Trees	2,222	2,309	2,057	1,129	2,085	9,802
			64	RPR-VII	All Trees	5,201	5,609	5,285	2,939	5,214	24,248
			66	BGM-I	All Trees	6,128	7,095	7,015	3,860	5,976	30,075
			67	BGM-II	All Trees	6,861	7,920	7,968	4,458	6,930	34,136
				BGM-III	All Trees	3,028	3,038	2,757	1,428	2,999	13,251
			68	BGM-IV	All Trees	6,519	6,905	6,981	3,790	7,126	31,321
			69	BGM-V	All Trees	6,743	7,145	6,722	3,588	6,725	30,922
		ATAI	(all)	(all)	(all)	54,547	60,577	58,996	32,774	55,000	261,894
			NRSC-7	BGM-VI	All Trees	753	751	824	544	1,015	3,887
		KADAGOTHA	(all)	(all)	(all)	753	751	824	544	1,015	3,887
			NRSC-5	DTI-VII	All Trees	754	1,360	1,575	206	1,528	5,423
		PALASPAL	(all)	(all)	(all)	754	1,360	1,575	206	1,528	5,423
			2	HPR-IX	All Trees	9,095	13,348	16,604	12,214	14,362	65,624
			3	HPR-X	All Trees	4,082	7,749	12,012	10,000	7,970	41,813
			32	MLP-V	All Trees	674	790	646	337	451	2,898
			34	HPR-IV	All Trees	5,114	6,007	6,413	3,785	5,893	27,211
			35	HPR-V	All Trees	8,188	9,429	9,213	5,234	8,086	40,151
			36	HPR-III	All Trees	1,726	1,537	1,576	822	2,163	7,823
				HPR-VI	All Trees	4,935	5,379	4,954	2,636	4,595	22,501
			37		All Trees	3,545	3,995	3,634	1,948	3,131	16,253

Table 11: Stock Table, Compartment Wise Estimated Volume of Trees (NON SFC) *(continued)*

						(Volume in Cu. m)					
						GIRTH CLASS (cm)					Total
COUPETYPE	RANGE	BLOCK	COMPARTMENT	COUPE	MAJOR SPECIES	30-60	60-90	90-120	120-150	> 150	
				HPR-VII	All Trees	2,565	2,773	2,573	1,375	2,462	11,747
			38	HPR-VIII	All Trees	2,965	2,835	2,681	1,392	3,258	13,131
			4	HPR-X	All Trees	172	304	377	298	336	1,487
			6	HPR-I	All Trees	4,155	5,993	7,592	5,472	5,406	28,617
			7	HPR-II	All Trees	2,941	3,668	4,563	3,144	4,374	18,690
			8	MLP-IX	All Trees	2,595	3,398	4,070	2,847	3,839	16,749
			9	MLP-X	All Trees	418	501	398	230	277	1,824
		REBANA			(all)	53,172	67,706	77,304	51,735	66,603	316,520
	DEOGAON				(all)	109,226	130,394	138,699	85,259	124,146	587,724
RWC					(all)	302,376	355,969	394,133	252,068	395,487	1,700,033
(all)	(all)	(all)	(all)	(all)	(all)	662,668	865,677	1,014,432	703,172	915,579	4,161,529

Appendix- XV

PROTECTION OF RESERVED FOREST AREAS BY THE COMMUNITY

GOVERNMENT OF ORISSA

FOREST FISHERIES & A.H. DEPARTMENT.

RESOLUTION No. 10F (Pron)-47/88/17240/FFAH, Dated, Bhubaneswar, the 1st August 1988.

Sub: - Protection of Reserve Forest Areas by the community.

The question of involving village communities for effective protection and conservation of Reserve Forests was, for some time past, under the active consideration of Government. After careful appraisal, Government is of the view that the task of protecting forests is so urgent and so enormous that the rural community should be fully and actively involved in it. Accordingly, it has been decided that the following scheme of involving the rural community will be implemented in this state. Under this scheme, villagers will be assigned a specific role in the protection of reserve forests adjoining their village and will in return, be granted, under section 24 of the Orissa Forest Act, 1972, certain concessions in the matter of meeting their bonafide requirement of fire wood and small timber.

1. The concerned Divisional Forest Officer shall assign the peripheral Reserve Forest areas to the adjoining villages according to the compartment line. The area in one compartment may cover one or more villages. Wherever the compartment line does not exist, natural boundary line like nalla, ridges etc., will form the demarcation point. Reserve Forest area notified under section 18(1) of the Wild life (Protection) Act, 1972, will however be excluded from the purview of the assignment.
2. The concerned Divisional Forest Officer shall constitute a Forest protection Committee for each of the assigned village. The committee shall comprise the Sarpanch of the concerned Gram-Panchayat, the ward Members belonging to the village, the local Forester, Revenue Inspector, V.L.W. and such other persons of the said village not exceeding three as may be nominated by the concerned Gram-Panchayat. The total number of the members of the Committee shall be at least eight, which shall, as far as possible, include persons belonging to the Scheduled Castes or Tribes, women and landless categories. The Sarpanch of the Gram-Panchayat and the local Forester shall be the Chairman and convener of the Committee respectively.

3. The villages shall, through the Forest Protection Committee, furnish an undertaking to the concerned Divisional Forest Officer for proper up-keep and maintenance of the assigned Reserve Forest areas. The assigned villagers shall be responsible for Fire protection and prevention of illicit fellings, thefts of forest produce and encroachments in the assigned Reserve Forest areas. The Forest Protection Committee shall be responsible for ensuring performance of the above function by the villagers of the assigned villages.

4. For performance of the duties enumerated in Para-3, the villagers shall be entitled to obtain their bonafide requirements of small timber and fire wood for household consumption only and not for sale or barter. The Forest Protection Committee shall be responsible for proper distribution of small timber and firewood among the households, keeping in view the following guidelines.

   (a) The minimum requirement of the households for building and agriculture purpose should be worked out by the Committee and the distribution made accordingly on the basis of available produce, before meeting their demand for other purposes.

   (b) As regards supply of firewood, the same shall be apportioned among the households keeping in view their real requirement as far as possible.

5. Small timber and firewood shall be removed from the assigned Reserve Forest areas only in accordance with a permit issued by the two members of the Committee authorised for the purpose. The permit issued as above shall be valid only within the limits of the village boundary to which the household belongs.

6. The above scheme of assignment will come into force with effect from 02.10.1988. In the intervening period, the Divisional Forest Officer will assign specific reserve forest areas in the periphery to the adjoining villages and constitute the forest protection committee.

O R D E R

Ordered that the Resolution be published in the extraordinary issue of the Orissa Gazette.

BY ORDER OF THE GOVERNOR
Sd/- (P.K. MOHANTY)
SECRETARY TO GOVERNMENT.

The Orissa Gazette

EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 2176, CUTTACK, THURSDAY, SEPTEMBER 22, 2011/ BHADRA 31, 1933

[No. 16524-IF-Affn.17/2011/F.& E.] **FOREST & ENVIRONMENT DEPARTMENT**

RESOLUTION

The 9th September, 2011

Sub: Joint Forest Management Resolution, 2011

1. Introduction:

Forests are one of the complex eco-systems of our planet. The role of forests in conservation of environment and economic prosperity of mankind is well established. Economic growth and environment protection are inextricably linked. For surviving on the earth human beings will have to live in harmony with nature. The need for conservation of environment and protection of forests and wildlife has been enshrined in our Constitution. Orissa has 61018 Sq. kms of forest area which is 39.18% of the geographical area of the State. The existing forest cover of 31.38 % of its geographical area plays a very significant role in the socio-economic and cultural life of the people of the State. However, over the past few decades, the forests of Orissa are under heavy biotic pressure. The rich bio-diversity of the State faces the risk of depletion. Man-animal conflict is on the rise. Hence, conservation and development of the forest eco-systems of Orissa is a priority of the State Government.

The National Forest Policy, 1988 envisaged co-operation of the people in conservation and development of forests. In keeping with this policy Government of Orissa adopted the Joint Forest Management (JFM) approach and sought community participation for protection, regeneration and management of the forest wealth. JFM has not only been a tool for forest regeneration, but also a means of employment generation and social empowerment of the forest-fringe dwellers.

The State Government enacted the Orissa Village Forest Rules, 1985 which envisaged preparation of a Management Plan for every village forest and sought co-operation of the community in protection of these forests. In 1988, the

State Government passed a resolution to formally introduce a Scheme of Protection of peripheral Reserve Forest areas with participation of the adjoining villagers by forming a Village Level Forest Protection Committee. The scope of this resolution was enlarged in 1990 to include the Protected Forests. To make the forest-people interface more effective, the Government of Orissa in Forest & Environment Department issued a Resolution dated 3.7.1993. This resolution dealt, in a fairly exhaustive manner, the involvement of all local communities in protection of adjoining forests, formation of Van Samrakshyana Samiti (V.S.S.), duties and responsibilities of the V.S.S. and their Executive Committees and the role of Forest Department and Gram Panchayats, preparation of Joint Forest Management plans, usufruct benefits for the V.S.S. and provisions of MoU etc. Since these Resolutions in the past did not cover the Mangrove Wetlands and the Protected Areas (PA) of the State, i.e. National parks and Sanctuaries, and participatory modes of management are needed there too, the 2008 Resolution was issued to extend the participatory approach to all types of forests. Eco-development was adopted as a strategy in order to improve the livelihood of local people and thereby secure their support for conservation.

Participatory Forest Management in JFM mode is an evolving concept encompassing ecological socio-cultural and economic dimensions. People have played an important role in protection and regeneration of forests all over the state of Orissa. Villagers have either formed V.S.Ss as per JFM Resolution or Community Forest Management Groups outside the existing JFM framework. It is desirable that associations of people, whether formed under Government resolutions, or by peoples' own initiative, with the forest conservation as the principal and core objective, are allowed to function smoothly.

Panchayat Extension to Scheduled Area (PESA) Act, 1996, which is applicable to scheduled areas, lays down as follows: "Every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution; Every Gram Sabha shall approve the plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the Panchayat at the village level and be responsible for the identification or selection of persons as beneficiaries under the poverty alleviation and other programmes." This Act vests the ownership of Minor Forest Produce (MFP) on Gram Panchayats in Scheduled areas. The decision of Government of Orissa to do away with the monopolies in collection and trading in 69 items of MFP is in consonance with the spirit of PESA Act.

The community forest resource has been defined under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (popularly known as Forest Rights Act). As per the said Act, community forest resource means customary common forest land within the traditional and customary boundary of the village and seasonal use of the landscape in case of pastoral communities etc. The Minor forest produce has been defined under the Forest Rights Act which includes all non-timber forest produce of plant origin such as bamboo, brushwood, stumps, cane, tassar, cocoons, honey, wax, lac, tendu or kenduleaf, medicinal plants and herbs, roots, tubers and the like. It may be mentioned here that in case of Kendu Leaf, the current policy of Government is to discharge certain responsibilities with a view to protecting the livelihood of forest-dependent communities while providing management inputs to facilitate a scale of operation required for adequate value realization and sustainable management process.

Under the Forest Rights Act, the Gram Sabha is to initiate the process of determining the individual and community forest right. Therefore the enactment of FRA provides an opportunity not only to strengthen the existing Participatory Forest conservation and management initiatives but to promote such initiatives in the areas which are devoid of such institutional arrangements. With the changing scenario of Forest Management, increasing awareness among people and experiences gained from the past management practices; it is now felt necessary that the resolution on Joint Forest Management, 2008 is revised.

2. Selection of Area:

(i) The forests of the State to be covered under this Resolution shall be grouped into the following two categories:

(a) Reserved Forests, Protected forests, Village forests, Revenue forests etc. not covered under Protected Areas.

(b) Protected Areas (National Park and Sanctuaries) excluding Core Areas, and Mangrove Wetlands.

The Committee constituted for the first category of forests will be known as Vana Surakshya Samiti (VSS) while the Committee constituted for the second category will be known as Eco-development Committee (EDC).

(ii) While deciding the extent of area to be assigned, the Palli Sabha shall consult the Forest Range Officer concerned and take into account the area customarily being protected and used by the community, the number of adjacent villages, their claims, if any, and users' regime. In case a group of villages decide to constitute one VSS jointly, they

may do so. The local Forester will provide the technical input and facilitate the process of identification of the forest area to be managed by the committee.

(iii) In case any change is required in the extent of forest area assigned to the existing VSS formed under the JFM Resolution, 2008, the same can be done in consultation with the village community and the local forest department officials not below the rank of a Forest Range Officer.

3. Constitution of VSS/EDC:

(i) Ordinarily there will be one VSS/EDC for a single village. One VSS may also cover more than one village or there may be more than one committee in a village especially large in size. Other Forest Protection groups, if any would also be covered under this Resolution.

(ii) All adults of the village will be the members of the VSS/EDC. They may pay an enrolment fee determined by the General Body (GB) of VSS/EDC.

(iii) The Palli Sabha shall send its Resolution to the Range Officer concerned regarding constitution of VSS / EDC for his record and communication to the DFO concerned for registration at the Division level.

4. Constitution of the Executive Committee (EC):

(i) The Palli Sabha shall elect the Chairperson, the Vice-Chairperson, the Secretary and the Treasurer and a minimum of other 11 (eleven) members to constitute the Executive Committee. At least 50% of the members of the EC shall be women. The number of SC & ST members in the Executive Body shall be in proportion to their membership in VSS / EDC. There should also be representation from the group of community, who do not have any livelihood support other than depending on the forests.

(ii) Either the Chairperson or Vice-Chairperson shall be a woman.

(iii) The composition of the EC shall be as follows:

1. Chairperson	1	Elected Member
2. Vice-Chairperson	1	Elected Member
3. Secretary	1	Elected Member
4. Treasurer	1	Elected Member
5. Ward Member (s) concerned		*Ex officio* Member (s)
6. Members	11	Elected Members
7. Local Forest Guard	1	*Ex officio* Member

(iv) The Range Officer concerned will act as the Returning Officer for conducting the election of the EC. It shall be the responsibility of the Returning Officer to ensure that the representation in the EC is in accordance with reservation specified in Para-i above.

(v) The EC will have tenure of 3 years at a time.

5. Meeting:

(i) General Body (GB)

(a) The GB meeting of the VSS / EDC shall be held at least once in every six months. It can also be called as and when required.

(b) The Secretary with the approval of the Chairperson will convene the meeting of the GB. Ordinarily a 15 days' notice would be necessary for convening the meeting. A copy of the notice will be sent to the Gram Panchayat.

(c) The Chairperson and in his absence the Vice-Chairperson shall preside over the meetings.

(d) 50% of the members of the VSS / EDC will constitute the quorum for the GB. At least one third of the members present should be women.

(e) Under special circumstances, a special meeting of the VSS/EDC can be convened provided at least one third of the members agree to convene such a meeting and make such a request to the Chairperson in writing. Where the Chairperson does not convene the meeting, the Secretary shall convene the GB meeting with the approval of the Vice-Chairperson. In all such cases, a 3 days' notice would be necessary indicating the purpose of the said meeting. The decision in such meeting shall be taken by a minimum of 2/3rd members of VSS / EDC.

(f) The Secretary shall record the proceedings and get them approved by Chairperson. A copy of the proceedings would be either pasted in a register or preserved in a guard file. A copy of the Resolution will be forwarded to the Forest Range Office and the Gram Panchayat under the signature of the Secretary.

(g) The Executive Committee shall be elected by GB at least one month before expiry of its tenure.

(ii) Executive Committee (EC)

(a) EC would meet as often as possible and necessary, but not less than once in two months.

(b) The meeting will be presided over by the Chairperson and in his absence by the Vice- Chairperson.

(c) The quorum for any meeting of the EC shall be 50% of its membership, out of which at least one-third shall be women.

6. Duties and responsibilities of VSS / EDC:

(i) The members of the VSS / EDC shall individually and collectively protect the forest, wildlife and biodiversity.

(ii) The VSS / EDC shall put in necessary efforts so that adjoining catchments area, water resources and other ecologically sensitive areas are protected.

(iii) The VSS/ EDC shall place adequate emphasis on plantation of indigenous medicinal and NTFP species in the forests as well as outside the forest area adjoining the village.

(iv) The VSS / EDC shall ensure that the decisions taken in the Palli Sabha to regulate access to community forest resources and stop any activity which adversely affects the wildlife, forests and the biodiversity, are complied with.

(v) The General Body of the VSS /EDC shall have the powers to remove and/or substitute any elected member of the EC by a two third majority of the members if the concerned member does not discharge his/her duties satisfactorily.

7. Duties and responsibilities of the Executive Committee (EC):

(i) The EC shall carry out the day-to-day business of the VSS / EDC as per provisions of the Resolution. The EC shall prepare the Micro Plan and Annual Work Plan for the assigned forest area and integrate other developmental activities outside the forest area associated with the forest based livelihood system and get it approved by the VSS / EDC after technical scrutiny by the Forest Range Officer concerned. The EC shall be responsible for managing and implementing the Micro Plan and Annual Plan and other decisions of the General Body of VSS / EDC.

(ii) The EC shall be responsible for protection of the forests assigned to the VSS / EDC and extend their assistance to the Forest Department for apprehending the offenders who commit forest offences. If the members of the VSS / EDC play a significant role in detection of forest offence and seizure of the forest produce within their village limits, they will be entitled for a fixed percentage of the value of the forest produce (except in case of WL Trophies) so seized as per procedure laid down in Para. - 11(iii).

(iii) The EC in consultation with the GB shall evolve methodology on all issues relating to membership, conflict resolution, prevention of encroachment, exercise of customary rights and use of the permissible forest resources such as NTFP including Bamboo.

(iv) The EC shall be responsible to account for and manage the funds and other resources received from the Government, other agencies and funds internally generated, if any. For this purpose a joint account called VSS account/EDC account shall be opened in any commercial, rural or Co-operative Bank recognised by the RBI or in any post office, which shall be operated, jointly by the Secretary and the Treasurer of the VSS / EDC. Utilisation Certificate relating to the expenditure incurred shall be jointly signed by the Chairperson and the Secretary and submitted to the authorities concerned.

(v) The EC shall be responsible for managing funds received by VSS / EDC by maintaining and operating VSS / EDC account as per the procedure detailed in Annexure A.

(vi) The EC shall try to establish marketing linkage for various NTFP items and other micro-enterprise products for securing better returns for the members. The Forest Department will provide necessary support in this regard.

(vii) Annual account of VSS / EDC shall be placed before the GB for its approval.

8. Role of Palli Sabha:

As per the 73rd Amendment of the Constitution, certain powers and responsibilities have been vested on the PRIs. Therefore it is necessary to define the relationship between village level institution like VSS / EDC and the PRI and establish a linkage with the Palli Sabha.

(i) Regarding protection and conservation of forest, wildlife and environment, the EC shall work as a Sub-Committee of Palli Sabha.

(ii) If the work of the EC of any VSS / EDC is found to be detrimental to forest conservation and against the larger and long term interests of the people, the VSS / EDC may recommend for dissolving and reconstituting the EC. The Palli Sabha, on receipt of such recommendation may enquire into the matter and forward its findings to the Divisional Forest Officer for necessary action. The Divisional Forest Officer, after examining the merit will dissolve the EC and advise the GB of VSS / EDC for its reconstitution. Such dissolution will be formally placed by the DFO before the District Level Steering Committee in its next meeting for information.

9. Role of the Forest Department:

(i) To register the VSS / EDCs and maintain close liaison with them.

(ii) To support the VSS / EDCs in identifying and apprehending the forest offender(s).

(iii) To take action as per law in cases where VSS / EDC members have handed over the offender(s) and forest produce involved in the offence.

(iv) To assist in capacity building of VSS / EDC members on different aspects of forest management, planning, silviculture, nursery technology, forest laws, accounting, book keeping, micro-enterprise development, value addition and processing of NTFPs etc.

(v) To provide technical help to the VSS / EDCs in preparation and implementation of the Micro plan/ annual work programme.

(vi) To invite suggestion from the VSS / EDCs while preparing the Working Plan / Management Plan of the concerned Forest Area / Protected Area.

(vii) To sign Memorandum of Understanding with the VSS / EDCs and ensure sharing of benefit as per norms in vogue.

(viii) To establish co-ordination with other departments/agencies for successful implementation of the micro plans and related area development programmes.

(ix) To facilitate the process of discharging the duties and resolving the conflicts by the ECs.

10. Micro Plan:

(i) After constitution of the EC, as soon as possible, a Micro Plan shall be prepared by the members of the Committee through a participatory process involving VSS Members and with the technical input provided by the field officers of the Forest Department.

(ii) The Micro Plan shall be prepared for conservation and sustainable management of the assigned forests while integrating other developmental activities outside the forest area associated with the forest based livelihood system, with participation and involvement of line departments, wherever necessary.

(iii) The Micro Plan will primarily prescribe afforestation with priority for plantation of indigenous medicinal and NTFP species, soil and moisture conservation measures and activities to be undertaken for livelihood support of the forest dependent communities. It may also incorporate formation of SHGs and micro-enterprises that could be undertaken based on locally available resources and may include activities such as:– eco-tourism, farm forestry, Agro forestry, Silvi-pasture development, promotion of fuel-efficient devices, animal husbandry, pisciculture, bee keeping, mushroom cultivation, tassar/lac cultivation etc.

(iv) The Micro Plan shall indicate the choice of species in different plantation schemes and models. It shall contain a detailed silvicultural operations plan, which shall be consistent with the prescriptions of the overall working plan covering the area or the Wildlife Management Plan of the Protected Area.

(v) The Micro Plan so prepared shall be in consonance with the existing laws of the land.

(vi) The Micro Plan shall also detail out the various NTFP items that can be collected. This shall be done with due regard to the carrying capacity, productivity and biodiversity of the local eco-system.

(vii) The draft Micro Plan prepared by the EC, will be scrutinized by the Forest Range Officer from the technical, financial and legal point of view. After that the same shall be placed before the GB for deliberation and approval.

11. Usufruct sharing:

(i) The VSS / EDC shall be entitled to the usufructuary benefits from the assigned forests as under:—

(a) Usufructs like fallen leaves, fodder grasses, thatch grass, broom grass, fencing materials, brushwood, fallen lops, tops and twigs to be used as fuel shall be available to the members free of cost.

(b) All intermediate yields in the shape of small wood, poles, firewood etc as may be obtained as a result of silvicultural operations and bamboo harvested in VSS / EDC assigned area shall be made available to the VSS / EDC members in a manner as may be decided by EC. If sold at a price, the funds so obtained shall be deposited in the VSS / EDC account.

(c) In case of Kendu leaves and specified forest produce other than bamboo, if any, the VSS will have the right to collect the same from the assigned forest but these items will be disposed of as per the prevailing provisions of Government and practices.

(d) While maintaining the forest cover in perpetuity, if any major harvest or final felling occurs in the assigned forest, the same shall be taken up by the forest department as per the prescription of the working plan/ duly approved micro plan. In case of natural calamities, harvesting of wind-fallen trees shall be treated as final harvest. Priority will be given to the members of the VSS /EDC for salvaging and harvesting work. Valuation of the produce so obtained shall be done and information shared with the VSS /EDC and the produce will be sold / disposed of by the forest department or by agents of the forest department. The VSS / EDC will receive 50% share of the sale price after deduction of proportionate harvesting cost and this will be deposited in the "VSS account". The VSS may also opt for 50% of the forest produce so

harvested if it is for their *bonafide* domestic use and they agree to pay the proportionate cost of harvesting.

(e) In case of village woodlots created and maintained by the VSS / EDC on non forest land, all usufructs including interim and rotational harvests shall go to the VSS / EDC.

(f) In the event of a natural calamity occurring in the village there may be a demand for house building materials and other forest produce from the assigned forest. In such cases, the VSS / EDC may go for harvesting the required quantity of timber or other forest produce as a deviation to the Micro Plan, with due approval of the Divisional Forest Officer concerned.

(ii) The EC shall be responsible for the distribution of the usufructuary benefits equitably among the members of the VSS. Need of the group or community, who do not have any livelihood support other than depending on the forests, should be specially considered.

(iii) In cases where member/ a group of members of the VSS /EDC play a major role in the collection of intelligence, detection and seizure of illegal forest produce in transit the concerned VSS/EDC shall be entitled to the prescribed percentage of the sale price of the forest produce as per Rule 4 (3) of the Orissa Rewards for Detection of Forest Offences Rules, 2004. Such amount shall be deposited by the DFO in the “VSS account/EDC account" after disposal of the seized produce following due procedure of law.

12. Transit of harvested forest product:

All forest produce requiring permits for transit as per provisions of Orissa Timber and Other Produce Transit Rules, 1980 shall be removed from the assigned forest area in accordance with a permit to be issued jointly by the President and the Secretary in the prescribed format (Form-4). The permit shall be valid only within the limits of the area to which the VSS members belong. A record will be maintained to this effect by the VSS / EDC and the Secretary will keep the local Forest Range Officer informed of the same on a quarterly basis. In case of transportation outside the above limit, the permit will be issued by the competent forest officer on receipt of application from VSS / EDC.

13. Conflict Resolution:

(i) In case of intra village conflict in matters of implementation of Joint Forest Management, the Executive Committee of the VSS/ EDC shall endeavour to amicably resolve the conflict. If it fails to resolve the conflict, it shall bring the same to the notice of the Palli Sabha and try to sort out the issue. If the conflict still remains, the same would be

referred to the Sub Divisional Level Steering Committee formed in the line of the SDLC under FRA, 2006 and their decisions would be final.

(ii) In case of inter village conflict; the same would be referred to the Sub Divisional Level Steering Committee and their decisions would be final.

14. Memorandum of Understanding (MoU):

(i) To ensure smooth working relationship between the Forest Department and the VSS /EDC and also to bring in a sense of ownership, empowerment and accountability a MoU shall be signed between the FD and VSS / EDC delineating the duties and responsibilities of the parties concerned.

(ii) The Chairperson of the VSS will sign the MoU on behalf of the VSS while the Range Officer concerned will sign the same on behalf of Forest Department. Other members at the EC will also be signatory to the MoU as witness while the concerned local forest officials such as:— the Forester and Forest Guard will sign the MoU as witness.

(iii) The MoU shall be in the prescribed form (Form-5).

15. Steering Committee:

(i) There shall be Steering Committees at the Sub Division Level, District Level and at the State Level.

(ii) Sub Division Level Steering Committee (SDLC): This committee shall comprise of the following members:—

(a) Sub Collector	:	Chairperson
(b) Assistant Conservator of Forests	:	Member Convener
(c) An Officer of the Tribal Welfare Department *in-charge* of the Sub-Division	:	Member
(d) Sub Divisional Police Officer (SDPO)	:	Member
(e) Forest Ranger concerned	:	Member
(f) Tahashildar concerned	:	Member
(g) Chairperson of the Panchayat Samiti concerned	:	Member
(h) Zilla Parishad member	:	Member
(i) Two Chairpersons/Vice-Chairpersons of VSS/EDC (to be nominated by the DFO)	:	Member

(iii) The SDLC will be responsible to resolve all cases of intra village and inter village conflicts as referred to them in regards to smooth functioning of VSS / EDC.

(iv) The SDLC will meet at least once in every quarter and shall facilitate functioning of the VSS / EDC and provide necessary support and guidance to them.

(v) The SDLC will facilitate the VSS / EDC for protection and sustainable management of forests, forest based livelihood and holistic development of the villages.

(vi) The SDLC may invite the representatives of the committees concerned and other such peoples' representatives, reputed persons / organizations working in the field of forest management to their meetings as per requirement.

(vii) District Level Steering Committee (DLSC): This committee shall comprise of the following members:—

(a) District Collector	:	Chairperson
(b) Divisional Forest Officers (Territorial and Wildlife)	:	Member
(c) ADM dealing with land matters	:	Member
(d) Deputy Director (Agriculture)	:	Member
(e) Chief District Veterinary Officer	:	Member
(f) PD, DRDA	:	Member
(g) PA, ITDA	:	Member
(h) District Welfare Officer	:	Member
(i) Deputy Director Horticulture	:	Member
(j) Soil Conservation Officer	:	Member
(k) 5 VSS (Chairperson/ Vice-Chairperson (at least 2 women) (to be nominated by the DFO)	:	Member

(viii) The DFO concerned having the jurisdiction over the district headquarters will be the Member Convener of the meetings of DLSC.

(ix) The tenure of the non-official members will be three years.

(x) The DLSC may co-opt NGOs or other experts as members with credibility and experience of working on forest related issues.

(xi) The DLSC will meet at least once in six months and shall facilitate functioning of the VSS / EDC and provide necessary support and guidance to them.

(xii) The DLSC will oversee protection and sustainable management of forests, forest based livelihood and holistic development of the villages.

(xiii) State Level Steering Committee (SLSC): The constitution of the State Level Steering Committee shall be as under:—

1. Minister (Forest)	: Chairperson
2. Chief Secretary	: Vice-Chairperson
3. Principal Secretary, F & E Department	: Member
4. Principal CCF (O)	: Member
5. PCCF (WL)	: Member
6. 2 D.F.Os./One RCCF from field to be nominated by PCCF (O) on rotation basis	: Member
7. Secretary, Revenue Department	: Member
8. Secretary, Rural Development Department	: Member
9. Secretary, Home Department	: Member
10. Secretary, PR Department	: Member
11. Secretary, SC & ST Department	: Member
12. Chief Conservator of Forests (Central)	: Member
13. Director, Orissa Watershed Development Mission	: Member
14. Two representatives of Civil Society Organisations / Experts to be nominated by F&E Department	: Member
15. Special Secretary, F& E Department	: Member
16. Chairpersons of two VSS / EDC to be nominated by the PCCF (O)	: Member
17. CCF (Plan, Programme & Afforestation), Office of PCCF, Orissa	: Member-Convener

(xiv) The non-official members of the State Level Steering Committee will have tenure of three years.

(xv) The Committee shall meet at least once in a year to guide the process of participatory forest management.

(xvi) Changes in the Resolution, if any shall be placed before the SLSC for approval and recommendation to Government.

16. Repeal and Savings:

This supersedes Forest & Environment Department Resolution No.17454-1F-Affn.17/2008/F&E., dated the 22nd October, 2008. However, all VSSs already formed under provisions of Forest & Environment Department Resolutions made earlier will be treated as VSS formed under this Resolution.

ORDER

Ordered that the Resolution be published in the Extraordinary issue of the *Orissa Gazette.*

By order of the Governor

AUROBINDO BEHERA Principal
Secretary to Government

VSS / EDC Account and Procedure of Accounting

(i) The Executive Committee (EC) of the VSS / EDC shall be responsible to account for and manage the funds and other resources received from the Government, other agencies and funds internally generated, if any. For this purpose a joint account called VSS account/EDC account shall be opened in any commercial, rural or Co-operative Bank recognised by the RBI or in any post office, which shall be operated, jointly by the Secretary and the Treasurer of the VSS / EDC. The account will be opened in the style of "(village name/any other prefix) VSS / EDC Account". All money received by the VSS / EDC either in cash or instrument shall be deposited into the account before it is used for any purpose.

(ii) Any withdrawal from the VSS / EDC account can be done only after a specific resolution of the EC in this regard.

(iii) The funds deposited into the VSS / EDC account shall be utilised towards the conservation, development and management of forest, development of the village or for any other purpose ancillary to the implementation of the Micro Plan.

(iv) In case the EC decides to spend the money from the "VSS Account/EDC account" for any other purpose it shall seek the approval of the General Body of the VSS / EDC.

(v) In case of detection of any financial irregularity the General Body may pass a resolution and freeze the VSS / EDC account for a specific period and refer the matter to the Palli Sabha. The Palli Sabha may conduct necessary enquiry and may take required action.

(vi) The Secretary shall be fully responsible for up keeping the Monthly account and maintenance of the Cash Book of the VSS / EDC. The local Forest Officials will provide guidance to the EC, whenever necessary to maintain the account in proper form.

(vii) A quarterly work programme may be drawn up by the EC and implemented subject to availability of funds for the purpose. Funds will be withdrawn accordingly from the VSS / EDC Account.

(viii) All vouchers will be passed by the EC and jointly signed by the Secretary and the Treasurer and shall be retained at the VSS / EDC level. The Secretary will prepare the monthly cash account along with an abstract of receipt and expenditure by the 10th of the following month to be approved by the EC.

(ix) Annual receipt and expenditure of the VSS / EDC shall be audited by an auditor to be appointed by the General Body of the VSS / EDC. The annual statement of receipt and expenditure of the VSS / EDC account shall be placed before the GB for its approval. Whenever funds provided by Govt. are utilized, the audited and approved abstract of annual receipt and expenditure shall be communicated by the EC to the concerned RO and DFO for record.

(x) Utilisation Certificate relating to the expenditure incurred out of funds received from Government or any other external agency shall be prepared by the Treasurer and jointly signed by the Chairperson and the Secretary and submitted to the authorities concerned.

Form –1

RESOLUTION

We the following villagers of _____ villages (s), hereby resolve to have formed / reconstituted a Vana Surakshya Samiti (VSS) / Eco Development Committee (EDC) for the protection and management of the part/whole of _____ forest in accordance with the provisions of Para 3 i of the Orissa Joint Forest Management Resolution, 2011. The details of the area are as follows:—

1. Name of Committee:
2. Village:
3. Gram Panchayat:
4. C.D. Block:
5. Police Station:
6. Forest Beat:
7. Forest Section:
8. Forest Range:
9. Total Members (list of members enclosed):
    (i) No. of S.T. member _____
    (ii) No. of S.C. member _____
    (iii) No. of Women members _____
10. Forest areas protected and managed _____ha.
11. Name of the Forest Block _____
12. Comp. No. _____

NAME OF VILLAGERS **SINGATURE**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

OFFICE OF THE FOREST RANGE OFFICER _____ RANGE

Memo No. _____ Date _____

FORMATION OF VSS / EDC

The villagers of _____ village (s) have formed / reconstituted the Vana Surakshya Samiti / Eco Development Committee (EDC) as per the provision of Para 3 i of the Orissa Joint Forest Management Resolution, 2011 for the protection and management of the part/whole of _____ forest. The details of the area are as follows:—

1. Name of Committee:
2. Village:
3. Gram Panchayat:
4. C.D. Block:
5. Police Station:
6. Forest Beat:
7. Forest Section:
8. Forest Range:
9. Total Members (list of members enclosed):
    (i) No. of S.T. member _____
    (ii) No. of S.C. member _____
    (iii) No. of Women members _____
10. Forest areas proposed to be protected and managed _____ha.
11. Name of the Forest Block _____
12. Comp. No. _____

The Resolution of the Palli Sabha of the village of _____village(s) is forwarded herewith for registration of the VSS / EDC in accordance with the provision of Para 9 i of the Orissa Joint Forest Management Resolution, 2011.

Signature of Forest Range Officer

OFFICE OF THE DIVISIONAL FOREST OFFICER _____DIVISION

OFFICE ORDER NO. _____ Date _____

In accordance with the provision of Para 9 i of the Orissa Joint Forest Management Resolution, 2011, the _____ Vana Surakshya Samiti / Eco Development Committee is here by registered in this office vide Registration No. _____

Forest Area Schedule:

Extent of Forest Area: ha

Description of Location:

DIVISIONAL FOREST OFFICER _____
FOREST DIVISION

OFFICE OF THE DIVISIONAL FOREST OFFICER _____ DIVISION

Memo No. _____ Date _____

Copy forwarded to Forest Range Officer _____Range for information and necessary action. He is instructed to demarcate the forest area as per above schedule and depict the area in the topo sheet (1:50000 scale). A copy of the map should be available with the VSS / EDC, and in the Range Office. Another copy of the map should be submitted to this office for record.

Copy forward to Sarpanch, _____ Gram Panchayat for information and necessary action.

DIVISIONAL FOREST OFFICER _____
FOREST DIVISION

Form – 4

PERMIT UNDER THE ORISSA JOINT FOREST MANAGEMENT RESOLUTION – 2011

Name of the assigned Forests _____

Description of Forest produce Quantity

Source of Procurement of the forest produce _____

Name of the VSS / EDC Member _____

Date of issue: Destination:

Valid up to:

Signature of the President
_____ VSS / EDC

Signature of the Secretary
_____ VSS / EDC

Form –5

MEMORANDUM OF UNDERSTANDING

1. We the members of the Executive Committee of the Vana Surakshya Samiti /Eco Development Committee of _____ village and the Officials of _____ Forest Range under _____ Forest Division have come together to collaborate and perform the duties and shoulder the responsibilities as detailed in the Orissa Joint Forest Management Resolution, 2011, for protection, and sustainable management of the forest areas as per the schedule given hereunder.

   i. Name of the VSS / EDC

   ii. Registration N.

   iii. District _____

   iv. Forest Division _____

   v. Forest Range:

   vi. Section :

   vii. Beat:

   viii. Police Station :

   ix. Village:

   x. Name of the assigned Forest Block:

   xi. Legal status of the Forest area: xii. Area (Ha) of the assigned forest: xiii. Boundaries of the area:

   North
   East
   South
   West

2. It is hereby agreed by and between us to abide by the provisions of JFM Resolution, 2011.

3. We undertake to function in consonance with the existing laws of the land.

4. A copy of the aforesaid Resolution is annexed herewith duly signed by us on every page in proof/evidence of our having read/understood the same in letter and spirit. It is hereby agreed that this MoU will come into effect from _____.

Signature of the Chairperson Signature of R.O.

_____VSS / EDC

Witnesses:

1.

2.

3.

Range:

Division:

Witnesses:

1.

2.

3.

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[No. 9182—F. & E.]

GOVERNMENT OF ODISHA

FOREST & ENVIRONMENT DEPARTMENT

RESOLUTION

The 1st June 2015

SUBJECT— Amendment to Joint Forest Management Resolution, 2011.

The Provisions laid down in the Clauses (i) and (iii) of the Para. 4 and Clause (vi) of the Annexure - A of the Joint Forest Management Resolution, 2011 issued vide this Department Resolution No. 16524-F. & E., dated the 9th September 2011 are substituted as under.

4. (i) The Palli Sabha shall elect the Chairperson, The Vice-Chairperson, The Treasurer and a minimum of other 11(eleven) members with Local Forest Guard/Local Forester (*Exofficio* Member) as Secretary and other *Ex-officio* Member such as concerned Ward Member(s) to constitute the Executive Committee. At least 50% of the members of the EC shall be women. The number of S.C. & S.T. members in the Executive Body shall be in proportion to their membership in VSS/EDC. There should also be representation from the group of community, who do not have any livelihood support other than depending on the forests.

4.(iii) The composition of the EC shall be as follows :

1. Chairperson	. .	Elected Member
2. Vice-Chairperson	. .	Elected Member
3. Secretary (Local Forest Guard/Local Forester)	. .	*Exofficio* Member
4. Treasurer	. .	Elected Member
5. Ward Member(s) concerned	. .	*Exofficio* Member(s)
6. Members	. .	Elected Members

Annexure - A

VSS/EDC Account and Procedure of Accounting :

(vi) The Secretary shall be fully responsible for upkeeping the monthly account and maintenance of the Case Book of the VSS/EDC.

By order of the Governor

U. N. BEHERA

Additional Chief Secretary

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Appendix-XVII

Year	Range	Section	Beat	State Code	Name of the VSS	Assigned area	Treatment Area
1	Anandapur	Anandapur	Dhakotha	AJY-Y15-P03-KJW01-1516	Arjunbania	64.05	50.51
2	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1527	Badudighara	64.69	53.82
3	Brahmanipal	Brahmanipal	Baliparbat	AJY-Y15-P03-KJW02-1543	Baliparbat	51.00	51.00
4	Brahmanipal	Palaspal	Palaspal(East)	AJY-Y15-P03-KJW02-1568	Bangurisuni	59.08	49.96
5	Anandapur	Ramachandrapur	Baranga	AJY-Y15-P03-KJW01-1536	Baranga	76.77	76.77
6	Brahmanipal	Daitari	Rebana	AJY-Y15-P03-KJW02-1546	Bareigoda	52.05	52.05
7	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1552	Bareigoda	51.42	51.42
8	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1590	Basumati Thakurani	50.33	50.23
9	Deogaon	Harichandanpur	Garagadabahal	AJY-Y15-P03-KJW03-2642	Basundhara	38.64	38.64
10	Deogaon	Bhagamunda	Bhagamunda	AJY-Y15-P03-KJW03-1571	Bhagamunda	123.98	80.40
11	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1528	Bhalughar	60.28	60.28
12	Anandapur	Gayalmunda	Panasdiha	AJY-Y15-P03-KJW01-1533	Bhikaramda	106.45	106.45
13	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1553	Bileisahi	51.62	51.62
14	Deogaon	Deogaon	Barabahali	AJY-Y15-P03-KJW03-2640	Billa	49.99	49.99
15	Anandapur	Budhikud	Budhikud	AJY-Y15-P03-KJW01-1524	Budhikud	50.21	50.21
16	Brahmanipal	Palaspal	Palaspal	AJY-Y15-P03-KJW02-1562	Budhipada	52.91	52.91
17	Brahmanipal	Palaspal	Palaspal	AJY-Y15-P03-KJW02-1563	Budhipada(Santalasahi)	51.05	51.05
18	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1591	Charchika	53.66	53.66
19	Anandapur	Gayalamunda	Gayalamunda	AJY-Y15-P03-KJW01-2636	Dahimalia	80.03	51.52
20	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1529	Dhabani	16.52	16.71
21	Anandapur	Anandapur	Anandapur	AJY-Y15-P03-KJW01-1511	Dihasahi	50.98	50.98
22	Anandapur	Gayalmunda	Panasdiha	AJY-Y15-P03-KJW01-1534	Dumuridiha	51.60	51.60
23	Deogaon	Harichandanpur	Garagadabahal	AJY-Y15-P03-KJW03-1586	Garagadabahal	51.59	51.59
24	Deogaon	Harichandanpur	Garagadabahal	AJY-Y15-P03-KJW03-1587	Garagadabahal	51.65	51.65

Year	Range	Section	Beat	State Code	Name of the VSS	Assigned area	Treatment Area
25	Brahmanipal	Daitari	Rebana (North)	AJY-Y15-P03-KJW02-1548	Ghutung	52.82	52.82
26	Anandapur	Anandapur	Ostapura	AJY-Y15-P03-KJW01-1521	Gohira	41.78	41.78
27	Brahmanipal	Palaspal	Palaspal (East)	AJY-Y15-P03-KJW02-1566	Gopinathpur	37.09	37.09
28	Brahmanipal	Daitari	Talapada	AJY-Y15-P03-KJW02-1560	Gumundu	50.07	31.71
29	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-2643	HanumanJew	62.37	41.12
30	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1530	Haribeda	51.19	51.19
31	Anandapur	Anandapur	Dhakotha	AJY-Y15-P03-KJW01-1517	Haridabahali	52.73	52.73
32	Deogaon	Bhagamunda	Bhagamunda	AJY-Y15-P03-KJW03-1572	Hatikutcha	51.72	51.72
33	Deogaon	Harichandanpur	Barabahali	AJY-Y15-P03-KJW03-1585	Jhinkipita	42.98	42.98
34	Anandapur	Anandapur	Anandapur	AJY-Y15-P03-KJW01-1512	Jugalkishorepur	139.81	78.59
35	Anandapur	Ramachandrapur	Patilo	AJY-Y15-P03-KJW01-1538	Kainsiari	51.36	51.36
36	Anandapur	Anandapur	Anandapur	AJY-Y15-P03-KJW01-1513	Kalabila	36.37	36.37
37	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1592	Kaliahudi	54.96	54.97
38	Brahmanipal	Daitari	Rebana (North)	AJY-Y15-P03-KJW02-1549	Kanjiapal	50.38	50.38
39	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1531	Kantala	49.90	35.46
40	Deogaon	Deogaon	Barabahali	AJY-Y15-P03-KJW03-1579	Kendudiha	53.84	53.84
41	Anandapur	Ramachandrapur	Patilo	AJY-Y15-P03-KJW01-1539	Khadikasulbahali	82.04	51.03
42	Anandapur	Budhikud	Taneipal	AJY-Y15-P03-KJW01-2634	Khajuribani	48.11	37.47
43	Brahmanipal	Palaspal	Palaspal	AJY-Y15-P03-KJW02-1564	Kuntala-I	56.38	56.38
44	Brahmanipal	Palaspal	Palaspal(West)	AJY-Y15-P03-KJW02-1570	Kuntala-II	114.38	106.14
45	Anandapur	Gayalmunda	Gayalmunda	AJY-Y15-P03-KJW01-1532	Kusapada	70.56	50.55
46	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1554	Kusumjodi	50.82	50.82
47	Brahmanipal	Palaspal	Palaspal(East)	AJY-Y15-P03-KJW02-1569	Laxmi Narayan	51.52	51.52
48	Anandapur	Ramachandrapur	Patilo	AJY-Y15-P03-KJW01-1540	Maa Mangala	50.44	50.44
49	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1593	Madhusahi	50.62	50.62

Year	Range	Section	Beat	State Code	Name of the VSS	Assigned area	Treatment Area
50	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1594	Mahabira	32.11	32.11
51	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1555	Mahulpanga	50.15	50.15
52	Anandapur	Budhikud	Budhikud	AJY-Y15-P03-KJW01-1525	Mandapada	54.74	54.74
53	Deogaon	Bhagamunda	Bhagamunda	AJY-Y15-P03-KJW03-1574	Maniabandha	51.87	51.87
54	Deogaon	Deogaon	Basantapura	AJY-Y15-P03-KJW03-1582	Manigiri	29.60	29.60
55	Anandapur	Anandapur	Dhakotha	AJY-Y15-P03-KJW01-1518	Marshapal	134.91	82.36
56	Deogaon	Bhagamunda	Bhagamunda	AJY-Y15-P03-KJW03-2639	Mausumjhari	53.46	53.46
57	Deogaon	Bhagamunda	Sagadapata	AJY-Y15-P03-KJW03-1575	Mudinucha	73.42	53.88
58	Brahmanipal	Daitari	Rebana	AJY-Y15-P03-KJW02-1547	Mundasahi	53.25	53.25
59	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1595	Mundulisahi	48.98	48.98
60	Anandapur	Ramachandrapur	Ganpur	AJY-Y15-P03-KJW01-1537	Nandabara	65.76	52.46
61	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1556	Nardangipentha	50.52	50.52
62	Brahmanipal	Palaspal	Palaspal (East)	AJY-Y15-P03-KJW02-1567	Nipania	50.97	50.97
63	Anandapur	Ramachandrapur	Patilo	AJY-Y15-P03-KJW01-1541	Nuniapatna	67.62	67.29
64	Deogaon	Bhagamunda	Sagadapata	AJY-Y15-P03-KJW03-1576	Palabani	134.47	59.91
65	Anandapur	Gayalmunda	Panasdiha	AJY-Y15-P03-KJW01-1535	Panasdiha	64.38	49.82
66	Brahmanipal	Brahmanipal	Baliparbat	AJY-Y15-P03-KJW02-1544	Pancham	57.19	50.94
67	Deogaon	Deogaon	Deogaon	AJY-Y15-P03-KJW03-1584	Panchugochhia	41.82	41.84
68	Brahmanipal	Daitari	Rebana (North)	AJY-Y15-P03-KJW02-1550	Pateswari	49.85	49.85
69	Anandapur	Ramachandrapur	Patilo	AJY-Y15-P03-KJW01-1542	Patharapada	23.13	23.13
70	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1557	Pathargoda	51.58	51.58
71	Anandapur	Gayalamunda	Gayalamunda	AJY-Y15-P03-KJW01-2637	Putujhari	65.75	65.75
72	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1558	Putujhari	50.94	50.94
73	Deogaon	Harichandanpur	Garagadabahal	AJY-Y15-P03-KJW03-1589	Rangapata	50.79	50.79
74	Anandapur	Budhikud	Taneipal	AJY-Y15-P03-KJW01-2635	Ratuan	82.03	82.03

Year	Range	Section	Beat	State Code	Name of the VSS	Assigned area	Treatment Area
75	Deogaon	Bhagamunda	Sagadapata	AJY-Y15-P03-KJW03-1577	Sagadapata	78.88	54.78
76	Anandapur	Anandapur	Anandapur	AJY-Y15-P03-KJW01-1514	Sailong	149.49	130.60
77	Anandapur	Anandapur	Dhakotha	AJY-Y15-P03-KJW01-1519	Salkudahi	63.55	63.55
78	Deogaon	Deogaon	Basantapura	AJY-Y15-P03-KJW03-1583	Samukanendi	39.72	39.72
79	Brahmanipal	Daitari	Rebana (North)	AJY-Y15-P03-KJW02-1551	Sanajimei	50.27	50.27
80	Brahmanipal	Daitari	Rebana (S)	AJY-Y15-P03-KJW02-2638	Sanasiadimal	50.02	50.02
81	Anandapur	Anandapur	Dhakotha	AJY-Y15-P03-KJW01-1520	Sandhyagotha	50.53	50.53
82	Hadagarh	Hadagarh	Sangam	AJY-Y15-P03-KJW04-1605	Sangam	21.46	11 Ha
83	Deogaon	Harichandanpur	Harichandanpur	AJY-Y15-P03-KJW03-1596	Sinduragouri	56.18	56.18
84	Anandapur	Anandapur	Anandapur	AJY-Y15-P03-KJW01-1515	Sunduria	61.02	61.02
85	Deogaon	Deogaon	Barabahali	AJY-Y15-P03-KJW03-1580	Talanatiasahi	48.97	48.97
86	Brahmanipal	Daitari	Talapada	AJY-Y15-P03-KJW02-1561	Talapada	50.09	50.09
87	Deogaon	Deogaon	Baripal	AJY-Y15-P03-KJW03-2641	Tasaragada	52.39	52.39
88	Brahmanipal	Brahmanipal	Brahmanipal	AJY-Y15-P03-KJW02-1545	Tentulipal	53.85	53.85
89	Brahmanipal	Daitari	Rebana (South)	AJY-Y15-P03-KJW02-1559	Turkipada	50.16	50.16

APPENDIX XVIII

GOVERNMENT OF ORISSA.
FOREST & ENVIRONMENT DEPARTMENT.
R E S O L U T I O N
NO. 5503 / F&E.DATED BHUBANESWAR THE 31ST MARCH 2000.

Sub: Policy on procurement and trade of non-timber forest produce.

1. Non-timber forest produce (NTFP) has traditionally been perceived as an important source of forest revenue. Accordingly the policies relating to N.T.F.P. over the years have generally tended to aim at maximization of revenue. However, NTFP is an important source of livelihood of tribals and the rural poor. Those gatherers of NTFP, majority of whom are women, have limited access to the market, and their primary concern is getting a fair price for the NTFP gathered by them and being able to dispose off the produce gathered. The prevailing system does not adequately provide these facilities to the primary gatherers. At the same time, it is also equally important that collection of NTFP must be on non-destructive basis so that sustainability of forests and long term sustainability of forests and long term sustainability of the NTFP based livelihood can be reasonably ensured.

2. The state Government have had under their consideration proposals for formulation of an appropriate policy on Non-Timber Forest Produce, keeping in view the consideration outlined in the preceding paragraph. While formulating the policy the provisions of the Panchayats (Extension to Scheduled areas) Act, 1996 have also to be kept in view. The term 'minor forest produce' has not been defined. Under the policy of Joint Forest Management, the local communities are being closely involved as partners of Forest Department in the management of degraded forests; and the members of the Vana Samarakshan Samiti are entitled to share of the usufructs, including the entire NTFP gathered from such a forest area. Considering all aspects of the matter, Government have been pleased to approve of the following policy guidelines for streamlining the system of collection and disposal of various Non-Timber Forest Produces items: -

Minor Forest Produce:

3 (a) The items of Non-Timber Forest Produce listed in Annexure will be treated as Minor Forest Produce (MFP) and the term MFP will only mean and include items listed in Annexure 'A'. The list of items of NTFP to be treated as MFP may however be modified by the Government from time to time, Gram Panchayat/Gram Sabha in the scheduled areas will have the ownership over MFP produce within its territorial jurisdiction, i.e. in respect of the MFP produced in and collected from the Government lands and forest lands within

the limits of the revenue villages comprising the Gram Panchayat. Under law, ownership of MFP in non-scheduled areas is not vested in Gram Panchayats. Gram Panchayats both in the scheduled and non-scheduled areas, will however, have the authority to regulate purchase, procurements (as distinct from collection by primary gatherers) and trading in MFP in accordance with the policy outlined in the succeeding paragraphs.

(b) No Gram Panchayat, whether situated within or outside the scheduled area will have ownership over MFP produced in Reserve Forests, in forest areas under Wildlife Sanctuaries and National Parks which are outside the limits of revenue villages. The Gram Panchayats will not therefore have the right to grant lease or license to any individual or agency for collection of Minor Forest Produce from any Reserve Forest or Sanctuary or National Park. However members of Vana Samarakshan Samities, tribals, and artisans etc. as part of their customary rights will be free to collect MFP from Forest areas excluding sanctuaries and National Parks. When any such MFP collected from forest areas is brought to a village, i.e. into the territory within a Gram Panchayat, it will come under the Gram Panchayat's powers to regulate procurement and trading. Where VSS has been formed, the Samiti and its members will have priority over the Gram Panchayat in the matter of collection and disposal of MFP of respective forest areas.

(c) Any person desirous of purchasing MFP from Primary gatherers or trading in MFP so purchased shall apply for registration to the concerned Gram Panchayats and the Gram Panchayat may register such dealers or traders for a season from the first day of October to the last day of September of the following year. Dealers and Traders will have to seek fresh registration for the next season. Gram Panchayats shall make all efforts to promote free competition in procurement of MFP by engaging as many dealers for each item of MFP as reasonably practicable. The Gram Panchayats shall also levy an annual registration fee from such dealers or traders at such rate as may be determined by the Gram Panchayat and shall issue a certificate of registration to the registered dealers and traders. The dealers registered by the Gram Panchayats will have to furnish a monthly return to the concerned Range Officer indicating the items of MFP procured, quantity procured and the Gram Panchayat from which procurement was made during the month. No person will be allowed to operate as Dealer /Trader in MFP in any area without being registered as such by the concerned GP.

(d) The collection of MFP by the primary gatherers will be subject to reasonable control to be exercised by the DFO in accordance with the provisions of law and sound silvicultural principles laid down in the Forest Working Plan which shall be given publicity in advance in the adjoining Gram Panchayats.

(e) The Government agencies like Orissa Forest Dev. Corporation; Tribal Development Co-operative Corporation etc. may also register themselves with one or more Grampanchyats for procurement and trading in one more items of MFP.

(f) A Gram Panchayat may cancel the registration of any dealer/trader or may refuse to grant registration for subsequent seasons if after summary enquiry, in course of which the affected party shall be given an opportunity to show cause, it is satisfied that the dealer/trader has procured any MFP from the primary gatherers at a rate lower than the minimum procurement price fixed for that item of MFP under para 5 of this resolution for the relevant year.

(g) No lease shall be granted by Government in respect of any MFP nor shall it levy any royalty on these items after commencement of this resolution. No forest Department Transit permit will be required thereafter for transport / movement of any MFP within the state.

Other items of N.T.F.P:

4.(a) The trade in Kendu leaf will continue to be directly controlled by the state Government as there are well laid down statutory provisions for control of trade in this item. Sal seed, which is the one NTFP items notified as Specified Forest Produce, under the Orissa Forest Produce (Control of Trade) Act. 1981 will also be dealt with in accordance with the provisions of law by Government keeping the overall interest of the trade, the industries and the gatherers in view.

(b) Certain items namely Sal Leaves, Gums and resins of different trees, Khaira and Catechu, the barks of different trees and climbers and roots of various species which have medicinal or other uses will not be leased out, as the collection of these items on commercial scale has adverse impact on the sustainability of the particular species and the forest. In particular localities, however, based on sound assessment of silvicultural availability and enforcement of appropriate collection procedure, any of these lease-barred items may be allowed to be collected either directly by field organisation or Forest Department or a Government undertaking.

(c) The remaining items of NTFP as per the list at Annexure B, which may be modified by the Government from time to time, will be allowed to be procured and traded by the dealers who have been registered for the purpose under this resolution by the concerned Divisional Forest Officers. Individuals, Societies, Co-operatives, Govt. Undertakings and corporations may be registered as a dealer for the above purpose. Such registration shall ordinarily be granted by the Divisional Forest Officers for a season (from the 1st day of October to the last day of September of the following calendar year) to applicants seeking such registration,unless there are valid reasons for refusing registration. The D.F.O.s will endeavour to promote competition

among the traders and dealers by registering as many dealers as reasonably practicable for a specified area. For each item, as many dealers as may come forward can be engaged for each Forest Division/Range. OFDC, TDCC, Co-operative Societies like LAMPS etc. will also be eligible to register themselves with the D.F.Os and should be encouraged to engage themselves in trading in these items. The VSS, Mahila Samiti, recognized groups of primary gatherers may also get themselves registered for this purpose. The fees to be paid for registration shall be prescribed by Government.

(d) The registered dealers will be required to furnish the names of their authorised agents/ nominees and the names of their collection and storage centres to the concern D.F.Os, and will also record the daily transactions in the prescribed formats. The dealers will have to enter into an agreement with the concern D.F.O.s under which the dealers will be responsible for achieving a minimum target of procurement to be fixed by the Divisional officer, of a particular item during a collection season. If the collection method of any particular item in any particular area is considered to be harmful or injurious to the forest, the D.F.O. may impose temporary ban on such collection.

(e) The registered dealers will have to pay royalty to the local Forest Range Officers at the rate fixed for the quantity of produce collected. The rate of royalty shall ordinarily not be less that 10 % of the minimum procurement price for the particular item, but this rate may be varied by Government from time to time, *suomotto* or on proposals submitted by the D.F.Os.

(f) The registered dealers will be required to take transit permits from competent Forest Officers for movement/transport of the produce out of the collection centres after setting the royalty dues etc.

(g) The Divisional Forest Officer may cancel the registration or refuse registration of any dealer/trader if after summary enquiry in course of which the affected party shall be given an opportunity to show cause, it is found that the dealer has procured any forest produce from the primary gatherers at a price less than the minimum procurement price fixed for the relevant year under para 5 of this Resolution or has failed to achieve the minimum target of procurement, or has failed to file the prescribed returns or has failed to settled the royalty dues in time.

5) For all NTFP items including MFP, the Committee appointed by the Government in SC and ST Development Department will fix the minimum procurement price each collection season or part thereof. These procurement prices shall be announced every year ordinarily during the month of September and will be given wide publicity as decided by Govt.

By order of the Governor
H.S. Chahar
Commissioner-cum-Secretary to Government

Annexure A

Sl. No.	Common Trade Name of the item of forest produce	Sl No.	Common Trade Name of the item of forest produce	Sl No.	Common Trade Name of the item of forest produce
1	Tamarind, Deseeded Tamarind, Tamarind seed	22.	Putrani	43	Rohini Fruit
2.	Mahua Flower	23.	Sikakai	44	Bhursunga Leaves
3	Hill Brooms	24	Jungle Jada (Gaba)	45	Rasna Root
4.	Thorn Broom (Jhadu, Ghoda Lanji)	25	Palasa Seed	46	Phenaphena Fruit
5.	Phula Jhadu	26	Siali Seed	47	Sidha Fruit
6.	Broom Grass	27	Indra Jaba (Korai seeds)	48	Sathabari
7.	Nux Vomica (Kochila Seeds)	28	Gila (Seed and coat)	49	Katha Lai
8.	Harida (Myrobalans)	29	Benachera	50	Atundi Lai
9.	Bahada (Myrobalans)	30	Bana Haldi	51	Khelua Lai
10	Aonla (Myrobalans)	31	Bana Kolatha	52	Suam Lai
11.	Soap Nut (Ritha Phala)	32	Gaba	53	Eksira Fruit
12.	Marking Nut (Bhalia)	33	Basil	54	Katha Chhatu (Mushroom)
13.	Cleaning Nut (Nirmala)	34	Makhana seed (Kanta Padma)	55	Mat Reed (Sapa Masina Grass)
14.	Honey	35	Tala Makhana Seed	56	Ananta Mula
15.	Siali Leaves	36	Baidanka Seed	57	Antia Pata
16	Sabai Grass	37	Baghanakhi seeds	58	Nageswar Flower
17.	Mango Kernel	38	Kamala Gundi Fruit	59	Mankad Kendu
18.	Thatch Grass	39	Landa Baguli	60	Atundi Fruit
19.	Simul Cotton	40	Bela		
20.	Arrow Root (Palua)	41	Chiraita (Bhui Neem)		
21.	Dhatuki Flower	42	Khajuripata		

ANNEXURE –B

1	Mahula Seed
2	Kusum seed
3	Karanja seed
4	Neem seed
5	Char Seed
6	Chakunda seed
7	Babul seed
8	Any other item(s) as may be notified by Government.

Items covered under para 4(b)

1. Sal Leaves
2. Sal Resin (Jhuna)
3. Gums (Dhaura Gum, Babul Gum, Genduli Gum, Bahada gum, Palas Gum, Salai gum etc.)
4. Khaira and Catechu
5. Barks of trees/climbers (Sunari, Lodha, Medha, Phenphena, Arjuna barks etc.)
6. Roots of Patala garuda (R.S. roots)
7. Sandal wood
8. Tassar cocoon
9. Canes

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PANCHAYAT RAJ (G.P.) DEPARTMENT

NOTIFICATION

The 14th November 2002

S.R.O. No. 934/2002 – Whereas the draft of certain rules which the State Government propose to make in exercise of the powers conferred by clause (w) of Sub-Section (1) of Section 44 read with Section 150 of the Orissa Grama Panchayats Act, 1964 (Orissa Act 1 of 1965) was published as required by sub-section (1) of Section 150 of the said Act in the extraordinary issue No. 1241, dated the 9th August 2002 of the Orissa Gazette under the notification of Government of Orissa in the Panchayat Raj (Grama Panchayat) Department No. 9570/ G.P. dated the 6th July 2002 beaqring S.R.O. No. 701/2002 inviting objections and suggestions from all persons likely to be affected thereby till the expiry of a period of thirty days from the date of publication of the same in the Orissa Gazette:

And whereas objections and suggestions received during the period specified above have been duly considered by the State Government.

Now, therefore, in exercise of the powers conferred by clause (w) of sub-section (1) of Section 44 read with Section 150 of the said Act, the State Government do hereby make the following rules, namely :-

1. (1) These rules may be called the Orissa Grama Panchayatas (Minor Forest Produce Administration) Rules, 2002.

   (2) They shall come into force on the date of their publication in the Official Gazette.

2. (1) In these rules, unless the context otherwise requires, -

   (i) “Act” means the Orissa Grama Panchayats Act, 1964 ;

   (ii) “Form” means a form appended to these rules ‘

   (iii) “Minor Forest Produce” means any or all of the Minor Forest Produces specified in the Schedule appended to these rules;

   (iv) “Section” means section of the Act; and

(v) “Trading year” means the seasonal year commencing from the first day of October and completing on the thirtieth day of September of the following year.

2. All other words and expression used but not defined in these rules shall have the same meaning as have been respectively assigned to them in the Act.

3. (1) The Grama Panchayat shall have the power to regulate procurement and trading of minor forest produce whether produced in Government lands and forest areas within the limits of the Grama or collected from Reserve Forests and brought into the Grama.

(2) In case, of the forest areas where Vana Samrakshyana Samiti has been formed the Grama Panchayats shall give priority to such Samities and its members in the matter of collection and trading of minor forest produce.

4. (1) Any person intending to procure Minor Forest Produce from the primary gatherers or to trade in minor forest produce within the limits of Grama during any trading year shall register himself as a trader in minor Forest Produce in the Grama Panchayat.

(2) Any person intending to be registered as a trader in minor forest produce shall apply to the Grama Panchayat in Form No.1. All such applications shall be placed before the Grama Panchayat immediately in its next meeting and with the approval of the Grama Panchayat the Sarapanch shall register the applicant as a trader in minor forest produce for the trading year ending next September and grant a Certificate of Registration in Form No. 2 to that effect.

(3) The names of all the traders of minor forest produce registered under sub-rule (2) each year shall be recorded in a Permanent Register to be maintained in Form No.3 in the Grama Panchayat.

(4) At the time of filling of application under sub-rule (2) the applicant shall deposit with the Grama Panchayats the required registration fees for each item of Minor Forest Produce applied for .

(5) No application for registration shall be entertained if the required fees has not been deposited under sub-rule (4).

(6) The fees for registration for every item of Minor Forest Produce shall be such as may be notified by Government from time to time.

5 (i) (a) In the month of September every year the Panchayat Samitis shall be adopting a resolution to that effect fix up the minimum price of procurement of different Minor Forest Produces payable to the Primary gatherers during the next trading year, which shall be applicable to all the Grama Panchayats within the Block.

Provided the Grama Panchayat shall be competent to modify the minimum price so fixed under this sub rule or sub-rule (3) by the Panchayat Samiti according to the local need by adopting a resolution to that effect.

(b) The representatives of Divisional Forest Officer, Tribal Development Cooperative Corporation, Orissa Forest Development Corporation and Tribal Cooperative Marketing Development Federation of India Ltd., shall be invited to the meetings convened under this sub-rule or under sub-rule (3).

(2) The minimum price fixed under sub-rule (1) or sub-rule (3) shall be notified in the notice board of the Panchayat Samiti and copies thereof shall be communicated to the Collector, Divisional Forest Officer, District Panchayat Officer, Sub-Collector and all the Grama Panchayats within the Block.

(3) If at any time or in any case it appears to the Collector that a Panchayat Samit has failed to fix up the minimum price for procurement of Minor Forest Produce under sub-rule (1) the Collector shall convene a Special Meeting of the Panchayat Samiti preferably in the month of October to fix up the minimum price of procurement of Minor Forest Produce.

(4) On receipt of intimation under sub-rule (2) regarding fixation of the minimum procurement price of the Minor Forest Produce fixed under sub-rule (1) or (3) the Grama Panchayat shall place the same before the Grama Sabha in its next meeting for ratification.

6 (1) A trader registered under these rules shall furnish a monthly return of Minor Forest Produce to the Grama Panchayat within fifteen days of the following month in Form No.3.

(2) Within one month of the closure of the trading year, the dealer shall also file an annual return of the Minor Forest Produce for the trading year in Form No.3.

(3)The Grama Panchayat shall communicate a copy of the annual return received under sub-rule (2) to the Forest Range Officer concerned.

7 (1) If at any time or in respect of any case it appears to the Sarpanch, that a trader, registered under these rules, has failed to -

(i) Pay the minimum price of procurement to the Primary gatherers fixed by the Grama Panchayat in Minor Forest Produce.

(ii) Rgister himself in the Grama Panchayat; or

(iii) Comply with the conditions of registration; the Sarpanch shall issue a notice to such dealer or person, as the case may be to show cause as to why the registration shall not be cancelled or action shall not be taken against him for such illegal trading.

(2) If such trader or person fails to show cause within seven days of receipt of the notice or show cause which is not satisfactory, the Sarpanch shall conduct an inquiry and after giving the traders or the person an opportunity of being heard, place his inquiry reqport before the Grama Panchayat in its next meeting together with the explanation, if any, received from such trader or person for its decision.

(3) On consideration of the inquiry report of the Sarpanch and the explanation of the trader if the Grama Panchayart are satisfied that circumstances specified in sub-rule (1) exist in relation to such trader or person, the Gram Panchayat shall resolve to cancel the registration of the dealer for the trading year and may also refused to register him as trader for the subsequent trading years;

Provided that if the person is engaged in the trading of minor forest produce without registering himself in Grama Panchayat the Sarpanch or Secretary of the Grama Panchayat shall lodge necessary complaint before the Divisional Forest Officer concerned for taking appropriate action against the person concerned for such illegal trade under the appropriate provisions of law.

(4) In pursuance of the decisions of the Gram Panchayat under sub-rule (3) the Sarpanch/ Secretary shall cancel the registration of the trader and in case of the person carrying an illegal trade in Minor Forest Produce the Sarpanch shall forthwith lodge the complain with the concerned Divisional Forest Officer.

(5) If after cancellation of the registration under sub-rule (4) it appears to the Sarpacnh/Secretary that the trader is still continuing his trade in the Minor Forest Produce the Sarpanch/Secretary shall report the matter to the Divisional Forest Officer for taking action against the person under the appropriate provisions of law.

(6) The item of Minor Forest Produce seized by the Divisional Forest Officer from the dealer or person shall be sold by public auction and the sale proceeds thereof be deposited under the appropriate Head of Account as provided under the Orissa Forest Act.

8. Any person aggrieved by the decision of the Grama Panchayat under these rules may prefer an appeal under Section 133 of the Act. The appeal shall be disposed of within thirty days from the date of admission of the appeal.

9 (1) Public Sector undertakings like the Orissa Forest Development Corporation, Tribal Development Cooperative Cooperation and Tribal Cooperative Marketing Development Federation of India Ltd. shall be deemed to have been registered under these rules.

(2) Notwithstanding the relaxation provided under sub-rule (1) the provisions of rules 6.7 and 8 shall apply to these public sector undertakings.

10. The Government may from time to time issue such instructions as occasion may require for :-

(a) smooth implementation of these rules and

(b) removal of any doubt or difficulties arising out of implementation of these rules.

SCHEDULE

(See rule 2(i)(iii)

LIST OF MINOR FOREST PRODUCE

1	Tamarind, de-seeded Tamarind, Tamarind seeds.	35	Tala Makhana seed
2	Mahua flower	36	Baidanka seeds
3	Hill Brooms	37	Baghanakhi Seeds
4	Thorn Broom (Jhadu or Ghoda Lanji)	38	Kamala Gundi Fruit
5	Phula Jhadu	39	Landa Baguli
6	Broom Grass	40	Bela
7	Nux Vomica (Kochila seeds)	41	Chiraita (Bhui Neem)
8	Harida	42	Khajuripata
9	Bahada	43	Riohini Fruit
10	Anla	44	Bhurusunga Leaves
11	Soap Nut (Ritha Phala)	45	Phenaphena Fruit
12	Marking Nut (Bhalia)	46	Rasana Root
13	Cleaning Nut (Nirmala)	47	Sidha Fruit
14	Honey	48	Sethabari
15	Siali Leaves	49	Katha Lai
16	Sabai Grass	50	Aundi Lai
17	Mango Kernel	51	Kherua Lai
18	Thatch Grass	52	Suan Lai
19	Simuli Cotton	53	Eksira Fruit
20	Arrow Root (Palua)	54	Katha Chhatu (Mushroom)
21	Dhatuki Flower	55	Mat Reed (Sapa Masina)
22	Putrani	56	Anarua Mula
23	Sikakai	57	Antia Pata
24	Jungal Jada or Gaba	58	Nageswar Flower
25	Palasa Seed	59	Mankada Kendu
26	Siali Seed	60	Atundi Fruit
27	Indra Jaba (Korani Seed)	61	Mahula seed
28	Giia (Seeda and Coat)	62	Kusum seed
29	Benachera	63	Karanja seed
30	Bana Haladi	64	Neem seed
31	Gaba	65	Char seed
32	Basil	66	Chakunda seed
33	Bana Kalatha	67	Babul seed
34	Makhena Seed (Kanta Padma)	68	Baibirang seed

DEVIATION STATEMENT

Year: 2009-10 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
3	3	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-III Atei R.F., Compt.No.61(P) 315.2315 Ha.	Plantation done in Ostapura RF-10 Ha, Patilo RF- 25 Ha, Rebena RF- 240 Ha., Palaspal RF-65 Ha., Boula RF-86 Ha and Sundaria KF- 25 Ha. total 451 Ha under F.D.A., in place of Atei and Turkipada R.F. 394.7898 Ha. as per F.D.A. guidlines, hence the deviations may be approved.
4	4	5.12.2.1, Table No. 5.3	Plantation Working Circle, Coupe No. TKP-III Turkipada R.F., Compt.No.(P) 79.5583 Ha.	
Year: 2010-11				
5	5	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-IV Atei R.F., Compt.No.61(P) 202.7997 Ha.	Plantation done in Atei RF - 65 Ha. out of 202.7997 Ha. and Rebena RF-20.29 and 140 Ha., out of Atei RF 137.7997 Ha.under CAMPA APO 2009-10. Plantation done in Rebana RF in place of Atei RF, deviation done due to non availability of suitable area in time. Turkipada RF- 24 Ha out of 63.3332 Ha., Rebena RF- 124 Ha., Palaspal PRF-77 Ha., Boula RF-32 Ha, Patilo RF- 1 Ha, Ostapura RF-3 Ha., Kalabila KF-1 Ha. and Sundaria KF-1 Ha. total 263 Ha plantation raised under F.D.A. as per F.D.A. guidlines, hence all above deviations may be approved.
6	6	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.TKP-IV Turkipada R.F., Compt.No.(P) 63.3332 Ha.	
Year: 2011-12				
7	7	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-V Atei R.F. 61(P) 308.7001 Ha. and TKP-V Turkipada R.F.(P) 81.8288 Ha.	Plantation raised in Santoshpur RF-7 Ha and Rebana RF -13 Ha total 20 Ha. done under O.B.D.P. in place of Atei RF and Turkipada RF 390.5289 Ha. due to non availability of suitable land deviation raised. Hence, the deviation may be approaved.

DEVIATION STATEMENT

Year: 2012-13 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
8	8	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-IV Atei R.F., Compt.No.61(B) 148.5697 Ha.	Atei RF- 6 Ha. Out of 148.5697 Ha., Gounighasa (Rev.land)-4 Ha, Baula RF-10 Ha., Rebana RF- 10 Ha., and Ostapura RF- 10 Ha. Total: 40 Ha plantation raised under State Plan Fodder. Baula RF-10 Ha., Rebana RF-10 Ha. plantation raised under OBDP and Rebana RF-5 Ha. under NBM and Turkipada RF 60 Ha. out of 46.0817 Ha. and Baranga RF 80 Ha., raised under FDA as per FDA guidlines. Hence, all above deviations raised may be approaved
9	9	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.TKP-IV Turkipada R.F., Compt.No.(B) 46.0817 Ha.	
Year: 2013-14				
12	12	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-VII Atei R.F., Compt.No.62(P) 265.5602 Ha.	Plantation raised in Sattira (Rev.land)-7 Ha., Rebana RF- 6 Ha. under State Plan Fodder. Plantation raised in Baula RF-10 Ha., Rebana RF-10 Ha. under State Plan OBDP and Rebana RF (near Bareigoda)-10 Ha. under NBM in place of Atei RF. Turkipada RF- 60 Ha., Rebana RF- 100 Ha., raised FDA Plantation under FDA guidlines. Hence, all the above deviations may be approaved.
Year: 2014-15				
13	13	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-VIII Atei R.F., Compt.No.62(P) 223.9338 Ha.	Plantation done in Rebena RF-30 Ha. Under Fooder Plantation and Baula RF-20 Ha. under State Plan OBDP in place of Atei RF. The deviations done for suitable sites, hence the deviation may be approved.

DEVIATION STATEMENT

Year: 2015-16 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
16	16	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-IX Atei R.F., Compt.No.62(P) 148.6857 Ha.	Plantation done in Santoshpur RF-20, Baula RF-5 Ha. and Rebana RF-5 Ha. Total-30 Ha. under Fodder Plantation. Santoshpur RF-5 Ha., Baula RF-5 Ha., Rebena RF-10 Ha. Total-20 Ha. under State Plan OBDP. Rebena RF-10 Ha., Santoshpur RF-30 Ha. Total-40 Ha. under CSR scheme in place of Atei RF. All the plantation done in suitable sites, hence for deviations the plan may be approved.
Year: 2016-17				
18	18	5.12.2.1, Table No. 5.3	**Plantation Working Circle**, Coupe No.KNT-X Atei R.F., Compt.No.62(B) 149.9533 Ha.	Plantation done in Santoshpur RF-5, Baula RF-5 Ha. and Rebana RF-10 Ha. Total-20 Ha. under State Plan OBDP. Patharapada Rev. land-20 Ha. & Asia Rev.land-20 Ha. under CAMPA APO 2015-16 (Baldhill). Rebana RF-40 Ha. under FDA as per FDA guidlines. Baigundi RF-50 Ha. and Dhaneipitha (Rev.land)-5 Ha. total 55 Ha. under CSR. All the plantation done in suitable sites in place of Atei RF, hence for deviation the plan may be approved.

DEVIATION STATEMENT

Year: 2014-15 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
14	14	3.4.1	**Improvement Working Circle**, Coupe No.VIII Ostapura R.F., Compt.No.STP VIII 460.5904 Ha. and Atei RF Compt. No. MSL-VIII - 452.0338 Ha.	Subsidiary Silvicultural Operation done over 750 Ha. in Ostapura RF in place of 460.5904 Ha. and in Atei RF S.S.O. work done over 900 Ha. in place of 452.0338 Ha. Hence for the above cases deviations may be approved.

DEVIATION STATEMENT

Year: 2008-09 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
1	1	4.4.1	**Rehabilitation Working Circle**, Coupe No.II Hatiabandha R.F., Compt.No.BTN-II 75.9795 Ha., Patilo RF Compt. No.BTN-II - 449.6679 Ha., Rebana RF, Compt No.PRS-II-422.9636 Ha., SNP-II-499.6679 Ha. & DNT-II-867.3337 Ha., Atei RF Compt No.SGP-II-536.5509 Ha.	In Baranga RF Economic Plantation raised under State Plan over 70 Ha. in suitable site and deviated Plan, hence the deviation may be approved.
Year: 2009-10				
2	2	4.4.1	**Rehabilitation Working Circle**, Coupe No.III Santoshpur R.F., Compt.No.BTN-III 337.2855 Ha.,Rebana RF Compt. No. PRS-III - 494.8186 Ha., Palaspal RF, Compt. No.SNP-III-342.5759 Ha., Rebana RF-DNT-III-522.3051 Ha. & Atei RF SGP-III-666.0693 Ha.	In Gayalmunda RF-200 Ha. and Patilo RF-200 Ha. Total 400 Ha. Deviated under MGNREGS and Ostapura RF-50 Ha, Mahisabahali KF-50 Ha and Patilo RF-50 Ha. Under FDA, these FDA plantations raised under FDA guidelines, hence above both plantation deviations may be approved.
Year: 2012-13				
10	10	4.4.1	**Rehabilitation Working Circle**, Coupe No.VI Santoshpur R.F., Compt.No.BTN-VI 583.9218 Ha.,Rebana RF Compt. No. PRS-VI - 706.0515 Ha., Palaspal RF, Compt. No.SNP-VI-324.0974 Ha., Rebana RF-DNT-VI-447.9162 Ha. & Atei RF SGP-VI-504.6607 Ha.	In Boula RF 300 Ha. Plantation raised under FDA, these FDA plantations raised under FDA guidelines and deviated the Plan, hence the above plantation deviations may be approved.

DEVIATION STATEMENT

Year: 2013-14 **Division :KEONJHAR WILD LIFE, ANANDPUR**

Serial No. of deviation	Control Book Name, Form No. page	Reference to Working Plan		Nature of deviation requiring sanction
		Paragraph	Nature of prescription	
11	11	4.4.1	**Rehabilitation Working Circle**, Coupe No.VII Santoshpur R.F., Compt.No.BTN-VII 410.4735 Ha.& 483.6585, Rebana RF Compt. No. PRS-VII - 825.6365 Ha., Palaspal RF, Compt. No.SNP-VII-374. 9131 Ha., Rebana RF-DNT-VII-891. 6163 Ha. & Atei RF SGP-VII-576.335 Ha.	In Ostapura RF 10 Ha. Plantation raised under FDA, these FDA plantations raised under FDA guidelines and Gayalmunda RF-50 Ha., Boula RF -100 Ha. raised under MGNREGS, 160 Ha. deviated the Plan, hence the deviations may be approved.
Year: 2015-16				
15	15	4.4.1	**Rehabilitation Working Circle**, Coupe No.IX Santoshpur R.F., Compt.No.BTN-IX 531.0796 Ha.& 245.3584, Rebana RF Compt. No. PRS-IX - 668.9502 Ha., Palaspal RF, Compt. No.SNP-IX-320.162 Ha., Rebana RF-DNT-IX-868.1494 Ha., Atei RF SGP-IX-358.4206 Ha. & Kadagotha PRF Compt.No.SGP-IX-95.3073 Ha.	In Boula RF 50 Ha. Plantation raised under FDA, these FDA plantations raised under FDA guidelines and deviated the Plan, hence the deviation may be approved.
Year: 2016-17				
19	19	4.4.1	**Rehabilitation Working Circle**, Coupe No.X Gayalmunda R.F., Compt.No.BTN-X 70.7673 Ha.Kuldiha RF Compt. No. BTN-X - 44.9449 Ha., Panasadiha RF, Compt. No.BTN-X-92.6973 Ha., Santo-shpur RF-BTN-X-354.6695 Ha., Mahulpanga PRF SNP-X-261.2832 Ha. Rebana RF Compt.No.DNT-X-865.4324 Ha.& Atei RF Compt.No.SGP-X-593.5858 Ha.	In Santoshpur RF deviated 220.3305 Ha. under CAMPA APO 2015-16 work, Rebana RF deviated 1260.5036 Ha. under CAMPA APO 2015-16 work and in Atei RF 42.4142 Ha. Deviated under FDA work and Boula RF near Bahabaradanda-23.763 Ha. under -CAMPA APO 2015-16 and Boula RF -60 Ha. under OMBADC work deviated for suitable sites, hence all the above deviations may be approved.

DEVIATION STATEMENT FOR PLANTATION WORKING CIRCLE

YEAR-2009-10 **Division : KEONJHAR WILD LIFE, ANANDPUR**

Sl. No. of deviation	Control book name, Form No. Page	Reference to Working Plan						Nature of deviation requiring sanction			
		Paragraph	Nature of Prescription								
			Coupe No.	Forest Block	Status	Comptt.	Area in Ha.	Forest Block	Area in Ha.	Scheme	Remarks
3	3	5.12.2.1 table No.5.3	KNT-III TKP-III	Atei	RF	61(P)	315.2315	Ostapura RF	10	FDA	Deviated
				Turkipada	RF	(P)	79.5583	Patilo RF	25	FDA	Deviated
				Total			**394.7898**	Rebana RF	240	FDA	Deviated
								Palaspal PRF	65	FDA	Deviated
								Sundaria KF	25	FDA	Deviated
								Total area	**365**	FDA	Deviated
YEAR-2010-11											
4	4	5.12.2.1 table No.5.3	KNT-IV TKP-IV	Atei	RF	61(P)	202.7997	Atei RF	65	CAMPA	Not Deviated
				Turkipada	RF	(P)	63.3332	Rebana RF	20.29	CAMPA	Deviated
				Total			**266.1329**	**Total area**	**85.29**		
								Turkipada RF	24	FDA	Not Deviated
								Rebana RF	124	FDA	Deviated
								Palaspal PRF	77	FDA	Deviated
								Patilo RF	1	FDA	Deviated
								Oatapura RF	3	FDA	Deviated
								Kalabila KF	1	FDA	Deviated
								Sundaria KF	1	FDA	Deviated
								Total area	**231**		
YEAR-2011-12											
5	5	5.12.2.1 table No.5.3	KNT-V TKP-V	Atei	RF	61(P)	308.7001	Santoshpur RF	7	OBDP	Deviated
				Turkipada	RF	(P)	81.8288	Rebana RF	13	OBDP	Deviated
				Total			**390.5289**	**Total area**	**20**		
YEAR-2012-13											
6	6	5.12.2.1 table No.5.3	KNT-VI TKP-VI	Atei	RF	61(B)	148.5697	Atei RF	6	SP Fodder	Not Deviated
				Turkipada	RF	(B)	46.0817	Gounighasa (Rev.)	4	SP Fodder	Deviated
				Total			**194.6514**	Rebana RF	10	SP Fodder	Deviated
								Ostapura RF	10	SP Fodder	Deviated
								Total area	**30**		
								Rebana RF	10	OBDP	Deviated
								Rebana RF	5	NBM	Deviated
								Turkipada RF	60	FDA	Deviated
								Baranga RF	80	FDA	Deviated
								Total area	**155**		

YEAR-2013-14

7	7	5.12.2.1 table No.5.3	KNT-VII	Atei	RF	61(P)	265.5602	Sattira(Rev.land)	7	SP Fodder	Deviated
				Total			**265.5602**	Rebana RF	6	SP Fodder	Deviated
								Rebana RF	10	SP OBDP	Deviated
								Rebana RF	10	NBM	Deviated
								Turkipada RF	60	FDA	Deviated
								Rebana RF	100	FDA	Deviated
								Total area	**193**		Deviated

YEAR-2014-15

9	9	5.12.2.1 table No.5.3	KNT-VIII	Atei	RF	62(P)	223.9338	Rebana RF	30	SP Fodder	Deviated
				Total			**223.9338**	**Total area**	**30**		Deviated

YEAR-2015-16

12	12	5.12.2.1 table No.5.3	KNT-IX	Atei	RF	62(P)	148.6857	Santoshpur RF	20	SP Fodder	Deviated
				Total			**148.6857**	Rebana RF	5	SP Fodder	Deviated
								Total area	**25**		Deviated
								Santoshpur RF	5	SP OBDP	Deviated
								Rebana RF	10	SP OBDP	Deviated
								Total area	**15**		Deviated
								Rebana RF	10	CSR	Deviated
								Santoshpur RF	30	CSR	Deviated
								Total area	**40**		Deviated

YEAR-2016-17

13	13	5.12.2.1 table No.5.3	KNT-X	Atei	RF	62(B)	149.9533	Santoshpur RF	5	SP OBDP	Deviated
				Total			**149.9533**	Rebana RF	10	SP OBDP	Deviated
								Total area	**15**		Deviated
								Patharpada (Rev.)	20	CAMPA	Deviated
								Asia (Rev.Land)	20	CAMPA	Deviated
								Total area	**40**		Deviated
								Rebana RF	40	FDA	Deviated
								Baigundi RF	50	CSR	Deviated
								Dhaneipitha (Rev.)	5	CSR	Deviated
								Total area	**95**		Deviated

DEVIATION STATEMENT FOR IMPROVEMENT WORKING CIRCLE

YEAR-2014-15 **Division : KEONJHAR WILD LIFE, ANANDPUR**

Sl. No. of deviation	Control book name, Form No. Page	Reference to Working Plan						Nature of deviation requiring sanction			
		Paragraph	Nature of Prescription								
			Coupe No.	Forest Block	Status	Comptt.	Area in Ha.	Forest Block	Area in Ha.	Scheme	Remarks
10	10	3.4.1	VIII	Ostapura	RF	STPVIII	460.5904	Ostapura RF	750	S.S.O.	Deviated 289.4096 Ha.
				Atei	RF	MSLVIII	452.0338	Atei RF	900	S.S.O.	Deviated 447.9662 Ha.
				Total area			**912.6242**	**Total area**	**1650**		Deviated 737.3758 Ha.

DEVIATION STATEMENT FOR REHABILITATION WORKING CIRCLE

YEAR-2008-09 **Division : KEONJHAR WILD LIFE, ANANDPUR**

Sl. No. of deviation	Control book name, Form No. Page	Reference to Working Plan						Nature of deviation requiring sanction			
		Paragraph	Nature of Prescription								
			Coupe No.	Forest Block	Status	Comptt.	Area in Ha.	Forest Block	Area in Ha.	Scheme	Remarks
1	1	4.4.1	II	Hatibandha	RF	BTN-II	39.9449	Baranga RF	70	S.P.	Deviated
			II	Hatibandha	RF	BTN-II	13.26				
			II	Hatibandha	RF	BTN-II	22.7746				
			II	Patilo	RF	BTN-II	449.6679				
			II	Rebana	RF	PRS-II	422.9636				
			II	Rebana	RF	SNP-II	499.231				
			II	Rebana	RF	DNT-II	867.3337				
			II	Atei	RF	SGP-II	536.5509				
				Total area			2851.7266	Total area	70		Deviated

YEAR-2009-10

2	2	4.4.1	III	Santoshpur	RF	BTN-III	337.2855	Gayalmunda RF	200	MGNREGS	Deviated
			III	Rebana	RF	PRS-III	494.8186	Patilo RF	200	MGNREGS	Deviated
			III	Palaspal	RF	SNP-III	342.5759	Ostapura RF	50	FDA	Deviated
			III	Rebana	RF	DNT-III	522.3051	Mahisabahali KF	50	FDA	Deviated
			III	Atei	RF	SGP-III	666.0693	Patilo RF	50	FDA	Deviated
				Total area			2363.0544	Total area	550		Deviated

DEVIATION STATEMENT FOR REHABILITATION WORKING CIRCLE

YEAR-2013-14 **Division : KEONJHAR WILD LIFE, ANANDPUR**

Sl. No. of deviation	Control book name, Form No. Page	Reference to Working Plan						Nature of deviation requiring sanction			
		Paragraph	Nature of Prescription								
			Coupe No.	Forest Block	Status	Comptt.	Area in Ha.	Forest Block	Area in Ha.	Scheme	Remarks
8	8	4.4.1	VII	Santoshpur	RF	BTN-VII	410.4735	Ostapura RF	10	FDA	Deviated
			VII	Santoshpur	RF	BTN-VII	483.6585	Santoshpur RF	50	MGNREGS	Not Deviated
			VII	Rebana	RF	PRS-VII	825.6365	Rebana RF	10	FDA	Not Deviated
			VII	Palaspal	RF	SNP-VII	374.9131	Gayalmunda RF	50	MGNREGS	Deviated
			VII	Rebana	RF	DNT--VII	891.6163	Rebana RF	100	MGNREGS	Not Deviated
			VII	Atei	RF	SGP-VII	576.335	Atei RF	100	MGNREGS	Not Deviated
				Total area			**3562.6329**	Baula RF	100	MGNREGS	Deviated
								Total area	**420**		Deviated 150 Ha.

YEAR-2015-16

Sl. No. of deviation	Control book name, Form No. Page	Reference to Working Plan						Nature of deviation requiring sanction			
		Paragraph	Nature of Prescription								
			Coupe No.	Forest Block	Status	Comptt.	Area in Ha.	Forest Block	Area in Ha.	Scheme	Remarks
11	11	4.4.1	IX	Santoshpur	RF	BTN-IX	531.0796	Baranga RF	20	FDA	Deviated
			IX	Santoshpur	RF	BTN-IX	245.3584	**Total area**	**20**		Deviated
			IX	Rebana	RF	PRS-IX	668.9502				
			IX	Palaspal	RF	SNP-IX	320.162				
			IX	Rebana	RF	DNT-IX	868.1494				
			IX	Atei	RF	SGP-IX	358.4206				
			IX	Kadagotha	PRF	SGP-IX	95.3073				
				Total area			**3087.4275**				

YEAR-2016-17

14	14	4.4.1	X	Gayalmunda	RF	BTN-X	70.7673	Atei RF	50	FDA	Deviated 42.4142 Ha.
			X	Kuldiha	RF	BTN-X	44.9449	Atei RF	48	CAMPA	Not deviated
			X	Panasdiha	RF	BTN-X	92.6973	Atei RF	538	CAMPA	Not deviated
			X	Santoshpur	RF	BTN-X	354.6695	Santoshpur RF	575	CAMPA	Deviated 220.3305 Ha.
			X	Mahulapanga	PRF	SNP-X	261.2832	Mahulpanga PRF	261	CAMPA	Not deviated
			X	Rebana	RF	DNT-X	865.4324	Rebana RF	1626	CAMPA	Deviated 760.5676 Ha.
			X	Atei	RF	SGP-X	593.5858	Rebana RF	499.936	CAMPA	Deviated 499.9360 Ha.
				Total area			**2283.3804**	**Total area**	**3597.936**		Deviated 1523.2483 Ha.

Source: Keonjhar Wild Life Division, Anandpur

Appendix – XX-B

II. IMPROVEMENT WORKING CIRCLE

CONTROL FORM NO

IMPROVEMENT CONTROL

WORKING CIRCLE: **IMPROVEMENT** **IMPROVEMENT Series**

IMPROVEMENT Series

Year of Treatment	Area Prescribed						Achievement (in Ha.)		
	Coupe No.	Forest block details					Area	Running Excess/Deficit	Remarks
2007-08	I								
2008-09	II								
2009-10	III								
2010-11	IV								
2011-12	V								
2012-13	VI								
2013-14	VII								
2014-15	VIII								
2015-16	IX								
2016-17	X								

III. REHABILITATION WORKING CIRCLE

CONTROL FORM NO

REHABILITATION CONTROL

WORKING CIRCLE: **Rehabilitation** **Rehabilitation Series**

Rehabilitation Series

Year of Treatment	Area Prescribed						Achievement (in Ha.)		
	Coupe No.	Forest block details					Area	Running Excess/Deficit	Remarks
2007-08	I								
2008-09	II								
2009-10	III								
2010-11	IV								
2011-12	V								
2012-13	VI								
2013-14	VII								
2014-15	VIII								
2015-16	IX								
2016-17	X								

IV. PLANTATION WORKING CIRCLE

CONTROL FORM NO.							
CONTROL OF TENDING OPERATIONS							
WORKING CIRCLE: **Plantation Circle**				PLANTING SERIES:			
Reference: Paragraph-							
Prescription						**Results**	
Year	**Coupe No.**	**Forest Block**	**Status**	**Comptt**	**Area in Ha.**	**Years in which actually done**	**Remarks**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
2007-08	I						
2008-09	II						
2009-10	III						
2010-11	IV						
2011-12	V						
2012-13	VI						
2013-14	VII						
2014-15	VIII						
2015-16	IX						
2016-17	X						

V. NTFP (OVERLAPPING) WORKING CIRCLE

CONTROL FORM NO.

NTFP CONTROL

WORKING CIRCLE: **NTFP (Overlapping)**

Year of Treatment	NTFP					Other activities done		Remarks
	Block(s)	Species	Species	Species	Total	Location	Type of work	
2007-08								
2008-09								
2009-10								
2010-11								
2011-12								
2012-13								
2013-14								
2014-15								
2015-16								
2016-17								

VI. WILDLIFE (OVERLAPPING) WORKING CIRCLE

CONTROL FORM NO. WILDLIFE CONTROL WORKING CIRCLE: **Wildlife (Overlapping)**			
Year of Treatment	**Activities Done**		
	Location	**Type of Work , EDC, Ecotourism**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

VII MISCELLANEOUS REGULATIONS

CONTROL FORM NO. MISCELLANEOUS CONTROL			
WORKING CIRCLE: **Miscellaneous Regulations** **Forest Consolidation** Reference: **Paragraph No:**			
Year of Treatment	**Activities Done**		
	Location	**Type of Work**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations**			**Maintenance of Block Boundary**
Reference: **Paragraph No:**			
Year of Treatment	**Activities Done**		
	Location	**Type of Work**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations**			**Forest Fire Management**
Reference: **Paragraph No:**			
Year of Treatment	**Activities Done**		
	Location	**Type of Work**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations** **Maintenance of Records** Reference: **Paragraph No:**		
Year of Activity	**Activities Done**	
	Type of Records Maintained	**Remarks**
2007-08		
2008-09		
2009-10		
2010-11		
2011-12		
2012-13		
2013-14		
2014-15		
2015-16		
2016-17		

WORKING CIRCLE: **Miscellaneous Regulations** **Developments of Forest Roads** Reference: **Paragraph No:**			
Year of Work	**Road Details**		
	Name	**Length Done(in Kms)**	**Remarks (Works etc)**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations** **Developments of Buildings/Wells** Reference: **Paragraph No:**			
Year of Work	**Building/Wells Details**		
	Name	**Work Done**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations** **Encroachment** Reference: **Paragraph No:**			
Year	**Activities Done**		
	Location	**Type of Work**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations**			**Illicit Felling and Prosecution**
Reference: **Paragraph No:**			
Year	**Activities Done**		
	Actions Taken	**Results**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations**			**Communication System &**
Reference: **Paragraph No:**			**Mobility**
Year	**Systems Developed**		
	VHFs	**Vehicles**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

WORKING CIRCLE: **Miscellaneous Regulations**			**Human Resources Development**
Reference: **Paragraph No:**			
Year	**Actions Taken**		
	Trainings	**Other Activities**	**Remarks**
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			
2013-14			
2014-15			
2015-16			
2016-17			

Appendix - XXI

11.6.A - FDA list(2008-09 to 2012-13) 1st Phase

SlNo	Name Of VSS	Village	RF	Range
1	MaaGadachandi	Rangamatia	Baula	Hadagarh
2	Kalasira	Bahiya	KF	Hadagarh
3	Ghagarasuni	Sajanpal	KF	Hadagarh
4	Marangaburu	Purunapani	Baula	Hadagarh
5	Palabani	Palabani	Atei	Deogaon
6	Rangapat	Bhoka	Rebana	Deogaon
7	Maa Sinduragouri	Madvapur	Rebana	Deogaon
8	Maa Hingula	Golabandha	Palaspal	Deogaon
9	Maa Charchika	Chasatangiri	Rebana	Deogaon
10	MaaBasumati Thakurani	Sanasiadimala	Rebana	Deogaon
11	Mahabir	Kamalangi	Rebana	Deogaon
12	Bisweswar	Sanasiadimala	Rebana	Brahmanipal
13	Baba Kumundeswar	Mahulpanga	Rebana	Brahmanipal
14	MaaMangala	Kanjipal	Rebana	Brahmanipal
15	MaaPateswari	Rebana	Rebana	Brahmanipal
16	Laxminarayana	Kusumadiha	Rebana	Brahmanipal
17	Maa Tarini	Mahulgoda	Palaspal	Brahmanipal
18	MaaBaramasi	Patharapada	Patilo	Anandpur
19	MaaMangala	Dantia	Patilo	Anandpur
20	Sunduria	Sunduria	VF	Anandpur
21	Mahisabahali	Mahisabahali	Ostapura	Anandpur
22	Marsapal	Marsapal	Atei	Anandpur

11.6.B-FDA list(2009-10 to 2013-14) 2nd Phase

S.I No.	Name Of VSS	Village	RF	Range
1	Gopinathpur		Rebana	Brahmanipal
2	Ghhutang		Rebana	Brahmanipal
3	Kantala		Santoshpur	Anandapur
4	Turkipada		Rebana	Brahmanipal
5	Sanajiemei		Rebana	Brahmanipal
6	Gumunda		Rebana	Brahmanipal
7	Putujhari		Rebana	Brahmanipal
8	Pathuripentha		Rebana	Brahmanipal
9	Harichandanpur		Rebana	Deogaon
10	Kanheigola		Rebana	Deogaon
11	Badapalasapal		Rebana	Deogaon
12	Bhagamunda		Rebana	Deogaon
13	Thakurpada		Rebana	Deogaon
14	Baunsagada		K.F.	Anandpur
15	Patharapada		Patilo	Anandapur
16	Jugalakishorepur		Atei	Anandapur
17	Ostopura		Ostapura	Anandapur
18	Kalabila		Atei	Anandapur

19	Sailong		Ostapura	Anandapur
20	Gohira		Ostapura	Anandapur
21	Panagharri		Hadagarh	Hadagarh
22	Malaharpada		Boula	Hadagarh
23	Padhiarpalli		KF	Hadagarh

11.6.C-FDA list(2011-12 to 2015-16) 3rdPhase				
S.I No.	Name Of VSS	Village	RF	Range
1	Baranga		Baranga	Anandapur
2	Turkipada		Rebana	Brahmanipal
3	Mukteswar	Mahalarapada		
4	Kalabila	Bahia	Atei	Anandapur
5	Ghagarasuni	Sajanapal	Gayalmunda	Anandapur
6	Maranaghuru	Purunapani	Baula	Hadagarh

11.6.D-FDA list(2012-13 to 2016-17) 4thPhase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Gohira	Gohira	Ostopura	Anandapur
2	Mapateswari	Rebana	Rebana	Brahmanipal
3	Turkipada	Turkipada	Rebena	Brahmanipal
4	Mahabira	Kantala	Santoshpur	Anandapur
5	Maamangala	Kanjapal	Patilo	Anandapur
6	Gumunda	Gumunda	Rebana	Brahmanipal

11.6.E-FDA list(2013-14 to 2017-18) 5th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Suakathi		Rebana	Brahmanipal
2	Tentulipal		Rebana	Brahmanipal
3	Rebana		Rebana	Brahmanipal
4	Jhinkipita		Atei	Deogaon
5	Gargadabahal		Rebana	Deogaon
6	Gohira		Ostopura	Anandapur

11.6.F-FDA list(2014-15 to 2018-19) 6th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Poitapani		KF	Hadagarh
2	Bangurusuni		Rebana	Brahmanipal
3	Ghutung		Rebana	Brahmanipal
4	Samukanendi		KF	Deogaon
5	Nandabara		Baranga	Anandapur

6	Talapada		Rebana	Brahmanipal
7	Santoshpur		Santoshpur	Anandpur
8	Tavakuda		Santoshpur	Anandapur
9	Mandapada		Santoshpur	Anandapur

11.6.G-FDA list(2015-16 to 2019-20) 7th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Patharagoda		Rebana	Brahmanipal
2	Barabahali		KF	Deogaon

11.6.H-FDA list(2017-18 to 2021-22) 8th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Dalkisahi		Rebana	Brahmanipal
2	Nialijharan		Atei	Deogaon

1165.I-FDA list(2018-19 to 2022-23) 9th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Bila		Atei	Deogaon
2	Ghanteisuni	Gayalmunda	Gayalmunda	Anandapur

11.6.J-FDA list(2019-20 to 2023-24) 10th Phase				
S.I No.	Name of VSS	Name Of Village	RF	Range
1	Kanjiapal		Rebana	Brahmanipal
2	Barang		Baranga	Ananadapur

Source: DFO, Keonjhar(WL)

APPENDIX-XXII

Table NO. 11.7 : List of FDA Plantation from (2009-10 to 2020-21) of Keonjhar Wildlife Division, Anandapur							
Sl No.	**Year**	**Name of Range**	**Name of VSS**	**Location**	**Name of Component**	**Area in Ha.**	**Entry Point Activity**
1	2009-10	Anandapur	Marangburu	Marshapal	ANR- 50, AR-10	60	Drying yard
2			Mahinsabahali	Mahinsabahal	ANR- 50	50	Drying yard
3			Sunduria	Sunduria	AR- 25	25	
4			MaaMangala	Dantia	AR- 25	25	
5			MaaBaramasi	Patharapada	ANR- 50	50	Drying yard
6		Brahmanipal	MaaTarina	Mahulagada	AR- 20, Mix-20	40	
7			Laxminarayan	Kusumadiha	AR- 20	20	
8			MaaPateswari	Rebana	AR- 20	40	
9			MaaMangala	Kanjiapal	ANR- 50	50	Drying yard
10			Baba Kumundeswar	Mahulapanga	ANR- 50	50	Drying yard
11			Bisweswara	Sanasidimal	ANR- 50	50	Renovation of Pond
12		Deogaon	Mahabira	Kamalangi	AR- 25	25	
13			MaaBasumati (Thakurani)	Badasiadimal	AR- 25	25	
14			MaaCharchika	Chasatangiri	AR- 25	25	
15			MaaHingula	Golabandha	ANR- 60, AR-40	100	Pendal
16			Maa Sinduragouri	Madhyapur	ANR- 30, AR-20	50	Pendal
17			Rangapat	Rangapat	ANR- 50, AR-50	100	Pendal
18			Palabani	Palabani	ANR- 30, AR-20	50	
19		Hadagarh	Marangburu	Purunapani	AR- 10, Mix- 23	33	
20			Ghagharasuni	Kantipal	Mix- 10	10	
21			Kalasira	Bahia	Mix- 18	18	
22			MaaGadachandi	Podasingidi	AR- 25	25	
Total :-						**921**	
1	2010-11	Anandapur	Patasila	Baunsagarh	Mix-1	1	
2			MaaBaramasi	Patharapada	Mix-1	1	
3			Jugal kishorepur	Jugal kishorepur	Mix-1	1	

Sl No.	Year	Name of Range	Name of VSS	Location	Name of Component	Area in Ha.	Entry Point Activity
4			Badapathara	Ostapura	Mix-1	1	
5			Kaliamba	Kaliamba	Mix-1	1	
6			Sailong	Sailong	Mix-1	1	
7			Gohira	Gohira	Mix-1	1	
8		Brahmanipal	Gopinathpur	Gopinathpur	AR-10, Mixed- 16	26	
9			MaaBasumati	Chhutung	AR-10, Mixed- 14	24	
10			Mahabira	Kuntala	AR-12, Mixed-14	26	
11			Turkipada	Turkipada	AR-10, Mixed-14	24	
12			Maa Basundhari	Sanajimei	ANR- 5, AR-10, Mixed- 14	29	
13			Gumundu	Gumundu	ANR- 5, AR-10, Mixed- 14	29	
14			Pathuripentha	Pathuripentha	AR-10, Mixed- 14	24	
15		Deogaon	Hanuman jew	Hari chananpur	AR- 8	8	
16			Kanheigola	Kanheigola	AR- 5	5	
17			Badapalaspal	Badapalaspal	AR- 5	5	
18			Maa Chanchakhai	Bhagamunda	AR-5, Mixed- 5	10	
19			Haraparbati	Thakurapada	Mixed-25	25	
20		Hadagarh	MaaLaxmi	Purunaghati	Mixed-1	1	
21			Mukteswar	Mallarapada	Mixed-1	1	
22			Sidheswar	Padiaripalli	Mixed-1	1	
Total :-						**245**	
1	2012-13	Hadagarh	Mallarpada	Mallarpada	ANR-100	100	Drying yard
2			Kalasira	Kalasira	ANR-100	100	Drying yard
3			Sajanapal	Sajanapal	ANR- 50	50	Drying yard
4			Purunapani	Purunapani	ANR- 50	50	Pendal
5		Brahmanipal	Turkipada	Turkipada	Mix- 80	80	Drying yard
6		Anandapur	Baranga	Baranga	Mix- 60	60	Drying yard
Total :-						**440**	

Sl No.	Year	Name of Range	Name of VSS	Location	Name of Component	Area in Ha.	Entry Point Activity
1	2013-14	Anandapur	Gohira	Gohira	ANR- 10	10	Renovation of Pond
2		Brahmanipal	Rebana	Rebana	ANR- 10	10	Drying yard
3			Turkipada	Turkipada	AR- 60	60	Drying yard
4			Kantala	Kantala	AR- 20	20	Drying yard
5			Kanjiapal	Kanjiapal	AR- 30	30	Pendal
6			Gumundu	Gumundu	AR- 20, Mix-30	50	Pendal
Total :-						**180**	
1	2014-15	Brahmanipal	Rebana	Rebana	ANR-40	40	
2			Tentulipal	Tentulipal	ANR-25	25	Renovation of Pond
3			Suakathi	Suakathi	ANR-25	25	Drying yard
4		Deogaon	Gargadabahal	Gargadabahal	ANR-25	25	Drying yard
5			Jhinkipita	Jhinkipita	ANR-25	25	Drying yard
6		Anandapur	Gohira	Gohira	ANR-40	40	
Total :-						**180**	
1	2015-16	Hadagarh	Poitapani	Poitapani	ANR-50	50	Drying yard
2		Brahmanipal	Bangurusuni	Bangurusuni	ANR-30	30	Drying yard
3			Ghutung	Ghutung	ANR-50	50	Drying yard
4			Samukanendi	Samukanendi	ANR-50	50	Drying yard
5		Anandapur	Nandabara	Nandabara	ANR-20	20	Drying yard
Total :-						**200**	
1	2016-17	Brahmanipal	Patharagada	Patharagada	AR- 40	40	Drying yard
2		Deogaon	Barabahali	Barabahali	ANR-50	50	Drying yard
Total :-						**90**	
1	2017-18						
1	2018-19	Brahmanipal	Dalkisahi	Dalkisahi	ANR	50	Drying yard
2		Deogaon	Nialijharan	Nialijharan	ANR	50	Drying yard
Total :-						**100**	
1	2019-20	Anandapur	Billa	Billa	ANR	40	Pendal
1	2020-21		Gayalmunda	Gayalmunda	ANR	40	Drying Yard
			Baranga	Baranga	ANR	100	Drain, Repairing, pendal
			Kanjiapal	Kanjiapal	ANR	65	Pendal
	Total					**245**	

Source: DFO, Keonjhar(WL)

Appendix-XXIII

Activities undertaken for control of forest fire.		
Year of Treatment	Activities Done	
	Location	Type of Work
2007-08	Santoshpur RF	Creation of fire line over 6Kms Incentive given to fire watcher
	Rebana RF	Creation of fire line over 10Kms
	Atei RF	Creation of fire line over 10Kms
2008-09	Rebana RF	Maint. of fire line over 30Kms Engaged fire squad, cost of POL & cost of 16 nos spot light & printing charges of leaf let for publicity awareness Programme
2009-10	Santoshpur RF	Creation of fire line over 4Kms
	Atei RF	Creation of fire line over 10Kms
	Rebana RF	Creation of fire line over 34Kms
	Patilo RF	Creation of fire line over 9Kms
	Palaspal RF	Creation of fire line over 9Kms
	Rebana RF	Creation of fire line over 35Kms Incentive to local people
	Gayalamunda, Harichadanpur, Panasadiha, Daitari &Budhikud	Deployed fire squad
	Santoshpur RF	Creation of fire line over 8Kms
2011-12	Anandapur	Purchase of 6 nos spot light
	Gayalamunda	Deployed one fire squad
	Rebana RF	Creation of fire line over 10Kms
	Santoshpur RF, Atei RF	Maint. of fire line over 35 Kms.
2012-13	Anandapur, Hadagarh & Deogaon	Deployed one fire squad each with hired vehicle to protect Forest fire.
	Rebana RF, Atei RF, Boula RF, Gayalamunda & Santoshpur RF	Creation of fire line over 116Kms under CAMPA Fund & const. 5 nos drying yard at local community towards incentive.
	Rebana RF, Boula RF & Santoshpur RF	Creation of fire line over 65 Kms. & engaged fire squad.
2013-14	Anandapur, Brahmanipal & Deogaon	Deployed 3 nos fire squad 1 no. each with hired vehicle & POL to protect Forest fire.
	Santoshpur RF, Boula RF, Atei RF and Rebana RF	Creation of fire line over 112 Kms. under CAMPA fund.
	Rebana RF	Creation of fire line over 10Kms

Year of Treatment	Activities Done	
	Location	Type of Work
2014-15	Anandapur, Deogaon, Hadagarh,Brahmanipal.	Deployed 5 nos fire squad with hired vehicle &POL to protect Forest fire.
	Rebana RF, Santoshpur RF, Boula RF and Atei RF	Creation and Maint. fire line done over 85 Rkm
	Anandapur, Brahmanipal	Deployed 2 nos fire fighting squad 1 no each
	Hadagarh & Deogaon	Deployed 2 nos fire fighting squad 1 no each
	Kathakata, Pitanau&Raighati	Deployed 3 nos fire fighting squad 1 no each
	Gadachandi& Bahia	Maint. of fire line over 40 Kms.
2015-16	Anandapur, Deogaon, Hadagarh, Brahmanipal.	Deployed 4 nos fire squad with hired vehicle & POL to protect Forest fire.
	Rebana RF, Atei RF, Santoshpur RF, Baranga RF, Boula RF & Ostapura RF	Creation and maint. of fire line done over 500 Rkm & Purchase of 2 nos bush cutters.
	Hadagarh, Kathakata, Pitanau and Raighati	Deployed 4 nos fire squad
	Gadachandit & Pitanau	Creation and maint. of fire line done over 40 Rkm
2016-17	Anandapur	Purchase of 10 nos fire blowers
	Hadagarh, Kathakata, Pitanau and Raighati.	Deployed 4 nos fire squad
	Gadachandi (Boula RF)	Maint. of fire line over 13.5 Kms.
	Bhaghamunda (Atei RF)	Deployed 1 no fire squad
2017-18	Deogaon Range	Purchase of 2 nos Fire blowers
	Brahmanipal Range	Purchase of 2 nos Fire blowers
	Anandapur Range	Purchase of 3 nos Fire blowers
2018-19	Santoshpur RF under Anandapur Range	Fire line Maintenance over 32kms
	Atei RF under Anandapur Range	Fire line Maintenance over 9kms
	Atei RF under Deogaon Range	Fire line Maintenance over 55kms
	Rebana RF under Deogaon Range	Fire line Maintenance over 92kms
	Rebana RF under Brahmanipal Range	Fire line Maintenance over 210kms
	Baranga RF	Fire line creation over 19.924 kms
	Santoshpur RF	Fire line creation over 18.42 kms
	Anandapur Range	Engagement of 5nos Fire fighting squad
	Deogaon Range	Engagement of 4nos Fire fighting squad
	Brahmanipal Range	Engagement of 4nos Fire fighting squad
	Anandapur Range	Purchase of 4 nos Fire blowers
	Deogaon Range	Purchase of 4 nos Fire blowers
	Brahmanipal Range	Purchase of 4 nos Fire blowers
	Deogaon Range	Training for Fire fighting squad members
	Anandap, Hadagarh Range, Deogaon Range & Brahmanipal Range	Logistic arrengment for Fire fighting squad

Year of Treatment	Activities Done	
	Location	Type of Work
2019-20	Santoshpur RF under Anandapur Range	Fire line Maintenance over 37.04kms
	Atei RF under Anandapur Range	Fire line Maintenance over 47kms
	Baranga RF under Anandapur Range	Fire line Maintenance over 9.96kms
	Atei RF under Deogaon Range	Fire line Maintenance over 62kms
	Rebana RF under Brahamanipal Range	Fire line Maintenance over 63kms
	Rebana RF under Deogaon Range	Fire line creation over 10 kms
	Rebana RF under Brahamanipal Range	Fire line creation over 16 kms
	Anandapur Range	Engagement of 6nos Fire fighting squad
	Deogaon Range	Engagement of 5nos Fire fighting squad
	Brahmanipal Range	Engagement of 5nos Fire fighting squad
	Gaduan(Deogaon Range)	Training for Fire fighting squad members
	Anandap, Hadagarh Range, Deogaon Range & Brahmanipal Range	Logistic arrengment for Fire fighting squad
2020-21	Anandapur Range	Engagement of 6nos Fire fighting squad
	Deogaon Range	Engagement of 5nos Fire fighting squad
	Brahmanipal Range	Engagement of 5nos Fire fighting squad

Source: DFO, Keonjhar(WL)

Appendix-XXIV

List of buildings.		
Year of Work	Building/ Wells Details	
	Name	Work Done
2007-08	Staff Qtr.,	Const. of RCC QTR at Salapada
	Staff Qtr.,	Const. of RCC QTR at Salapada
	Staff Qtr.,	Const. of RCC QTR at Salapada
	Staff Qtr.,	Const. of AC Sheet QTR at Salapada
	Forest Guard Qtr.	Const. of F.G .G.G.Bahala (A.C. Sheet)
2008-09	Forest Guard Qtr.	Const. of F.G. RCC QTR at Budhikud
	Forest Guard Qtr.	Const. of RCC QTR at Gaduan
	Protection Camp shed	Const. of Protection Camp shed at Salapada (RCC)
	Tourist hut and Congregation hall	Const. of Tourist hut and Congregation hall at Gadachandi
	Forest Guard Qtr.	Const. of RCC QTR at Sangam
	DFO, Res,	Const. of DFO, Res, Salapada (RCC)
	Staff Qtr.,	Const. of RCC QTR at Salapada
	Barrack	Const. of Barrack at Hadagarh
2009-10	Staff Qtr.,	Const. of RCC QTR at Salapada
	Garrage number-1	Const. of Garrage at Salapada 1no.
	Garrage number-2	Const. of Garrage at Salapada 1no.
	Forest Guard Qtr.	Const. of RCC QTR at Raighati
	Barrack	Const. of Barrack at Daitari
	Barrack	Const. of Barrack at Salapada
2010-11	Forest Guard Qtr.	Const. of F.G QTR at Deogaon
	Malkhana	Const. of Malkhana at Salapada
	Camp shed	Const. of Camp shed at Brahmanipal RCC
2011-12	Rescue Centre of wild animal	Const. of Rescue Centre of wild animal at Kathakata
	Forest Guard Qtr.	Const. of F.G QTR at Bahia
	Barrack	Const. of Barrack at Gayalamunda
	Range Office	Const. of Range Office at Hadagarh
	Barrack	Const. of Barrack at Singibilla
	Forest Guard Qtr.	
	Forest Guard Qtr.	Const. of F.G QTR at Baranga
2012-13	Forest Guard Qtr.	Const. of F.G QTR atBasantapura
	Watch tower	Const. of Watch tower at Dalki
	Protection Camp shed.	Const of Protection Camp shed, Dalki

Year of Work	Building/ Wells Details	
	Name	Work Done
2013-14	Range Office	Const. of Range Office at Deogoan
	Malkhana	Const. of Malkhana at Deogoan
	Seizure yard	Const. of Seizure yard at Brahmanipal
	Forest Guard Qtr.	Const. of F.G QTR at Harichandanpur
	Forest Guard Qtr.	Const. of F.G QTR at Taneipal
	Forest Guard Qtr.	Const. of F.G QTR at Anandapur
	Forest Guard Qtr.	Const. of F.G QTR at Pitanau
	Forest Guard Qtr.	Const. of F.G QTR at Sagadapata
2014-15	Forest Section Office	Const. of Forest Section Office, Kathakata
	Forest Guard Qtr.	Const. of F.G QTR at Ostapura
	Forest Guard Qtr.	Const. of F.G QTR at Kantipal
2014-15	Forest Guard Qtr.	Const. of F.G QTR at Palaspal
	Forest Guard Qtr.	Const. of F.G QTR at Baliparabat
	Forest Guard Qtr.	Const. of F.G QTR at Barabahali
2015-16	Nil.	Nil.
2016-17	Range Officer Residence	Const. of Range Officer Residence at Hadagarh
	Forester Qtr.	Const. of Forester Qtr. At Palaspal
	Forest Guard Qtr.	Const. of F.G QTR at Panasadiha
	Forest Guard Qtr.	Const. of F.G QTR at Palaspal
2017-18	**CAMPA-APO-2016-17**	
	Range Office Residence	Construction of RANGE Office Residence at Brahmanipal Range
	Forester Quarter	Construction of Forester quarter at Deogaon (Deogaon Range)
	Forest guard quarter	Construction of Forest guard quarter at Ganpur (Anandapur Range)
	Forest guard quarter	Construction of Forest guard quarter at Raighati (Hadagarh Range)
	Forest guard quarter	Construction of Forest guard quarter at Palaspal (Brahmanipal)
	Forest guard quarter	Construction of Forest guard quarter at Mahabiraposi (Brahmanipal)
	Anti-poaching check gate quarter	Construction of Anti-poaching chack gate quarter at Bareigoda

Year of Work	Building/ Wells Details	
	Name	Work Done
2018-19	Range Office Residence	Construction of RANGE Office Residence at Anandapur Range
	Forester Quarter	Construction of Forester quarter at Anandapur
	Forest guard quarter	Construction of Forest guard quarter at Anandapur
	Forest guard quarter	Construction of Forest guard quarter at Gayalamunda
	Forest guard quarter	Construction of Forest guard quarter at Gadachandi
	Forester Quarter	Construction of Forester quarter at Salapada
	Anti-poaching Barrack	Construction of Barrack at Chaturisahi Hadagarh Range
	Anti-poaching Barrack	Construction of Barrack at Masaghati Hadagarh Range
	Anti-poaching check gate	Construction of Check Gate at Taneipal Anandapur Range
	Parmanent Camp Shed	Construction of Permanent Camp Shed at Salapada
2019-20	Forester Quarter	Construction of Forester Quarter at Hadagarh Range
	Forest guard quarter	Construction of Forest guard quarter at Daitari Brahmanipal
2020-21 (up to October'20)	Range Office Residence	Construction of Range Office at Deogaon
	Range Office	Construction of Range Office at Anandapur
	Forester Quarter	Construction of Forester quarter at Bhagamunda Deogaon
	Forest guard quarter	Construction of Forest guard quarter at Hatichapal Anandapur Range under progress
	Forest guard quarter	Construction of Forest guard quarter at Kathakata Hadagarh Range under progress
	Forest guard quarter	Construction of Forest guard quarter atBaniapanka Hadagarh Range under progress
	Forest guard quarter	Construction of Forest guard quarter at Hadaharh(Hadagarh Range) under progress

Source: DFO, Keonjhar(WL)

PLANTATION SURVEY **Annexure-XXV(A)**

Range	Scheme	Year of Plantation	Location	Area (In Ha.)	Species	Mean Average Height (In Mtr.)	Mean Average Girth (In cm.)	Survival Percetage on whole
1	2	3	4	5	6	7	8	9
Brahamanipal	**CAMPA**	2010-11	Chhutung	40	Teak	4	20	15.16
					Radhachuda	2.5	12	
					Acacia	16.5	42.5	
					Chhatian	8	18.84	
	CAMPA	2010-11	Talapada	50	Teak	5.97	28.79	61.02
	CAMPA	2010-11	Rebena		Teak	5.74	29.56	26
				50	Chatian	4	45	
	State Plan	2013-14	Talapada	10	Bamboo			NIL
	State Plan	2011-12	Talapada	7	Bamboo			NIL
	Fodder	2014-15	Tukripada	30	Teak	3.75	17.71	28.54
					Sirisa	4	17.2	
					Simaruba	4	16.6	
					Chhatian	2	16	
					Karanja	3	32	
					Piasal	3.3	13.6	
					Gambhari	4	16.25	
					Sisoo	4	18	
	Fodder	2013-14	Kantajhari	6	Krushnachuda	Seedling		36
					Teak			
					Sisoo			
					Kasi			
					Radhachuda			
					Asana			
					Bahada			
					Bela			
	OBDA	2011-13	Rebena	10	Bamboo			NIL

	NBM	2012-13	Tukripada	5	Bamboo			NIL
	13th FC Fodder	2012-13	Rebena		Teak	3	17.25	23.3
				10	Sirisa	5	5	
	CSR	2017-18	Chandan Hudi	15				78
			Bada Jimei	15				
	OMBARDC		Mahulapanga	20				80
	AJY		Gumundu	10				78
			Rebana	10				
Deogaon	**CAMPA compensatory Afforestation**	2015-16	Nuabaripal	4	Acacia	4	18	69
	CAMPA	2010-11	Jhinkipita	5	Teak	2.5	13.3	60.05
	State Plan	2014-15	Ostiaposi	5	Bamboo			NIL
	CAMPA	2010-11	Mudinucha	10	Teak	3.3	10.2	9
	MGNREGS	2015-16	Kamalangi	5	Bamboo	1.3		61
	CAMPA	2010-11	Billa	20	Teak	2.7	10.9	10
					Simaruba	4	10	
	State Plan	2011-12	Gargadbahal	6	Bamboo			NIL
	CAMPA	2010-11	Chasatangiri	20.29				NIL
	State Plan Fodder	2012-13	Billa	6	Teak	3.6	13.6	62
	AJY	2017-18	Chasatangiri	10				75
			Garagadabahala	10				
			Bhoka	10				
Anandapur	**CAMPA Bald Hill**	2015-16	Patharapada		Kaju	1.25	12.3	
					Amba	1.125	15	
					Mahaneem	2.25	9.375	
					Bara	1.22	11.614	
					Neem	2.08	9.5	
					Aswasta	1.45	9.44	
					Simaruba	1.3	10.16	
					Badachakunda	2.9	16	
					Acacia	2.9	12.83	
					Dimbiri	1.8	13.4	

					Sirisa	2.145	14.75	
					Gambhari	2	10	
					Jamu	1.45	11	
				20	Teak	1.3	12	67.5
					Karanja	1.475	9.5	
					Babul	1	10.8	
					Tentuli	1.375	10.75	
					Sanachakunda	2.285	15.57	
					Dhauranga	1.125	8.5	
					Gohira	1	10	
					Ambada	0.9	10	
					Simili	1	11.66	
					Bela	1	10	
					Sunari	1.5	8	
					Amla	1.75	12.5	
					Panasa	2	15	
					Arjuna	3	12	
	State Plan MGNREGS	2015-16	Chandikahaman	5	Bamboo	1.25		85
	State Plan	2014-15	Chandikahaman	5	Bamboo	1.25		73
	Fodder	2014-15	Chandikahaman	20	Barakoli	1.72	2.5	
					Ambada	3.5	16	61
					Gohira	1.2	1.6	
	State Plan 13th FC	2011-12	Dhobani	20	Teak	4	27.4	7
	State Plan Fodder	2012-13	Mahisabahali		Eucalyptus	2.675	6	
					Teak	1.875	6.25	
					Neem	2	9	
					Acacia	3.5	9	
					Chakunda	2	10	35.37
					Sirisa	3.25	12	
					Jamu	1.06	5.6	
					Kaju	1.6	8	
				10	Bamboo	2.8		

	CAMPA	2010-11	Jugalkishorpur	25	Teak	6.15	30.77	63.16
	Fodder	2013-14	Satatira River side		Sisoo	8	33	84
					Acacia	9.75	29.5	
					Krushnachuda	4	30	
					Radhachuda	5	29	
					Amba	3.3	7.3	
					Sirisa	22	12	
					Subabulk	3	12	
					Badachakunda	8	22.5	
				7	Sanachakunda	8	22	
	Compensatory Afforestation	2009-10 & 2010-11	Arjunabania	5	Teak	2.5	10.3	15.2
	Urban Plantation	2014-15	Dhaneipitha		Kaju	3	15	73.5
					Jamu	2.5	12	
					Neem	2	15	
					Simaruba	3	14	
				2	Sanachakunda	3	15	
	AR (AJY)	2017-18	Khajuribani	10				65
			Kantala	10				
	AR Plantation (CSR)		Baranga RF	30				61

Plantations undertaken by Keonjhar Wild Life Divison						Annexure-XXV(B)
Year	Name of Scheme	Name of Range	Location of plantation	Area planted (in ha.)	No.of seedlings planted	Seedlings Planted
1	2	3	4	5	6	7
1983-84	NREP	Anandapur	Panasadiha	20 ha.		Acasia, Arjuna
		Deogaon	Kadagatha K.F	16 ha.		
		Anandapur	Kollhadiha	8 ha.		
			Panasadiha	8 ha.		
			Chhenapati	8 ha.		
			Turigaon	8 ha.		
1983-84		Deogaon	Chasatangiri	13 Ac.		Asana, Arjuna
		Deogaon	Rebena R.F	55ha.		
			Atei RF	50ha.		
			Nalapanga BRF	25ha.		
			Patilo BRF.	30ha.		
		Anandapur	Kantipal	40ha.		
			Kantala	60ha.		
1984-85 Drought relief scheme.		Deogaon	Dalki	15ha.		
			Chadakmara	50ha.		
			Sagadapata	60ha.		
		Anandapur	Baniajodi (Encroachmen	100ha.		
			Hatadihi (Encroachmen	100ha.		
		Daitary	Daitary	8ha.		
			Baliparbata	10ha.		
		Deogaon	Gundichaghai	10ha.		
1984-85		Anandapur	Panasadiha	10ha.		
			Dhenkasanga m	10ha.		
		Deogaon	Rekutia (College)	10ha.		
			Chamuhin	5ha.		
			Balibaruan	5ha.		
			Astapur	1ha.		
			Sailang-Deogaon	5Km.		
		Anandpur	Anandpur-Hatadihi	4.5Km.		
1985-86	NREP	Anandapur	Baniajodi	30ha.		
			Jhadeswar	100ha.		
			Hadagarh	30ha.		
			Jhunigaon	10ha.		
			Dhenkasanga m	10ha.		
		Deogaon	Chhutung	15ha.		
			Sagadapata	20ha.		
			Billa.	20ha.		
			Bramhanidebi	5ha.		
1986-87		Anandapur	Garh chandi vill-	30ha.		Asana, Arjun, Karanja, Teak, Sisoo, Chakunda Acasia, Holde

			Garh chandi vill-Sadha.	40ha.		Chakunda,Acasia, Halda, Bamboo
			Garh chandi vill-	100ha.		
			Baniapanka	40ha.		
		Deogaon	Baripal vill-	60ha.		Asana, Arjun, Karanja, Teak, Sisoo, Chakunda,Acasia, Halda, Bamboo
			Sagadapata vill- Billa.	50ha.		
			H.C.Pur vill-Nuagaon	50ha.		
		Anandapur	Garh chandi (Rangamatia)	0.9Km.		
			-do-	1.2km.		
			Purunapani	3.0km.		
			Baniapanka	1.2km.		
		Deogaon	Baripal	1.8km.		
			Sagadapata	1.5km.		
			H.C.pur	1.5Km.		
		Anandapur	Garh chandi vill-Rangamatia.	30ha.		
			Garh chandi	40ha.		
			Garh chandi vill-Purunapani	100ha.		
			Baniapanka	40ha.		
		Deogaon	Baripal	60ha.		
			Sagadapata	50ha.		
			H.C.pur	50ha.		
1987-88		Deogaon	Salkudahi	63ha.		
1988-89		Anandapur	Purunapani	62ha.		
			Kaliamuha	55ha.		
			Sankatapalia	50ha.		
		Deogaon	Barigaon KF	67ha.		
			Talapada KF	60ha.		
			Taladihi KF	40ha.		
1989-90		Anandapur	Gohaldahi	120ha.		
			Raighati	80ha.		
		Deogaon	Remal	70ha.		
			H.C.Pur	70ha.		
			Daitary	60ha.		
		Deogaon	Bhagamunda	20ha.		
		Anandapur	Santoshpur	30ha.	80000	
1990-91 eco.plnt.		Anandapur	Boula RF	13ha.	20800	Teak, Bamboo Ganbhara &Sisoo.
1991-92	**Eco. Plnt.**	Anandapur	Kathakata (In boula RF)	25ha.	22500	Teak, Sisoo, Gambhara &Bamboo
		Deogaon	Sagadapata in Rebena RF	75ha.	40000	Teak
1995-96 b-eco. plnt.		Anandapur	Pitanau	80ha.	128000	
			Padhanghati	60ha.	96000	
			(Luniapatna RF)	10ha.	16000	
	Silvi-	Anandapur	Boula RF	5ha.	13000	
1996-97	**b-Eco. plnt**	Anandapur	Santoshpur RF	5.50ha.	8800	
1997-98	**ECO/ RDF**	Deogaon	Malarpada BRF	33ha.	10000	Teak, Karanja

2001-02	**I.A.EP**	Deogaon	Baranga BRF	400ha.	30800	M.Neem, Sisoo, Accasia, Simarua, Karanja, Tamarind, Teak, Bamboo, Jack,
2003-04	**Eco. Plnt.**	Deogaon	Mahulagadia	30ha.	48000	Teak & Others
2003-04		Brahmanipa l	Mahulgoda	30	48000	Gambhari, Teak and Sisoo
2004-05		Deogaon	Deuldihi	16.386		
			Ranipada	40.4683	142136	Mixed Plantation
		Anandapur	Deojharan	6.7178		
			Kantala	19.9065		
			Bhalughar	22.0028	175390	Mixed Plantation
			Uleihundi	6.9444		
			Putjhari	4.8764		
			Haribeda	9.7084		
2005-06		Brahmanipa l	Turkipada	100	30000	
		Hadagarh	Kaliamba			
			Kathakata	50	15000	Fodder species

INFORMATION ON TRANSFER OF PLANTATION FROM DIFFERENT WINGS TO KEONJHAR (WL) DIVISION							Annexure-XXV(C)	
Name of the Agency transferring plantation	Year of Plantation	Year of transfer	Name of the Range	Location of the Plantation	Area of Plantation in Ha.	Species planted	No.of Species planted	Survival Percentage at the time of transfer
Balasore Affn.Division	1997-98	2003-2004	Hadagarh	Baniapanka	30	E.Ptus, Sisoo, Neem etc.	48000	52.5
Balasore Affn.Division	2000-01	2003-2004	Hadagarh	Baula,Chiljhari	20	Anla, Arjun, Jamu etc,	22000	58.5
Balasore Affn.Division	1999-2000	2003-2004	Hadagarh	Baula,Chiljhari, Bahia	100	Natural regeneration		
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Baula RF	75	Sisoo, Gohira, Karanja	20000	45
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Purunapani N.R	100	Sisoo, Sirish, Neem	20000	61
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Kaliamba N.R.	150	Gambhar, Chakunda, Simul	31000	53
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Gadachandi	60	Gambhar, Chakunda, Simul	66000	58
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Sankatapalia	125	Gambhar, Chakunda, Simul	25000	62
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Ketaki M.I.	75	Bamboo, Mahula, Bahada etc.	82500	71
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Tanda N.R.	100	Bamboo, Mahula, Bahada etc.	20000	62
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Rangamatia N.R.	100	Bamboo, Mahula, Bahada etc.	20000	61
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Nuasahi N.R.	50	Bamboo, Mahula, Bahada etc.	10000	59
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Raighati M.I	40	Gambhar, Bija, Sisoo etc.	44000	61
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Nuasahi N.R.	50	Gambhar, Bija, Sisoo etc.	15000	57
Cuttack Affn. Division	1999-2000	2003-2004	Hadagarh	Phuljhar N.R.	75	Gambhar, Bija, Sisoo etc.	15000	58

Cuttack Affn. Division	2000-2001	2003-2004	Hadagarh	Sundarsini N.R.	125	Gambhar, Bija, Sisoo etc.	25000	61
Cuttack Affn. Division	2000-2001	2003-2004	Hadagarh	Chiljhari N.R.	125	Gambhar, Bija, Sisoo etc.	25000	61
Cuttack Affn. Division	1999-2000	2003-2004	Anandapur	Atei R.F.	140	Natural regenration		
Cuttack Affn. Division	2000-2001	2003-2004	Anandapur	Naniakbahali	25	Gambhari, Sisoo etc.	10000	45
Cuttack Affn. Division	2000-2001	2003-2004	Anandapur	Barang	25	Bamboo	10000	55
Cuttack Affn. Division	1999-2000	2003-2004	Anandapur	Barang	200	Akasia, Bamboo etc.	320250	51

List of Plantations raised by O.F.D.C.Ltd, Keonjhar Annexure-XXV(D)

Year	Name of Scheme	Name of the Sub-Division /Block	Name of the Plantation	Nature of Land	Area in H.C.	Species planted	No. of trees planted	Total Working cost	Remarks
	1		3	4	5	6	7	8	9
1986-87	N.R.E.P. D.R.D.A.	Anandapur/ Ghasipura	Kantipal	R.L.	25	-do-	40000	20630	Damaged Transfer to D.F.O.(T)
	-do-	-do-	Hatibandha	BRF	45	-do-	72000	47067.98	36% Transfer to D.F.O.(T) 15.2.91
	M.F.P.	Anandapur/ Ghasipura	Podakhamana	K.F.	30	Tola	12000	16500	Damaged Transfer to D.F.O.(T) on 24.10.91
1987-88	N.R.E.P. D.R.D.A.Keonjhar	-do-	Khatpal	K.F.	154	Banboo, S.Babul, Acasia	246400	293949	Damaged Transfer to D.F.O.(T) on 24.10.91
	-do-	-do-	Tangiriapal	K.F.	65	-do-	104000	130677	74% Transfer to D.F.O.(T) on 6.1.94
	-do-	-do-	Hatibandha	B.R.F.	20	-do-	32000	41845	41% Transfer to D.F.O.(T) 15.2.91
	-do-	-do-	Badakhamana	K.F.	37	-do-	59200	64740	1% Damaged Transfer to D.F.O.(T) 24.1.91
	-do-	-do-	Baranga	B.R.F.	144	-do-	230400	249771	44% Transfer to D.F.O.(T) 7.7.91
1987-88	N.R.E.P. D.R.D.A.Keonjhar	Keonjhar Pl./ Harichandanpur	Budhakhaman	KF	50	-do-	83000	108528	5%Transfer to D.F.O.(T) 2.4.91
	Silvipasture								
	N.R.E.P	Harichandanpur	Sanarpada	KF	40	-do-	64000	64736.4	50%Transfer to D.F.O.(T) 23.6.91
	-do-	H.C.Pur	Budhakhaman	KF	95	-do-	162000	155217.5	60%Transfer to D.F.O.(T) 23.6.91
						E.puts,Accasia,			

1988-89	-do-	Anandapur Pl. Ghasipura	Baranga	BRF	350	Sisoo,Bamboo, etc.	560000	468984	49%Transfer to D.F.O.(T) 8.7.91
	-do-	-do-	Gohira	RL	35	-do-	56000	95865	48%Transfer to D.F.O.(T) 5.7.91
	-do-	-do-	Khadbil	RL	7	-do-	11200	14554.84	21%Transfer to D.F.O.(T) 5.7.91
	-do-	-do-	Naduan	RL	8	-do-	12800	8873.35	27%Transfer to D.F.O.(T) 5.7.91
89-90	N.R.E.P.	Anandapur PL Ghasipura	Jinkipita	KF	80	Bamboo, Acasia, Anla,Karanja, Tentuli, etc.	128000	128945	4.5%Transfer to D.F.O.(T) 6.1.94
	-do-	-do-	Baranga	BRF	70	-do-	112000	112827.4	5%Transfer to D.F.O.(T) 6.9.92
90-91	M.F.P.	Keonjhar PL Harichandanpur	Budhakhaman	RL	25	Karanja, Panasa, Anla, etc.	40000	85682	61%Transfer to D.F.O.(T) 13.7.93
	-do-	Harichandanpur	Taldihi	KF	25	-do-	40000	60713.43	57%Transfer to D.F.O.(T) 6.1.93
	-do-	-do-	Gharsanatangar	KF	25	-do-	40000	61751.9	53%Transfer to D.F.O.(T) 6.1.93
	-do-	-do-	Deulahudi	KF	24	-do-	28400	55533.35	53%Transfer to D.F.O.(T) 6.1.93
	-do-	-do-	Badasialimala	KF	16	-do-	24000	34790.85	53%Transfer to D.F.O.(T) 6.1.93
	-do-	-do-	Raidiha	KF	25	-do-	40000	57726.77	53%Transfer to D.F.O.(T) 6.1.93
	M.F.P.	Anandapur PL Anandapur	Kanto	KF	20	Anla, Bahada, Asana, Arjuna, etc.	32000	41961.45	35%Transfer to D.F.O.(T) 6.1.94
91-92	J.R.Y. Silvipasture	Anadapur PL Kalimati	Arjunabila	RL	4	-do-	10000	33453	56.32%Transfer to D.F.O.(T) 12.2.94
	-do-	Ghasipura	Purunabandhaghera	RL	4	-do-	10000	36903	83.11%Transfer to D.F.O.(T) 27.3.94

	-do-		Biragobindapur	RL	25	E.Puts, Accasia, Chakunda, Sisoo, Arjuna, Bamboo	62500	228168	76%Transfer to D.F.O.(T) 29.4..94
92-93	J.R.Y.	Anadapur PL Ghasipura	Nuhamalia	RL	12	E.Puts, Khaira, Gambhari, etc.	30000	113093	77%Transfer to D.F.O.(T) 21.4.95
	J.R.Y. Mixed	Hatadihi	Asia	RL	25	-do-	62500	261688.06	77.07%Transfer to D.F.O.(T) 4.4.95
	Silvipasture	Deogaon PL Ghasipura	Baripal	RL	12	-do-	30000	175230.24	84.21%Transfer to D.F.O.(T) 19.4.95
	R.D.F. Compensatory	KeonjharPL Harichandanpur	Dumuria	RL	191.52	-do-	286600	1349189	73%Transfer to D.F.O.(T) 17.4.95
	-do-	Deogaon PL Ghasipura	Jhinkipita	RL	147.802	-do-	231500	919979	76%Transfer to D.F.O.(T) 23.5.95
	-do-		Badakatali	RL	24.427	-do-	61075	260181	82.1%Transfer to D.F.O.(T) 30.4.95
	-do-		Basantapur	RL	51.536	-do-	128600	245057	75%Transfer to D.F.O.(T) 25.5.95
	-do-	Ghatagaon PL Harichandanpur	Kanheigola	RL	150	Accasia, E.Puts, Sisoo, Cashew, etc.	330600	1388539	75%Transfer to D.F.O.(T) 25.5.95
	M.F.P.	Anandapur PL Anandpur	Baunsghasi	RL	20	-do-	32000	106855.66	71%Transfer to D.F.O.(T) 16.7.96
	-do-	Hatadihi	Sundarfpal	RL	20	-do-	32000	103311.86	63%Transfer to D.F.O.(T) 30.7.96
	-do-	Deogaon PL Ghasipura	Kalimati	RL	15	-do-	24000	76015.75	75%Transfer to D.F.O.(T) 5.7.96

93-94	-do-		Nuabaripal	RL	15	-do-	24000	74162.63	50%Transfer to D.F.O.(T) 5.9.98
	-do-		Gopalpur	RL	25	-do-	40000	111414.09	55%Transfer to D.F.O.(T) 24.8.96
	-do-	Harichandapur	Sarubila	RL	20	-do-	50000	255436.43	85%Transfer to D.F.O.(T) 1.10.96
	-do-	Anandapur PL Hatadihi	Jambubira	RL	10	-do-	25000	184641	77.54%Transfer to D.F.O.(T) 22.9.96
94-95	M.F.P.	Anandpur PL Hatadihi	Baruaw	RL	15	-do-	24000	74320.46	55%Transfer to D.F.O.(T) 19.4.97
	-do-	-do-	Kathakata	ARF	20	-do-	32000	99087.85	22%Transfer to D.F.O.(T) 12.4.97
	-do-	-do-	Purunaghati	RL	40	-do-	64000	195524	51%Transfer to D.F.O.(T) 12.4.97
	-do-	-do-	Asia	RL	25	-do-	40000	123820.21	50%Transfer to D.F.O.(T) 28.4.97
94-95	M.F.P.	Deogaon PL Ghasipura	Ostapura	BRF	40	-do-	64000	199875.66	50%Transfer to D.F.O.(T) 22.4.97
	-do-	-do-	Masaghati	RF	30	-do-	48000	144026.87	52%Transfer to D.F.O.(T) 22.4.97
	-do-	-do-	Chandaposi	RF	30	-do-	48000	153917.97	51%Transfer to D.F.O.(T) 22.4.97
	-do-	Anandpur PL Anandapur	Kolimati	RL	10	-do-	68000	192962.94	75%Transfer to Sect. TRCS, Kuladiha on 26.7.97
	-do-	Deogaon PL H.C.Pur	Sagadapata	RL	10	Asan, Arjun etc.	68000	193553.45	76.33%Transfer to Sect. TRCS, Tanagiripal on 23.4.97
95-96	JRY Sericulture	Anandapur PL Anandapur	Kolimati	RL	10	-do-	68000	184007.66	75.73%Transfer to Benificiaries through Sarapanch Kolimati GP on 30.2.98.
	-do-	Anandapur PL Hatadihi	Bancho	2 Rkm		-do-	4200	99514.05	82.26%Transfer to Sarapanch, Bancho G.P on 13.3.98

Source: -Divisional Manager, Keonjhar (C) Division

COMPENSATORY AFFORESTATION SITES FOR APPROVED PROJECTS OF KEONJHAR DISTRICT AND PLANTATION TAKEN OVER — **Appendix XXV-E**

Sl No.	Name of the project	Non Forest Land alloted	Area Stipulated for Plantation.						Plantation taken over						
			Tahasil	Village/RF	Khata No.	Plot No	Kissam	Area in ha	Tahasil	Village	Khata No.	Plot No.	Kissam	Total area Planted	Year of Plantation
1	Joda East		Ghatgaon	Kundapitha	171/1	42/2094	P-I	2.5671							
	Mines of			Deulahudi	23/1	1/392	P-II	16.3857	Ghatgaon	Deulahodi	23/1	1/392	P-II	16.3857	WL Div.
	M/s. TISCO Ltd.			Ranipada	32/1	362/395	Patharbani	24.2812	Ghatgaon	Ranipada	32/1	362/395	Patharbani	24.2812	WL Div.
						317/396	Patharbani	16.1874				317/396	Patharbani	16.1874	WL Div.
								59.4214						**56.8543**	
			Anandapur	Kantala	49AAA	246	Patharbani	3.0432	Anandapur	Kantala	49AAA	246	Patharbani	3.0432	WL Div.
						267	Patharbani	1.9749				267	Patharbani	1.9749	WL Div.
						277	Patharbani	0.5666				277	Patharbani	0.5666	WL Div.
						303	Patharbani	0.8943				303	Patharbani	0.8943	WL Div.
						385	Patharbani	0.7001				385	Patharbani	0.7001	WL Div.
						386	Patharbani	1.2262				386	Patharbani	1.2262	WL Div.
						896	P-II	1.9263				896	P-II	1.9263	WL Div.
						970	Patharbani	3.5774				970	Patharbani	3.5774	WL Div.
						1018	Patharbani	1.9830				1018	Patharbani	1.9830	WL Div.
						1064	Patharbani	0.9227				1064	Patharbani	0.9227	WL Div.
						223/1121	Patharbani	1.6026				223/1121	Patharbani	1.6026	WL Div.
						455	Patharbani	1.4892				455	Patharbani	1.4892	WL Div.
								19.9065						**19.9065**	
				Patajhari	57	98	Patharbani	0.8498		Patajhari	57	98	Patharbani	0.8498	WL Div.
						224	P-II	1.5580				224	P-II	1.5580	WL Div.
						406	Patharbani	0.4452				406	Patharbani	0.4452	WL Div.
			Anandapur	Patajhari	57	415/1	P-II	0.6475		Patajhari	57	415/1	P-II	0.6475	WL Div.
						478	P-II	1.3759				478	P-II	1.3759	WL Div.
								4.8764						**4.8764**	
				Haribeda	25	76	Patharbani	1.7563		Haribeda	25	76	Patharbani	1.7563	WL Div.
						78	Patharbani	0.8256				78	Patharbani	0.8256	WL Div.
						123	Patharbani	0.4775				123	Patharbani	0.4775	WL Div.
						131	Patharbani	1.8211				131	Patharbani	1.8211	WL Div.
						134	Patharbani	0.5180				134	Patharbani	0.5180	WL Div.
						216	Patharbani	4.3100				216	Patharbani	4.3100	WL Div.
								9.7085						**9.7085**	
				Bhalughar	76	128	Patharbani	1.0279		Bhalughar	76	128	Patharbani	1.0279	WL Div.
						188	Patharbani	1.4569				188	Patharbani	1.4569	WL Div.
						358	Patharbani	2.7519				358	Patharbani	2.7519	WL Div.
						399	Patharbani	1.2505				399	Patharbani	1.2505	WL Div.
						427	Patharbani	2.7316				427	Patharbani	2.7316	WL Div.
						559	Patharbani	1.8211				559	Patharbani	1.8211	WL Div.
						570	Patharbani	1.7604				570	Patharbani	1.7604	WL Div.
						572	Patharbani	1.3152				572	Patharbani	1.3152	WL Div.
						801	Patharbani	2.3350				801	Patharbani	2.3350	WL Div.
						811	Patharbani	5.5361				811	Patharbani	5.5361	WL Div.
								21.9866						**21.9866**	
				Deojharan	39	423	P-I	5.1193		Deojharan	39	423	P-I	5.1193	WL Div.
						553	P-I	1.5985				553	P-I	1.5985	WL Div.
								6.7178						**6.7178**	
				Uleikundi				6.9444		Uleikundi				6.9444	WL Div.
2	Jilling - Langalota		Anandapur	Asia	97	170/1(P)	P-III	4.5972	Anandapur	Asia	97	170/1(P)		4.597	WL Div.
				Basantpur	523	158/2	Parbat	8.4134							
3	Iron & Mn mines	30.8047	Anandapur	Asanbahali	7AAA	144/B	Patharbani	12.893							
	of ESSEL					150	Patharbani	9.2067							
						160/P	Patharbani	8.705							
								30.8047							
4	Kanpur MIP		Anandapur	Jhinkipita	26	141	Paarbat(60 ac)	24.2812							
						55	Paarbat-I(80 a	32.3749							
						172	Paarbat(50 ac)	20.2343							
								76.8904							
			Anandapur	Jhinkipita	26	329	Paarbat(26ac)	10.5218							
						514	Paarbat(150ac	60.7029							
							Total (366ac)	**71.2247**							
				Basantapur	523	4/p	Parbat(26.96a	10.9063							
						158/p	P-I(99.21ac)	40.1367							
							Total (126.17a	**51.043**							
				Badaektali	248	1081/1287/p	Parbat(60.35a	24.4228							
5	M/s O.M.C.Ltd	17.365	Anandapur	Asanbahali	7AAA	124/p	Patharbani	17.365							
	serenda Bhadrasahi Mines														
	M/s SAIL, Bolani Ore	113.5266	Anandapur	Khalana	1/1	172/7067	P-II	4.047							
				Talagaon	2/1	594	P-I	16.3084							
				Asanbahali	1/1	111/381	Patharbani	20.235							
				Samukanendi	1/1	134/2660	Patharbani	4.855							
				Sanpurunapani	1/1	106/645	P-II	11.9628							
			Hatadihi	Asia	86/71	1	P-II	14.8675							
						2	P-II	12.5537							
						4/512	P-II	0.9348							

					170/513	P-II	21.6919	
							50.0479	
6	M/S O.M.C. Ltd.	214.423	Hatadihi	Bahabaraduda	292	11	Patharbani	1.994
	Daitari Township					14	Patharbani	2.306
						17	Patharbani	5.443
						19	Patharbani	1.706
						27	Patharbani	10.117
						29	Patharbani	4.047
						32	Patharbani	1.214
						63	Patharbani	5.135
						117	P-III	6.289
						328	P-III	10.574
						583	P-III	5.504
						727	P-III	4.800
						799	P-III	4.301
								63.430
				Matha	319	1/1585	P-III	28.329
						1/1586	P-III	7.203
								35.532
		214.423	Hatadihi	Asia	97	90	P-III	16.188
						341		16.188
				Nuaragadi	109	2	P-I	12.546
						106	P-I	6.475
				Padhiaripally	345	692	P-III	19.345
				Sundarapal	392	2	P-II	35.128
				Podasingidi	195	125	P-III	5.140
				Thunigaon	39	1/152	P-III	4.452
								115.461
		77.4	Anandapur	Asanbahali	7AAA	121/B	Patharbanbi	43.2
						124/P	Patharbanbi	34.2
								77.4
		17.365	Anandapur	Asanbahali	7AAA	124/P	Patharbani	17.365
7	Joda West	14	Anandapur	Asanbahali	7AAA	68/b	Patharbani	5.5
	Mn. Mines					121/p	Patharbani	5.4
						1	Patharbani	3.1
								14
8	Sri S.D.Sarma	23.245	Anandapur	Asanbahali	7AAA	135	Patharbani	5.949
	Mines Owner					144/p	Patharbani	17.296
								23.245
9	Sri D.B.Pattnaik	8.54	Anandapur	Asanabahali	7AAA	160/P	Patharbani	8.54
	Jamudiha Kha &							
	Balidiha Project							

Appendix XXV(F)

YEAR WISE AND SPECIES WISE COMMERCIAL PLANTATION FROM 1980-81 TO 2005 OF O.F.D.C Ltd. KEONJHAR (C-KL) DIVISION.

Sl. No.	Year	Location of Plantation	Area Planted in Hac.	No. of Scheduling Planted	Species planted	Expenditure incurred.
1	1988-89	Ostapura PRF	218	328800	-do-	616845
2	1988-89	Patilo BRF	107	171200	-do-	302450
3	1989-90	Rebana RF	26	65000	Teak	141705
4	1990-91	Mankalamundi (Rebana)	60	150000	Teak	460218
5	1991-92	Baranga RF	50	125000	-do-	407117
6	1991-92	Boula RF(Chilajhari)	175	437500	-do-	1446887
		G. Total	**636**	**1277500**		**3375222**

Source: DM O.F.D.C. Ltd., Keonjhar (C) Division.

Appendix - XXV-G

Information on Site Wise Block & ANR Plantation during 2009-10 to 2020-21 in Keonjhar Wildlife Division, Anandapur.					
Year	**Name of Scheme**	**Name of the Range**	**Name of the Site**	**Name of the R.F**	**Area**
1	**2**	**3**	**4**	**5**	**7**
2009-10	**FDA**	Anandapur	Marshapal	Atei RF	10
		Anandapur	Sunduria		25
		Anandapur	Dantia	Ostapura	25
		Brahmanipal	Mahulagoda	Palaspal	40
		Brahmanipal	Kusumdiha	Turkipadda	20
		Brahmanipal	Rebana	Rebana RF	40
		Brahmanipal	Kamalangi	Rebana RF	25
		Brahmanipal	Badasiadimal	Palaspal	25
		Deogaon	Chasatangir	Rebana RF	25
		Deogaon	Golabandha		40
		Deogaon	Madhyapur	Rebana RF	20
		Deogaon	Bhoka	Rebana RF	50
		Deogaon	Palabani	Atei RF	20
		Hadagarh	Sajanapal		10
		Hadagarh	Bahia		18
2010-11	**CAMPA**	Anandapur	Jugalakishorpur (Atei RF)	Atei RF	25
		Brahmanipal	Chhutung (Rebana RF)	Rebana RF	40
		Brahmanipal	Talapada (Rebana RF)	Rebana RF	50
		Brahmanipal	Rebana	Rebana RF	50
		Deogaon	Billa	Atei RF	20
		Deogaon	Mudinucha (Atei RF)	Atei RF	10
		Deogaon	Jhinkipita	Atei RF	5
	CAMPA (woodlot)	Deogaon	Chasatangiri		20.29
	FDA	Deogaon	Gopinathpur	Palaspal	26
		Deogaon	Chhutung	Rebana RF	24
		Brahmanipal	Kantala	Rebana RF	26
		Brahmanipal	Turkipada VSS	Turkipadda	24
		Brahmanipal	Sanajimei	Rebana RF	24
		Brahmanipal	Gumunda	Rebana RF	24
		Brahmanipal	Pathuripentha, Putujhari	Rebana RF	24
		Deogaon	Harichandanpur		8
		Deogaon	Kanheigola	Rebana RF	5
		Deogaon	Badapalaspal		5
		Deogaon	Bhagamunda	Rebana RF	10
		Deogaon	Thakurpada	Rebana RF	25

		Anandapur	Baunsagarh		1
		Anandapur	Patharapada	Patilo	1
		Anandapur	Jugalkishorepur	Atei RF	1
		Anandapur	Ostapura	Ostapura	1
		Anandapur	Kalabilla	Ostapura	1
		Anandapur	Sailong	Ostapura	1
		Anandapur	Gohira	Ostapura	1
2011-12	**S.Plan 13th FC**	Anandapur	Dhabani		20
	S.Plan Bamboo	Anandapur	Budhikud	Santoshpur	7
		Brahmanipal	Talapada	Rebana RF	7
		Deogoan	Garagadabahal	Rebana RF	6
2012-13	**State Plan 13th FC**	Hadagarh	Baniapanka		12
		Hadagarh	Chaturisahi		8
	OBDP	Brahmanipal	Rebana	Turkipadda	10
	NBM (Bamboo)	Brahmanipal	Rebana	Turkipadda	5
		Brahmanipal	Bareigoda	Turkipadda	3
	FDA	Brahmanipal	Turkipada	Rebana RF	60
		Anandapur	Baranga	Baranga RF	80
	State Plan Fodder	Brahmanipal	Rebana (Near Rebana RF)		10
		Anandapur	Mahinsabahali		10
		Deogoan	Billa	Atei RF	6
		Deogaon	Gounighasa		4
2013-14	**State Plan 13 th FC**	Hadagarh	Junabadi		10
	State Plan Bamboo	Brahmanipal	Talapada	Turkipadda	10
	NBM	Brahmanipal	Rebana	Turkipadda	10
	State Plan Urban	Anandapur	Tahasil Campus, Anandapur		3000 nos.
	Fodder	Anandapur	Satatira		7
		Brahmanipal	Kantajhari	Rebana RF	6
	FDA	Brahmanipal	Turkipada	Rebana RF	60
		Brahmanipal	Kantala	Rebana RF	20
		Brahmanipal	Kanjiapal	Rebana RF	30
		Brahmanipal	Gumundu	Rebana RF	50
2014-15	**Non Plan**	Brahmanipal	Turkipada	Rebana RF	30
	State Plan		Dhaneipitha		3000nos
2015-16	**CAMPA Interest Money (Fodder)**	Anandapur	Chandikhamana	Santoshpur	20
		Hadagarh	Kathakata		5
		Deogoan	Kamalangi	Palaspal	5
	State Plan Bamboo	Anandapur	Chandikhamana	Santoshpur	5
		Brahmanipal	Pancham	Rebana RF	5
		Deogoan	Ostiaposi	Rebana RF	5
	State Plan Urban	Anandapur	Anandapur college		3000nos

	CAMPA Bald Hill	Anandapur	Patharapada		20
	CAMPA C.A/PCA	Deogaon	New Baripal		4
	FDA	Brahmanipal	Talapada	Rebana RF	10
		Anandapur	Santoshpur	Santoshpur	10
		Anandapur	Tavakud	Santoshpur	15
		Anandapur	Mandapada	Santoshpur	5
2016-17	**State Plan - D/S-IGCS- Bamboo Convergence with MGNREGS**	Anandapur	Chandikhaman	Santoshpur RF	5
		Deogoan	Kamalangi	Rebana RF	5
		Brahmanipal	Champanagar	Rebana RF	5
	State Plan - D/S-IGCS- Urban	Anandapur	Dhaneipitha Irrigation Colony		1.875
	FDA	Brahmanipal	Patharagoda	Rebana RF	40
	CSR	Anandapur	Bhikaramada	Santoshpur	40
			Rugudisahi	Santoshpur	10
			Dhaneipitha		5
2017-18	**AR Plantation (CS**	Anandapur	Baranga RF	Baranga RF	30
		Deogoan	Chandan Hudi	Rebana RF	15
		Brahmanipal	Bada Jimei	Rebana RF	15
	Urban under CSR (OMC funding)	Anandapur	Murabali & Veterinary Farm Campus,		
	AR (OMBADC)	Brahmanipal	Mahulapanga		20
	AR (AJY)	Anandapur	Khajuribani	Santoshpur	10
		Anandapur	Kantala	Santoshpur	10
		Brahmanipal	Gumundu	Rebana RF	10
		Brahmanipal	Rebana	Rebana RF	10
		Deogoan	Chasatangiri	Rebana RF	10
		Deogoan	Garagadabahala		10
		Deogoan	Bhoka		10
2018-19	**Avenue MGNREGS (Pure)**	Deogoan	Mirigimundi to Samukanandi		5
		Anandapur	Dhakotha to Salukudahi		5
		Hadagarh	Chhenapadi to Ambulapura		10
		Hadagarh	Sulana to Mugupuru		10
		Deogaon	Panchugochia to Kadagotha		5
		Brahmanipal	Bareigoda to Sanasiadimala		10
		Brahmanipal	Bareigoda to Palaspal		5
		Brahmanipal	Balishai chhak to Bangurusuni		5
	AR (Pvt. Land) MGNREGS (Pure)	Anandapur	Khadikasulabahali		1.5
		Anandapur	Patharapada		1.5
		Deogaon	Bhagamunda		2
		Deogaon	Ranipada		1.5
		Brahmanipal	Ghutung		1

		Brahmanipal	Talapada		2.5
	AR (CSR)	Anandapur	Baranga	Baranga RF	15
		Brahmanipal	Pancham	Rebana RF	20
2019-20	State Plan IGCS	Anandapur	Atei RF near Arjunaban	Atei RF	10
		Anandapur	Baranga RF near Nanda	Baranga RF	10
		Anandapur	Patharapada		15- Bald Hill
		Anandapur	Salapada SDVO Office campus		5600- UTP
	Green Mahanadi Mission	Anandapur	Taneipal		5
		Anandapur	Kodapada & Bhogapur		11.64
		Anandapur	Haridapal, Chatra & Mangalpur		18.36
		Anandapur	Tukuna		4
		Anandapur	Sudusudia		2
		Anandapur	Goudadiha		5
		Anandapur	Palaspur		2.5
		Anandapur	Nahaguna		2.5
		Anandapur	Talagaon &		49
		Hadagarh	Habaleswar		10
		Hadagarh	Gobindapur		10
		Hadagarh	Ambo		10
		Hadagarh	Bancho		10
		Deogaon	Singibilla		1750- UTP
		Deogaon	Rekutia		1750- UTP
	MGNREGS	Hadagarh	Kaliamba		3
		Deogaon	Kanneigola & Ranipada		3.5
		Brahmanipal	Siadimala		3.5
		Anandpur	Chamunhi to Naduan		5
		Deogaon	Golabandha to Rohi		5
		Anandapur	Kainipura to Balarampur		10
		Hadagarh	Baruan to Baunsagarh		7
		Hadagarh	Salabani Chhak to Khadipal		8
		Deogaon	Bhagamunda to Billa		10
		Brahmanipal	Palaspal to Sunapentha		5
		Brahmanipal	Rasol chhak to Alutuma		5
		Brahmanipal	Talapada to Gumudu Talapada to		5
	IGCS Convergence with MGNREGS	Brahmanipal	Rebana RF near Baliparbat	Rebana RF	15
		Brahmanipal	Rebana RF near Nipania	Rebana RF	15
	CSR	Brahmanipal	Rebana RF (Gopinathpu	Rebana RF	40
		Deogaon	Raghunathpur		20

2020-21	**MGNREGS State Plan GMM (UTP)**	Anandapur	Kumunia		6600
		Hadagarh	Gobindapur		5000
		Deogaon	Kolhabeda		3400
		Deogaon	Dhabadi		1600
		Brahmanipal	Gopinathapur		3400
	MGNREGS State Plan IGCS UTP (Convergence)	Anandapur	Purunia		7600
		Hadagarh	Sarala		4000
		Hadagarh	Kuradhighasa		2000
		Deogaon	Raidihi		1800
		Deogaon	Singhbilla		3200
		Brahmanipal	Gopinathapur		5000
	CSR	Anandapur	Baranga	Baranga RF	25
		Hadagarh	Sarala		10
			Karagola		15
			Kuradhighasa		10
	MGNREGS (Pvt. Land)	Anandapur	Taneipal		4000
		Hadagarh	Kaliamba		4000
		Deogaon	Nola		4000
	MGNREGS (Converged)	Anandapur	Santoshpur to Budhikud		10
	MGNREGS (Pure)	Anandapur	Dahimalia to Gendabasha		4
		Anandapur	Chaumuhin colony chhak to Bhatisira		4
		Anandapur	Patharapada to Kanpur (via-		8
		Hadagarh	Chetanakendra to Bidyadharapur		7
		Hadagarh	Sadha chhak to Gadachandi temple		3
		Deogaon	Golabandha to Majhisahi		5
		Deogaon	Nuagaon to Maniabindha		4
		Brahmanipal	Rasol to Alutuma		10
		Brahmanipal	Chilikidhara to		5
	MGNREGS (Out side	Hadagarh	K.Balipal		6.25
		Hadagarh	Karagola		6.25

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STATE FOREST HEADQUARTERS, ODISHA
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS
ARANYA BHAWAN, CHANDRASEKHARPUR, BHUBANESWAR – 23
Office No.0674-2300053/2300855, Email: affn.pccfodisha@gmail.com

Circular No. 1102 /12 (Affn.)258/2018
Dated, Bhubaneswar, the 04th October, 2018

Forest connotes an area rich in biodiversity and covers with herbs, shrubs and tree species. Forest conservation demands that the original make, composition of the forest area is maintained. Forest Plantation (Afforestation & Reforestation) programs are primarily meant to cover the area with trees, without significantly affecting the originality of the vegetation in the landscape. Species mix of any plantation program is of great importance from Forestry & Wildlife point of view, In many of the plantations in natural forest, Teak (*Tectona grandis*), Acacia (*Acacia auriculiformis*), Sana Chakunda (*Cassia siamea*) and Eucalyptus are preferred due to its non-browsable nature and fast growth. Plantation of such species in forest area significantly reduces biodiversity. Other plant species (herbs, shrubs, climbers, trees) are unable to come up below Teak and Acacia plantations. Teak, Acacia and Sana Chakunda have not much relevance for wild animals and birds. Plantation of Teak, Acacia, Eucalyptus and Sana Chakunda in Sal rich forest areas of the State is ecologically not wise.

In view of the above, as per field observations and ecological basis, following guidelines are issued for immediate implementation by all Forest & Wildlife Divisions in Odisha.

1. Nowhere in Forest area, Teak (*Tectona grandis*), Acacia (*Acacia auriculiformis*), Sana Chakunda (*Cassia siamea*) and Eucalyptus shall be planted from 2019 plantation onwards.
2. Since Bamboo reportedly sequesters higher amount of Carbon dioxide and they are also preferred food plant of wild animals especially elephants, Bamboo (*Dendrocalamus strictus, Bambusa arundinacea*) will be given high priority in the forest plantations and seed sowing in forest areas and wildlife corridors. Under planting of Bamboo (both Salia and Daba) may be undertaken in degraded forest / open forest / scrub forest to improve the density.

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3. Sincere efforts will be made to promote plantation of indigenous species including medicinal plants (A suggestive list of such plants is enclosed as **Annexure-A**).
4. Teak, Acacia, Sana Chakunda and Eucalyptus may be planted in barren, refractory area outside forest land where raising of indigenous species is extremely difficult.
5. Since Teak, Acacia, Eucalyptus are in high demand by the public due to its commercial importance, they will continue to be raised in forest department nurseries for distribution to public.
6. Tal (*Borassus flabellifer*) sapling to be planted around the boundary of forest and plantations.
7. Crown of Bara (*Ficus benghalensis*) & Aswastha (*Ficus religiosa*) provide cool shade for public and animals & shelter for Birds and other creatures. Therefore, at least 10,000 Aswastha / Baras per division needs to be plant every year.

The guidelines will come into effect for 2019-20 plantations onwards. The guidelines are issued in supercession of previous instructions in this regard and to that extent.

Swain 4/10/18

(Dr. Debabrata Swain)
Principal Chief Conservator of Forests &
Head of Forest Force, Odisha

Memo No. 20426 Dt. 04-10-2018

Copy forwarded for information and necessary action to:

1. Additional Chief Secretary, Forest & Environment Dept., Govt. of Odisha, Bhubaneswar
2. Principal CCF (WL), Odisha, Bhubaneswar
3. Principal CCF (KL), Odisha, Bhubaneswar
4. Project Director, OFSDP, Ghatikia, Bhubaneswar
5. All Regional Chief Conservator of Forests
6. Additional Principal Chief Conservator of Forests (T&D)
7. All Divisional Forest Officers (T & WL Divisions)
8. Silviculturist, Bhubaneswar / Rayagada
9. All WPOs

A K Pathrao

Additional PCCF
(Plan, Program & Afforestation)

ଏହି କାର୍ଯ୍ୟାଳୟ ଓଡ଼ିଆଭାଷାରେ ଲେଖା ଚିଠିଗୁଡ଼ିକୁ ସ୍ୱାଗତ କରୁଛି

Annexure-A/158

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List of Plantation

No.	Botanical Name	ODIA/Local Name
1	2	3
1	*A. nilotica (var. indica)*	Babul
2	*Adina cordifolia*	Kuruma
3	*Aegle marmelos*	Bela
4	*Albizia lebbeck*	Kala Sirisa
5	*Albizia procera*	Dhala Sirisa
6	*Artocarpus hetero phyllus*	Jack fruit
7	*Azadirachta indica*	Neem
8	*Anogeissus acuminata*	Phasi
9	*Anogeissus latifolia*	Dhaura
10	*Bambusa arundinacea*	Kanta Baunsa
11	*Barringtonia acutangula*	Hinjal
12	*Bauhinia variegata*	Kanchan
13	*Bixa orellana*	Kum Kum
14	*Bombax ceiba*	Simal
15	*Bridelia retusa*	Kasi
16	*Calophyllum inophyllum*	Polanga
17	*Careya arborea*	Kumbhi
18	*Cassia fistula*	Sunari
19	*Casuarina equisetifolia*	Jhaun
20	*Ceiba pentandra*	White Silk cotton tree
21	*Celastrus paniculata*	Pengu
22	*Cerbera odollam*	Paniamba
23	*Chloroxylon swietenia*	Bheru
24	*Cordia macleodii*	Samarsingha
25	*D. Sissoo*	Sissu
26	*Dalbergia latifolia*	Sissu / Pahadisisoo
27	*Dendrocalamus strictus*	Solid Bamboo
28	*Dillenia indica*	Ou
29	*Dillenia pentagyna*	Rai
30	*Emblica officinalis / Phyllanthus emblica*	Anla
31	*Ficus benghalensis*	Bar
32	*Ficus racemosa*	Dimiri
33	*Ficus religiosa*	Pipal tree
34	*Gmelina arborea*	Gamhar
35	*Lagerstroemia parviflora*	Sidha
36	*Lannea coromandalica*	Mai
37	*Litsea glutinosa*	Lodha
38	*Madhuca indica*	Mahula
39	*Mangifera indica*	Amba
40	*Mesua ferrea*	Nageswar
41	*Michelia champaca*	Champa
42	*Mimusops elengi*	Baula
43	*Mitragyna parviflora*	Mundi
44	*Morinda tinctoria / M. pubesceus*	Achu
45	*Nyctanthes arbor-tristis*	Gangasiuli

Sl. No.	Botanical Name	ODIA/Local Name
46	*Oroxylum indicum*	Phanaphana
47	*Pterocarpus marsupium*	Bija
48	*Pterospermum acerifolium*	Muchu Kunda
49	*Pterospermum solvansis*	Padhel
50	*Samanea saman*	Rain tree
51	*Santalum album*	Sandal wood tree
52	*Sapindus emarginata/ trifoliata*	Ritha
53	*Saraca asoca*	Ashok
54	*Schleichera oleosa*	Kusum
55	*Semecarpus anacardium*	Bhalia
56	*Shorea robusta*	Sal tree
57	*Soymida febrifuga*	Rohini
58	*Sterculia urens*	Genduli
59	*Streblus asper*	Sahada
60	*Strychnos potatorum*	Katak
61	*Swietenia nux-vomica*	Kochila
62	*Swietenia mahogany/ S. macrophylla*	Mahogany
63	*Symplocos racemosa*	Lodha tree
64	*Syzygiujm cumini*	Jamun
65	*Tamarindus indica*	Tamarind tree
66	*Terminalia arjuna*	Arjuna tree
67	*Terminalia bellirica*	Beleric mynobalan
68	*Terminalia chebula*	chebulic myrobalan
69	*Terminalia tomentosa/ alata*	Asana
70	*Xylia xylocarpa*	Kangada
71	*Ziziphus mauritiana*	Indian jujube

APPENDIX-XXVII

List of VSS of Keonjhar (WL) Division under Reserve Forest

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
1	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Taneipal	Ratuan	Santoshpur RF	82
2	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Dihasahi	Hatibandha RF	51
3	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Jugalkishorepur	Atei RF	140
4	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Kalabila	Atei RF	36
5	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Sailong	Ostapura RF	149
6	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Dhakotha	Arjunbania	Atei RF	64
7	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Dhakotha	Haridabahali	Atei RF	53
8	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Dhakotha	Marshapal	Atei RF	135
9	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Dhakotha	Salkudahi	Atei RF	64
10	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Dhakotha	Sandhyagotha	Atei RF	51
11	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Ostapura	Gohira	Ostapura RF	42
12	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Putujhari	Santoshpur RF	66
13	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Dahimalia	Santoshpur RF	80
14	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Budhikud	Budhikud	Santoshpur RF	50
15	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Budhikud	Mandapada	Santoshpur RF	55
16	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Taneipal	Khajuribani	Santoshpur RF	48
17	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Badudighara	Santoshpur RF	65
18	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Bhalughar	Santoshpur RF	60
19	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Haribeda	Santoshpur RF	51
20	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Kantala	Santoshpur RF	50
21	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Kusapada	Baigundi RF	71

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
22	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Panasdiha	Bhikaramda	Santoshpur RF	106
23	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Panasdiha	Dumuridiha	Santoshpur RF	52
24	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Panasdiha	Panasadiha	Santoshpur RF	64
25	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Baranga	Baranga	Baranga RF	77
26	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Ganpur	Nandabara	Baranga RF	66
27	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Patilo	Kainsiari	Meghanadpahi RF	51
28	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Patilo	Khadi Kasul bahali	Patilo RF	83
29	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Patilo	MaaMangala	Patilo RF	50
30	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Patilo	Nuniapatna	Nuniapatna RF	68
31	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ramchandrapur	Patilo	Patharapada	Patilo RF	23
32	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Budhikud	Santoshpur	Santoshpur RF	300
33	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Ram chandrapur	Patilo	Dantia	Patilo RF	150
34	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Ostapura	Ostapura	Ostapura RF	200
35	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Mahinsa bahali	Ostapura RF	75
36	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Budhikud	Tavakud	Santoshpur RF	280
37	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Budhikud	Budhikud	Taneipal	Santoshpur RF	100
38	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Ghanteisuni	Gayalamunda RF	100
39	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Bramanipal	Baliparbat	Baliparbat	Rebana RF	55
40	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Bramanipal	Baliparbat	Pancham	Rebana RF	57
41	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Bramanipal	Brahmanipal	Tentulipal	Rebana RF	54
42	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana	Bareigoda-1	Rebana RF	77
43	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana	Mundasahi	Rebana RF	53
44	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(North)	Ghutung	Rebana RF	53

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
45	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(North)	Kanjiapal	Rebana RF	50
46	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(North)	Pateswari	Rebana RF	50
47	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(North)	Sanajimei	Rebana RF	149
48	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Bareigoda-2	Rebana RF	52
49	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Talapada	Dalkisahi	Rebana RF	120
50	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Bileisahi	Rebana RF	52
51	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Kusumjodi	Rebana RF	51
52	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Mahulpanga	Rebana RF	52
53	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Nardangi	Rebana RF	119
54	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Pathargoda	Rebana RF	52
55	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Putujhari	Rebana RF	64
56	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Turkipada	Rebana RF	50
57	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Talapada	Gumundu	Rebana RF	53
58	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Talapada	Talapada	Rebana RF	50
59	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Budhipada	Rebana RF	53
60	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Budhipada(Santalasahi)	Rebana RF	51
61	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Kuntala-1	Rebana RF	56
62	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(south)	Sanasiadimal	Rebana RF	50
63	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(East)	Gopinathpur	Rebana RF	58
64	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana (North)	Biswesara	Rebana RF	100
65	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(East)	Nipania	Rebana RF	51
66	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(East)	Bangurisuni	Rebana RF	59
67	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(East)	Laxmi Narayan	Rebana RF	52

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
68	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(west)	Kuntala-2	Rebana RF	58
69	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana(North)	Pathuripentha	Rebana RF	200
70	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Suakathi	Rebana RF	55
71	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Basumati VSS Chhutug	Palaspal RF	50
72	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal	Mahulagoda	Palaspal RF	55
73	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Talapada	Kartikeswar	Rebana RF	50
74	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Palaspal	Palaspal(west)	Maa Tarini	Palaspal RF	50
75	Keonjhar WL Division, Anandapur	Keonjhar	Brahmanipal	Daitari	Rebana	MaaBasundhari	Rebana RF	50
76	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Bhagamunda	Bhagamuda	Rebana RF	124
77	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Bhagamunda	Haticutcha	Atei RF	52
78	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Bhagamunda	Mausumjhari	Atei RF	53
79	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Bhagamunda	Maniabindha	Atei RF	72
80	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Sagadapata	Mudinucha	Atei RF	73
81	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Sagadapata	Palabani	Atei RF	134
82	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Sagadapata	Sagadapata	Rebana RF	79
83	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Barbahali	Billa	Atei RF	50
84	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Baripal	Tasaragada	Atei RF	52
85	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Deogaon	Panchugochia	Atei RF	42
86	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Barbahali	Jhinkipita	Atei RF	43
87	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Garagadababahal-1	Rebana RF	109
88	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Garagadababahal-2	Rebana RF	56
89	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Basundhara	Rebana RF	39
90	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Rangapata	Rebana RF	58

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
91	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	BasumatiThakurani	Rebana RF	80
92	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Charchika	Rebana RF	134
93	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Kaliahudi	Atei RF	140
94	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Madhusahi	Atei RF	52
95	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Mahabira	Rebana RF	64
96	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Mundulisahi	Atei RF	49
97	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Sinduragouri	Rebana RF	56
98	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Hanuman Jew	Atei RF	62
99	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	MaaHingula	Palaspal RF	100
100	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Kanheigola	Rebana RF	200
101	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Bhagamunda	Bhagamunda	Chanchakhai	Rebana RF	200
102	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Madhyapur	Rebana RF	100
103	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Barabahali	Nialijharan	Atei RF	100
104	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Gargadabahal	Badapalaspal	Rebana RF	50
105	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Thakurapada	Rebana RF	50
106	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Barbahali	Kendudiha	Atei RF	55
107	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Barbahali	Talanatisahi	Kadugotha RF	73
108	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Barabahali	Barabahali	Atei RF	150
109	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Harichandanpur	Harichandanpur	Haraparbati	Rebana RF	200
							***Total**	**8670**
Table No. 6.2.B : List of VSS of Keonjhar (WL) Division under Revenue Forest								
1	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Gayalmunda	Gayalmunda	Dhabani	KF	17
2	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Baunsagada	KF	30
3	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Basantpura	Manigiri	KF	30

Sl. No	Name of the Division	Name of the District	Name of the Range	Name of the Section	Name of the Beat	Name of EDC/VSS	Name of RF/PF/ Khesra	Assigned Area in Ha.
4	Keonjhar WL Division, Anandapur	Keonjhar	Deogaon	Deogaon	Basantpura	Samukanendi	KF	82
5	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Hadagada	Ghagarasuni	KF	50
6	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Kathakata	Bahia	Kalasira (Bahia)	KF	150
7	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Baniapanka	Siddheswar	KF	50
8	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Kantipal	Poitapani	KF	100
9	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Hadagada	Purunaghati	KF	25
10	Keonjhar WL Division, Anandapur	Keonjhar	Anandapur	Anandapur	Anandapur	Sunduria	Gramya Jungle	61
11	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Sangam	Sangam	Gramya Jungle	21
12	Keonjhar WL Division, Anandapur	Keonjhar	Hadagarh	Hadgada	Baniapanka	Padhiaripalli	Gramya Jungle	20
							**Total	636
							G.Total:	9306

*JFM under Reserve forest

** JFM under Revenue forest

Annexure –XXVIII

P.R.EXERCISE FORMAT

A. Village Level Information (through PRA)

A.1 Sources of fuel wood (focused group interview with land owner and landless separately)

1. Are your fuel wood requirements met with the existing wood in the forest ? Yes /No. If no, then how do you meet this deficit; own farm -1; village common land-2; purchase-3.
2. Do you sell the excess fuel wood collected from the forest after meeting your village requirements ? Yes/No.
3. If yes, where and at what rate: Place code: Within village– 1; Outside village – 2; Rate (Rs./qtl): .....
4. Distance travelled for fuel wood collection per trip (km): _____
5. No. of trips per week: _____
6. Weight of the fuel wood (one head load) (kg): Man: _____, Woman: ____, Child: ____
7. Species wise priority rating of fuel wood according to its advantages/Utility.
   1.
   2.
   3.
   4.

A.2 AII open grazing, stall feeding and fodder sources (separate focused group interviewed for Land owner and Landless)

1. Are your fodder requirements met with the existing sources in the forest? Yes/ No.
2. If no then how the deficit requirement is met: own farm–1; village common land– 2; purchase– 3;
3. Do you sell the excess fodder collected from the forest after meeting the requirements? Yes/ No.
4. If yes, where and at what rate: Place code: Within village – 1; outside village- 2; rate (Rs./qtl) : .....
5. Distance travelled for fodder collection per trip (km): .....
6. No. of trips per week: .....
7. Weight of the fodder (one head load) (kg): Man: ....., Woman: ....., Child: .....
8. Is 'Dati system' practice prevailing in your area? Yes/No/ Any other practice
9. Is practice of sillage making followed? Yes/No

10. Name of fodder grasses and its priority rating according to its advantages/ Utility.
    1.
    2.
    3.
    4.

11. Non timber forest produce (NTFP) found in the village, if any. Yes/ No
    If Yes, write the names: ……

12 Have measures taken to stop open grazing? Yes/ No

B. Household Information

Forests and Fodder products obtained from different lands

B.1. Private lands (non-cultivated) /community lands

Parameters	Small timber, etc.	Fuel wood	Leaf fodder	Grasses	NTFP products	Quantity of fodder used for stall feeding	Quantity of total fodder sold/ purchased
1	2	3	4	5	6	7	8
Quantity (qtl) per week							
Duration of collection a - no. of weeks in a month							
b - no. of months in a year)							

B.2. Forests lands

Parameters	Small timber, etc.	Fuel wood	Leaf Fodder	Grasses	NTFP products	Quantity of fodder used for stall feeding	Quantity of total fodder sold/ purchased
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
No. of head loads per week							
Weight of each head load (kg)							
Time consumed (hrs) for collection per day							
Distance travelled for collection per trip (km)							
Quantity (qtl) per week							
Duration of collection a - no. of weeks in a month, b - no. of months in a year)							

ANNEXURE - XXIX

PLANT AND ITS PARTS CONSUMED BY ELEPHANTS IN ORISSA.

Order/ Family	Species	Local name(s) in Oriya	Part(s) consumed by elephants
(1)	(2)	(3)	(4)
I.Ranales	1. *Polyalthia*	Debadaru	Leaves
i.Annonaceae	*longifolia*		
II.Theals			
i.Dipterocarpaceae	2. *Shorea robusta*	Sal	Bark
III.Parietales			
ii.Capparidaceae	3. *Crateva magna*	Varuna	Leaves
IV.Malvales			
v.Bombacaceae	4. *Bombax ceiba*	Simili	Leaves and small stems
v.Tiliaceae	5. *Grewia helicterifolia*	Sonaranga	Leaves
	6. *Grewia tiliaefolia*	Dhaman	Leaves
vi.Malvaceae	7. *Kydia calycina*	Kapasia	Leaves
	8. *Thespesia populnea*	Habali	Leaves
vii.Sterculiaceae	9. *Helicteres isora*	Murmuika	Leaves
	10.*Pterospermum canescens.*	Makai champa	Leaves and bark
	11.*Sterculia urens*	Genduli	Stem and bark
	12.*Sterculia villosa*	Kodalo	Leaves and bark
V.Euphorbiales			
viii.Euphorbiaceae	13.*Bridelia retusa*	Kasi	Leaves
	14.*Dimorphocalyx glabellus*	–	Leaves
	15.*Emblica officinalis*	Anla	Leaves
	16.*Macaranga peltata*	Manda	Leaves
	17.*Mallotus philippinensis*	Kamalagundi	Leaves
	18.*Trewia nudiflora*	Panigambhari	Bark
VI.Urticales			
ix.Ulmaceae	19.*Celtis cinnamomea*	–	Leaves
x.Moraceae	20. *Artocarpus heterophyllus*	Panasa	Leaves, bark and fruits
	21.*Ficus benghalensis*	Bara	Leaves and bark
	22.*Ficus glomerata*	Dimiri	Leaves and fruits
	23.*Ficus religiosa*	Aswatha	Leaves and branches
	24.*Ficus retusa*	Jari	Leaves and branches
	25.*Streblus asper*	Sahara	Leaves and branches
VII.Geraniales			
xi.Linaceae	26.*Hugonia mystax*	Chulijinka	Vines
xii.Rutaceae	27.*Ægle marmelos*	Bela	Fruits
	28.*Atalantia monophylla*	Narguni	Leaves
	29.*Limonia acidissima*	Kaitha	Bark and fruits
	30.*Glycosmis pentaphylla*	Chauldhua	Leaves
xiii.Burseraceae	31.*Boswellia serrata*	Salai	Leaves,branches and bark

Cont....

	32.*Garuga pinnata*	Kathakusuma (Saru patri)	Leaves
xiv.Meliaceae	33.*Aglaia elaeagnoidea*	–	Leaves
xv.Anacardiaceae	34.*Lannea coromandelica*	Moi	Leaves and branches
	35.*Mangifera indica*	Amba	Fruits
VIII.Sapindales			
xvi.Sapindaceae	36.*Schleichera oleosa*	Kusuma	Leaves
IX.Celastrales			
xvii.Celastraceae	37.*Elaeodendron glaucum*	Mukha	Leaves
X.Rhamnales			
xviii.Rhamnaceae	38.*Zizyphus mauritiana*	Barkoli	Leaves
	39.*Zizyphus oenoplia*	Kantakolia	Leaves
	40.*Zizyphus xylopyrus*	Ghonto	Leaves
xix.Vitaceae	41.*Cissus quadrangularis*	Hadabhanga	Vines
XI.Santalales			
xx.Loranthaceae	42.*Loranthus* sp.	Malanga	Vegtetative parts
xxi.Leguminosae			
Caesalpiniaceae	43.*Bauhinia racemosa*	Ambalota	Leaves
	44.*Bauhinia vahlii*	Siali	Leaves, bark and stem
	45. *Tamarindus indica*	Tentuli	Leaves and fruits
	46.*Cassia fistula*	Sunari	Leaves and small stem
Mimosaceae	47.*Acacia ferruginea*	Kantachira	Leaves
	48.*Acacia leucophloea*	Gohira	Leaves
	49.*Acacia pennata*	Dontari	Leaves
	50.*Acacia torta*	Konti(Dontari)	Leaves
	51.*Dichrostachys cinerea*	Vurtuli	Leaves
	52. *Mimosa pudica*	Lajkuli	Leaves and inflorescence
Fabaceae	53.*Butea monosperma*	Palasa	Leaves
	54.*Crotalaria* sp.	–	Vegetative parts
	55.*Pterocarpus marsupium*	Piasal	Leaves
	56.*Pterocarpus santalinus*	Raktachandan	Roots of young plant
XII.Myrtales			
xxii.Cambretaceae	57.*Anogeissus latifolia*	Dhaura	Leaves
	58.*Terminalia chebula*	Harida	Leaves
	59.*Terminalia belerica*	Bahada	Leaves
xxiii.Myrtaceae	60.*Syzygium cumini*	Jamu	Leaves
xxiv.Lecythidaceae	61.*Careya arborea*	Kumbhi	Leaves and fruits

Cont....

xxv.Melastomaceae	62.*Memecylon umbellatum*	Niresho	Leaves
xxvi.Lythraceae	63.*Lagerstroemia parviflora*	Sidha	Bark
XIII.Ebenales			
xxvii.Sapotaceae	64.*Madhuca indica*	Mahula	Flowers
	65.*Manilkara hexandra*	Khirkuli	Leaves
	66.*Mimusops elengi*	Baula	Leaves
xxviii.Ebenaceae	67.*Diospyros ferrea*	Guakuli	Leaves
	68.*Diospyros malabarica*	Mankadakendu	Leaves
	69.*Diospyros melanoxylon*	Kendu	Root of young plant
	70.*Diospyros ovalifolia*	–	Leaves
XIV.Oleales			
xxix.Salvadoraceae	71.*Salvadora persica*	Pilùgach	Leaves
XV.Gentianales			
xxx.Apocynaceae	72.*Carissa spinarum*	Dudhkoli	Leaves (Sankarenda)
xxxi.Loganiaceae	73.*Strychnos nuxvomica*	Kochila	Leaves
	74.*Strychnos potatorum*	Katako	Leaves
XVI.Polemoniales			
xxxii.Convolvulaceae	75.*Ipomoea* sp.	Kalam	Vines
	76.*Argyreia speciosa*	Brudha daraka	Vines
XVII.Boraginales			
xxxiii.Boraginaceae	77.*Cordia monoica*	–	Leaves
XVIII.Lamiales			
xxxiv.Verbenaceae	78.*Premna latifolia*	Gandhana	Leaves
XIX.Rubiales			
xxxv.Rubiaceae	79.*Ixora parviflora*	Lohajharia	Leaves
	80.*Morinda tinctoria*	Achu	Leaves
	81.*Randia dumetorum*	Potuaphala	Leaves
	82.*Randia malabarica*	Phirikia	Leaves
XX.Spadicifloreae			
xxxvi.Typhaceae	83.*Typha angustata*	Hatiaghasa	Vegetative parts
xxxvii.Palmaceae	84.*Calamus* sp.	Beta	Root
	85.*Cocos nucifera*	Nadia	Fruits
XXI.Glumiflorae			
xxxviii.Cyperaceae	86.*Cyperus* sp.	Mutha	Vegetative parts
xxxix.Poaceae	87.*Andropogon ascinodis*	–	Leaves and base
	88.*Apluda mutica*	–	Leaves and base
	89.*Apocopis paleacea*	–	Leaves and base
	90.*Arthraxon* sp.	–	Leaves and base
	91.*Bambusa arundinacea*	Kanta baunsa (Dhaba baunsa)	Leave,branches and shoots
	92.*Bothriochloa bladhii*	–	Leaves and base
	93.*Bothriochloa pertusa*	–	Leaves and base
	94.*Brachiaria* sp.	–	Leaves and base
	95.*Capillipedium*		

Cont....

	assimile	–	Leaves and base
	96.*Chrysopogon aciculatus*	–	Leaves and base
	97.*Cynodon dactylon*	Duba	Vegetative parts
	98.*Dactyloctenium aegyptium*	–	Leaves and base
	99.*Desmostachya bipinnata*	–	Leaves and base
	100.*Dichanthium caricosum*	–	Leaves and base
	101.*Dendrocalamus strictus*	Salia baunsa	Leaves,branches and shoots
	102.*Digitaria* sp.	–	Leaves and base
	103.*Echinochloa colona*	–	Leaves and base
	104.*Eleusine* sp.	Mandia	Vegetative parts, inflorescence and grains
	105.*Eragrostis* sp.	–	Vegetative parts
	106.*Hygrorhiza aristata*	–	Leaves and base
	107.*Heteropogon contortus*	Sukla	Leaves and base
	108.*Hackelochloa granularis*	–	Leaves and base
	109.*Imperata cylindrica*	Chhana ghasa	Leaves and base
	110.*Isachne globosa*	–	Leaves and base
	111.*Iseilema laxum*	–	Leaves and base
	112.*Ischaemum* sp.	–	Vegetative parts
	113.*Oryza sativa*	Dhana	Vegetative parts, inflorescence and grains
	114.*Oryza meyeriana*	–	Leaves and bark
	115.*Panicum repens*	Panidala	Vegetative parts
	116.*Paspalum scrobiculatum*	–	Leaves and bark
	117.*Pennisetum purpureum*	–	Leaves and base
	118.*Rottboellia cochinchinensis*	–	Leaves and base
	119.*Saccharum officinarum*	Akhu	Vegetative parts
	120.*Schima nervosa*	–	Leaves and base
	121.*Setaria* sp.	–	Leaves and base
	122.*Sporobolus indicus*	–	Leaves and base
	123.*Themeda* sp.	–	Vegetative parts
	124.*Zea mays*	Maka	Vegetative parts,and entire cob
XXII.Liliflorae Lx.Dioscoreaceae	125.*Dioscorea* sp.	Bainya alu, Kasa alu, etc.	Tubers

Lxi.Liliaceae	126.*Asparagus racemosus*	Satabari	Tubers
Lxii.Smilaceae	127.*Smilax zeylanica*	Muturi	Leaves
Lxiii.Pontederiaceae	128.*Eichornia crassipes*	Borjhanji	Vegetative parts
XXIII.Scitamineae			
Lxiv.Musaceae	129.*Musa paradisiaca*	Kadali	Stem and fruits

SOURCE : ASIAN ELEPHANTS PAST, PRESENT AND FUTURE BY DEBABRATA SWAIN

ANNEXURE-XXX

OFFICE OF THE ASSISTANT EXECUTIVE ENGINEER
R.W. SUB- DIVISION, ANANDAPUR
KEONJHAR
*****

Letter No. _____ /WE // Dt _____ //

To

The Executive Engineer ,
Rural Works Division, Anandapur..

Sub: Supply of list of R.D Road in respect of Anandapur Sub-Division from 2016-17 to 2018-19 required in connection with raising of Avenue Plantation.

Ref : Memo No. 293/4F(Plan) - 2/2019 dtd. 25.03.2019 of D.F.O, Forest Resources Survey Division, Cuttack

Sir,

In inviting a kind reference to the subject cited above, it is to submit herewith the required information regarding list of R.D.Road in respect of R.W. Sub Division, Anandapur. This is for favour of kind information and necessary action at your end.

Encl: List of R.D. roads – 1 Set.

Yours faithfully

Assistant Executive Engineer,
R.W.Sub- Division, Anandapur

Memo No. 150 /WE // Dt 12.4.2019 //

Copy submitted to Divisional Forest Officer, Forest Resources Survey Division, Cuttack for favour of kind information and necessary action.

Encl: List of R.D. roads – 1 Set.

12/4/2019

Assistant Executive Engineer,
R.W.Sub- Division, Anandapur

Memo No. _____ /WE // Dt _____ //

Copy submitted to Sri K.C. Sahoo, Range Officer for information and necessary action.

Encl: List of R.D. roads – 1 Set.

Assistant Executive Engineer,
R.W.Sub - Division, Anandapur

LIST OF RD ROAD UNDER R.W. SUB DIVISION, ANANDAPUR

Sl. No	Name of the Division	Name of the Sub-Division	Name of the Block	Name of the Roads	Total length (In Km.)
1	2	3	4	5	6
1	Anandapur	Anandapur	Anandapur	Belabahali-Dihasahi Road	5.000
2	Anandapur	Anandapur	Anandapur	Anandapur-Gayalmunda-Panasadiha Road	26.200
3	Anandapur	Anandapur	Anandapur	Panasadiha-Manoharpur Road	2.700
4	Anandapur	Anandapur	Anandapur	Baladuan-Kantipal Road	4.000
5	Anandapur	Anandapur	Anandapur	Barigaon-Panchupali Road	8.300
6	Anandapur	Anandapur	Anandapur	Dadhibamanpur-Taratara-Kantipal Road	11.000
7	Anandapur	Anandapur	Anandapur	Khadipal-Kathakata Road	6.000
8	Anandapur	Anandapur	Anandapur	Anandapur-Banusagarh Road	9.600
9	Anandapur	Anandapur	Anandapur	MDR 13 to Fakirpur	2.250
10	Anandapur	Anandapur	Anandapur	Salabani-Sadangi Road	6.000
11	Anandapur	Anandapur	Anandapur	NH-215 to Chamuhin via Barigaon-Bhatsira - Khadibil Road.	5.000
12	Anandapur	Anandapur	Anandapur	SH-53 to Bankhidi	1.800
13	Anandapur	Anandapur	Anandapur	AK Road to Joragadia Via Bhogapur.	4.000
14	Anandapur	Anandapur	Ghasipura	Ramachandrapur-Balibaruan Road	11.300
15	Anandapur	Anandapur	Ghasipura	Samukanandi-Natia Road	8.000
16	Anandapur	Anandapur	Ghasipura	Ramachandrapur-Angarua Road	10.400
17	Anandapur	Anandapur	Ghasipura	Baripal-Kansa-Kendua Road	6.200
18	Anandapur	Anandapur	Ghasipura	Bhandaridiha-Tarimul Road	3.500
19	Anandapur	Anandapur	Ghasipura	Mahuri-Sainpal Road	2.500
20	Anandapur	Anandapur	Ghasipura	Narangapur-Toraniapal Road	3.500
21	Anandapur	Anandapur	Ghasipura	Badapadana-Raitola Road	3.600
22	Anandapur	Anandapur	Ghasipura	Kashadurapal-Brahmanipal Road	3.650
23	Anandapur	Anandapur	Ghasipura	Chamuhin-Nandua Road	2.580
24	Anandapur	Anandapur	Ghasipura	Rekutia-Daradipal Road	8.500
25	Anandapur	Anandapur	Ghasipura	Balipal-Tolakanendi Road	2.380
26	Anandapur	Anandapur	Ghasipura	Balarampur-Dihasahi Road	4.000
27	Anandapur	Anandapur	Ghasipura	Chauliabahali-Gobargali Road	5.000

Sl. No	Name of the Division	Name of the Sub-Division	Name of the Block	Name of the Roads	Total length (In Km.)
1	2	3	4	5	6
28	Anandapur	Anandapur	Ghasipura	Jarda to Purunabandhagoda via Ganpur road	6.000
29	Anandapur	Anandapur	Ghasipura	NH-215 Gohira Bramheswar Chhaka Biragobindapur via jugalakisorepur road.	10.000
30	Anandapur	Anandapur	Ghasipura	Basantapur -Dalksahi road	7.000
31	Anandapur	Anandapur	Anandapur	d)Bhogapur-Haribeda	3.030
32	Anandapur	Anandapur	Anandapur	NH-215 to Badaektali .	1.580
33	Anandapur	Anandapur	Anandapur	RD Road to Dudugaon	1.270
34	Anandapur	Anandapur	Anandapur	NH-215 (Kumuda) to Kadabahali.	2.300
35	Anandapur	Anandapur	Anandapur	Bhogapur to taneipal	1.640
36	Anandapur	Anandapur	Anandapur	NH 215Jalananda	2.000
37	Anandapur	Anandapur	Anandapur	JalanandaArjunbana	1.510
38	Anandapur	Anandapur	Anandapur	b) Salabani to Belda	1.980
39	Anandapur	Anandapur	Anandapur	a) SH53 to Sunduria	2.640
40	Anandapur	Anandapur	Anandapur	N.H-215 to Marhapal	2.600
41	Anandapur	Anandapur	Anandapur	Kantara Chhak to Bhalughara Road	3.850
42	Anandapur	Anandapur	Anandapur	RD Road (Kathakata Chhak) to Jogiabandha Road	1.570
43	Anandapur	Anandapur	Anandapur	S.H-53 to Kantara Chhak Road	13.600
44	Anandapur	Anandapur	Anandapur	Gayalamunda to Santoshpur Road	13.210
45	Anandapur	Anandapur	Anandapur	Kumuda to Kadabahali Road	6.500
46	Anandapur	Anandapur	Anandapur	N.H-215 to Nuapada Road	4.200
47	Anandapur	Anandapur	Anandapur	Dadhibamanpur - Kathakata	7.500
48	Anandapur	Anandapur	Anandapur	Baniajodi to Kothadiha Road	5.100
49	Anandapur	Anandapur	Anandapur	Barigaon to Panchupally Road	8.450
50	Anandapur	Anandapur	Ghasipura	b) Gudiadihi- Gadabandhogoda	2.200
51	Anandapur	Anandapur	Ghasipura	Kochianandi to Tarimul	1.300
52	Anandapur	Anandapur	Ghasipura	Hasanpur to Madanpur	3.300
53	Anandapur	Anandapur	Ghasipura	NH-215 to Jalasuan.	2.550
54	Anandapur	Anandapur	Ghasipura	Bholnuagaon to Ostapura	3.000
55	Anandapur	Anandapur	Ghasipura	Aunapal to Baripal	0.930

RD road

OGP—PP—CTCP (F&E) 2—700 Bks.—15-6-2022