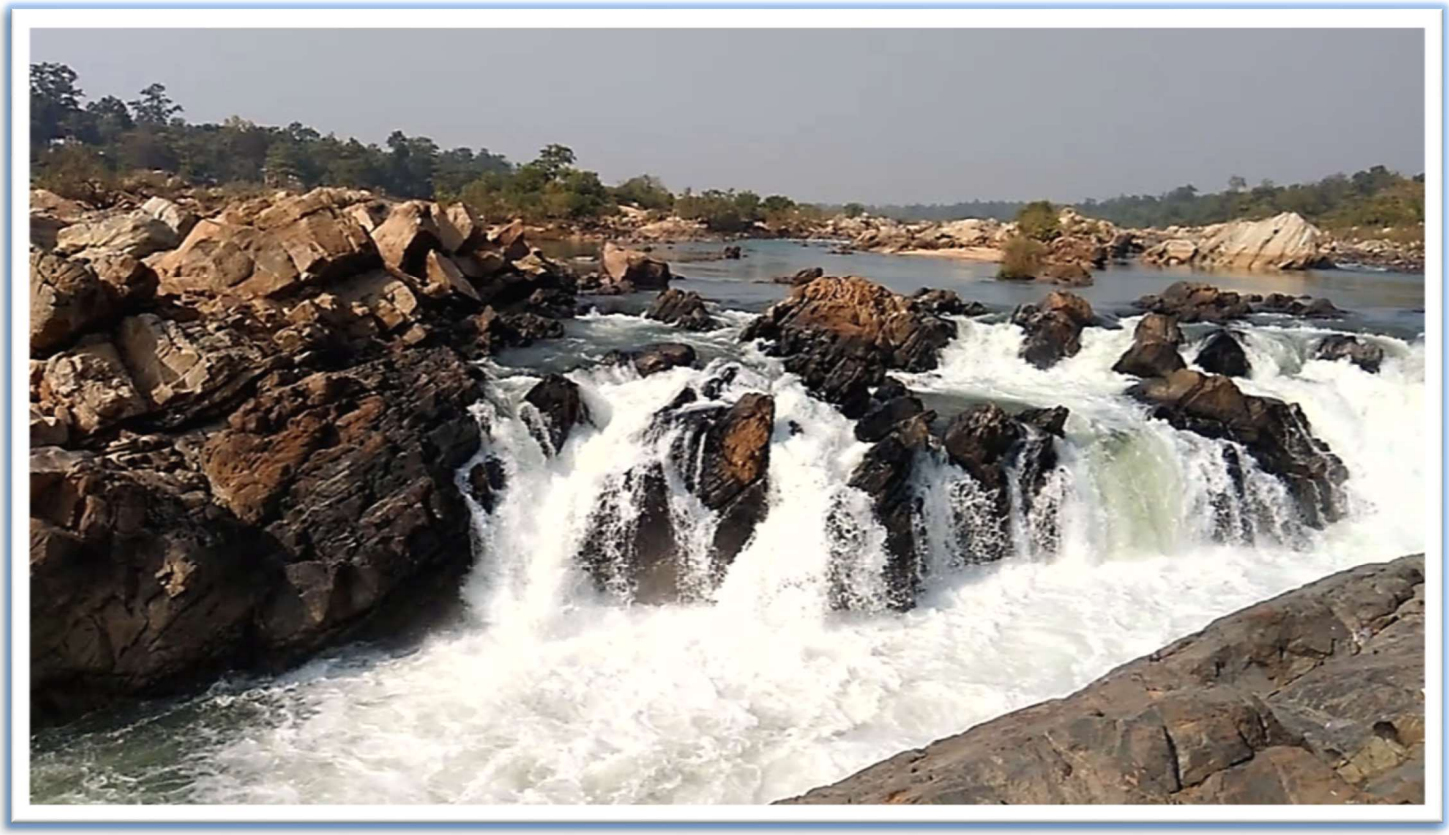
WORKING PLAN OF KARANJIA FOREST DIVISION

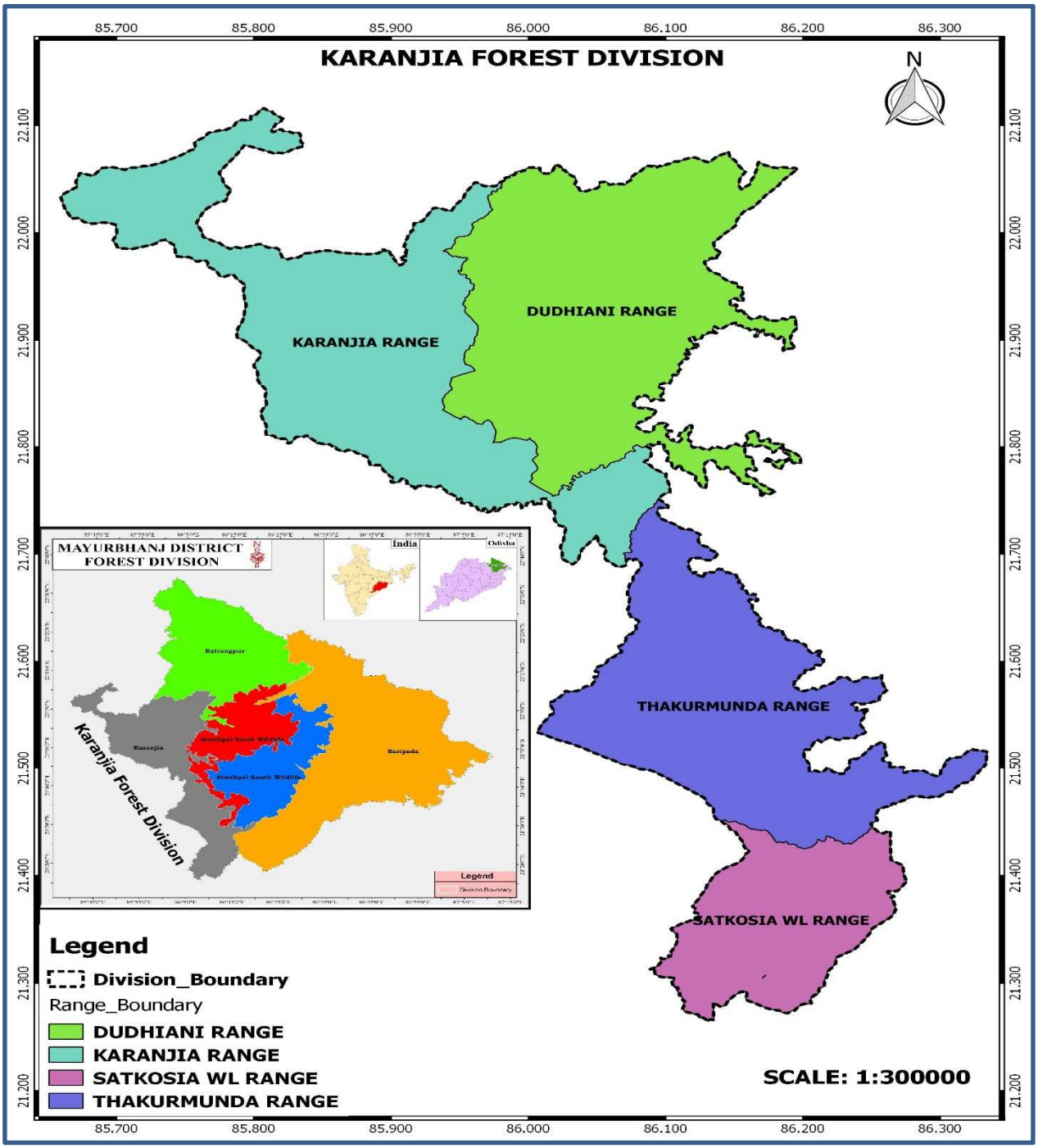


For the Period 2021-22 to 2030-31

By

Sri Lade Gajanan Dayanand, IFS

DIVISIONAL FOREST OFFICER, KARANJIA DIVISION.


KARANJIA FOREST DIVISION
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KARANJIA RANGE
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THAKURMUNDA RANGE
SATKOSIA WL RANGE
MAYURBHANJ DISTRICT FOREST DIVISION
India
Odisha
Karanjia Forest Division
Legend
Division_Boundary
Range_Boundary
DUDHIANI RANGE
KARANJIA RANGE
SATKOSIA WL RANGE
THAKURMUNDA RANGE
SCALE: 1:300000

भारत सरकार / Government of India
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय / Ministry of Environment, Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय / Integrated Regional Office
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303

No. 8(31)29/2016-FCE 15th July, 2022

To

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

Sub: Approval of draft Revised Working Plan of Karanjia Forest Division for the period from 2021-22 to 2030-31 - reg.

Ref: The PCCF & HoFF, Odisha letter No. 2928/11F (SFM) 30/2018 dated 15.02.2022 and Letter No. 11413/11F (SFM) 30/2018 dated 04.06.2022.

Sir,

I am directed to inform that the revised draft Working Plan of Karanjia Forest Division for the period 2021-22 to 2030-31 submitted by the PCCF, Odisha was examined and accordingly, additional information was sought from the State Govt. on the shortcomings/observations observed by IRO, Bhubaneswar vide this office letter No.8(31)36/2016-FCE dated 16.03.2022. The reply to the shortcomings/ observations made by IRO, Bhubaneswar has been received from PCCF, Odisha vide letter No. 11413/11F (SFM) 30/2018 dated 04.06.2022 and examined by this office. 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 Karanjia Forest Division for the period of 2021-22 to 2031-32, subject to the following General & 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 Integrated Regional Office is to be obtained. **No felling shall be carried out without an approved Annual Timber Operation by the competent authority.**
4. This working plan is approved for the year **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.

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. 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.

(301)

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. Implementation of 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.

Padma Mahanti

(Padma Mahanti)
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.

Dy. Inspector General of Forests (C)

ଦେବୀଦତ୍ତ ବିଶ୍ୱାଳ
DEBIDUTTA BISWAL

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

FOREWORD

The Revised Working Plan of Karanjia Forest Division has been approved vide Letter No. 8 (31) 29/2016-FCE dtd. 15.07.2022 of the Govt. of India, Ministry of Environment, Forests & Climate Change, Integrated Regional Office, Bhubaneswar. This is the 04th Revised Working Plan of Karanjia Forest Division for the period from 2021-22 to 2030-31 since the creation of Karanjia Forest Division.

The Plan has been prepared with realistic prescription to achieve expected outcome based on the SWOT analysis. Three exclusive Working Circles (i.e. Selection Working Circle, Rehabilitation Working Circle & Plantation Working Circle) & three overlapping Working Circles (i.e. N.T.F.P overlapping working circles, J.F.M. overlapping working circles & Wildlife overlapping working circles) are prescribed in this Working Plan covering a total area 43261.83 ha. In the current plan, qualitative improvements of degraded forests have been prescribed in Rehabilitation WC with a special focus on Soil and Moisture Conservation. Management of Water Resource and Climate Change has been incorporated for better appreciation of Climate Change of the locality. Encouragement of native vegetation for plantation is given the top priority. Extensive use of GIS technology in survey & mapping of areas, before taking interventions has been prescribed.

Sri Lade Gajanan Dayanand, IFS, DFO, Karanjia Forest Division under the guidance of Shri M. Yogajayanand, IFS, (Ex- Field Director, Similipal Tiger Reserve-cum- Regional Chief Conservator of Forests, Baripada Circle) has carried out an outstanding job in preparing the Revised Working Plan for Karanjia Forest Division to meet the challenging circumstances linked to modern forest management. I congratulate all the Forest Officers and hope this plan will serve as a technical and scientific document to achieve its stated objectives and improve the Socio-Economic Status of society especially the Tribal.

(Debidutta Biswal, IFS)

ଅରଣ୍ୟଭବନ, ଜିଡି-୨/୧୨, ଚନ୍ଦ୍ରଶେଖରପୁର, ଭୁବନେଶ୍ୱର-୭୫୧୦୨୩, ଫୋନ: ୦୬୭୪-୨୩୦୦୮୫୩
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AUTHORS' PREFACE

Karanjia Forest Division is carved out from sylvan Similipal, the land of roars of the tigers and trumpets of elephants. It consists of dense forests in plain & in hilly terrains intermingled with variety of valuable wild animals. The Government vide notification no 1F- (A)-71/2018-3913/ F&E dated 21.02.2019 reorganized the Division with consideration to Boundary of Similipal Tiger Reserve. By that time the Preliminary Working Plan Report was finalized and approved. The outgoing working plan by Sri A.O.F. Bakhla, IFS was for the Reserved Forests of this Division only. The present plan has been prepared comprising all the Reserved Forests, Proposed Reserved Forests, Demarcated Protected Forests and the Village Forests. The total geographical area of Karanjia Division is 1845.78 Sq. Km after re-organization. The total forest area proposed for management is 432.61 Sq. Km which is about 23.43% of the total Geographical area.

The forests under consideration are passing through a crucial stage where the crop is at young stage and few matured trees are available to be managed as seed bearers to sustain a high forest system.

Further participatory forest management is gaining momentum all over the division matching with the footsteps in the State. In this short tenure as Divisional Forest Officer, I get to assess the potentiality of the Forests of Karanjia Division to a certain extent and tried my best to incorporate best possible management practices suitable to the forests of the Division.

The present plan for the period 2021-2022 to 2030-31 is prepared by utilizing the benefits of Modern techniques, Satellite imagery interpretation, GIS facilities of Forest Headquarters with the support of many individuals, organizations directly or indirectly. It is a great privilege and opportunity on my part to write my first working plan for this Division basing on the National Working Plan Code 2014. The ORSAC and the NRSA, Hyderabad have played a crucial & vital role using the Remote sensing techniques for selecting sample points, collections of primary data from sample points and its analysis for calculating the growing stock and preparation of Maps. Due to their extensive help and co-operation, it could be possible to write the plan within a small span of time.

I extend my heartfelt thanks to my predecessor Sri Prasanna Kumar Behera, IFS, who had drafted the PWPR. I am indebted to Sri H.K. Bist, IFS, Ex- Field Director, Similipal Tiger Reserve-cum- Regional Chief Conservator of Forests, Baripada who had taken a lot of pain in giving proper shape to the PWPR and guiding principles in finalizing the working circles.

I am very much thankful to Sri Sisir Kumar Ratho, IFS, PCCF and HoFF; Sri Jitendra Kumar, IFS, PCCF, FD & Nodal Officer, FC Act and Sri Sandeep Tripathy, IFS, Ex- PCCF & HoFF, Odisha, Sri A.K Jayswal, IFS, Ex-CF (P&SM) for their inspiration and valuable guidance from time to time in drafting the working plan.

Sri M. Yogajayanand, IFS, Field Director, Similipal Tiger Reserve-cum- Regional Chief Conservator of Forests, Baripada has guided with his valuable suggestion on forest management. I extend my sincere thanks for sharing his valued experience.

I am thankful to Heads of different line Departments of the District like Agriculture and water resource for providing required information on ground water and other related information.

I am thankful to Sri Batakrushna Padhy, Retd. DCF; Assistant Conservator of Forests of Karanjia Division, Sri Diganta Sovan Chand & Sri Falguni Behera, Sri Mihir Ranjan Pattnaik, Ex ACF Karanjia Forest Division; Range Officers, Foresters, Forest Guards, Ministerial Staffs and Data Entry Operators of this Division for their Valuable assistance for bringing out this plan to lime light.

Sri Harish Dash, Retired Forester has contributed his best for compilation of required information for this plan and deserves all praise and commendation who has worked as an architect of this plan.

I hope, this Plan will lead to a sustainable management of Forest resource and act in a direction of checking the global Climate Change. It will provide vital guidance to field staffs, managers, planners, readers, research scholars working in the field of Forestry & Wildlife.

At the end, once again I extend my heartfelt thanks and appreciation to all for their cooperation.

Sri Lade Gajanan Dayanand, IFS
Divisional Forest Officer,
Karanjia Division.

Contents

AUTHOR'S PREFACE…… 8
1. Abbreviations used…… 22
2. *List of Flora:* *25*
3. *List of Fauna:* *29*
Vision Statement…….. 30
Executive Summary ……. 35
PART-I…… 39
CHAPTER-1…….. 40
THE TRACT DELT WITH…….. 40
1.1 Name and Situation …….. 40
1.1.1. Geographical Area…… 40
1.1.2 Administrative Details…… 41
1.2 Configuration of the ground……. 42
1.2.1 Altitude…… 42
1.2.2 River System…… 42
1.3 Geology, Rock and Soil…… 43
1.3.1 Geology…… 43
1.3.2 Rock …… 43
1.3.3 Minerals…… 44
1.3.4 Soil …… 46
1.4 Climatic Parameters…… 46
1.4.1 Rainfall ……..47
1.4.2 Temperature …….. 49
1.4.3 Winds ……..52
1.4.4 Hail…….52
1.4.5 Natural Calamity ……52
1.5 Water Resources …… 53
CHAPTER-2 …… 55
MAINTENANCE & INCREASE IN THE EXTENT OF FOREST AND TREE COVER……. 55
2.1 Area of Forests under different legal classes (RF, PF, UF and Others…… 55
2.1.1 Reserve Forests (RF) …… 55
2.1.2 Proposed Reserve Forests PRF)…… 55

2.1.3 Demarcated Protected Forests (DPF)…… 55
2.1.4 Village Forests (VF)…….. 56
2.1.5 Un-Classed Forests (UF) ……56
2.1.6 DLC Forest…… 56
2.1.7 Total Forest Area of the Division…… 58
2.2 Forest Area unde different Working Circle in Outgoing Plan…….. 59
2.3 Percentage of Forest with Secured Boundaries…… 64
2.4 Lande use, Land use Change and Forestry (LULUCF)…… 64
2.5 Threats to the Forest…… 65
2.5.1 Natural Disturbances…… 65
2.5.2 Biotic Interference…….. 68
2.6 Distribution of Different Forest Types…… 76
2.7 Tree Cover Outside Forest Area (TOF)…… 77
2.8 Shifting Cultivation (Jhumming)…… 82
CHAPTER-3…….. 83
MAINTENANCE, CONSERVATION AND ENHANCEMENT OF BIODIVERSITY…… 83
3.1 Forest Composition & Distribution…….. 83
3.1.1 Floristic Composition…… 83
3.2 Plant Species Diversity…… 84
3.3 Status of Species prone to over exploitation…….. 85
3.4 Conservation of Genetic Resource……. 86
3.5 Fauna and their Habitats……. 88
3.6 Threats and Challenges to Wildlife…… 88
3.6.1 Fragmentation of Habitat due to construction / widening of Roads, Transmission lines….. 89
3.6.2 Depletion of tree cover / Forest crop density…… 89
3.6.3 Scarcity of Water in interior & high-altitude Forests in summer…… 90
3.6.4 Depletion of Food stock and deterioration of quality Food / Fodder…… 90
3.6.5 Depletion of Prey base / herbivorous…… 90
3.6.6 Annual Fire and loss of Ground Flora…… 91
3.6.7 Heavy biotic interference and intrusion by domestic animals (Cattle/ Goat/ Sheep)…….. 91
3.6.8 Poaching…… 91
3.7 Protection & Management of Fauna…… 92
3.7.1 Elephant Corridors in the Division & status…… 92

3.7.2 Management Practices adopted…… 95
CHAPTER-4…….. 99
MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND VITALITY……. 99
4.1 Status of Regeneration…… 99
4.2 Area affected by forest fire…… 104
4.3 Area damaged by natural calamities…… 106
4.4 Area protected from grazing…… 106
4.5 Looping Practices…… 109
4.6 Area infested by invasive weed species in Forests……109
4.7 Incidences of pest and diseases……..……110
4.8 Forest degradation and its drivers…… 112
4.9 Pollution control and protection of Environment…… 113
CHAPTER-5…… 115
CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES…… 115
5.1 Area treated under Soil and water conservation measures……115
5.2 Duration of Water flow in the Selected Seasonal Streams……122
5.3 Wetlands in Forest Areas…… 122
5.4 Water Level in the wells in the vicinity (up to 5km) of forest area…… 124
5.5 Status of Aquifiers…… 130
CHAPTER-6……133
MAINTENANCE & ENHANCEMENT OF FOREST RESOURCE PRODUCTIVITY…… 133
6.1 Growing Stock of Wood……133
6.2 Growing Stock of Bamboo……137
6.3 Increment in Volume of Identified Timber Species…… 137
6.4 Effects towards enhancement of Forest Productivity through Quality Plantation activities… 139
6.5 Carbon Stock…… 143
6.6 Carbon Sequestration& Mitigation…… 159
CHAPTER-7…… 161
OPTIMIZATION OF FOREST RESOURCE UTILIZATION…… 161
7.1 Recorded Removal of Timber……161
7.2 Recorded Removal of Fuel wood…… 170

7.3 Recorded Removal of Bamboo / Rattans:……. 172

7.4 Recorded removal of locally important NTFPs including MAPs:…… 172

7.5 Demand & Supply of Timber and important Non- Timber Forest Produce:…… 176

7.5.1 Timber / Firewood depot:…… 177

7.5.2 Important MAPs Collected:…… 177

7.6 Import & Export of Wood & Wood Products:…… 180

7.7 Import & Export of NTFPs: …… 180

7.8 Removal of Fodder:…… 184

7.9 Valuation of Products:…… 184

CHAPTER-8…… 185

MAINTENANCE & ENHANCEMENT OF SOCIAL,ECONOMIC, CULTURAL AND SPIRITUAL BENEFITS……. 185

8.1 Number of JFM Committees and areas protected by them:…….. 185

8.2 Status of empowerment of JFMCs:……. 187

8.2.1 Odisha Forestry sector Development Project Phase-II……. 188

8.2.2 Gender Mainstreaming Creating Models for CMRV……. 190

8.3 Labour welfare:…… 192

8.4 Use of indigenous knowledge:…… 192

8.4.1 Concept and Definitions of Indigenous Knowledge:…… 194

8.4.2 Sources of Indigenous Traditional Knowledge:…… 196

8.4.3 Documenting the Indigenous Knowledge:…… 197

8.5 Extent of Cultural / Sacred groves:…….. 198

8.6 Eco-tourism areas and activities:…….. 199

8.7 Social Customs (As relates to Forests):…… 199

8.8 Status of Compliance of Forest Right Act (FRA):……. 200

8.9 Other Rights and Concessions:…… 201

8.10 Dependency of Local People on NTFPs:…… 201

8.11 Other aspects:…….. 202

CHAPTER-9……. 203

Adequacy of Policy, Legal and Institutional Framework……. 203

9.1 Existing policy and legal framework and their compliance:…… 203

9.2 Status of approved working plan and compliance:…… 204

9.3 Number of forest offences:…… 205

9.4 Status of research and development:…… 207

9.5 Human resource capacity building efforts:…….. 207

9.6 Forest Resource Accounting:…….. 209

9.7 Budgetary allocations to the forestry sector:……. 215
9.8 Existence of monitoring, assessment and reporting mechanism:…….. 216
9.9 Public awareness and education:…….. 216
9.10 Adequate manpower in forest division:…… 217
CHAPTER-10……. 220
Five Year Plans…… 220
10. Five Year Plans:……. 220
10.1 Planning in India…… 220
10.1.1 Planning Process:…….. 220
10.1.2 Planning Commission & National Development Council:…… 221
10.2 Five Year Plan…… 222
10.3 First Five Year Plan (1951-52 to 1955-56)……. 222
10.4 Second Five Year Plan (1956-57 to 1960-61):…… 223
10.5 Third Five Year Plan (1961-62 to 1965-66)…… 224
10.6 Annual Plan (1966-67 to 1968-69):…… 225
10.7 Fourth five year Plan (1969-70 to 1973-74):…….. 225
10.8 Fifth Five Year Plan (1974-75 to 1978-79)…….. 226
10.9 Sixth Five Year Plan (1980-81 to 1984-85)…….. 227
10.10 Seventh Five Year Plan (1985-86 to 1989-90)……. 228
10.11 Annual Plan (1990-91 to 1991-92)…… 229
10.12 Eight Five year Plan (1992-93 to 1996-97)…… 230
10.13 Ninth Five year Plan (1997-98 to 2001-02)…… 231
10.14 Tenth Five year Plan (2002-03 to 2006-07)……. 232
10.15 Eleventh Five year Plan (2007- 2012)…….. 233
10.16 Tweleveth Five year Plan (2012-17)…… 234
10.17 Plan expenditure in Karanjia Forest Division…… 235
10.17.1 Feedback for Future Mangement……. 236
CHAPTER-11…… 237
Past System of Management…… 237
11.1 General history of the Forests:…… 237
11.1.1 Working from 1885-86 to 1904-05:…… 237
11.1.2 Wortking plan By Sri B.M. Dasgupta: (1947-48 to 1952-53)…… 242
11.1.3 Working plan By Sri Shree pal Jee, IFS (1953-54 to 1972-73):…….. 244
11.1.4 Working Plan By Sri R. Mishra, IFS (1973-74 to 1992-93)…… 250
11.1.5 Working plan By Sri A.O.F Bakhla, IFS (1996-97 to 2015-16):…….. 257
11.2 Special works of improvement undertaken:……. 282

11.3 Past yield, revenue and expenditure:…… 308
CHAPTER-12…… 309
STATISTICS OF GROWTH AND YIELD…… 309
12.1 Statistics of Forest Carbon Stock:…… 315
12.1.1 Methodology used by FSI in estimating carbon stock…… 315
PART-II…… 325
CHAPTER- 13……. 326
BASIS OF PROPOSALS…… 326
13.1: Objectives of Management:…… 326
13.1(I): Dynamics of Forests and Stands:…… 327
13.1(II): Forests and Soil:…… 329
13.1(III): Forests and Water…… 329
13.1(IV): Forest Biodiversity:……. 330
13.1(V): Climate and Forests:…….. 330
13.1(VI):Socioeconomic Considerations and generation of forest based employment and opportunities livelihood options:…… 331
13.1(VII): Tools for integrated development:…… 331
13.2: Method of treatment to be adopted:…….. 332
13.3: Constitution of Working Circles…… 333
13.4: Period of Working Plan and necessity for intermediate revision…….. 336
CHAPTER-14…… 337
SELECTION WORKING CIRCLE (SWC)……. 337
14.1 Name of Working Circle:…… 337
14.2 General Constitution of Working Circle:…… 337
14.3 General Characteristics of Vegetation:……. 343
14.4 Felling series, cutting sections and JFM Areas……. 343
14.5 Blocks, Compartments and JFM Area:……. 347
14.6 Special Objectives of Management:…… 347
14.6.1 Analysis of the crop:……. 350
14.6.2 Silvicultural System…… 356
14.6.3 Rotation Period:…… 356
14.6.4 Harvestable Diameters:…….. 357
14.6.5 Reduced Factors and reduced areas:…….. 358
14.6.6 Felling Cycle:……. 359
14.6.7 Division into Periods & allotment to periodic blocks…… 359
14.6.8 Calculation of the yield& its regulation:…… 359

14.6.9 Table of felling :……. 362
14.6.10 Method of executing the felling:…… 377
14.6.10.1 Demarcation of Annual Coupes…….. 377
14.6.10.2 Marking Rules……. 378
14.6.10.3 Marking of Trees……. 380
14.6.10.4 Working Agency……. 382
14.6.10.5 Execution of Felling…… 382
14.6.11 Subsidiary Silvicultural Operations, cleaning & thinning:……. 384
14.6.12 Regeneration:…… 386
14.6.13 Associated regulations and measures:…….. 386
CHAPTER-15…… 388
REHABILITATION WORKING CIRCLE (RWC)…… 388
15.1 Name of the Working Circle:…… 388
15.2 General Constitution of Working Circle:…… 388
15.3 General characteristics of Vegetation:…… 389
15.4 Felling series, cutting section & JFM areas…… 390
15.5 Blocks, Compartments and JFM Area:…… 390
15.6 Special Objectives of Management:…… 390
15.6.1 Analysis of the crop:…… 391
15.6.2 Silvicultural System:…… 391
15.6.3 Rotation Period:…… 392
15.6.4 Harvestable Diameters:…… 392
15.6.5 Reduceing Factors and reduced areas:…… 392
15.6.6 Felling Cycle/ Rehabilitation Cycle:…… 393
15.6.7 Division into periods & allotment to periodic block:…… 393
15.6.8 Division in to Annual Rehabilitation Coupe:…… 393
15.6.9 Table of Treatment:…… 394
15.6.10 Calculation of the yield:…….. 406
15.6.11 Table of felling:……. 406
15.6.12 Method of executing the felling:…… 406
15.6.13 Subsidiary silvicultural operations cleaning & thinning:…… 406
15.6.14 Regeneration:…….. 446
15.6.15 Associated regulations & measures:……. 446
CHAPTER-16…… 449
PLANTATION WORKING CIRCLE (PWC)…… 449
16.1 Plantation working circle:…… 449

16.2 General Constitution of :…… 450

16.3 General characteristics of Vegetation:…… 455

16.4 Treatment series:…… 455

16.5 Blocks, Compartments and JFM Area:……. 455

16.6 Special Objectives of Management:…… 455

16.6.1 Analysis of the crop:…… 456

16.6.2 Silvicultural System:…… 457

16.6.3 Rotation Period:…… 457

16.6.4 Harvestable Diameters:…… 458

16.6.5 Reduced Factors and reduced areas:…… 458

16.6.6 PlantingCycle:…….. 458

16.6.7 Calculation of the yield…… 462

16.6.8 Table of felling & Planting:…….. 463

16.6.9 Method of executing the felling & Planting:…… 463

16.6.10 (a) Cleaning:…… 468

16.6.10 (b) Thining:…….. 468

16.6.11 Regeneration:…… 469

16.6.11.1 Survey,Demarcation,Site preparation,Alignment & Stacking…….. 469

16.6.11.2 Pitting…….. 469

16.6.11.3 Choice of Species and Nursery……. 470

16.6.11.4 Planting…… 471

16.6.11.5 Soil and Moisture Conservation…… 472

16.6.12 Associated Regulations & Measures:…… 472

16.6.12.1 Grazing…… 473

16.6.12.2 Map on Topo sheet…….. 473

16.6.12.3 Plantation Control Form…… 473

16.7 Plantation raised during previous Working plan & Working scheme:…… 474

16.8 Trending series:…… 477

16.8.1 Operation in tending series:…… 479

16.8.2 Exploitable Diameters…….. 479

16.8.2.1 Plantation Treatment Cycle…… 479

16.8.2.2 Yield Calculation……..……. 480

16.8.3 Table of plantation treatmnet…… 480

16.8.4 Method of executing the plantation tretment:…… 480

16.8.5 Demarcation:…… 481

16.8.6 Site Map:…….. 481

16.8.7 Treatment Map:…… 481
16.8.8 Tending:…… 482
16.8.9 Tending in teak planation:…… 482
16.8.10 Tending in other plantation:…….. 483
16.8.11 Item of operation in cleaning:…….. 483
16.8.12 Thinning:…….. 484
16.8.13 Items of operation in thining:……484
16.9 Other regulation:……484
CHAPTER-17…… 487
NTFP (OVERLAPPING) WORKING CIRCLE……487
17.1 Name of the Working Circle:…… 487
17.2 General Constitution of Working Circle:…….. 487
17.3 General characteristics of Vegetation:…….. 488
17.4 Felling Series, Cutting section & JFM areas:……488
17.5 Blocks, Compartment & JFM areas…….. 488
17.6 Special Objectives of Management:…… 500
17.6.1 Annalysis of the crop:…….. 501
17.6.2 Silvicultural System:…… 536
17.6.3 Rotation Period:…….. 537
17.6.4 Harvestable Diameter / Sustainable harvesting:…… 537
17.6.5 Reducing factors & reduced areas:…… 538
17.6.6 Felling cycle:…….. 538
17.6.7 Division in to periods and allotment to periodic blocks:…… 538
17.6.8 Calculation of yield:…….. 538
17.6.9 Table of felling:…… 538
17.6.10 Methods of executing the felling:…….. 538
17.6.11 Subsidiary silvicultural operations, cleaning & thining:……538
17.6.12 Regenerations…….. 538
17.6.13 Associated regulations & measures…… 538
17.6.13.1 Training to Panchayat Raj Institution…… 539
17.6.13.2 Infrastructure for Processing Storing and Marketing…… 539
17.6.13.3 Marketing…….. 539
17.6.13.4 Maintenance of Records and Database…….. 540

17.6.13.5 Participation and Empowerment of VSS…… 540
CHAPTER-18…….. 542
JFM (Overlapping) Working Circle…… 542
18.1 Name of the Working Circle:…… 542
18.2 General Constitution of Working Circle:…… 542
18.3 General characteristics of Vegetation:…….. 545
18.4 Felling series, cutting sections & JFM areas:…… 545
18.5 Special objectives management:…… 545
18.5.1 Silvicultural System:…… 546
18.5.2 Roation Period:……. 546
18.5.3 Harvestable diameters:…….. 546
18.5.4 Reducing factors & areas:…… 546
18.5.5 Felling Cycle…….. 546
18.5.6 Division in to periods & allotments to periodic block:…….. 547
18.5.7 Calculation of the yield:…….. 547
18.5.8 Table of felling:…… 547
18.5.9 Method of executing the felling:…….. 547
18.5.10 Subsidiary silvicultural operations:…….. 547
18.5.11 Regenerations:……..….. 547
18.5.12 Associated regulations & measures…… 547
18.5.13 Institutionalisation of V.S.S:……..… 548
18.5.14 Capacity Building:……..… 548
18.5.15 Preparation of Micro Plan:……..… 549
18.5.16 Protection Mechanism:…… 550
18.5.17 Rejuvenation & Development Process:…… 551
18.5.18 Benefit of Usufruct:……..…… 551
18.5.19 Support Activities:……..…… 553
18.5.20 Expansion of Joint Forest Management:…… 553
18.6 Other Regulations:…… 554
18.6.1 Monitoring & Evaluation:……..…….. 554
18.6.2 Review:…….. 555
18.6.3 Rewards:…… 555
18.6.4 Conflict Resolution:…… 555
18.6.5 Convergence with other Rural Development Activities:…… 556

18.6.6 Publicity:……. 556

CHAPTER-19…….… 558

WILDLIFE (OVERLAPPING) WORKING CIRCLE)……..…… 558

19.1 Name of Working Circle:……..……. 558

19.2 General Constitution of Working Circle:…… 558

19.3 General characteristics of Vegetation:……. 558

19.4 Felling Series / Cutting Section and JFM Area;……..… 559

19.5 Blocks, Compartments and JFM Area:……. 559

19.6 General characteristics of Vegetation& Fauna:…….. 572

19.6.1 Characteristics of Flora:…… 572

19.6.2 Characteristics of Fauna:…… 573

19.6.3 Mayurbhanja Elephant Reserve…… 573

19.6.4 Similipal Tiger Reserve:…… 574

19.6.5 Elephant Corridors:……. 578

19.7 Special objectives of management:…… 580

19.8 Activities of the Working Circle:…… 582

19.8.1 Habitat Development:……. 583

19.9 Wildlife census:…… 599

19.10 Human-Wildlife Conflict (HWC):…… 606

19.11 Wildlife Crime & Poaching:…… 609

19.12 Control of Man Wild Animal Conflicts:……. 610

19.12.1 Establishment of Anti-Poaching Squads…… 611

19.12.2 Awareness among the local people…… 611

19.13 Wildlife Disease:…… 613

19.13.1 Blackleg, black quarter, quarter evil, or quarter ill…… 613

19.13.2 Hemorrhagic Septicemia (HS) …… 615

19.13.3 Foot and Mouth Disease ……. 617

19.13.4 Rinderpest:…… 623

19.13.5 Anthrax:…… 624

19.13.6 Tuberculosis:…… 624

19.14 Wildlife Habitat Relationship:…… 624

19.14.1 Succession Stage…… 626

19.14.2 Vertical Structure…….. 628

19.14.3 Size of Area…….. 629

19.14.4 Special Habitat Features…….. 629

19.14.5 Snags and Cavity Trees…… 629

19.14.6 Dead Trees…… 630
19.14.7 Rocky Outcrops and Caves…….. 631
19.14.8 Evergreens……. 631
19.14.9 Temporary Pools…… 631
19.15 Mismanaged habitats:…… 636
19.16 Other Regulations:……. 636
19.16.1 Infrastructure & Training:…… 637
19.16.2 Establishment of an animal rescue-cum-rehabilitation Centre:…… 637
19.16.3 Information Network, Record Keeping & Database:……. 638
19.16.4 Prosecution of Wildlife Crime…… 639
19.16.5 Wildlife Depredation…… 639
19.16.6 Control of Grazing & Fire Protection Measure…….. 640
19.16.7 Incentives & Rewards…… 640
CHAPTER-20…….. 641
Tree Outside Forest area…… 641
20.1 Introduction……. 641
20.2 General constitution of Working Circcle:…… 642
20.3 General Characteristic of Vegetation:…… 643
20.4 Felling series, cutting section, & JFM areas:……. 647
20.5 Blocks , Compartments & JFM areas:…… 647
20.6 Special objective of Management of ToF area:……. 647
20.6.1 Analysis of the crop:……. 649
20.6.2 Silvicultural System:……. 667
20.6.3 Roatation Period:…… 667
20.6.4 Harvestable Diameters:…… 667
20.6.5 Reducing Factors & reduced areas:…… 668
20.6.6 Treatment Cycle:…… 668
20.6.7 Division in to periods & allotment to periodic blocks:…… 668
20.6.8 Calculation of the yield:…….. 668
20.6.9 Table of felling:…… 668
20.6.10 Method of executing felling:…… 669
20.6.11 Subsidiary Silvicultural Operation:…… 669
20.6.12 Regeneration:……. 670
20.6.13 Associated Regulation & Measure:…… 673
CHAPTER-21…… 675
Application of Modern technologies to Forest Mangement…… 675

21.0 Introduction…… 675
21.1 Modern Technology being adopted:…… 677
21.2 Modern Technology to be introduced in Forest Management:…… 679
CHAPTER -22……. 681
Reduce Emissions from Deforestation and forest Degradation (REDD+)…… 681
22.1 Introduction:……. 681
22.2 FAO's support to countries' Nationally Determined Contributions (NDCs):…… 684
22.3 REDD+ Implementation:…… 684
22.3.1 Country highlights:…… 685
22.3.2 India's first NDC includes commitments:…….. 686
22.3.3 Indicative Work plan to combat Climate Change:……. 689
22.3.4 Suggestive measures on Forestry Sector……. 690
CHAPTER-23…… 691
General…… 691
23.1 General Financial forecast & financial operation…… 691
23.2 Source of Funding:…… 694
23.3 Petty felling & extraction :…… 694
23.4 Rights and Concessions:…… 694
23.5 Other research and Bio Diversity study……. 695
CHAPTER-24…… 696
Miscellaneous Regulation……. 696
CHAPTER-25…… 697
25.1 Water Resources Management (Introduction)…….. 697
25.2 Forest and Water…….. 697
25.3 Climate change impacts on Forests & Hydrology…… 698
25.4 Management of Water…… 698
25.4.1 Temperature and Precepitation…… 700
25.4.2 Ground Water Level…… 701
25.4.3 Management Intervention…… 706
CHAPTER-26…….. 707
Summary of Prescription…… 707
ANNEXURES…… 723 to 916

ABBREVIATIONS USED	
AR	Artificial Regeneration
ANR	Aided Natural Regeneration
BGL	Below Ground Level
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CBD	Convention on Biological Diversity
CD	Community Development
CDVO	Chief District Veterinary Officer
CGWB	Central Ground Water Board
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoP	Conference of the Parties
DBH	Diameter at Breast Height
DGPS	Differential Global Positioning System
DLC	District Level Committee
DPF	Demarcated Protected Forest
EAC	Environment Impact Assessment Committee
EIA	Environment Impact Assessment
F&E	Forest & Environment Department
FAO	Food and Agriculture Organization
FDA	Forest Development Agency
FFAH	Forest, Fisheries & Animal Husbandry
FSI	Forest Survey of India
FYM	Firm Yard Manure
FYP	Five Year Plan
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Green House Gas
GIM	Green India Mission
GIS	Geographic Information Systems
GPS	Global Positioning System
IGA	Income Generation Activities
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
JFM	Joint Forest Management
JFM(O)WC	Joint Forest Management (Overlapping) Working Circle
JFMC	Joint Forest Management Committee

LBCD	Loose Boulder Check Dams
LED	Light Emitting Diode
LIDAR	Light Detection and Ranging
LPG	Liquefied Petroleum Gas
MAP	Medicinal & Aromatic Plant
MDF	Moderately Dense Forest
MFP	Minor Forest Produce
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MODIS	Moderate Resolution Imaging Spectroradiometer
MoU	Memorandum of Understanding
NAC	Notified Area Council
NAP	National Afforestation Program
NBM	National Bamboo Mission
NDC	National Development Council
NFI	National Forest Inventory
NGO	Non-Government Organization
NITI	National Institution for Transforming India
NRSA	National Remote Sensing Agency
NTFP	Non Timber Forest Produce
NTFP(O)WC	Non Timber Forest Produce (Overlapping) Working Circle
NWPC	National Working Plan Code
OF	Open Forest
OFDC	Odisha Forest Development Corporation
OFSDP	Odisha Forest Sector Development Project.
OMBADC	Odisha Mineral Bearing Areas Development Corporation
ORSAC	Odisha Space Application Centre
PCCF	Principal Chief Conservator of Forests.
PF	Protected Forest
PRA	Participatory Rural Appraisal
PRF	Proposed Reserved Forest
PRI	Panchayati Raj Institutions
PWPR	Preliminary Working Plan Report
QPM	Quality Planting materials
RCCF	Regional Chief Conservator of Forests
REDD+	Reduce Emissions from Deforestation and Forest Degradation
RF	Reserved Forest
RWC	Rehabilitation Working Circle
SAPs	Special Action Plans

SDG	Sustainable Development Goal
SFP	Social Forestry Project
SHG	Self Help Groups
SMC	Soil & Moisture Conservation
SNPP	Soumi National Polar-orbiting Partnership
SWC	Selection Working Circle
TOF	Tree outside the Forest
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VDF	Very Dense Forest
VF	Village Forest
VFC	Village Forest Committee
VHF	Very High Frequency
VSS	Vana Surakshya Samiti

I. LIST OF FLORA OF KARANJIA DIVISION

Sl. No	Odia Name Trees	Botanical Names	Family
1	Amba	*Mangifera Indica*	Anacardicaceae
2	Ambada	*Spondias pinnata*	Anacardiaceae
3	Amla	*Phyllanthus emblica*	Phyllanthaceae
4	Arjun	*Terminalia arjuna*	Combretaceae
5	Asan	*Terminalia tomentosa*	Combretaceae
6	Ashoka	*Saraca asoca*	Fabaceae
7	Aswasttha	*Ficus religiosa*	Moraceae
8	Bahada	*Terimalia belerica*	Combretaceae
9	Bana champa	*Phoebe lanceolata*	Lauraceae
10	Bana karpur	*Cinnamomum caudatum*	Lauraceae
11	Banakopasia	*Kydia xalyxina*	*Malvaceae*
12	Bara	*Ficus benghalensis*	*Moraceae*
13	Barsapakor	*Grewia sapida*	*Tiliaceae*
14	Bastura/porjo	*Litsea polyantha*	*Lauraceae*
15	Batguri	*Ardsia solanacea*	*Myrsinaceae*
16	Bela	*Aegle marmelos*	*Rutaceae*
17	Bhalia	*Semexarpus anacardium*	*Anacardiaceae*
18	Bhurukunda (Kansa)	*Hymeodictyon excelsum*	*Rubiaceae*
19	Champa	*Magnolia champaca*	*Magnoliaceae*
20	Champati	*Polyalthia cerasioides*	*Annonaceae*
21	Chandan (sandal)	*Santalum album*	*Santalaceae*
22	Chara	*Buchanania lanzan*	*Anacardiaceae*
23	Charia	*Holoptelea intergrifolia*	*Ulmaceae*
24	Chhatian	*Alstonia scholaris*	*Apocynaceae*
25	Dhaura	*Anogeissus latifolia*	*Combretaceae*
26	Dimiri	*Ficus racemosa / glomeratea*	*Moraceae*
27	Domsal/Gandha palasa	*Millius velutina*	*Anonaceae*
28	Ekwsira/Mukha	*Schrebera swietenioides*	*Reaceae*
29	Gambhari	*Gmelina arborea*	*Verbenaceae*
30	Genduli	*Strerulia urens*	*Sterculiacease*
31	Ghadalanij/Kala Siris	*Albizia chinensis*	*Fabaceae*
32	Gohira	*Acacia lecucophloea*	*Fabaceae*
33	Gudikoik	*Mitragyna parviflora*	*Rubiaceae*
34	Gunda-guria	*Macarananga peltata*	*Euphoroiaceae*
35	Harida	*Terminalia chebula*	*Combretaceae*
36	Hopa/Pita alu	*Cochlospermum gosspium*	*Bixaceae*

Sl. No	Odia Name Trees	Botanical Names	Family
37	Jamu	*Syzygium cumuni*	*Mytraceae*
38	Jeuta	*Artocarpus lakoocha*	*Moraceae*
39	Kadamba	*Neolamarckia cadamba*	*Rubiaceae*
40	Kalchua	*Glochidion lanceolarium*	*Euphoribiaceae*
41	Kamala gundi	*Mallotus philippinensis*	*Euphoribiaceae*
42	Kanta buda	*Sideroxylon tomentosum*	*Sapotaceae*
43	Kanteikoli	*Flacourtia indica*	*Flacurtiaceae*
44	Karanja	*Millettia pinnata*	*Papilionaceae*
45	Kasi	*Bridelia retusa*	*Euphoribiaceae*
46	Katha kusum	*Garuga pinnata*	*Burseracease*
47	Kendu	*Diospyros melanoxylon*	*Ebanaceae*
48	Khajur	*Phoenix sylvestris*	*Palmaceae*
49	Kia/Mai	*Lannea coromandelica*	*Anacardiceae*
50	Kodalo	*Sterculia villosa*	*Sterculiacease*
51	Koim	*Haldina cordifolia*	*Rubiaceae*
52	Kochila	*Strychnos nuxcomica*	*Loganiceae*
53	Kultho/Dhaman	*Grewia tiliaefolia*	*Tiliceae*
54	Kumbhi	*Careya arborea*	*Lecythdaceae*
55	Kusum	*Schleichera oleosa*	*Oleaceae*
56	Lodha	*Symplocos racemosa*	*Styraceae*
57	Magaki (Mahala)	*Ailanthus excelsa*	*Simarubaceae*
58	Mankar Kendu	*Diospyros peregrine/ Montana*	*Ebenaceae*
59	Mahul	*Madhuca indica*	*Sapotaceae*
60	Nageswar	*Mesua ferrea*	*Guttiferaceae*
61	Neem	*Azadirachta indica*	*Meliaceae*
62	Padashi (Karada)	*Cleistanthus collinus*	*Euphobiaceae*
63	Palash	*Butea monosperma*	*Papilionaceae*
64	Panasa	*Artocarpus hetrophyllus*	*Moraceae*
65	Panigambhari	*Trewia nudiflora*	*Euphobiaceae*
66	Paniudum	*Firmiana colorata*	*Sterusaceae*
67	Paruli	*Stereospermum suaveolens*	*Bignoniaceae*
68	Piasal	*Pterocarpus marsupium*	*Papilionaceae*
69	Poijam	*Syzygium cerasoides*	*Mytraceae*
70	Rai	*Dillenia pentagyna*	*Dilleniaceae*
71	Rimili,ramohi	*Protinm serratum*	*Bruseraceae*
72	Rohini	*Soymida febrifuga*	*Meliaceae*
73	Sal	*Shorea robusta*	*Dipterocarpaceae*
74	Salai	*Boswellia serrate*	*Burseraceae*

Sl. No	Odia Name Trees	Botanical Names	Family
75	Sanchukuruchi	*Wrightia tomentosa*	*Asclepidaceae*
76	Siali	*Bauhinia vahlii*	*Caesalpiniceae*
77	Sidha	*Lagerstroemia speciosa*	*Lythraceae*
78	Simli	*Bombax ceiba*	*Bombacaceae*
79	Siris (Kala)	*Albizzia lebbeck*	*Mimcsaceae*
80	Siris(Dhala)	*Albizzia procera*	*Mimcsaceae*
81	Sisoo (Bali)	*Dalbergia sissoo*	*Papilpnaceae*
82	Sisoo (Pahadi) **(Rose wood)**	*Dalbergia latifolia*	*Papilpnaceae*
83	Soitani	*Micromelum minutum*	*Rufaceae*
84	Sojana (Bara akulia)	*Dalbergia paniculata*	*Papilpnaceae*
85	Strawbery bush	*Euonymus glaber*	*Celastraceae*
86	Sunari	*Cassia fistula*	*Ceaslapiniaceae*
87	Tala	*Borassus flabellifer*	*Palmaceae*
88	Teak	*Tectona grandis*	*Verbenaceae*
89	Tentuli	*Tamarindus indica*	*Ceaslapiniaceae*
90	Toon	*Toona cilliata*	*Maliaceae*
	Shurbs		
91	Bana Dadri	*Hyptianthera stricta*	*Rusiaceae*
92	Banda	*Dendrophthoe falcata*	*Lorntheceae*
93	Bchhuati	*Mucuna pruriens*	*paplilionaceae*
94	Borokoli	*Ziziphus maurtitana*	*rhaamanceae*
95	Dhatuki	*Woodfordia fructicosa*	*lythraceae*
96	Kangada	*Xylia xylocarpa*	*Fabaceae*
97	Karanda (Ghrurudu	*Gardenia gummifera*	*Rubiaceae*
98	Kuduchi/Kurei	*Holarrhena antidysenterica*	*Apocynaceae*
99	Saromutr	*Clerodendron serratum*	*Verbenaceae*
100	Willow (Sali)	*Salixtetra soermaa*	*Salicaceae*
	Herbs		
101	Bilati Dhania	*Eryngium foctidum*	*Umsolliferecеae*
102	Chhota Rasna	*Globa recemosa*	*Zingibraceae*
103	Kalmegh	*Anadrographis paniculata*	*Acanthaceae*
104	Palo	*Curcuma aromatica*	*zingiberaceae*
105	Paro	*Curcumaangustifiloia*	*zingiberaceae*

Sl. No	Odia Name Trees	Botanical Names	Family
Climbers			
106	Anantamula	*Hemidesmus indicus*	*Aselepaidaceae*
107	Atundi	*Combretum decandrum*	*Combretaceae*
108	Durkuli	*Erycibe paniculata*	*Convolvulaceae*
109	Gaichara (Satabari)	*Asparagus racemosus*	*Liliaceae*
110	Galio	*Gnetum oblongum (Galio) (Gymnosperm)*	*Gnetaceae*
111	Gillo	*Entada scandens*	*Papilionacace*
112	Guadhuni	*Millettia auriculata*	*Papililonaceae*
113	LohiPalasa	*Butea superba*	*Papilionaceae*
114	Muturi	*Smilax macrophylla*	*Liliaceae*
115	Pitaalu	*Dioscorea bulbifera*	*Dioscoreaceae*
116	Rajdantani	*Smilax zeylanica*	*Liliaceae*
Epiphyte			
117	-	*Aerides multiflora*	*Orchidaceae*
118	-	*Dendrobium transparens*	*Orchidaceae*
119	-	*Dendrobium aphyllum*	*Orchidaceae*
120	-	*Luisia trichorrhiza*	*Orchidaceae*
121	-	*Vanda*	*Orchidaceae*
122	-	*Habenaria spp.*	*Orchidaceae*

II. LIST OF FAUNA OF KARANJIA FOREST DIVISION

Sl.	English Name	Local Oriya Name	Zoological Name	Status
1	Barking deer	Kutura	*Muntiacus muntjak*	Sch. III
2	Chitala / Spotted deer	Harina / Miriga	*Axis axis*	Sch. III
3	Common mangoose	Neula	*Herpestes edwardsi*	Sch. II
4	Five striped palm squirrel	Gundichimusa	*Funambulus pennanti*	Sch. IV
5	Fulvous fruit bat	Badudi	*Rousettus leschenaulti*	Sch. V
6	Striped Hyena	HetaBagha / Hundala	*Hyaena hyaena*	Sch. III
7	House rat	Musa	*Rattus rattus*	Sch. V
8	Indian Wolf	Gadhia	*Canis lupus pallipes*	Sch. I
9	Indian giant squirrel	Belari Musa	*Ratufa indica*	Sch. II
10	Indian Elephant	Hati	*Elephas maximusindicus*	Sch. I
11	Indian Fox	Kokisiali	*Vulpes bengalensis*	Sch. II
12	Indian flying Fox	Badudi	*Pteropus giganteus*	Sch. V
13	Indian porcupine	Jhinka	*Hystrix indica*	Sch. IV
14	Jungle Cat	Banabilei	*Felis chaus*	Sch. II
15	Jackal	Bilua	*Canis aureus*	Sch. II
16	Large Indian civet	Kattas	*Viverra zibetha*	Sch. II
17	Langur, Common	Mankad	*Presbytis entellus*	Sch. II
18	Leopard	Kalarapatria Bagha	*Panthera pardus*	Sch. I
19	Pangolin	Bajrakapta	*Manis crassicaudata*	Sch. I
20	Ratel / Honey badger	Gada Bhalu	*Mellivora capensis*	Sch. I
21	Rhesus macaque	Pati Mankada	*Macaca mulatta*	Sch. II
22	Sloth bear	Bhalu	*Melursus ursinus*	Sch. II
23	Small Indian civet	Salia Patani	*Viverricula indica*	Sch. IV
24	Small Indian Mangooes	Neula	*Herpestes auropunctatus*	Sch. IV
25	Short nosed fruit bat	Chemini	*Cynopterus brachyotis*	Sch. V
26	Tiger	Mahabala Bagha	*Panthera tigristigris*	Sch. I
27	Wild pig	Barha	*Sus scrofa*	Sch. II

EXECUTIVE SUMMARY ALONG WITH THE CONSTRAINTS FACED DURING WRITING OF THE PLAN

I. INTRODUCTION

a. Vision Statement–

The present working Plan has been drafted with a vision to achieve different goals on various sectors by 2030-31 i.e. by end of the Plan Period. The Sector wise vision for Karanjia Division perceived is as follows –

i. Increasing green cover by encouraging outside forest plantation like farm forestry, agroforestry, avenue plantation etc.

ii. Creation of Soil and Water Conservation structures inside degraded forest with watershed approach.

iii. Qualitative Improvement of areas under Bamboo working Circle. The demand of bamboo met by the farmers having bamboo plantation thus reducing biotic pressure on bamboo inside the forest.

iv. Secured forest boundary with real time change analysis using RS and GIS and monitoring of fresh encroachment.

v. Improving People's participation towards management of forest.

vi. Adoption of Modern Technology like Remote sensing, GIS, Drone in Forestry.

vii. Conservation and propagation of Wildlife

viii. Maintaining and restoring biodiversity in forests and safeguarding humans from climate change.

b. Goals and objectives of management–

i. To maintain environmental stability and ecological balance by protecting, preserving and enriching the existing natural forests.

ii. To ensure protection of the soil by checking soil erosion.

iii. To carry out sustainable harvesting of forest produce scientifically and by encouraging natural regeneration and planting of indigenous species.

iv. Meeting the requirement of fuel wood, fodder, non-wood forest produce and small timber of the rural and tribal populations. Salvaging of the available dead and fallen trees in order to cater the needs of the population to the extent possible.

v. The Non-Timber Forest Produce resources will be managed in a sustainable manner by the JFM.

vi. To involve people in protection, management and development of forests. Joint Forest Management (JFM) programmes will be an integral part of management and protection of forests.

c. SWOT analysis for prescription of strategies for achieving the goals and objectives–

In the preparation of working plans with the objectives for achieving sustainable forest management, Strengths, weakness, Opportunities and Threats are identified. Based on the SWOT analysis alternative strategies are developed for the division.

Strength

- Ability to maintain forest cover.
- Trained Staff.
- Area of the forest department is well spread.
- Infrastructure of nurseries, offices and quarters are good.

Weakness

- Lack of innovation and motivation.
- Lack of legal awareness and implementation.
- Involvement of people in forest management.

Opportunity

- Training in new technology and exposures to staff.
- Creation of assets and infrastructures.
- Involvement of people and NGOs in conservation of Biodiversity.
- Increasing the scope of Ecotourism, creating new tourist points, under Karanjia Division.

Threats

- Lack of control over encroachment, over grazing, illicit felling, etc.
- Forest Fire.
- Human-Elephant Conflict

d. Expected outcome–

External and Internal factors of environment are considered to achieve the expected outcome.

(i) Increase in productivity of the forest ecosystem and maintenance of the vitality

(ii) Reduction in soil erosion, enhancement of fertility of the soil and ensured stability of the forest ecosystem.

(iii) Enhancing water conservation capacity of the forest ecosystem.

Mitigation/carbon sequestration capacity of the forests and adaptation with change in climate.

(iv) Meeting the fuel wood, fodder and timber requirements of the local communities, enhancing livelihood and employment opportunities, ensuring usufruct/ benefit sharing and protection of their traditional knowledge and traditional/cultural practices, etc.

e. Abstract of plan prescriptions

Chapter No.	Para No. / Sub para No.	Prescribed activity	Remarks
A	B	C	D
14. Selection working circle	**14.4**	Scattered single trees or small groups of trees are selected over the whole area and removed, where conditions are favorable, natural regeneration springs up in the gaps so created.	8 Felling series created under this system, which is elaborated in SWC.
	14.6.2	Silvicultural System– selection felling is prescribed in this system.	The tending and subsidiary cultural operations shall be taken up to boost up the growing stock and to induce sustainable regeneration
	14.6.9	Table of felling - felling shall be phased and sequential in the forest blocks.	
	14.6.11	Subsidiary silvicultural operations, cleaning and thinning - Removal and disposal of slash and debris of main felling coupled with some hygienic operations like climber cutting, soil conservation measures etc. are the major components.	The details prescribed in the SWC.
15. Rehabilitation Working Circle	**15.6.2**	Silvicultural system - to achieve the major objectives, the broad operations prescribed are regeneration cleaning (inclusive of even thinning where ever necessary) Soil and Moisture Conservation, gap-plantation of desired species and the protection from biotic interference.	
	15.6.6	Felling cycle / Rehabilitation Cycle - A 10 (ten) years Rehabilitation Cycle is to be adopted coinciding with the working plan period.	
	15.6.8	Division into Annual Rehabilitation Coupe: The trend of rehabilitation measures of different blocks and compartments shall be taken up as per the Annual Coupes, which have been constituted by dividing each series into 10 segments intending to take up one such segment per year so that the entire area can be treated during the plan period.	

Chapter No.	Para No. / Sub para No.	Prescribed activity	Remarks
15. Rehabilitation Working Circle	**15.6.9**	Method of treatment: High stumps cutting, Singling out the multiple coppice shoots, cleaning operation to reduce congestion in the crop.	
	15.6.13	Subsidiary silvicultural operations cleaning and thinning.	The details prescribed in Chapter No. 15
16. PLANTATION WORKING CIRCLE	**16.4**	Treatment Series -The area from VFs are assigned to one planting series i.e. Karanjia Planting Series.	
	16.6.2	Silvicultural System: Clear felling with standard followed by Artificial Regeneration by planting''	The number of standards per hectare will depend upon biotic interference, possibility of dispersal of seeds for a high forest system, fruit bearing species, having timber value at a higher girth class.
	16.7	Plantations raised during previous working plan and working scheme - Old plantations raised during previous working plan between 1996-97 to 2015-16 and plantations raised in working schemes period from 2016-17 to 2020-21 have been mentioned below. Owing to biotic pressure, the survival percentage is not as expected hence the thinning operations and other tending operations can be taken up very judiciously.	
	16.8	Tending Series: In order improve of Old plantations raised during previous working plan i.e. 1996-1997- to 2016-2017 and to boost new plantations raised during the scheme from 2016-2017 detail prescription has been prescribed under a new tending series called Karanjia Tending Series.	The detail operation is prescribed in PWC.
	16.6.9	Method of executing the felling & planting	The details prescribed in this Chapter.
17. N.T.F.P. (Overlapping) Working Circle	**17.2**	N.T.F.P. yielding species have made its presence throughout Karanjia Forest Division. A separate overlapping Working Circle would serve the purpose of assessing the production, propagation, collection and management. The Overlapping Working Circle comprises of an area of 43261.83 Ha extending over 335 forest blocks.	

Chapter No.	Para No. / Sub para No.	Prescribed activity	Remarks
18. J.F.M. (Overlapping) Working Circle	**18.2**	The JFM (Overlapping) Working Circle is constituted for portions of Reserved Forests, Proposed Reserved Forests, Village forests etc. assigned to Vana Surakshya Samiti (V.S.S.) spreading over 21057.5 Ha .An area of 21057.5 Ha has been allotted to this Working Circle. This working circle includes some of the RF, PRF, DPFs, VF covered under Selection Working Circle, Rehabilitation Working Circle, Plantation Working Circle of Karanjia Division.	
19. Wildlife (Overlapping) Working Circle	**19.2**	This Overlapping Working Circle extends whole the plan area for protection of wildlife and also for promotion and conservation of biodiversity. The area extends over the entire Plan Area of 335 Forest Blocks with 43261.83 Ha.	

f. Works prescribed during the Plan period:

Chapter No.	Para No./ Sub Para No.	Prescribed activity	Year wise (year 1-10) distribution of physical target (HA)
A	**B**	**C**	**D**
14. Selection working circle	**14.2**	Entire area assigned to this working circle has been categorized into eight felling series. In this working circle 102 No. R.F, 12 No. PRF and 01 No. DPF are included.	28995.78 Ha over 10 Years
15. Rehabilitation Working Circle	**15.2**	There are 08 Nos. of Rehabilitation series includes 103 nos. RF, 33 nos. PRF, and 07 nos. of DPFs.	12854.23 Ha over 10 Years
16. Plantation working circle	**16.2**	The plantation Working circle covers 1411.82 ha.	For 10 Years Karanjia Planting Series -401.21 Ha Karanjia Tending Series. -1010.6 Ha. **Total-**1411.82 **Ha**
17. N.T.F.P. (Overlapping) Working Circle	**17.2**	The Overlapping Working Circle extending over 335 forest blocks.	43261.83 Ha over 10 years.
18. J.F.M. (Overlapping) Working Circle	**18.2**	J.F.M. (Overlapping) Working Circle	21057.5 Ha. over 10 years
19. Wildlife (Overlapping) Working Circle	**19.2**	Wildlife (Overlapping) Working Circle	43261.83 Ha. over 10 years

Executive summary

The Government vide notification no 1F- (A)-71/2018-3913/ F&E dated 21.02.2019 have reorganized the Division with consideration to Boundary of Similipal Tiger Reserve and created two Wildlife Division namely Similipal South Wildlife Division and Similipal North Wildlife Division with effect from 01st October 2019. In the process, Similipal Sanctuary part of this Division were carved out limiting the geographical area to 1845.78 Sq. Km.

The forests under this division were being managed as per Working Plan prepared by Sri A.O.F Bakhla, IFS (1996-97 to 2015-16). The outgoing plan had covered only the Reserved Forests of the division. After expiry of the Plan, the forests are being managed basing on Annual Schemes prepared by the Division.

In this plan all the forest blocks of Karanjia Division under administrative control of Forest Department have been included and management practices have been prescribed. The forest area covered under this plan is **43261.83 ha** (Reserved Forest – 205 Blocks- 40030.34 ha; PRF-45 Blocks-1475.75 ha; DPF-8 blocks-1354.53 ha and VF-77 blocks-401.21 ha).

A. Administrative Setup:

For Administrative convenience, the division is divided in to four Ranges. Ranges have been further sub divided to 22 Sections and 55 Beats. Range is the executive unit of forest administration and Beat is the smallest unit headed by a Forest Guard. Besides the inherited buildings and assets, many buildings have been constructed under CAMPA to house all offices under the division. Residential buildings have also been constructed as required at various headquarters. There are ten forest roads covering a length of 61.6 km for management, inspection of forests and transportation of Forest Produce.

B. Crop Condition:

The forests of Karanjia Division are mostly of North Indian Tropical Moist Deciduous Peninsular Lowlevel Sal Forest **(3C/$C_{2e(ii)}$).** Sal is the major crop with its associates like Asan, Piasal, Dhaura, Kendu, Kuruma, Jamu etc. Bamboo is absent. During Working Plan preparation 406 sample plots of 0.1 ha was taken for Sample enumeration as per sample points provided by ORSAC, Bhubaneswar. The uploaded data have been analyzed by National Remote Sensing Centre for 385 sample points and analysis report has been received. The analysis report indicates that the existing crop is more tilted towards young crop i.e. towards Girth Class of 30-90cm. The crop composition above 90cm GBH is very less. Similarly, the growing stock is available

in younger girth class than in Girth class above 120 cm. This indicates the crop is not at all harvestable on commercial point of view.

C. Non Timber Forest Produce:

Mayurbhanj district is a tribal district and its forests are rich in NTFP (Non Timber Forest Produce). Karanjia Division has limited NTFP resource. These are Sal Leaf, Sal Resin and Sal seed, Mahua, Honey & Wax, Tamarind, Char, Kusum, Gums and Barks etc. At present the contribution of NTFP to tribal family income is about 25%. Once forest is degraded, the availability of NTFP resources are also in a downward trend. Unscientific collection methods have further added for its degradation and its poor availability year after year. The NTFP market is very unstable and volatile. All out efforts are required to improve NTFP resource in the forest, implement practice of scientific collections and ensure better price to primary gatherers. Though most of the NTFP collections and trade have been regulated by the Panchayats, forest personnel are required to put their efforts for improvement of the NTFP resources in forest.

D. Wildlife:

Elephant and Tiger are the two flagship species of Karanjia Division. It is a part of Mayurbhanj Elephant Reserve. There are two elephant corridors in the division namely Badampahar (Mayurbhanj) –Dhobadhobin (Jharkhand) and Similipal-Hadgarh-Kuldiha corridor. Satkosia (WL) Range is completely a Similipal Tiger Reserve Range and some areas of Thakurmunda Range are also coming under the Tiger reserve. These three important aspects relating to wildlife management need to be taken care of for better management of Wildlife in the division.

E. Peoples' Participation & Natural Resource Management:

Joint Forest Management is the accepted way of Forest Management in order to achieve the objectives of forest management and improvement of forest resource. At present 272 VSSs are actively participating in the forest management and protection. 44.2 Percent of Forest area has been assigned to them. In most cases, the area is required to be demarcated on ground. Executing MoU, Preparation of Micro Plan and approval, dissemination of knowledge for skill development among villagers is desired. There is scope not only to increase the number of VSS and area assigned to them but also to qualitatively improve the level of participation in Joint Forest management. At present 80 VSS have been taken up under Odisha Forestry Sector

Development Programme-II (OSDP-II) and very good works have been taken up for rehabilitation of degraded forests and improving livelihood of the local people.

F. Conservation & Improvement of Bio Diversity:

All the forest management practices were mostly elite species oriented. Primary species, Secondary species and inferior species concept is deeply associated with forest management. Now the concept has been changed towards bio diversity, its improvement has become basic objectives of all forest & wildlife management. Karanjia Division has basically Sal forest. Due to moist environment, many herbs, shrubs and climbers are observed in forests close to Similipal Tiger Reserve. Steps are to be formulated for a better bio-diversity management with preparation of Peoples' Bio-Diversity Register (PBR). The staffs are to be re-oriented on this aspect.

G. Sacred Grove Management:

There are many sacred groves in Karanjia Division associated with tribal culture and customs. Due to influence of modern thinking in young generation, the attachment to Sacred Groves is now weakening. The Sacred Groves are in path of shrinking its area. If adequate steps are not initiated in time, sacred Groves may vanish in a short period. Proactive steps are required to be formulated to save the Groves and conserve them. So far 265 Nos. of Sacred Grove Conservation Projects has been taken up under CAMPA.

H. REDD+ and Climate Change:

Most global issue on environment aspect at present is the Global warming, Climate change and Carbon sequestration to reduce the ill effects of population explosion and rapid industrialization. The changing life style of modern days has its effect on all spheres of life. Effective steps on forest sector are required to be implemented with a measurable goal.

I. Implementation of Modern Technology:

Many modern technologies have been developed and used in forest management practices. Use of GPS, mobile applications for determining crop density, Soil erosion status, elephant movements, Application of Remote Sensing, vegetative propagation, tracking of animals through Radio signals etc. In spite of all developments, infrastructure development in production of Quality Seed, Quality

Planting Materials and quick germination / pretreatment facilities are yet to be developed to required level. Modern technology in firefighting front is required to be adopted in all sections / beats of this division. Development of modern high tech nursery with all facilities for speedy propagation of desirable species and required quantity in a short notice is essential.

In consideration of all the above aspects, this plan has been prepared with an aim to fill up the gaps between what we required and what is available. The forests have been proposed to be managed under the following Working Circles.

i.	Selection Working Circle	28995.78	Independent Working Circle
ii.	Rehabilitation Working Circle	12854.23 ha	
iii.	Plantation Working Circle	1411.82 ha	
iv.	Wildlife (Overlapping) Working Circle	43261.83 ha	Overlapping Working Circle
v.	Non Timber Forest Produce (Overlapping) Working Circle	43261.83 ha	
vi.	Joint Forest Management (Overlapping) Working Circle	21057.5 ha	
viii.	REDD+		General
ix.	Implementation of Modern Technology.		

The aim & objectives of each working Circle is basically to improve the forest and has been elaborated in the respective chapters. The cost of implementing the prescription has been furnished at **Chapter- 22**.

WORKING PLAN OF KARANJIA FOREST DIVISION
PART -1



For the Period 2021-22 to 2030-31

By

Sri Lade Gajanan Dayanand, IFS

DIVISIONAL FOREST OFFICER, KARANJIA DIVISION.

CHAPTER – I

THE TRACT DEALT WITH

1.1. Name and Situation: -

Karanjia Forest Division is carved out from sylvan Similipal, the land of roars of the tigers and trumpets of elephants. It consists of dense forests in plain & in hilly terrains intermingled with variety of valuable wild animals. The moist tropical deciduous forests along with semi evergreen patches with its luxuriant vegetation are a true paradise. The valuable forests fill the state's coffer and it was once upon a time one of the maximum revenue earning Divisions of the State. The foot prints spell ample evidence of big cats like tigers, leopards etc. in the forests and there is always direct sighting of Elephants, Spotted Deer, Barking Deer, Wild Pigs, Pangolins, Civets, Porcupines etc. In no way it is less popular so far as different eco-tourism spots are concerned. Goddess Kichakeswari at Khiching at about 25 Km. from Karanjia is the most revered deity worshipped by one and all of Panchpir Sub-Division and surrounding areas from the time of erstwhile the ruler of Mayurbhanj State.

1.1.1 Geographical location:

Forest Department of Odisha has been re-organized vide Notification No. 13228/F&E dt. 08.8.2003 with effect from dt. 1.10.2003 and consequent upon reorganization of Similipal Sanctuary and Forest administration of Mayurbhanj District vide Notification No. 1F-(A)-71/2018-3913/ F&E dated in 21.02.2019, implemented from 01.10.2019 vide office order no. 2925/2F-03.2019 dated 30.09.2019 of field Director–cum Similipal Tiger Reserve-Cum Regional RCCF, Baripada one new division namely Similipal North Wild Life Division with Headquarters at Jashipur has been created covering the Similipal Sanctuary area of Karanjia Forest Division. After re-organization the entire area of KaranjiaForest Division is situated between **Longitude E- 85°39' 51.3" to E- 86°22' 30.9" & latitude N- 21° 15' 49.0" to N-22°06' 55.8".** It extends from North by Rairangpur Forest Division, on the South Keonjhar (WL) Division, on the East Similipal North and South Wild Life Division and on the west Keonjhar Forest Division. It covers **1845.78 Sq. Km.** of geographical area.

After re-organization of erstwhile Karanjia Forest division, some changes have been made in the administrative unit. The abstract of changes made in the numbers of Ranges, Sections and Beats are given in the **Table No. 1.1.** Details are given in **Annexure No. III.**

Table No. 1.1
Abstract of Administrative Unit of Karanjia Forest Division.

Sl. No.	Administrative Units	Numbers of Units
1	Range	4
2	Section	22
3	Beat	55
4	Forest Check gates	6

1.1.2: Administrative details

This Forest Division covers 5 no. of C.D. Blocks namely Karanjia, Raruan, Sukruli, Thakurmunda & Jashipur (part), two assembly constituencies Karanjia&Jashipur and it is under one parliamentary constituency i.e. Keonjhar. To meet the boarding and officiating of the staff 43 nos. of buildings have been constructed since 2019.

(List of residential buildings is given in **Annexure – IV** and that of non-residential Govt. buildings in **Annexure –V**). For swift mobility of the staff of this division for protection and management of Forest and wild life and the forest fringe dwellers 10 **no.** forest roads have been constructed and regularly maintained over a stretch of 61.6 Kms inside the forest **(The list of the forest roads is given in Annexure – VI).** Due to prolong arid climatic condition of the area**,** the Forests wealth of Karanjia Division is vulnerable to seasonal surface fire and it becomes an arduous task before the authority to combat it effectively.

For smooth protection and management of forests and wildlife this Division has been partitioned into 55 Beats, 22 Sections & 4 Ranges, which is submitted in **Annexure –III.** Administrative details of the Proposed Working Plan area are given in**:-**

Table No. 1.2
Administrative Details of the Proposed Working Plan Area

Sl. No.	Name of the Range	Area in Sq. Km.	No of sections	No of beats	No. of RF	No. of PRF	No. of DPF & UDPF	No. of VF
1	Karanjia	603.41	5	14	89	7	4	32
2	Dudhiani	556.26	7	16	37	8	2	44
3	Thakurmunda	505.57	6	14	72	26	2	01
4	Satkosia (WL)	180.54	4	11	7	5	-	-
	Total:-	**1845.78**	**22**	**55**	**205**	**46**	**8**	**77**

1.2 Configuration of the ground

The Similipal hills rising very precipitously from the plains of Udala and Baripada in the south and south-east extend as far as Jashipur in the North, Bisoi in the West and Thakurmunda in the east covering about 2500 Sq. Kms. with innumerable crests and valleys, clad with rich forests interspersed with countless Nalas and streams. These Nalas and streams feed bigger ones which radiate in all directions between folds of the hills and emerge to the plain country all around. A chain of hills at its North Eastern corners near Bisoi extend out forming the Badampahar and Gorumahisani complex.

In between Gorumahisani hills and Bisoi the area is hilly having a large number of hills both big and small. On the south the Notto hills radiating from the southern face of the central mass of the hills march up to Dhatikidiha and Noda in the extreme south west on south westerly direction. The rest of the areas more or less are plains.

1.2.1 Altitude:

The altitude of the division ranges from 357 mtrs to 394 mtrs above Mean Sea Level (MSL).The main peaks are Jashipur (394m) in Dudhiani and Khiching (357 m.) in Karanjia area.

1.2.2 River System

The river Budhabalanga and its prominent tributaries like Palapala, Sunei, Kalo, Sanjo, Deo, Gangahari and Katra serve as the important drainage system of the division. It raises in the Similipal hills and plunges through Barehipani Falls, the second-highest waterfall in India, located in the Simlipal Wildlife Sanctuary. It then flows in a northerly direction up to the village Karanjiapal in Bangiriposhi Police Station. Thereafter, it turns to the north – east and

flows along the railway track up to the village Jhankapahadi. There it changes its course to the south and meets the Katranala. The other tributaries are the Palpala and the Chipat both of which are hill streams rising from the Similipal hills. Then the river passes through Baripada. It later flows through Balasore district and into the Bay of Bengal. The Budhabalanga is about 175 Kilometres (109 mile) long and has a total catchment area of 4,840 Square Kilometres (1,870 Sq. Mile).

1.3. Geology, Rock and Soil:

1.3.1 Geology

The older metamorphic, Singhbhum granites, Iron ore, super group of rocks and territory formations constitute the main rock units of the district. The formation of different rocks from the geological groups is given in the below table.

Table No. 1.3

Geology, Rock and Soil

Sl. No.	Group	Sub-Group
1	Recent to quaternary	Soil, laterite, clay and local pebbles, gravel zone
2	Tertiary	Clay, shale and sandstone with tertiary fossils, occasional pebbles.
3	Intrusive	Newer dolerite.
4	Older metamorphic	Basic intrusive, calc-gneiss, Hornblende schists, quartzites, quartz schist.

1.3.2 Rock

The description of different rocks and its availabilities in the forest blocks have been discussed briefly in below **Table No. 1.4**.

Table No. 1.4

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 Carnockite 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

Sl. No.	Name of rocks	Description
		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. Being less resistant to weathering and erosion it is found as mounds in low laying area along nalas.
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 mineralization 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 Gondwana rocks are marked as greenish laminated shale inter bedded with dirty gray sand stone. It contains undecomposed feldspar suggestive of prevalent cold condition during the period of deposition.
6	Shale	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 color Feld spathic sand stone 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 Barkar.
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.

1.3.3 Minerals

The area under this division has been visited from time to time by several geologists of the Geological Survey of India and the State Directorate of Mines for investigation of minerals. Their investigation reveals that the Minerals deposit of this zone is not highly significant for commercial exploitation.

The important Minerals noticed in this tract along with their description and distribution has been discussed in brief **Table No. 1.5**.

Table No. 1.5

Description of minerals

Sl. No.	Name of Minerals	Description
1	China Clay	(a) Kalikapur-Chanchbani-Purunapani-Batpalsa-Sorisbari-Gudidiha-Kurma belt near Karanjia (T.S. No.73 K/1),(b) Dhobadiha-Jamda-Kalapathuria belt near Jashipur and its extension towards Rugudi, Jorali, Manipur (T.S. No.73 K/1),(c)Bala-Dumuria-Dhalabani-Madarangajodi-Dumbisahi- Ramchandrapur-Badbil (T.S. No.73 G /13), (d)Chiruhat-Angarpada belt (T.S. No.73 G/13) (e) Gulasahi-Jamuti-Budhamara-Kasiabora-Indupur belt (T.S. No.73 G/13), (f)Paraidhora-Tikasil-Ulidihi-Tangursahi-Kalakada-Kenjhra-Guras belt (T.S. No.73 G/2), (g)Inter district boundary and the Deo River. The china clay reserve of the district has been estimated at 50 million tones.
2	Quartz and quartzites	Reserve of 2.53 million tonnes of quartz and quartzites containing 96% of silica has been estimated around Khiching and Singda.
3	Gold	Occurrence of gold is reported from Jashipur belt lying south of Kundurkucha gold deposits of Bihar.However,no commercially viable deposit has been encountered.
4	Soap Stone	Soap stone and steatites occur in Kendumundi, and Kesna and area.
5	Mica	The pegmatite is composed of muscovite transparent Quartz and plagioclase feldspar. Muscovite bearing pegmatite dykes have been found intrusive into the granetiferous gneissic formation. Mica bearing pegmatite of cream colours are fairly numerous in rocky tracts. The materials as judged from the surface indication are not of commercial important.
6	Asbestos	Occurrence of asbestos are reported around Jashipur, and Kudarsahi.
7	Manganese	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 innature.Oxidizing bacteria also render it unavailable to plant.
8	Pyrophyllite	Occurrence of Pyrophyllite of green gray and yellowish colour are seen to the east of Jashipur.
9	Nickel	Occurrence of nickel is reported in Similipal area around Ramjodi, Bilapagha. The average percentage of Nickel is 0.6.
10	Kankar	Occurrences of Lime kankar have been marked near Ankulpur.
11	Road metal / Decorative stones	Road metals are mainly obtained from rocks like dolerite, gabbros, basics and ultra-basics available all over the district. Blocks of granites, dolerites, quartzites, basics, quartz-schists, Phyllites are utilized as building materials. Some of the granites, gabbros, dolerites and ultra-basics reported around Singda, Kathakaranjia belt, Thakurmunda suitable for use as dimension / decorative stones.

1.3.4 Soil

The various sub-soil rocks, enumerated above give rise to soil differing in chemical and physical properties which extent considerable influence on the growth of trees in forests, shales found in the area on weathering yield impervious and heavy clay soil which is not very fertile for tree growth. But where it forms a mixture with laterites, the physical conditions of the soil have changed favorably for trees. Hematite rocks on disintegration produce soil as in some of the forest blocks in Thakurmunda range. In these red soil areas where the soil is of sufficient depth and well drained having a suitable slope, Sal attains a fairly good quality and luxuriance of growth and tends to be most gregarious. In the rest of the areas mentioned above, although Sal occurs as the principal species, good quality and growth is not to be found as the soils are not of sufficient depth. Laterite which is another ferruginous rocks of tertiary origin formed by bacterial action in a monsoon type of climate with heavy rain fall is found extensively as an under laying rock in the forest and outside all over the plain part of the area. Where the overlying clay on disintegrated laterite is sufficiently deep, Sal forms a pure crop though not of good quality. But where the overlying soil is too shallow or exposed laterite hardened, as is usually the case, tree growth is very poor and the area is almost barren. Lime stones do not occur very much inside the forests. Lime soils with nodular deposits are found near Jashipur, Chanchabani and Karanjia. These soils tend to become heavy and unless there is good drainage, Sal avoid such soils. Phyllites weather rapidly forming a good dark coloured soil which support good growth of trees mixed with Sal. With sufficient rain fall and with good drainage Sal grows well here.

1.4. Climatic Parameters:

The district Mayurbhanj comes under “North Central Plateau agro-climatic region with an average rainfall of 1648.20 mm per annum. Being away from the coastal belt, the district experiences a sub-tropical climate with a hot summer, chilling winter with good precipitation. The climatic conditions of this locality for the year have been discussed in **Table No. 1.6**.

Table No. 1.6			
Climatic condition of the locality.			
Sl. No.	**Climatic condition**	**Month**	**Descriptions**
1	Summer	March to June	The summer season is more pronounced from mid-March to nearly end of June. The highest temperature is felt in the month of May-June. The highest temperature goes up to 42^0C. Occasionally showers with thunderstorms are a common feature experienced in this locality.
2	Rain	July to September	Uniform precipitation occurs mainly during June to September. But rain starts from 15th June. Practically there is no rain from December to January. Occasional shower occurs during February and March. It has been observed that unusual heavy precipitation occurs some time causing floods in the river systems of this Division
3	Post Monsoon	October to November	Medium to heavy shower occurs in places, which impart an important role for the vegetation.
4	Winter	December to February	Practically cold season start from mid-November and last till the end of February. But in the higher altitudes cold winter is felt till the middle of March. The continuity of dense vegetation imparts a distinct cold for a longer period.

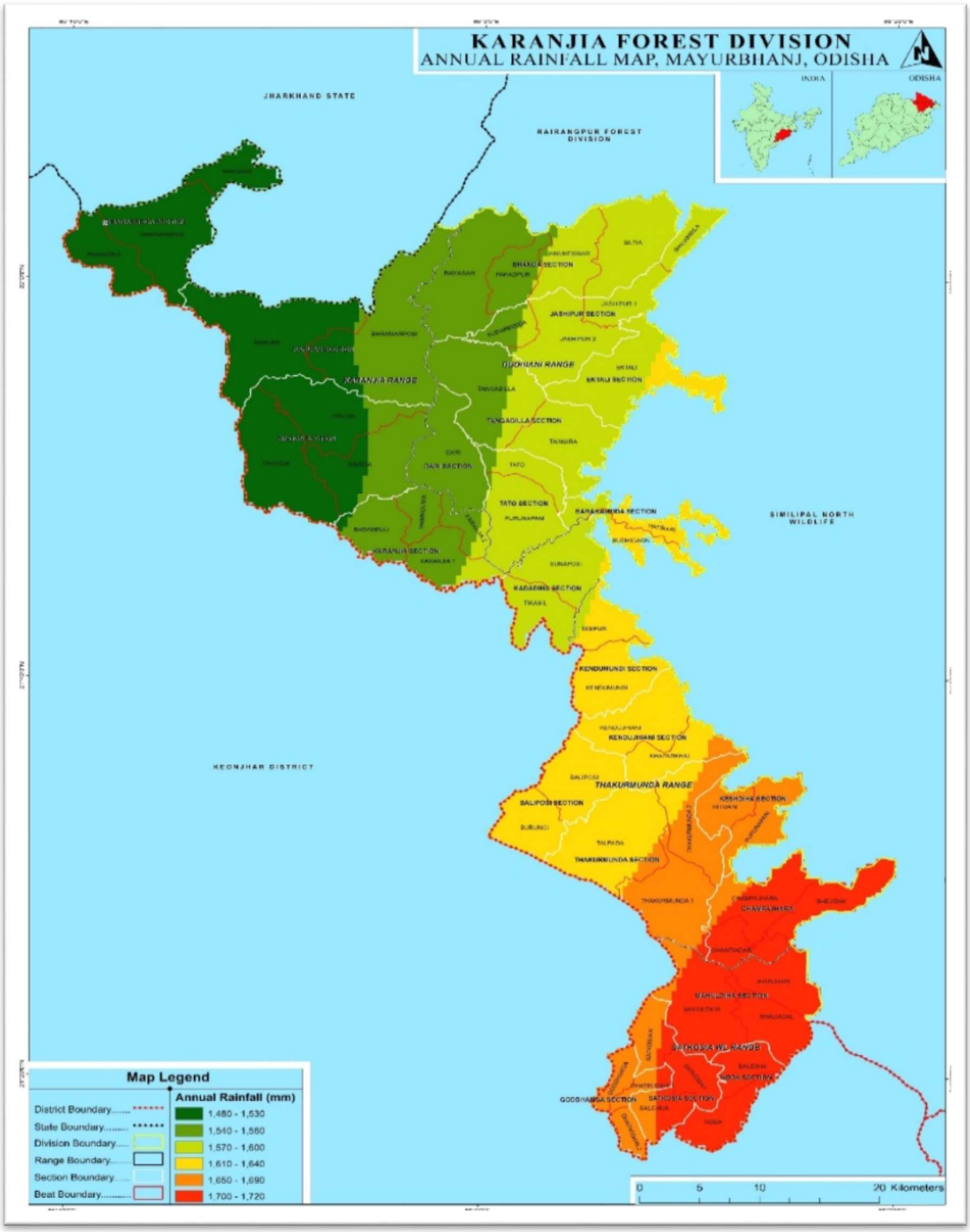
1.4.1 Rainfall

The annual rain fall is about 1443 mm. Most of the rainfall received is in between July-September. The statement showing the extent of rainfall in Karanjia Forest Division displayed in the **Table No. 1.7**.

Table No. 1.7					
Rainfall Data of Karanjia Forest Division in mm.					
Year	**CD Block Karanjia**	**CD Block Sukruli**	**CD Block Raruan**	**CD Block Thakurmunda**	**CD Block Jashipur**
2005	1795.00	1390.00	1507.00	2143.00	1978.00
2006	1475.50	1196.00	1295.00	1973.00	1689.20
2007	1835.00	2046.00	1701.00	2400.00	2197.20
2008	1492.00	1878.00	1664.00	1912.00	1933.80
2009	1099.00	958.50	993.00	1318.00	1394.00
2010	736.50	973.50	879.00	1295.00	1006.20
2011	1280.80	1303.60	1390.50	1668.70	1757.60
2012	1003.70	1120.40	1535.00	1573.00	1488.00
2013	1012.40	1041.20	927.50	1188.00	1361.60
2014	1490.00	1106.10	1001.00	1272.00	1430.00
Average	1321.99	1301.33	1289.30	1674.27	1623.56

Source: Meteorological Centre, Bhubaneswar

As per the data, the rainfall in this tract is irregular. The maximum rain fall is 2400.00 mm during the year 2007 in Thakurmunda CD block.The minimum rain fall is 736.50 mm during the year 2010 in Karanjia CD block. Due to change of rainfall pattern, the condition and composition of the vegetation differs. The average rainfall indicates that the percentage of forest covers determines the amount of rainfall of a particular area.



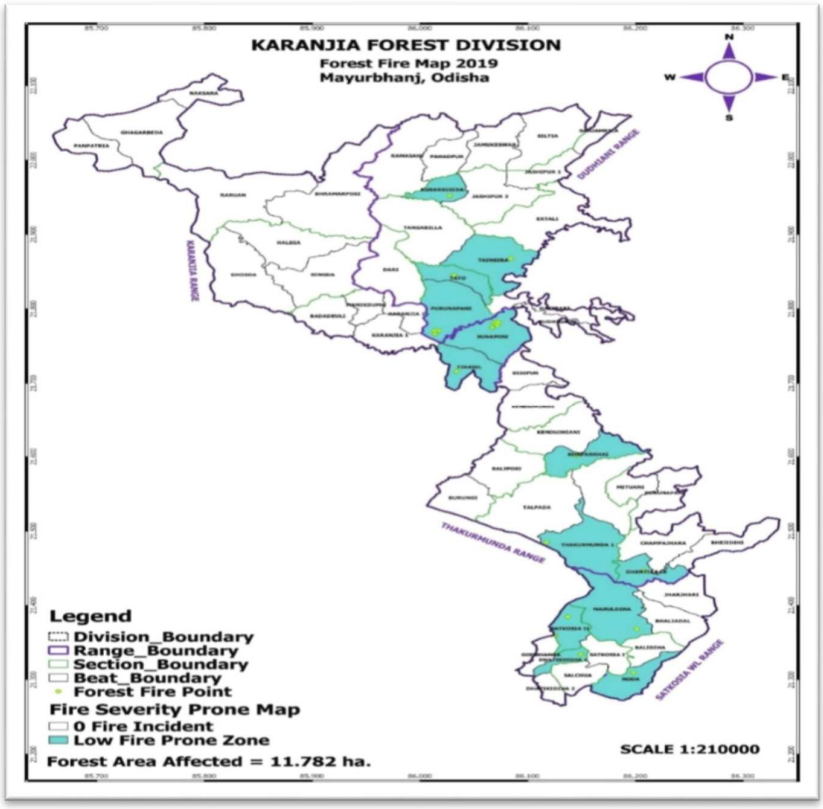
1.4.2 Temperature

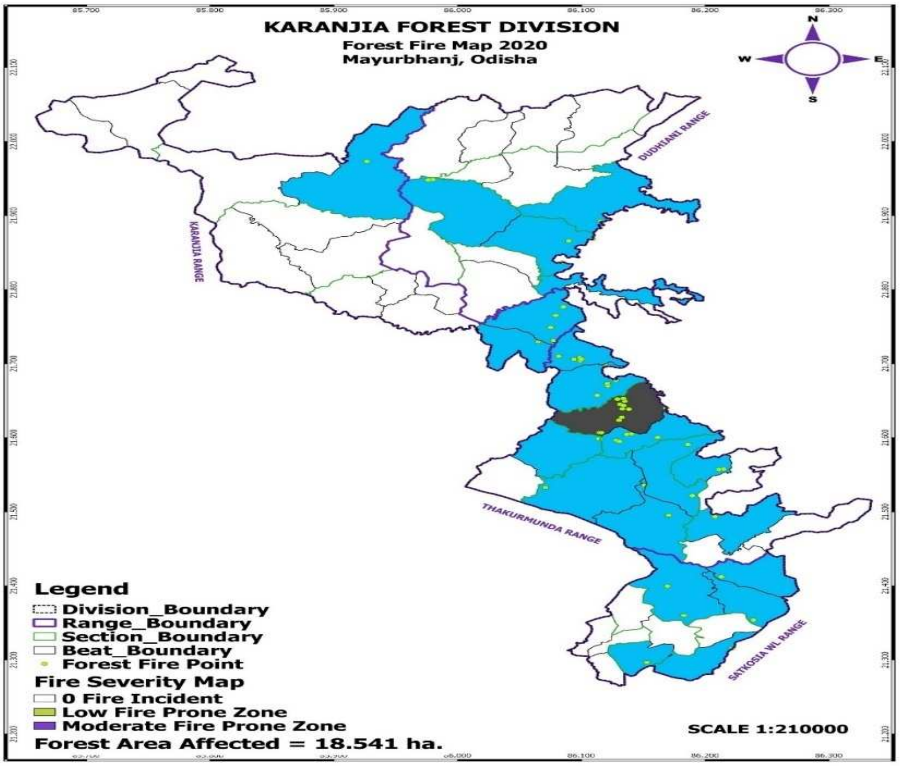
The maximum temperature during hot weather rises up to 48.9^0 C (120^{0}F), while the minimum temperature during cold weather comes near about 4.4^{0}C (40^{0}F).

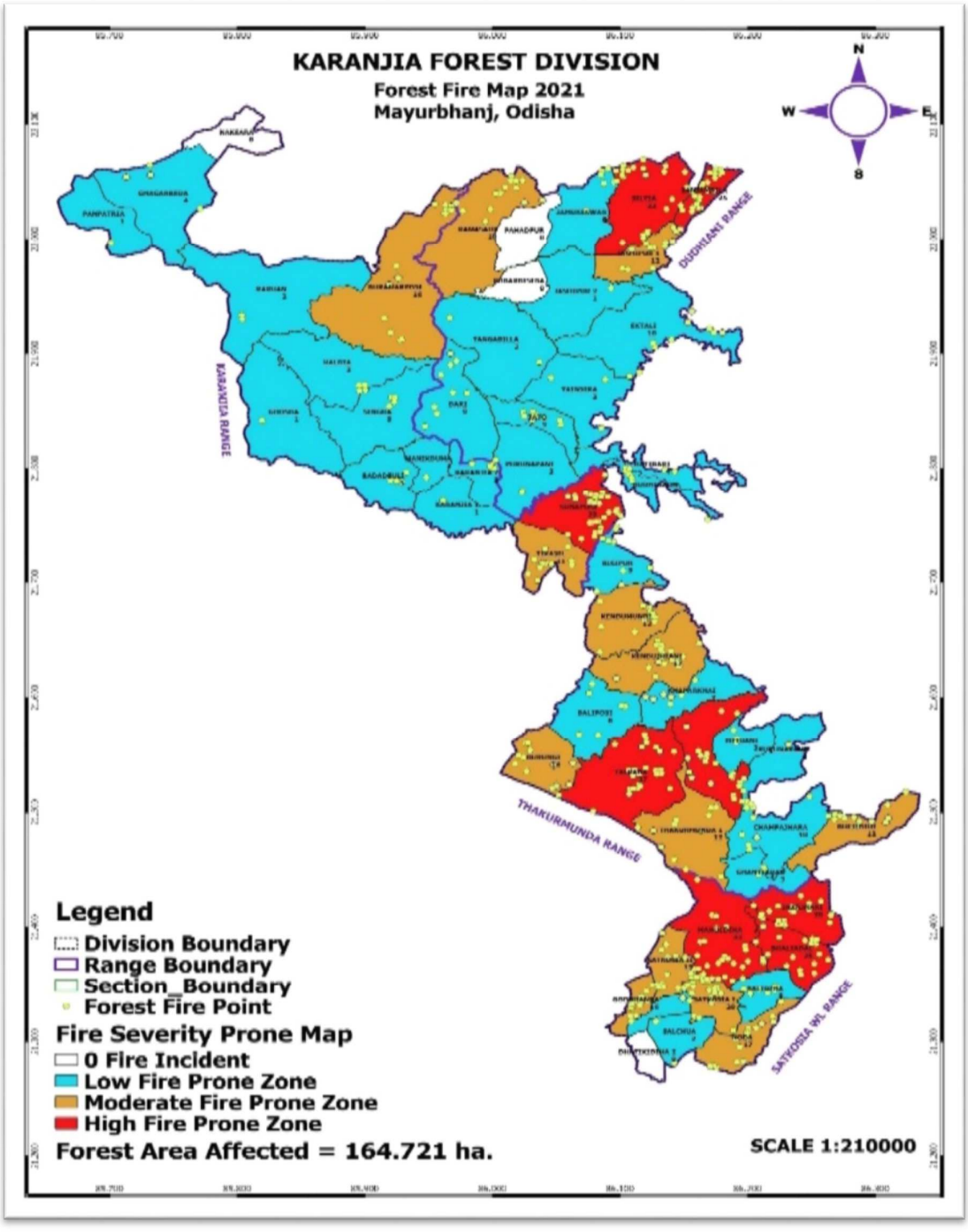
The relative humidity varies from 25.0% to 82.5%. The mean temperature is found to vary from 21^0 C to 29^0 C. Due to proximity to the sea the humidity is higher on the Southern side. Portions of Panchipir Sub-Division and Similipal hills are cool in summer than other Sub-Divisions of the district. There is occurrence of heavy dew in the central highlands and in the forest clad areas in the southwest. Forest fire occurs annually in the western valleys of Similipal.

Table No 1.8 Temperature in 0 C

Month	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Jan	27	12	26	12	26	15	27	13	28	14	28	15	28	14	28	13	26	14	27	17
Feb	32	17	31	16	31	18	31	17	31	17	33	18	32	19	32	15	31	19	31	20
Mar	40	22	37	21	36	22	37	22	26	22	36	23	36	23	35	20	35	25	35	24
Apr	46	27	40	24	41	27	41	27	43	27	40	24	42	27	40	25	38	27	40	28
May	43	29	42	28	43	29	42	29	43	28	44	30	39	27	39	27	38	32	31	29
Jun	40	29	37	28	41	30	36	27	42	30	39	29	36	27	36	27	37	27	39	29
Jul	32	25	33	25	34	27	34	26	35	27	35	27	32	26	32	26	32	26	35	28
Aug	33	22	31	25	32	25	33	25	34	25	35	26	32	25	33	29	32	25	33	26
Sept	31	24	30	24	32	24	34	24	34	24	35	25	31	24	33	29	31	21	30	24
Oct	31	21	31	21	31	20	30	22	32	21	34	22	31	21	30	23	31	16	30	24
Nov	29	19	29	17	28	16	30	16	31	16	32	19	28	16	27	18	30	23	29	23
Dec	25	14	26	14	27	13	28	14	28	13	30	17	27	13	26	16	25	21	26	17


KARANJIA FOREST DIVISION
Forest Fire Map 2019
Mayurbhanj, Odisha
N
W
E
S
DUDHIANI RANGE
KARANJIA RANGE
THAKURMUNDA RANGE
SATKOSIA WL RANGE
Legend
Division_Boundary
Range_Boundary
Section_Boundary
Beat_Boundary
Forest Fire Point
Fire Severity Prone Map
0 Fire Incident
Low Fire Prone Zone
Forest Area Affected = 11.782 ha.
SCALE 1:210000


KARANJIA FOREST DIVISION
Forest Fire Map 2020
Mayurbhanj, Odisha
N
W
E
S
DUDHIANI RANGE
KARANJIA RANGE
THAKURMUNDA RANGE
SATKOSIA WL RANGE
Legend
Division_Boundary
Range_Boundary
Section_Boundary
Beat_Boundary
Forest Fire Point
Fire Severity Map
0 Fire Incident
Low Fire Prone Zone
Moderate Fire Prone Zone
Forest Area Affected = 18.541 ha.
SCALE 1:210000


KARANJIA FOREST DIVISION
Forest Fire Map 2021
Mayurbhanj, Odisha
N
W
E
S
DUDHIANI RANGE
KARANJIA RANGE
THAKURMUNDA RANGE
SATKOSIA WL RANGE
Legend
Division Boundary
Range Boundary
Section_Boundary
Forest Fire Point
Fire Severity Prone Map
0 Fire Incident
Low Fire Prone Zone
Moderate Fire Prone Zone
High Fire Prone Zone
Forest Area Affected = 164.721 ha.
SCALE 1:210000

1.4.3 Winds: -

The area experiences wind from South West direction in monsoon which usually brings rain to this division. During winter North East wind brings cold wave. The preferred direction in different period is furnished below.

Table No. 1.9

Season	Preferred Wind Direction	Average Speed in KM/hr.
Summer	North-West	70
Monsoon	North-East	50
Autumn	South-West	45
Pre-winter	South-West	30
Winter	South-West	20
Spring	South-East	25

1.4.4 Hail: -

The freezing of raindrops into pellets of ice varying in diameter occur during the pre-monsoon period. Hailstorms occur along with high velocity wind and thunders in this zone.

1.4.5 Natural Calamity: -

The damage is not significant. The effect of cyclone to this Division is also not significant. During the plan period due to Phailin some trees are uprooted, which have been handed over to OFDC Ltd. after salvage the details of which are furnished in table below. There is no damage of Hudhud in the Division.

Table No. 1.10		
No. of trees uprooted and salvaged		
Name of Range	**Name of Forest Block**	**No. of trees uprooted/felled & delivered to OFDC Ltd.**
Thakurmunda	Mituani	85
	Mandaljhari	17
	Purunapani	04
	Vejidiha	59
	Thakurmunda	47
	Talpada	45
	Bharandia	01
Satkosia	Satkosia	47
Karanjia	Karanjia	26
	Baddeuli	34
	Sunaposi	53
	Bhromarposi	30
	Ghosda	96
Kendumundi	Bisipur	66
	Kendumundi	157
	Patbil	26
Dudhiani	Ranipat	19
	Tato	388
Gurguria	Kudarbisida	29
	Total:-	**1229**
Sources: Divisional Forest Officer, Karanjia Division		

1.5. Water Resources:

Mayurbhanj district have nine major perennial rivers namely Budhabalanga, Deo, Sunei, Gangahar, Jambhira, Kharjhai, Khairibhadan, Bankabal, Katara and their tributaries, which originate mainly from Similipal Hills. These provide a good perennial water resource throughout the district. The Budhabalanga is the main river which rises from the Similipal Hills and flows about 90.00 Km through the district. Katra, Palpala and Chipat hill streams are its important tributaries. The river Baitarini divides the districts of Mayurbhanj and Keonjhar. The river Subarnrekha meanders through the States of Bihar, West Bengal and Odisha. However, only 23.4% of the net sown area is irrigated and the farmers mostly depend

on the monsoons for a normal harvest. The need for expansion of irrigation facility is highly essential for the socio-economic development of the people. There is a great scope for exploitation of irrigation potential for the all-round benefit of the farmers. Besides, there is a tremendous scope for fresh water fishery through scientific pisciculture and exploitation of captive fishery. Judicious management of water resources will not only help us to regenerate our forests resources but also it will help in raising water table of that region and supplement in watershed management and its better functioning for agriculture, horticulture etc. All the forestry activities and land use plan should be made on micro watershed basic,so as to get good results. In Karanjia NAC area drinking water facilities have been made.

Ground Water: -

The water table in most of the areas goes down as low as 9.5 mt from the ground level. Scarcity of water is acutely felt all over the division during summer season.

CHAPTER 2

MAINTENANCE/ INCREASE IN THE EXTENT OF FOREST AND TREE COVER

2.1 Area of forests under different legal classes (RF, PF, UF and others)

The Karanjia Forest division has Reserved Forests/ Proposed Reserved Forests/ Demarcated Protected Forests/ Protected Forests and Village Forests covering an area of 46810.66 hectares as detailed below.

2.1.1 Reserved Forest (RF)

The Karanjia Forest Division After re-organisation of Karanjia Forest Division there are 205 Nos. of Reserved Forests in this Division covering an area of 43567.03 ha. The details of the RF area to be included in this Division are given in the **Annexure -VII.**

2.1.2 Proposed Reserved Forest (PRF)

During the course of time, 46 nos. of forest blocks have been notified u/s-4 of Odisha Forest Act, 1972 and covering an area of 1487.89 ha. **(Annexure-IX).**

2.1.3 Demarcated Protected Forest (DPF)

Another 8 nos. of forest blocks covering 1354.53 Ha. for which process have been initiated for notification u/s-4 of Orissa Forest Act but has been included in the purview of this working plan **(Annexure-X).**

2.1.4 Village Forests

77 nos. of Village Forest declared under the provisions of Orissa Village Forest Rules-1985 for the plantations raised under Social Forestry Project have been included in this plan. The list of such forest blocks is furnished at **Annexure-XI** and covering an area of 401.21 ha

2.1.5 Un-Classed Forests

The area under administrative control of Forest department but not declared under provisions of Odisha Forest Act, 1972 are considered as unclassed Forests. The total area of un-classed forests in Karanjia Division is 80 Ha.

2.1.6 DLC Forest

The DLC Forest accepted by District level Committee and submitted to Supreme Court of India is being maintained at Division Level and Tahasil Level. The Range wise / Tahasil wise abstract of DLC Forest is furnished at **Table No 2.1** below. **The details of DLD Forest is furnished in Annexure (XXIV, separate Volume.)**

Table No. 2.1: DLC Forest in Karanjia Division

Sl.No	Range	Name of Tahasil	No of Village Involved	DLC Forest		Total
				In Ac	In Ha.	
1	Dudhiani	Jahipur	134	13093.157	5298.61	7723.11
2	Dudhiani	Raruan	18	1933.06	782.28	
3	Dudhiani	Karanjia	71	4058.02	1642.22	
4	Karanjia	Karanjia	65	4220.247	1707.87	4565.25
5	Karanjia	Raruan	79	4051.49	1639.58	
6	Karanjia	Sukruli	81	3009.266	1217.807	
8	Thakurmunda	Karanjia	8	1369.43	554.18	9538.12
7	Thakurmunda	Thakurmunda	135	22199.8	8983.94	
9	Satkosia	Thakurmunda	20	8300.81	3359.21	3359.21
		TOTAL:-	**611**	**62235.28**	**25185.7**	**25185.69**

2.1.7 Total Forest Area of the Division

The Total Forest area in the Division is furnished in **Table No 2.2**

Range	Reserved forest		PRF		DPF		Village Forest		DLC Forest		Total Conventional Forest	Un-Classed in ha	Total Forest Area
	No	Area in ha	No	Area in ha	No	Area in ha	No	Area in ha	Village No	Area in ha	Area in Ha		Area in Ha
Karanjia	89	9574.47	7	51.45	4	79.31	32	179.78	225	4565.257	14450.267		
Dudhiani	37	7343.04	8	421.63	2	1152.18	44	210.91	223	7723.11	16850.87		
Thakurmunda	72	11217.02	26	825.48	2	123.04	1	10.52	143	9538.12	21714.18		
Satkosia (WL)	7	15432.50	5	189.33	-	-	-	-	20	3359.21	18981.04		
Division Total	**205**	**43567.03**	**46**	**1487.89**	**8**	**1354.53**	**77**	**401.21**	**611**	**25185.697**	**71996.357**	**80.00**	**72076.357**

2.2 Forest area under different working circle/management Plan

The outgoing plan was prepared by Sri A.O.F. Bakla IFS. The plan was for the period 1996-97 to 2015-16 i.e. for 20 years. The plan was for Karanjia and Baripada Division combined. The prescriptions those are applicable for forests of Karanjia Division were considered for preparing PWPR during 2016. Again, it is now reorganized with effect from 01st October'2019. After reorganization, the plan prescriptions as relates to present forest blocks are only considered in this chapter for discussion. The Range wise entire forest area of Karanjia Division proposed to be covered under Working Plan is furnished in **Annexure-XIII**, the abstract of which is furnished in **Table No.2.3** and **2.4.**

Table No.2.3
Forest Area of Karanjia Forest Division Proposed To Be Covered Under Working Plan

Name of Forest	Nos. of blocks	Total area of the Block in Ha	Area diverted in Ha.	Area in ha. Proposed to be covered under Revision of the Plan
RF	205	43567.03	3536.69	40030.34
PRF	46	1487.89	12.14	1475.75
DPF	8	1354.53	--	1354.53
VF	77	401.21	--	401.21
Total	**336**	**46810.66**	**3548.83**	**43261.83**

Table No. 2.4

Forest Block-wise Forest Area Diverted Under FRA & FCA

Sl. No.	Name of the Range	Name of the Forest block	Notified area in ha	Area diverted in ha		Balance area to be included in ha	
				FRA	FCA	Total	
1	Karanjia	Ankura RF	77.6	--	1.9	1.9	75.7
2		Jambani RF	107.2	9.56	2.74	12.3	94.9
3		Kalakad RF	100	0.01	--	0.01	99.99
4		Padheidura RF	457.6	--	1.49	1.49	456.11
5		Paudia RF	639.2	1.4	10.4	11.8	627.4
6		Sarubali RF	83.2	--	2.06	2.06	81.14
7		Sarubhadi RF	55.2	--	3.1	3.1	52.1
8		Singda – III RF	112.4	0.22	7.42	7.64	104.76
9	Satkosia	Satkosia RF	13732.8	57.78	--	57.78	13675.02
10	Dudhiani	Begunia-I RF	629.6	0.42	--	0.42	736.38
11		Begunia-II RF	107.2		--		
12		Biunria RF	146	--	3.77	3.77	142.23
13		Chanchbani RF	63.2	7.54	--	7.54	55.66
14		Gudidiha RF	329.2	--	5.54	5.54	323.66
15		Jharbeda RF	152.8	--	6.96	6.96	145.84
16		Kadambeda RF	79.2	--	3.76	3.76	75.44
17		Ranipat RF	20	0.35	--	0.35	19.65
18		Rasamtala RF	162.8	--	6.99	6.99	155.81
19		Salrapada RF	89.2	2.06	--	2.06	87.14

Sl. No.	Name of the Range	Name of the Forest block	Notified area in ha	Area diverted in ha		Balance area to be included in ha	
				FRA	FCA	Total	
20		Barakamuda PRF	12.14	--	12.14	12.14	0
21	Thakurmunda	Chamakpur RF	182.8	0.08	--	0.08	182.72
22		Handiphuta RF	306	0.11	--	0.11	305.89
23		Purunapani – II RF	55.77	0.79	--	0.79	54.98
24		Thakurmunda RF	250.8	0.53	--	0.53	250.27
25		Vejidiha – II RF	17.88	0.56	--	0.56	17.32
26		Chheratangar RF	800	0.04	--	0.04	799.96
27		Kaliajiani – I RF	378.8	0.01	--	0.01	378.79
28		Kaliajiani – II RF	147.6	0.02	--	0.02	147.58
29		Kendumundi – I RF	147.6	0.04	--	0.04	147.56
30		Patbil RF	154.8	0.02	--	0.02	154.78
Total Area Diverted				**81.54**	**68.27**	**149.81**	
Hadgarh Wildlife Sanctuary Area inside Satkosia RF				**3399.02**			
Grand Total				**3548.83**			

Table No. 2.4 (A)
Range/ Section/ Beat wise Forest Area Diverted Under FRA & FCA

Sl. No.	Name of the Range	Section	Beat	Name of the Forest block	Notified area in ha	Area diverted in ha	
						FRA	FCA
1	Karanjia	Karanjia	Karanjia I	Ankura RF	77.6	--	1.9
2		Singda	Haldia	Jambani RF	107.2	9.56	2.74
3		Kadadiha	Tikasil	Kalakad RF	100	0.01	--
4		Kadadiha	Tikasil	Padheidura RF	457.6	--	1.49
5		Kadadiha	Sunaposi	Paudia RF	639.2	1.4	10.4
6		Karanjia	Karanjia II	Sarubali RF	83.2	--	2.06
7		Karanjia	Karanjia II	Sarubhadi RF	55.2	--	3.1
8		Kadadiha	Tikasil	Singda – III RF	112.4	0.22	7.42
9	Satkosia	Satkosia, Godabhanga, Noda, Mahuldiha	Satkosia, Godabhanga, Noda, Mahuldiha	Satkosia RF	13732.8	57.78	--
10	Dudhiani	Jashipur	Jashipur II	Begunia-I RF	629.6	0.42	--
11		Jashipur	Jashipur II	Begunia-II RF	107.2		--
12		Tato	Tato	Biunria RF	146	--	3.77
13		Tato	Purunapani	Chanchbani RF	63.2	7.54	--
14		Tato	Purunapani	Gudidiha RF	329.2	--	5.54
15		Tato	Purunapani	Jharbeda RF	152.8	--	6.96

Sl. No.	Name of the Range	Section	Beat	Name of the Forest block	Notified area in ha	Area diverted in ha	
						FRA	FCA
16		Tato	Purunapani	Kadambeda RF	79.2	--	3.76
17		Tangabila	Tainsira	Ranipat RF	20	0.35	--
18		Tato	Purunapani	Rasamtala RF	162.8	--	6.99
19		Tato	Purunapani	Salrapada RF	89.2	2.06	--
20		Barakamuda	Barakamuda	Barakamuda PRF	12.14	--	12.14
21	Thakurmunda	Thakurmunda	Thakurmunda	Chamakpur RF	182.8	0.08	--
22		Thakurmunda	Thakurmunda II	Handiphuta RF	306	0.11	--
23		Baliposi	Baliposi	Purunapani – II RF	55.77	0.79	--
24		Thakurmunda	Thakurmunda	Thakurmunda RF	250.8	0.53	--
25		Champajhar	Vegidiha	Vejidiha – II RF	17.88	0.56	--
26		Kendujiani	Kendujiani	Chheratangar RF	800	0.04	--
27		Kendujiani	Kendujiani	Kaliajiani – I RF	378.8	0.01	--
28		Kendujiani	Kendujiani	Kaliajiani – II RF	147.6	0.02	--
29		Kendumundi	Kendumundi	Kendumundi – I RF	147.6	0.04	--
30		Kendumundi	Kendumundi	Patbil RF	154.8	0.02	--

2.3 Percentage of Forest with secured boundaries

There are 205 Reserved Forest block, 46 PRF, 38 DPF and 77 Village Forest blocks. The pillars of RF, PRF and DPF are posted and maintained regularly. The current position of boundary pillars of RF, PRF and DPF and 10 years cycle of pillar maintenance are given in **Annexure-XIV**. No detail survey has been done for VF of the Division.

2.4 Land Use, Land Use Change and Forestry (LULUCF):

The Forest Survey of India (FSI) publication 2017 indicates land use pattern for Karanjia Division as Follows.

Table No 2.5 Land Use pattern as per FSI Report.

Sl No	Land Use	Area in Ha	Area in Sq. Km	Percentage
1	Very Dense Forest (VDF)	31199.89	312.00	13.16
2	Medium Dense Forest	46313.89	463.14	19.54
3	Open Forest	22729.44	227.29	9.59
4	Scrub	1025.79	10.26	0.43
4	Non Forest Use	134045.98	1340.46	56.55
5	Water body	1727.19	17.27	0.73
Total		**237042.18**	**2370.42**	**100.00**

***At present CA Land in lieu of Forest Land Diverted is not available in this Division.**

2.5 Threats to the Forests

Since time immemorial, forest vegetation is prone to injury, whatever the proximate causes may be but all are attributed to human and their activities baring a few caused by vagaries of nature. Other organisms like animals, insects, bacteria etc. also cause some damage to the crop. It is observed that the forest is reared naturally well than tending through human care which is more crucial to reduce the hindering activities in comparison to augmenting ones. All these injury/damage causative agents are disturbing/ interfering with the process of growth and development of the forest crop. So said factors are broadly categorized in to two major groups namely Natural Disturbances and Biotic Interferences.

2.5.1 Natural Disturbances

Though nature and forest are often considered as synonymous and symbiotic in association but sometimes fluctuations of high degree in the functional aspects of the nature affects the crop considerably. Such damage causing disturbances of the nature are described in detail as under.

(a) Frost

Freezing of super cooled moisture into a smooth coat of ice on terrestrial objects is called Frost. This is due to accumulation of a considerable depth of heavy cold air flowing down into natural depressions from the adjoining areas. This has a more deleterious effect on vegetation than the ground. Damage on this account is not significant except its adverse effect on Sal regeneration crop in prolonging the period to establish.

(b) Wind

Wind is generally light to moderate. During summer and southwest monsoon season, the wind velocity increases. Though there is no cyclone worth mention reported so far in this district but at times wind pressure causes some cyclonic effect in some pockets thereby uprooting trees. Such wind fallen and uprooted trees are very often reported in Karanjia Division. The old and mature crops are more prone to this damage causing effect. This wind disturbance causes some loss to the forests.

(c) Fire

Fire constitutes by far the greatest danger to which forests are susceptible and it is a grave menace indeed. The causes are many and varied, but all those are traceable to human and their activities. The details in this regard has been discussed in foregoing para.

(i) Burning the leaves underneath the Mahul trees to facilitate collection of flowers and allowing the fire to run unchecked to engulf the forests, setting the fire in the forests to drive or scare away the animals, burning the ground vegetation to get an early flush of healthy and vigorous shoots, throwing inflammable materials carelessly while passing through forests and sometimes evil design to settle scores against forest staffs etc. are few enumerated reasons. Many fires may be and some no doubt are malicious but the greater numbers are the outcome of carelessness due to ignorance.

(ii) Forest fire in Karanjia is by and large ground fire. Occurrence of crown fire has not been reported so far. However, ground flora particularly regeneration crop is worst victim of this menace. Sometimes pole crops are also subject to damage by fire. The site condition is deteriorated due to ground fire. In Karanjia, the fire season is a prolonged period of 4 (four) months starting from mid-February till mid-June or onset of monsoon. Due to such large duration of vulnerability it is difficult to contain this problem effectively.

(iii) As the forest belongs to mostly deciduous category, the accumulation of dry leaves in the forest floor during summer is a common phenomenon. Extreme dry condition and high temperature during the summer are congenial for easy and quick ignition of the inflammable dry materials through the activities enlisted above to become forest fire which spreads rapidly being encouraged by the high wind speed during the said period. The convergence of all such factors makes it a menace for the forests.

(iv) It is felt that the problem cannot be solved through enforcement by the forest officials. Viable alternatives are to be provided to wean away practitioners from these practices. A concerted effort is indispensable to solve this problem gradually. A convergent

strategy needs to be formulated by involving other line department to take up the issue in the all Gram Panchayats of the district.

2.5.2 Biotic Interference

This is the influence exerted by living organisms like human beings, animals, insects, fungus etc. on the vegetation. The most important factor is the relentless pressure of local people on the forests. However, the interference made by all such organisms is described as under.

(a) Illicit Removal:

This is so far the greatest cause of injury to the forests. It is not only the single dominant factor of destruction but also a matter of alarming concern throughout the world. However, the scenario of the Forest Divisions is described as under.

(i) Due to galloping rise in population, the demand of forest produce is increasing day by day. The permissible removal of the products from the forests is far away from the quantum of requirement and as a result there is a huge deficit on this account. On the other hand no viable alternative is in place particularly for the rural mass in meeting their need of fuel wood and other forest products. In these circumstances, excess removal of such products from forests beyond the permissible limit is resulting through illegal means by local people. The clandestine removal of trees by smugglers is also

aggravating the situation. Sometimes inhabitants of forest fringe villages earn their livelihood through sale of illicitly procured timber and firewood from the forests. Another peculiar habit of the tribal of Karanjia is to fell the tree not for the sake of timber or firewood but to collect Jhuna, Honey and any rodent residing in that tree. The tribal will prefer to fell the tree and leave the entire tree at the stump site after collecting the aforesaid materials. This is a serious ethical problem. On the whole the forests have been depleted mainly due to the aforesaid relentless over exploitation and the same is the greatest cause of injury to the forests.

(ii) Efforts have been made to control this problem through enforcement of forests rules and regulations as well as motivation of the people through VSS.

Apart from the above-mentioned controlling measures through enforcement of Forest Acts and Rules, efforts through Joint Forest Management have also been made for protection of Forests by assigning the forest area to the VSS under JFM.

(i) Animal:

The crop is liable to injury on account of grazing, browsing and damage by activities of animals. The cattle grazing is the most important one. Not only the vegetation is damaged but also the regeneration is destroyed due to trampling and hardening of the soil. The damage due to wild animals shall not be construed as a threat

since both forests and wild animals are the habitat and inhabitants respectively. Further some portion of the vegetation should be set aside for the food of herbivores. The matter of concern is the uncontrolled grazing in the forest land violating the prescription of the Working Plan. The damage on this score has far reaching consequences. The carrying capacity of forest is far less to accommodate the huge cattle population which is increasing in geometrical progression. The efforts to contain this problem has not been made seriously so far considering tangible loss as less grievous but ignoring colossal intangible loss.

(a) Encroachments: -

Earlier forest land was the easy target of encroachment in anticipation of settlement. But after enactment of Forest Conservation Act during 1980, the stringent provisions in regularization of the encroachments become a stumbling block and same has dampened spirit of encroachment to some extent. Further, poor boundary maintenance of forest blocks gives scope for encroachment in absence of well exhibited demarcation in the field particularly when forest blocks are coterminous with private lands. With the initiation of DGPS survey of all the forest blocks, this problem will be addressed to a large extent. Eviction of encroachment and restoring same to the fold of Forest Department is a difficult task. It is necessary to tackle the problem at the very beginning just like to nip in the bud.

(b) Insect Pests:

Though there are a number of insect pests which are harmful to the forest crop as well as plantations but the following few causing considerable damage to the forests and plantations of the division are described in brief as under.

i. Teak defoliator (*Hyblaea puera)*

This is the most serious pest of Teak both in natural and plantation. It causes major problems together with some group of minor pests. Controlling this pest by mechanical or physical means is of limited use. Silviculturally it can be controlled by allowing the strips of existing mixed crop or raising strips of mixed plantations as the isolation barrier. The pest population can also be controlled by its natural enemy under biological control.

ii. Teak skeletoniser (*Eutectona machaeralis*)

Instead of defoliation, this pest eats away chlorophyll portion of leaves leaving internal tissue as such. As a result, leaves in its skeletal form is visible on the tree. Like the defoliator, it is also a major pest of Teak. These two pests are the serious menace of Teak Plantation in this Division. Its control is similar to that described above for the defoliator.

iii. Sal heartwood borer (*Hoplocerambyx spinicornis*)

It attacks Sal tree particularly heartwood portion which is the most valuable and durable part of the Sal tree. It affects the timber quality

thereby causing depreciation in commercial value. The damage by this pest is sporadic and its intensity is not so acute. It attacks mostly felled / fallen un-barked logs and unhealthy moribund standing trees. The attack on healthy trees is very rare. It can be controlled effectively through biological methods.

(c) Fungus:

Fungi are the causative agents of numerous plant diseases but few notable ones affecting some valuable tree crop of the division is described individually as under.

i. Fomes caryophylli

It is brown heart rot of Sal. In the early stages of its attack, heartwood is stained slightly dark to brown. Ring rot is caused. Later decayed wood become spongy. After causing appreciable decay fungus emerges through sound sap wood into bark in form of pink knots. Bark in the region of eye is gradually shed off. Branch stubs and knots caused on stem. Epitomic branches emerge but it does not always indicate of heart rot. Sporophore rarely develops. Damage caused due to it appears less and only in dead and fallen trees.

ii. Fomes faustuous

It is a secondary parasite as well as a saprophyte on the bark of the Sal. It causes heart rot in butt region. In early stages the heart wood shows darker brown stains in patches which develop later into small pockets. Under active decay these pockets get filled with white

decayed fibers which disintegrate, in later stages pockets appear empty and brown.

iii. Hymenochaete rubiginosa

It causes pockets rots in heart wood. Due to it, tissues in affected pockets become white and fibrous surrounded by brown wood. Sporophores appear in tiers one above other in close cluster from the stem of affected trees.

iv. Polyporus shoreae

The Sal root fungus is more prevalent in the moister and often better-quality forests where it tends to affect middle-aged stems and young vigorous poles. The dying off appears in groups, which is a very characteristics symptom. It often kills the best stems.

v. Fomes badius

It causes heart-rot in Khair and Babul but the incidence is not noticeably high. Study on this aspect is essential since Babul is occurring both in forest and farm lands and also considered as one important tree for agricultural implements and rural households.

Control measures

Though the remedial measures are many but the best way of tackling this problem is to maintain the hygienic condition of the forests by removing the seriously infected crop and also to reduce the fire incident which is one of contributory factors causing damage to the

bark of saplings and young poles and thereby rendering them prone to fungal infection.

(d) Loranthus:

This is an aerial hemi parasitic evergreen shrub on other seed plants. *Dendrophthoe falcata*, *Loranthus longiflorus* and *Scurrula parasitica* are seen on the trees like Sal, Karla, Mahul, Amla, Mango and Teak etc. These parasitic plants are locally called as Madanga or Malanga. *Scurrula parasitica* is seen in upper hill slopes affecting the seed plants. The damage by Loranthus is though noticed but not of serious nature.

(e) Climbers:

A herbaceous or woody plants that climbs up trees or other supports by twining round them or by holding on to them by tendrils, hooks, aerial roots or other attachment. The climber menace is very much observed in the forests. Climber grows spirally around small trees initially and in course of time it grows thicker and stiffer strangulating the growing trunk of the tree. It presses so tightly against the trunk that it is eventually gets embedded in the trunk. Finally, the trunk becomes convoluted with a deep spiral groove running from the bottom to the top. In this process the technical quality of tree is spoiled which leads to huge depreciation in commercial use and value. Few notable climbers causing menace in the forests are mentioned below.

i. Budel (*Butea parviflora*)
ii. Lata Palas or Palas Lai (*Butea superba*)
iii. Atundi (*Combretum decandrum*) (*Combretum roxburghii*)
iv. Marda (*Millettia extensa*)
v. Muturi (*Smilax zeylanica*)

(i) Weeds

Any unwanted plant that interferes or tends to interfere with the growth of individuals of the favoured species is termed as Weeds. In natural forests having good canopy cover, there is little scope for invasion of weed. But large opening in the canopy encourages the weed to invade in that portion of the forests. Once introduced in an area, it is subsequently naturalized and grows rapidly. As a result, it inhibits growth of regeneration crop. In plantation, impact of weed growth is very much felt in view of suppression of growth of the planted seedlings. While weeding is prescribed for the plantations to control this problem, suitable silvicultural practice should be adopted for natural forests to tide over such situation. Though there are a number of weeds but few notable ones which are a matter of concern are mentioned below.

i. Pokasunga (*Chromolaena odorata*):
ii. Ban Tulsi *(Hyptis suaveolens)*
iii. Naguari *(Lantana camara*)

2.6 Distribution of different forest types

The forest of Karanjia division can be classified into following groups and sub-groups according to standard classification based on "Revised survey of the forest types of India "by H.G Champion and S.K Seth.

The probable zone of occurrence of each sub-group of forest type are detailed in respect of Karanjia division is given in **Table No.2.6.**

Table No.2.6

SL. No.	Group	Sub Group	Type	Sub Type	Variety	Forest Block and Range
					1	**2**
1	3-Tropical Moist Deciduous Forest	3C-North Indian Tropical Moist Deciduous Forest	$3C/C_2$ – Moist Sal Bearing Forest	$3C/C_{2e}$- Moist Peninsular Sal Forest	3C/C2e (ii) Moist peninsular low-level Sal forest	All forest blocks of Karanjia, Dudhiani, Thakurmunda Range. Few forest blocks of Satkosia Range.

2	3-Tropical Moist Deciduous Forest	3C-North Indian Tropical Moist Deciduous Forest	3C/C_2 – Moist Sal Bearing Forest	3C/C_2/DS_1-Moist Sal Savanah		Distributed over hilly and valleys region of Badampahar RF of Dudhiani Range

1. Tropical Moist Deciduous Forest:

a) Moist Peninsular low-level Sal-3C/$C_{2e(ii)}$

This type of forests occurs in the moist areas of the division bordering the Similipal Hill Range. The main species is Sal with its associates of *Pterocarpus marsupium* (Piasal), *Terminalia tomentosa* (Asan) in top storey. The middle storey *Emblica officinalis, climber Bahuinia vahlii, Smilax and under growth of Clerodendron* are noticed. Natural regeneration is good to plenty.

b) 3C/C_2/DS_1 -Moist Sal Savanah

This type is characterized by open sal forest with heavy grass and is characterized by open sal forest with heavy grass. The sal occurs in groups with other fire hardy species such as *Lagerstroemia parviflora, Lannea coromandelica, Wrightia tomentosa, Emblica officinalis etc.* The grasses include *Themeda, Imperata, Cymbopogon* etc.

2.7. Tree cover outside Forest area

Besides the notified forest areas of the Division (RF, PRF, DPF and VF) there are many revenue forest areas, Avenue plantations, and fuel &

Fodder plantations raised by department contribute to Tree outside the Forests (TOF). From Social Forestry Project period; Farm Forestry is being patronized by the Govt. by free distribution of seedlings.

The TOF are integrated contribution of

a) Plantations raised outside the conventional Forest area by Forest Department, Horticultural plantation and other department.

b) Plantations raised by private individuals in their fellow land and back yard.

c) Farm Forestry practices.

d) Avenue Plantations.

e) Institutional Plantations.

The plantations raised during last plan period are furnished below.

Table No. 2.7- Plantation outside Forest areas in different Schemes

Year (2010-11 to 2020 - 21)	Name of the scheme	AR in Ha.	ANR with gap plantation. In Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
1	2	3	4	5	6	7
2010-11	CAMPA - Avenue				1.58	0.00316
2012 - 13	S.P. Avenue Plantation				15	0.0375

Year (2010-11 to 2020 - 21)	Name of the scheme	AR in Ha.	ANR with gap plantation. In Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
2012 - 13	MGNREGS (Avenue)				40	0.08
2013 – 14	SP-COL-Avenue Pltn.				20	0.05
2013 – 14	NBM-Non forest land	10		10		0.04
2013 – 14	MGNREGS -Avenue Pltn.				70	0.14
2014 – 15	MGNREGS Avenue				95	0.188
2014 – 15	-do- Non – Forest Land	15		15		0.06
2014 – 15	SP – Avenue				15	0.03
2015 – 16	MGNREGS – Avenue Plantation				80	0.2
2015 – 16	SP – Avenue Plantation				20	0.04
2016-17	MGNREGS - Avenue				132	0.3375
2016-17	MGNREGS - School plantation					0.142

Year (2010-11 to 2020 - 21)	Name of the scheme	AR in Ha.	ANR with gap plantation. In Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
2016-17	MGNREGS – Private land plantation	55.5		55.5		1.3875
2016-17	SP – Urban Pltn.					0.15
2016-17	OMBADC – Avenue				21	0.0525
2019-20	PE - Urban Plantation					0.036

Table No. 2.8 - Farm Forestry details under OFSDP-II, Karanjia Division, 2020-21

Name of the DMU (Division)	Name of the FMU (Range)	Name of the VSS	Total		
			No of Beneficiary	Area	No of Seedling
Karanjia	Dudhiani	Tulasiposi	5	2.25	2250
		Tato	20	6.52	6520
		Purunapani	37	22.86	11837
		Nuagaon	11	6.22	6220
		Kuita	37	9.9	8820
		Kenjra	4	0.9	900
		Jharbeda	16	17.2	3493
		Jarali	5	1.09	713
		Kathakaranjia	80	23	11791
		Biunria	30	13.12	5311
		Kadamadak	13	8.12	3094
		Mota	19	5.84	4280
		Siramanipur	17	6.2	2480
		Dumuria	9	5.57	5570
		Chanchabani	10	12	7848
		Tainsira	40	21.95	14355
		Gudidiha	9	5.056	2022
Total			**362**	**167.8**	**97505**

Table No. 2.9- Raising of Nursery 6-month-old seedlings through VSS under OMBADC Scheme

Name of the Range	Location	Number
Dudhiani	Goudgaon VSS	8600
	Padampur VSS	8600
	Chhadban VSS	8600
	Chhamundia VSS	8600
	Badmaranda VSS	8600
	Total	**43000**

All the seedlings have been distributed among the beneficiaries for planting in their private land. Apart from this 1840300 nos. of seedlings have been distributed among beneficiaries in last 10 years under different schemes for planting in their private land.

2.8. Shifting cultivation (Jhumming)

Shifting cultivation is not observed in Mayurbhanj district. The Karanjia division also doesn't experience shifting cultivation.

CHAPTER – III

MAINTENANCE, CONSERVATION AND ENHANCEMENT OF BIODIVERSITY

3.1. Forest Composition and Distribution:

The tract is situated partly in the moist deciduous & partly in the dry deciduous zones of Indian vegetation as per diagrammatic representation of Indian Forest Types in "the Forest Types of India" by Champion & Seth. Varying with the configuration of the ground constitution of the soil influencing its water retaining capacity, past & present biotic influence composition as also the quality of vegetation exhibit marked local variations. Consequently, a drier type of vegetation is met with locally in the moist deciduous zone as also the vice versa is locally found. Irrespective of the type changes, Sal is the predominant species all over the forest, at places forming almost a pure crop and at others forming but a small percentage of the forest as in the mixed deciduous type.

3.1.1. Floristic composition –

Varities of large woody perennial plant having a single well-defined stem and more than 6.0 mt height are sporadically distributed in all forest blocks in this Division. The present condition and floristic composition of the principal species available in the area have been discussed in the table below.

Floristic composition of R.F					
Name of R.F	**Name of principal trees**	**Floristic composition**	**Condition**		
			Age	**Health**	**Quality**
Most of the RFs of Karanjia and Dudhiani Range **(Except Kadadiha Section)**	Sal	Asan, Jamu, Chara, Mahula, Bhalia, Kusuma, Kendu, Dhaura, Chaara, Harida, Bahada, Jammu, Kurum, Karanja, Arjuna, Mundi, Khakada, Rai, Kumbhi, Sidha, Mango, Rimuli, Sunari, Simuli etc.	10-20 Years	Good	III
Miludihi RF, Padeidhara RF, Sunaposi RF, Tikasil RF, Pantho RF, Badampahar RF, Hatisalbeda RF, Singda RF, Ghodaghaguri RF, Pakamunda RF, Sarubil RF, Sarubhadi RF, and most of the RF of Thakurmunda Range & Satkosia Range	Sal	Asan, Jamu, Chara, Mahula, Bhalia, Kusuma, Kendu, Dhaura, Chaara, Harida, Bahada, Jammu, Kurum, Karanja, Arjuna, Mundi, Khakada, Rai, Kumbhi, Sidha, Mango, Rimuli, Sunari, Simili etc.	50-100 Years	Good	II

3.2. Plants Species Diversity:

For working plan purpose, to record the variety of species available in the forests point sampling method has been adopted. The Importance Value Index (IVI) of Species has been computed and furnished in

Annexure-XV and the Biodiversity Index of Shrubs & Herbs is furnished in **Annexure-XV (a) & XV (b).**

3.3 Status of Species prone to over exploitation:

Sal is the Principal Species of the division followed by Asan. Piasal, Kuruma are the major furniture wood available in the forest. These species are over exploited and day by day, the forest is transforming from Sal forests to mixed forests. The species subjected to over exploitation in the past are Piasal and Kuruma. At present, the species facing over exploitation are Sal, Dhaura, Asan and Kendu. It is now time to take steps to check over exploitation of these species and try to regenerate already over exploited species.

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 Biodiverisity Management Committee at GP, Block, District, Urban areas like Muncipal Corporation and District level.

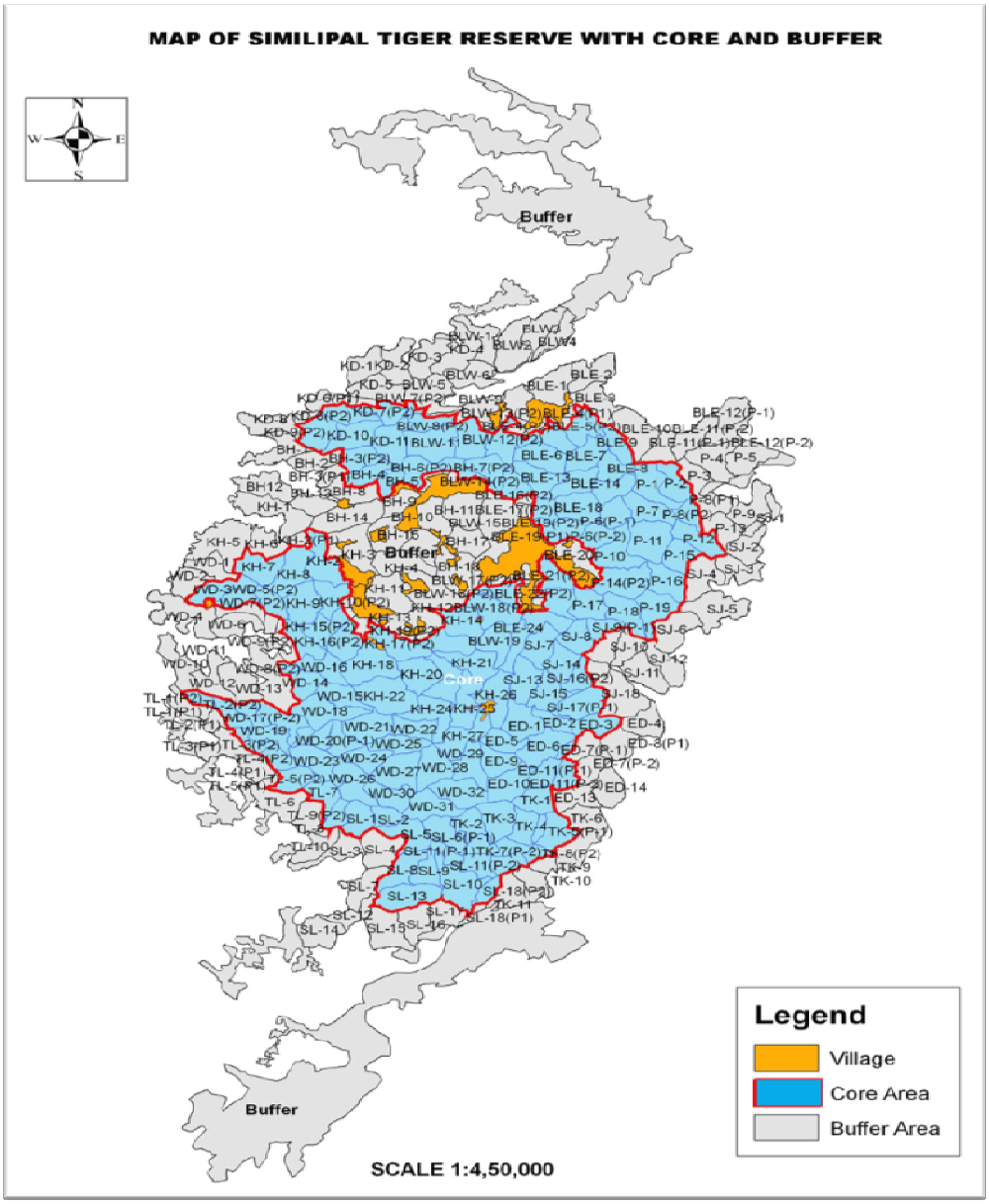
As per Rule 21 of the OBD Rules 2012 BMCs shall prepare People's Biodiversity Register at all the local bodies level. The BMCs have the power and responsibilities to protect and conserve the native biodiversity int their respective jurisdictions and they can levy charges on any companies, traders and manufactures against the commercial collection of bioresources under Acess and Benefit sharing Agreement

(ABS) fees which is 3 to 5% of the exfactory grass sale of the total value of the bioresources. The 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 Bidiversity Fund (LFB).

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.

3.4 Conservation of Genetic Resource:

At present no steps has been initiated to conserve Genetic Resources in this Division. The Government of **Odisha** declared Simlipal as a wildlife sanctuary in 1979 with an area of 2,200 square kilometers (850 sq mi). Government of India declared Simlipal as a **biosphere reserve** in 1994. UNESCO added this national park to its list of **Biosphere Reserves** in May 2009. The part of Similipal Bio sphere reserve under Karanjia Division has been transferred to newly constituted Similipal North Wildlife Division with headquarters at Jashipur. Similipal Tiger Reserve was declared in 1973 and area enhanced to 2750 Km^2. in 2007. Satkosia Wildlife Range and Thakurmunda Range is coming within the buffer zone of Similipal Tiger Reserve.


MAP OF SIMILIPAL TIGER RESERVE WITH CORE AND BUFFER
N
W
E
S
Buffer
Buffer
Core
Buffer
Legend
Village
Core Area
Buffer Area
SCALE 1:4,50,000

3.5 Fauna and their habitats:

Apart from the tiger, the major mammals are Elephants, Leopard, Jungle Cat, Wild Boar, Giant Squirrel, Common Langur etc. Grey Hornbill, Indian Pied Hornbill and Malabar Pied Hornbill are also found in the forests included in the buffer zone of Tiger reserve coming within Satkosia Wildlife Range and Thakurmunda Range. The Division also has a sizeable population of reptiles, which includes the longest venomous snake, the King Cobra and the Tricarinate Hill Turtle. The forest blocks adjoining to Similipal Sanctuary harbours most of the wildlife of the division.

3.6 Threats and Challenges to wildlife:

The wildlife is facing greater challenge due to

(i) Fragmentation of Habitat due to construction / widening of Roads, Transmission lines.

(ii) Depletion of tree cover / Forest crop density.

(iii) Scarcity of Water in interior & high-altitude Forests in summer.

(iv) Depletion of Food stock and deterioration of quality Food / Fodder.

(v) Depletion of Prey base / herbivorous.

(vi) Annual Fire and loss of Ground Flora.

(vii) Heavy biotic interference and intrusion by domestic animals (Cattle/ Goat/ Sheep)

(viii) Poaching

3.6.1 Fragmentation of Habitat due to construction / widening of Roads, Transmission lines.

According to the National Transport Development Policy Committee, the demand for road-based transport services has dramatically accelerated following economic liberalization, and has provided for as much as 90% of the total passenger traffic, leaving a meager 10% for rail. Rail and road freight traffic is expected to grow at about 12% and 8% per annum respectively, to achieve a 50% share each in the total freight traffic at the end of 15th plan. Accordingly, construction of New Roads/Up-gradation of existing road net work exerts pressure on Forest Land. This depletes forest wealth as well as fragments the habitat leaving the animals in isolation. Similarly, the transmission lines are being drawn in all rural/urban areas and it passes through forests posing danger to wild animals.Instances of Man-Animal Conflicts, action taken for diffusing the conflicts and Rescuing/relocating the wild animals during the projects details are furnished below.

3.6.2 Depletion of tree cover / Forest crop density:

From satellite imagery study and experience, it is observed that the crop density is more or less is declining and more forest blocks are being managed under Rehabilitation Working Circle. Reasons for such depletion / thinning of over wood resulted in depletion of cover to animals.

3.6.3 Scarcity of Water in interior & high-altitude Forests in summer:

Now as it is observed, the Forests are more or less confined to Hills / Ridges. Plain Forests are decreasing day by day and are subject to much biotic pressure. Animals are withdrawing from forest fringes and concentrating on inaccessible pockets of Forest. Day by Day, the rainfall is erratic and number of rainy days in a year is decreasing. The nalla / rivulets are drying up and in summer, they become dry. The animals face water scarcity. Sometimes, in search of water they come to nearby habitation and endanger their life.

3.6.4 Depletion of Food stock and deterioration of quality Food / Fodder.

The forests of the tract are becoming drier due to annual fire, reduced rainfall and reduced rainy days, compacting of soil, increased runoff, top soil erosion etc. The plant community is gradually regressing towards thorny, unpalatable, stunted seral stage rather than improving towards climax. In the process, the forest lacks quality food / fodder to herbivorous. Due to lack of microorganisms, bears, wild boar etc are facing scarcity of food stock.

3.6.5 Depletion of Prey base / herbivorous.

Herbivorous animals are mostly the base pray of all Carnivorous. Due to depletion of Grasslands/quality fodder and poaching of animals, their number / population is in a declining tread. It has affected the population of carnivore's animals. In many forest areas, concentration of pray base is at a threshold limit. The health of the

forest is also indicated from presence/ abundance of carnivorous animals. It is a common observation in all forest blocks of Karanjia Division that both prey base and predators are in a rapid declining trend. It is clear signal to all forest managers to act for increase in fodder, water and adequate tree cover for animals.

3.6.6 Annual Fire and loss of Ground Flora.

All the forests of Karanjia Division are of deciduous nature. Annual Fire is a common occurrence, which destroyed the ground flora, regeneration, humus layer and affects the living of animals. Though adequate steps are being taken by department, it is felt the need to associate the VSS, general public in an intensive manner to combat fire menace.

3.6.7 Heavy biotic interference and intrusion by domestic animals (Cattle/ Goat/ Sheep)

The forests are freely assessable to the public throughout the year though it is legally prohibited. Lopping of branches, cutting of trees for fodder for cattle, Goat etc is a common phenomenon. It always breaks the tranquility of wild animals. It seriously hampered the breeding, movement and always in a state of disturbed environment. Grazing related Problems are increasing.

3.6.8 Poaching

Poaching poses a serious threat to wildlife in the forest blocks of Karanjia Division.

3.7 Protection & Management of Fauna:

Satkosia Wildlife Range and Some part of Thakurmunda Range are coming within the Similipal Tiger Reserve.The Protection & Management is in general level in all Ranges except Tiger Reserve Part. The following measures are being taken for Protection & Management of Fauna in this Division.

3.7.1 Elephant Corridors in the Division & status:

There are two identified elephant corridors in the Division. These are

Badamphar (Mayurbhanj) – Dhobadhabin (Jharkhand) corridor: - ***Name of the corridor:***

Badampahar- Dhobadhabin Elephant corridor.

Name of the elephant habitat to be linked with the corridor:

Dhobadhobin Protected forest of Jharkhand State and Badampahar RF of Orissa State.

Boundary Description:

Badampahar- Dhobadhabin elephant corridor comprises an area of 24.3 sq. km. It joins two major elephant habitats – Dhobadhobin PF of Jharkhand state and Badampahar RF of Orissa. Dhobadhobin is a protected forest having an area of 3000 ha (approx.) located in Singhbhum east district under Jharkhand state while Badampahar is a Reserve Forest having an area of 6000 ha located in Panchpir and Bamanghaty revenue Subdivisions of Mayurbhanj district of Orissa.

The corridor traverses through Dhalbhum Forest Division, Rairangpur Forest division and Karanjia Forest Divison and is about 16 Km in length. Dhobadhabin protected forest extend from 85°54' 25" E to 85° 59' 30" E longitude and from 22°04' N to 22° 07' 30" N latitude (Topo sheet reference No. 73 F/16). The corridor starts from Dhobadhabin and moves in east direction and crosses the interstate border of Jharkhand and Orissa and reaches Basila RF of Rairangpur Forest Division (22° 06' N, 86° 30 E, Toposheet reference No. 73 J/4). Basila RF is almost contiguous to Dhobadhabin PF from Basila RF, the corridor runs south direction up to the Budhipat DPF (22° 02' N, 86° 2'E) of Karanjia Forest Division through Dhatkidiha, Basila, Jhatsirnga, Barsagutu, Thuntipani, Tangursahi, Kadalidhua, Jharbeda, Gontaisahi, Mandam, Badampahad, Raisahi, Jhaipabandha, Trillipi villages and then reaches Badampahar RF (22° 04' 10 N, 86° 07' 30' E, Topo-736 J/4).

Major land use:

Forest, human settlement and agriculture.

***Frequency of usage of the corridor by elephants*:**

Regular and seasonal; mostly used by Bulls and small herds of 6-10 elephants during October to February.

***Threats to the Corridor*: -**

- Degradation of Forest
- Habitat Fragmentation: - National Highway 220 connecting Jashipur and Rairangpur passes through the corridor

fragmenting Budhipat DPF and through the corridor fragmenting Budhipat DPF and Badampahar RF.

- Expansion of settlement and agricultural activities

Conservation Plan:

- Declaration, Demarcation and legal protection of the corridor under various laws appropriate for the state.
- Eco-development activities in corridor villages to reduce dependency and improvement of forest cover.

Similipal- Hadgarh- Kuldiha Corridor:

The distribution of South-Eastern Population of Asiatic Elephant in Orissa is confined mainly to Similipal- Hadgarh- Kuldiha Sanctuary. These three sanctuaries are joined by a narrow strip of land covered with highly fragmented degraded forest. The Forest coverage constitutes Reserve Forest like Noto RF, Satkosia RF and also Revenue Forest. As migration of elephant is an inherent characteristic, they have been using this narrow strip of Forest for their migration from one sanctuary to another. Generally, the elephants of Similipal sanctuary are coming to Noto RF and return back to same area regularly. But occasionally they move to Hadgarh via Satkosia RF.

The elephants of Hadgarh sanctuary usually coming to Satkosia RF and return back to same area. The elephants of Kuldiha sanctuary come to Hadgarh sanctuary through Sarisua-Sukhapatra Hill Block, which is covered with degraded forest growth in revenue land.

Name Elephant Habitats to be linked with the corridor:

Similipal Sanctuary, Hadagarh Sanctuary, Kuldiha Sanctuary are linked with the Corridor.

***Frequency of usage of the corridor by elephants*:**

Regular; used by herds of 20- 25 elephants.

Threats to the corridor:

The chunk of forest land has been affected adversely due to lack of proper protective measures, multifarious use of forest and anthropogenic pressure over 3409 ha. Coming within the limitations of corridor. The corridor has been affected by encroachments of land installation of stone quarries and other has led to frequent Human-Wildlife Conflict.

Conservation Plan: -

• Declaration, Demarcation and legal protection of the Corridor under various laws appropriate for the state

- Eviction of encroachments
- Improvements of forest cover in corridor forest.
- Wildlife conservation awareness program among the Local people.

3.7.2 Management Practices adopted:

A. Deployment of Squad:

In order to strengthen the existing staffs in Ranges, Squads have been deployed under various nomenclatures i.e. Anti Depredation Squad, Elephant trackers, Anti Poaching squad, Fire Fighting Squad, Protection Squad.

Deployment of Protection Squad in different Ranges of Karanjia Forest Division during the Financial Year 2021 – 22.

Scheme	No. of staff	Range wise Distribution				Remarks
		Dudhiani	Karanjia	Th. Munda	Satkosia	
Protection Squad						
PE – Critically Endanger area squad	10			10		
PE- - Elephant corridor – Elephant squad	10	5	5			
PE- 0361 - CSS – Elephant squad	15	5	10			
PE– STR Anti-smuggling squad	07				7	
CAMPA (G) (Para Forest staff)	60	10	30	10	10	
CAMPA(WL) Anti-depredation squad	20		10		10	
Elephant Tracker	2	1	1			
Total Protection Squad:-	**124 Nos.**	**21 Nos.**	**56 Nos.**	**20 Nos.**	**27 Nos.**	
Fire squad:-						
CAMPA (G)	40Nos.	10 Nos.	10 Nos.	10 Nos.	10 Nos.	
PE- - Elephant corridor – Elephant squad	5 Nos.	2 Nos.	3 Nos.			
PE- 0361 - CSS – Elephant squad	5 Nos.			2 Nos.	3 Nos.	

Man power position for Protection 2020 – 21

Scheme	No. of staff	Range wise Distribution				Remarks
		Dudhiani	Karanjia	Th.munda	Satkosia	
Protection Squad:-						
PE – Critically Endanger area squad	10	-	-	10 Nos.	-	
PE-EMP - Elephant corridor –	10	5 Nos.	5 Nos.	-	-	

Elephant squad						
PE- 0361 - CSS – Elephant squad	15	5 Nos.	10 Nos.	-	-	
PE– STR Anti-smuggling squad	07	-	-	-	7 Nos.	
Continuation of forest protection created 2011 – 12	10	-	-	10 Nos.	-	
CAMPA (G) (Para Forest staff)	60	10 Nos.	30 Nos.	10 Nos.	10 Nos.	
CAMPA(WL) Anti-depredation squad	20	-	10 Nos.	-	10 Nos.	
Elephant Tracker	2	1 No.	1 No.	-	-	
Total Protection Squad:-	**134 Nos.**	**21 Nos.**	**56 Nos.**	**30 Nos.**	**27 Nos.**	
Fire Squad:-						
PE-EMP - Elephant corridor – Elephant squad	5	5 Nos.				
PE- 0361 - CSS Elephant corridor – Elephant squad	5		5 Nos.			
CAMPA (G) Fire Squad	40	10 Nos.	10 Nos.	10 Nos.	10 Nos.	
Total Fire Squad:-	**50 Nos.**	**15 Nos.**	**15 Nos.**	**10 Nos.**	**10 Nos.**	

Deployment of Protection and Fire Squad in different Ranges of Karanjia Forest Division for the year 2019 – 20.

Scheme	No. of staff	Range wise Distribution				Remarks
		Dudhiani	Karanjia	Th. Munda	Satkosia	
Protection Squad:-						
PE – Critically Endanger area squad	10			10 Nos.		
PE-EMP - Elephant corridor – Elephant	10	4 Nos.	6 Nos.			

squad						
PE- 0361 - CSS Elephant corridor – Elephant squad	10	5 Nos.	5 Nos.			
PE– STR Anti-smuggling squad	17	3 Nos.	11Nos.		3 Nos.	
Continuation of forest protection created 2011 – 12	10			10 Nos.		
CAMPA (G) (Para Forest staff)	31	7 nos.	22 nos.	2 nos.	-	
CAMPA(WL) – Protection squad	6		4 Nos.		2 nos.	
Anti-depredation squad	10				10 Nos.	
Elephant Tracker	1	1				
Total Protection Squad:-	**105 Nos.**	**20 Nos.**	**48 Nos.**	**22 Nos.**	**15 Nos.**	
Fire Squad:-						
PE-EMP - Elephant corridor – Elephant squad	5	5 Nos.				
PE- 0361 - CSS Elephant corridor – Elephant squad	5		5 Nos.			
CAMPA (G) Fire Squad	40	10 Nos.	10 Nos.	10Nos.	10 Nos.	
Total Fire Squad:-	**50 Nos.**	**15 Nos.**	**15 Nos.**	**10 Nos.**	**10 Nos.**	
G. Total:-	**155 Nos.**	**35 Nos.**	**63 Nos.**	**32 Nos.**	**25 Nos.**	

B. Creation of Water Body:

In order to improve habitat, besides plantations water body are being created inside the Forest Blocks where the concentration of Animals is good.

C. Public Awareness camps:

For creation of public awareness, Wildlife Week is being celebrated every year with involvement of School Children, VSS mebers and local NGOs.

CHAPTER – IV

MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND VITALITY

4.1 Status of Regeneration:

The process of replacing old crop with younger generation either naturally or artificially is called regeneration. Forest regeneration process may include external interventions like assisted natural regenerations with seed showing, enrichment planting, controls measure to reduce grazing and lopping activities etc.

The intensity of regeneration refers to the extent the regeneration successfully established in an area for a given species or a group of species. The establishment of regeneration rely on factors like weeds, climate, soil, moisture regimes, grazing intensity, diseases, insect attack, fire incidence and topographic factors like slope and aspects.

In case of dry deciduous Sal forest, the regeneration is badly hampered due to biotic interference, annual fire and removal of more forest growth than required.

The management is aiding the Natural regeneration process through silvicultural cleaning, Soil & Moisture Conservation and planting of saplings. In a bird's eye view, the forest requires intensive care to have good regeneration from seeds. Coppice shoots have a lower rotation period and a lesser diameter growth. The same is supported from Regeneration survey during sample point enumeration.

For recording intensity of regeneration, four subplots of size 3×3 m, are laid out at a distance of 30 m from the centre of the main plot of size 0.1ha, in all four directions along the diagonals. For computing all the regeneration of the tree species (established) were recorded in the 9m × 4m = 36 m^2 and are classified according to NWPC – 2014 the regeneration status is classified into Adequate/Moderate/Poor and Absent.

The status of natural regeneration as assessed from the field study conducted by 406 No.s Sample Point Enumeration and overall status of regeneration in respect of individual forest block are furnished in the following proforma in **Table No. 4.1**

Table No.4.1
Forest Block wise status of natural regeneration of Karanjia Division

Sl. No.	Name of the Forest Block	Name of the Range	Regeneration Status		
			Adequate	Moderate	Poor
1	Bisipur RF	Thakurmunda			✓
2	Paudia RF	Thakurmunda			✓
3	Sarubil RF	Thakurmunda			✓
4	Kendumundi RF I	Thakurmunda			✓
5	Kendumundi RF II	Thakurmunda			✓
6	Patbil RF	Thakurmunda			✓
7	Dangapani RF	Thakurmunda		✓	
8	Rengalbeda RF	Thakurmunda			✓
9	Kendumundi RF	Thakurmunda			✓

Sl. No.	Name of the Forest Block	Name of the Range	Regeneration Status		
			Adequate	Moderate	Poor
10	Jadbil RF	Thakurmunda			✓
11	Kaliajiani RF I	Thakurmunda			✓
12	San Andharikhaman RF	Thakurmunda			✓
13	Chheratangar RF	Thakurmunda			✓
14	Saleibeda RF	Thakurmunda			✓
15	Purunapani RF	Thakurmunda			✓
16	Kadapani RF	Thakurmunda			✓
17	Kendujiani DPF	Thakurmunda		✓	
18	Boring RF	Thakurmunda		✓	
19	Sanrugudibeda RF	Thakurmunda		✓	
20	Satkosia RF	Satkosia		✓	
21	Ghosda RF II	Karanjia			✓
22	Maricha RF	Karanjia			✓
23	Panpatria RF	Karanjia			✓
24	Ankura RF	Karanjia			✓
25	Halpur RF II	Karanjia			✓
26	Bhanjabeda RF	Karanjia			✓
27	Singda RF	Karanjia			✓
28	Chaturasahi RF	Karanjia			✓
29	Kenjhar RF	Karanjia			✓
30	Tikasil RF	Karanjia			✓
31	Ghagi RF	Karanjia			✓
32	Pokharia RF II	Karanjia			✓
33	Chauthia RF	Karanjia			✓
34	Nuagaon RF	Karanjia		✓	✓
35	Hatisalbeda RF	Karanjia			✓
36	Poreidhora RF	Karanjia			✓

Sl. No.	Name of the Forest Block	Name of the Range	Regeneration Status		
			Adequate	Moderate	Poor
37	Kalakoda RF	Karanjia			✓
38	Badsarei RF	Karanjia			✓
39	Jhaddumuria RF	Karanjia			✓
40	Sandeuli RF	Karanjia			✓
41	Haldia RF	Karanjia			✓
42	Kasia RF	Karanjia			✓
43	Mauliasale RF	Karanjia			✓
44	Sanbadposi RF	Karanjia			✓
45	Miludihi RF	Karanjia			✓
46	Paudia RF	Karanjia			✓
47	Baddeuli RF	Karanjia			✓
48	Kujiam RF	Karanjia			✓
49	Sunaposi RF	Karanjia			✓
50	Pokamunda RF	Dudhiani		✓	
51	Gudidiha RF	Dudhiani		✓	
52	Rasamtala RF	Dudhiani		✓	
53	Pantho RF	Dudhiani		✓	
54	Kunjia RF	Dudhiani		✓	
55	Hatimundi RF	Dudhiani		✓	
56	Sialnai RF	Dudhiani		✓	
57	Kuita RF	Dudhiani		✓	
58	Dumuria RF	Dudhiani		✓	
59	Mota RF	Dudhiani		✓	
60	Dari RF	Dudhiani		✓	
61	Purunadeogaon RF	Dudhiani		✓	
62	Kanthikana DPF	Dudhiani		✓	

Sl. No.	Name of the Forest Block	Name of the Range	Regeneration Status		
			Adequate	Moderate	Poor
63	Masinabila RF	Dudhiani		✓	
64	Budhipat DPF	Dudhiani			✓
65	Badampahad RF	Dudhiani			✓
66	Kundarbisida RF	Dudhiani			✓
67	Badbil RF	Thakurmunda		✓	
68	Bharandia PRF	Thakurmunda		✓	
69	Vegidiha RF	Thakurmunda		✓	
70	Taramara RF	Thakurmunda		✓	
71	Thakurmunda RF	Thakurmunda		✓	
72	Sanrugudibeda RF	Thakurmunda		✓	
73	Purunapani PRF	Thakurmunda		✓	
74	Patrapada RF	Thakurmunda		✓	
75	Mulapal RF	Thakurmunda		✓	
76	Mituani RF	Thakurmunda		✓	
77	Mituani RF II	Thakurmunda		✓	
78	Mituani RF III	Thakurmunda		✓	
79	Mankadabeda RF	Thakurmunda		✓	
80	Mandaljhori RF	Thakurmunda			✓
81	Majuraposi RF	Thakurmunda		✓	
82	Khejuria RF	Thakurmunda		✓	
83	Kaliaposi RF	Thakurmunda		✓	
84	Hatigoda RF	Thakurmunda		✓	
85	Handiphuta RF	Thakurmunda		✓	
86	Gudiadiha RF	Thakurmunda		✓	
87	Ghorabindha RF	Thakurmunda		✓	
88	Digdhar RF	Thakurmunda		✓	

Sl. No.	Name of the Forest Block	Name of the Range	Regeneration Status		
			Adequate	Moderate	Poor
89	Dangadiha RF II	Thakurmunda		✓	
90	Dakeipal RF	Thakurmunda		✓	
91	Chamakpur RF	Thakurmunda		✓	
92	Chakulia RF	Thakurmunda		✓	
93	Bharandia RF	Thakurmunda		✓	
94	Bhadubeda RF	Thakurmunda		✓	
95	Baunsdiha RF	Thakurmunda		✓	
96	Banamunda RF	Thakurmunda			✓
97	Badbaliposi RF	Thakurmunda		✓	

4.2 Area affected by forest fire

Forest fire is a chronic phenomenon in our Deciduous Forest. During last 10 years the area affected by Fire and extent thereof is furnished at Table No 4.2.

Table 4.2
Incidence of Forest Fire and area affected in Karanjia Division

Year	Total No of Fire Incidents	Total area affected in Ha.
2011	Nil	Nil
2012	09 No	41.0 Ha
2013	08 No	12.85 Ha
2014	Nil	Nil
2015	97 No	150.61 Ha
2016	113 No	57.97 Ha
2017	185 No	79.303 Ha
2018	321 No	67.56 Ha
2019	28 No	11.782 Ha
2020	54 No	18.541 Ha

Forest fires have many implications on biological diversity. At the global scale, they are a significant source of emitted carbon, contributing to global warming which could lead decline biodiversity. At the regional and local level, they lead to change in biomass stocks, alter the hydrological cycle impact plant and animal species' functioning. Smoke from fires can significantly reduce photosynthetic activity (Davies and Unam, 1999) and can be detrimental to health of humans and animals.

Forest fire in this Division is largely by ground fire. However, the ground flora particularly regeneration crop is the worst victim of this menace. Sometimes pole crops get damaged. In addition, site condition is deteriorated due to ground fire. The length fire season is quite long in this Division starting from mid-February till mid-June or the onset of rains. Due to such large stretch of vulnerability, it becomes difficult to fix it effectively. The deciduous nature of the forest of this division pile up dry substratum on the floor conducive for the fire to proliferate.

Extreme dry condition and high temperature during the summer are congenial for easy and quick ignition of the aforesaid inflammable materials through the activities enlisted above to become forest fire which spreads rapidly being encouraged by the high speed of wind during the said period. The convergence of all such factors makes it a menace for the forests.

4.3 Area damaged by natural calamities

Natural Calamity except fire has not occurred in this division. The effect of cyclonic storm "Phani", "Hud Hud" has not caused any remarkable damage to forests and infrastructures of this division.

4.4 Area protected from grazing

Socio economic survey report Pasture land (Gochar available in the village) Indian grasslands are degraded stage of deciduous forests and hence are not climax grasslands (Champion & Seth 1968). In India, with a wide range of environmental variables, the climax can be either forest or desert and the grasslands that exist in the country are in serial stage (Bor, 1960). These grasslands are spread all spread all over the country, but dominant the Peninsular Indian Landmass.

Table No. 4.3
LIVE STOCK POPULATION IN KARANJIA FOREST DIVISION AS PER 2007 CENSUS (CD BLOCK WISE)

Sl. No.	Name of the CD Block	No. of the Gram Panchayat	No. of the village	Cattle Population				
				Cow	Buffalo	Goat	Sheep	Total
1	Karanjia	15	156	2191	390	2235	529	5345
2	Jashipur	20	228	3529	340	2928	721	7518
3	Thakurmunda	15	110	2992	311	3778	600	7681
4	Raruan	12	110	2889	192	3439	547	7067
5	Sukruli	9	90	2092	98	1776	401	4367
Total:-		**71**	**694**	**13693**	**1331**	**14156**	**2798**	**31978**

(Source-CDVO, Baripada)

Table No. 4.4

LIVE STOCK POPULATION IN KARANJIA FOREST DIVISION AS PER 2012 CENSUS (CD BLOCK WISE)

Sl. No.	Name of the CD Block	No. of the Gram Panchayat	No. of the village	Cattle Population				
				Cow	Buffalo	Goat	Sheep	Total
1	Karanjia	15	156	2378	478	2568	672	6096
2	Jashipur	20	255	3269	326	3224	830	7649
3	Thakurmunda	15	173	2694	354	4234	534	7816
4	Raruan	12	112	2712	208	3653	622	7195
5	Sukruli	9	90	2146	113	2845	423	5527
Total:-		**71**	**786**	**13199**	**1479**	**16524**	**3081**	**34283**

(Source-CDVO, Baripada)

LIVE STOCK POPULATION OF KARANJIA DIVISION

Type of Cattle	No. as per 2007 Census	No. as per 2012 Census	Change
Cow	13693	13199	(-)494
Buffalo	1331	1479	(+)148
Goat	14156	16524	(+)2368
Sheep	2798	3081	(+)283
	31978	**34283**	**(+)2305**

Table No. 4.5

ANNUAL FODDER REQUIREMENT IN THE SAMPLE AREA

Type of Cattle	Number	Daily Fodder need per individual	Fodder required per annum in Tons	Fodder met from other sources in Tons	Fodder met from Forest in Tons
Cow	13199	20 Kg	263.98	143.35	120.63
Buffalo	1479	30 Kg	44.37	20.00	24.37
Goat	16524	03 Kg	49.57	12.75	36.82
Sheep	3081	03 Kg	9.24	0	9.24
	34283		**367.16**	**176.10**	**191.06**

The data revealed that the total number of domesticated grazing and browsing animals in these surveyed areas comes to 34283 for which the requirement of fodder come to 367.16 tons per annum of which 176.10 tons are met from stall feeding and rest of 191.06 tons are exhausted from the nearby forest irrespective of its status. Under normal condition one ha of land produces 1 ton of grass per annum, so the open forest and scrubs with vegetation and invasive weeds can produce ¼ of it i.e.0.25 ton of grass per annum and for this amount of 191.06 tons 764.24 ha of forested land is required for grazing which is exceeding the even the total working plan area. When the cattle of 15% fringe village need more than the total management area to fill up the forage, it is quite imaginable how great the negative drivers of grazing over the forest of Karanjia Division.

4.5 Lopping practices: -

Tree lopping is the process of trimming various sections of a tree. The lopping may involve clearing away branches or limbs, or even shortening trunks. There are two schools of thought in regard to the practice of lopping, with some people feeling the process is beneficial and others believing the practice should be avoided if at all possible.

The goat / Sheep population entirely thrives on forest vegetation and lopping is a favourite practice to feed them. Sal, Sisoo, Bija, Sirisa, Bada Chakunda, Kanchan, Barkoli are the favourite forest species usually lopped for fodder.

Fruits of *Phyllanthus emblica*, *Terminalia chebula*, *Semecarpus anacardium*, *Diospyros melanoxylon, Madhuca indica* are generally harvested by the ignorant villagers for their uses by (lopping young trees) destructive method of collection causing heavy damage to the young crop.

4.6 Area infested by invasive weed species in Forests: -

Any unwanted plant that interferes or tends to interfere with the growth of main crop species is termed as Weeds. In natural forests with good canopy cover, there is little scope for invasion of weed. But large opening in the canopy encourages the weed to invade in that portion of the forests.

In plantation, the impact of weed growth is very much felt in view of the suppression of the growth of the planted seedlings. While de-weeding is prescribed for the plantations to control this problem, suitable silvicultural practice should be adopted for natural forests to tide over such situation.

The natural regeneration is badly hampered due to invasion of weeds in forests. Any open space created by way of felling, immediately the area is occupied by weeds. *Lantana camara*, Eupatorium, Banatulasi (*Ocimum tenuiflorum*) are the major weeds noticed in the division.

4.7 Incidences of pest and diseases.

Though there are a number of insect pests which are harmful to the forest crop as well as plantations but the following few causing considerable damage to the forests and plantations of the division are described in brief as under.

(i) Teak defoliator (*Hyblaea puera*)

This is the most serious pest of Teak both in natural and plantation. It causes major problems together with some group of minor pests. Controlling this pest by mechanical or physical means is of limited use. silviculturally it can be controlled by allowing the strips of existing mixed crop or raising strips of mixed plantations as the isolation barrier. The pest population can also be controlled by its natural enemy under biological control.

(ii) Teak skeletoniser (*Eutectona machaeralis*)

Instead of defoliation, this pest eats away the chlorophyll portion of the leaf leaving the internal tissue as such. As a result, leaf in its skeletal form is visible on the tree. Like the defoliator, it is also a major pest of Teak. These two pests are the serious menace of Teak Plantation in this Division. Its control is similar to that for the defoliator.

(iii) Sal heartwood borer (*Hoplocerambyx spinicornis*)

It attacks Sal tree particularly the heartwood portion. It affects the timber quality thereby causing depreciation in commercial value. The damage by this pest is sporadic and its intensity is not so acute. It attacks mostly felled / fallen un-barked logs as well as unhealthy moribund standing trees. Attack on healthy trees is very rare. It can be controlled effectively through biological methods.

(iv) Fungus:

Fungi are the causative agents of numerous plant diseases but few notable ones affecting some valuable tree crop of the division are ***Fomes caryophylli, Fomes faustuous, Polyporus shoreae*** and ***Fomes badius.***

(v) Loranthus:

This is an aerial hemi parasitic evergreen shrub on other seed plants. *Dendrophthoe falcata* (*Loranthus longiflorus*) and *Scurrula parasitica* are seen on the trees like *Shorea robusta, Cleistanthus collinus, Madhuca indica, Emblica officinalis, Mangifera indica, Tectona grandis* etc. These parasitic plants are

locally called as Madanga or Malanga. *Scurrula parasitica* is seen in upper hill slopes affecting the seed plants. The damage by Loranthus is though noticed but not of serious nature.

4.8 Forest degradation and its drivers:

Forest degradation is mainly due to illegal removal of Forest Produce i.e. timber & Fire wood. Due to Biotic pressure & interference like heavy grazing, Ground fire and above all pressure from increasing population which exert pressure on land resulting encroachment.

The nature of degradation & its driver are summarized below.

Table No 4.4
Drivers of Forest degradation & remedial measures.

Forest Degradation	Drivers of Degradation.	Remedial measures.
Loss of Tree cover	Collection of Firewood and timber for local consumption. Mining on forest area	To provide alternate fuel, timber substitute. To have strict enforcement of protection & legal action. Progressive Reclamation of Mined out area. Adequate plantation.
Loss of Ground Flora	Forest fire.	Regulating Picnic party entering in to Forest / Plantations. Maintaining Fire Lines, Strict vigilance

		on Forest Fire detection & combating. Taking help of nearby Fire stations / brigades.
	Heavy Grazing.	Regulating Grazing, Practicing Rotational grazing. Development of Grass lands.
Reduction in Forest area.	River Bank erosion.	Planting of Soil binding species on River banks. Resorting to construction of structures to prevent bank erosion in extreme cases of importance.
	Land grabbers / Encroachers.	Appropriate legal action, Motivate the encroachers to resort to Agro Forestry.
Bio diversity.	Loss of Bio diversity.	Introduce / protect less known species. Educate students / villagers importance of Bio Diversity. Control use of pesticides in agriculture. Protect Riverine plant succession.

4.9 Pollution control and protection of Environment:

As there is no large industry exists within the limits of the division, the damage to the forest crop is very negligible. However, due to use of the

plastic materials, Polythene bags, and thermocol etc., the reserve forest blocks on the fringe of villages and small towns are affected. The forest crop in the reserve is also affected by covering the leaves with dust particles hampering the photosynthesis of the plant. Although the effect is not visible today but if the status quo is maintained in perpetuity then the growth of the stand would be affected. The Lichens, who are the first group of plants in the plant succession to be affected by air pollution (As lichens don't have roots; they are in direct contact with air which makes them a good indicator of environmental pollution). Monitoring of the status of lichens in Forest areas in a time scale basis can enlighten us with effect of air pollution on the forest land.

CHAPTER – V

CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES

5.1. Area Treated under Soil and Water Conservation Measures:

Soil and moisture conservation measures is one of the major forestry activities for the upgrading of the moisture regime of a forested ecosystem. The approach of the activities was under the watershed basis to ensure maximum conservation of moisture and soil, which act as drought proofing measures. All the annual coupes were super imposed with the watershed maps and the soil and moisture measures were taken up from the top of the slope to the bottom approach.

Some plain reserve forest of Karanjia division like Kudarbisda RF-II, Begunia RF-II of Jashipur section Kathakaranjia RF, Mota RF, Dumria RF, Kenjhra RF, Siramanipur RF, Dari RF, Chanchabani RF, Jharbeda RF, Kuita RF, Kunjia RF, Gudidiha RF, Salrapada RF, Tato RF, Kadadiha RF of Dudhiani Range and Talapada and Taramara RF of Thakurmunda Range are very much susceptible to soil erosion. In many forest areas of Kudarbisda RF and portion of Begunia RF gullies leading to ravines have been noticed which leads to extensive crop damage. In Jharbeda RF, Dumria RF and Mota RF due to sheet erosion the top fertile soil has been washed out leading to barren lands and stunted growth of degraded crop.

Hence necessary soil and moisture conservation measure need to be taken up at the vulnerable soil erosion effected forest areas to arrest soil erosion and facilitate moisture conservation. Vegetative brush wood check dams, Loose Boulder Check Dam (LBCD), wire mesh check dam, diaphragm (Inverted concrete wall) earthen graded bund, Staggered trench, percolation pit, contour trench, stone bond, water harvesting structure, concrete check dam etc. are needed to be constructed as per site specific requirement to check soil erosion and facilitate moisture conservation. Apart from SMC measures the degraded forest areas need to be covered with vegetative growth by way of AR and ANR plantation to control soil erosion. Very recently SMC measures have been taken up under 20 VSS areas of Dudhiani Field Management Unit and 20 VSS of Gurguria Field Management Unit under Karanjia Divisional Management Unit of OFSDP phase –II.

The following works were proposed in this activity

(a) Gully Plugging: -

(1) Check dams were proposed to be made across the gullies with loose boulder check dams (LBCD) provided in the middle reaches of the gullies having a width of 1.0 mt. to 3.0 mt. Rough stones of size of 0.15 to 0.3 cum were proposed for the construction of these structures. Earthen bunds were proposed to be provided in both sides of the structure. Height of the check dam was proposed to be regulated 1/3rd to ½ of the gully depth. These check dams were to be constructed at

regular intervals depending on the gradient, steeper the slope, more check dams are required. More number of check dams are required in Category-II areas since the slopes are steep and the velocity of runoff is high. (2) For brush wood dam for gully plugging were proposed as per the suitability and availability of the vegetative soil binders like Sabai grass, Vetiver grass and Agave. Generally, for brushwood check dams, the height of the fall taken into consideration was fixed 1 meter, the maximum width of the gully was 3 meter and depth was 0.6 meter.



Figure: L.B.C.D

(b) Palisading, Agave Planting & Vegetative Building: -

With the available materials palisading was to be prepared along the contours to counteract the force of water movement. 10 to 20 meters apart depending on the slope with the growing of grasses like Khus Khus, Napier Grass, Saccharum etc. 10 to 20 meters from the second line Agave should be planted.

(c) Contour Bunds: -

Contour bunds were proposed to be constructed along the contour to cease run-off water. Grass turfing was proposed on the side slope and top of the bund. The soil binding species like Vetiver grass were to be planted on the upper slope of the bund with spacing of 0.23 meter.

(d) Staggered Trenches: -

These trenches were proposed to be constructed along the contours of size 2m×0.5m×0.5m and for undersize, equal tranches of more number were to be dugout. The soil dug from the trenches to be kept at least one foot away from the trench in an inverted trapezoid structure when the slope goes more than 30%. The trenches half the original size (2m×0.5m×0.5m) were to be built along the contour line. Generally, the distance between the two trenches could be 3 meters along the contour and also 3 meters along the slope.



Figure: Staggered Trench

(e) Percolation Tanks: -

These tanks were to be constructed on the flat surface of the highest points. Generally, each tank was to be dug out with dimensions of 5m×5m×0.5m. The width and the depth can vary depending on the availability of the flat surface. The dugout soil from the tanks should be stacked in an inverted trapezoid with the compaction. No inlet and outlet to be provided from the percolation tank. The bunds were to be treated with seeds of Dhanicha (*Sesbania aculeata*), Sun hemp or even Horse gram.

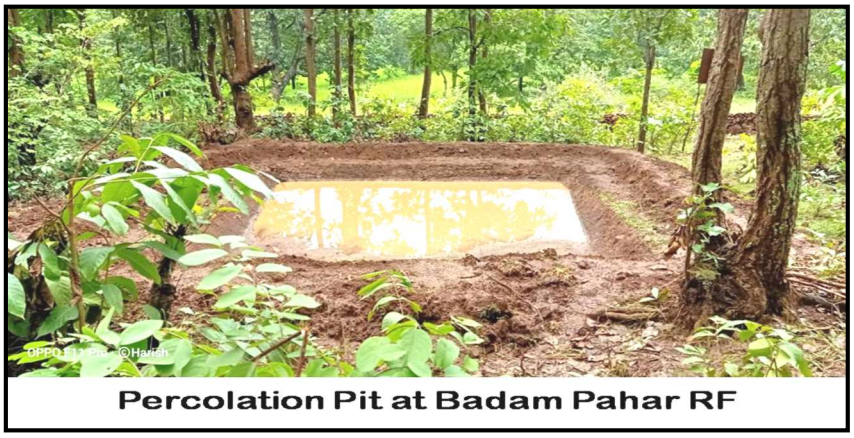


Figure: Percolation Pit

Plantation: The blank areas which had least chance of restocking through promotion of existing growing stock, were to be covered through planting. Choice of species for planting shall be based on its suitability to the site, need of the local people and easy propagation with a special emphasis on indigenous species but NTFP, fruit bearing, medicinal plant species were to be preferred. Generally, species like Asana, Arjuna, Mahula, Khaira, Babool, Karanja, Amla, Sirisa, Bija, Champa etc. were proposed for different areas proposed for planting. In the areas close to villages Ficus species and fruit bearing species like Mango, Jackfruit, Tamarind, Mahula, Karanja, Neem, Kusum and others were proposed. On much eroded and degrades sites species like *Senegalia catechu, Zizyphus spp*., *Aegle marmelos*, Babul and Agave were proposed along bunds and gullies.



Figure: Earthen Graded Bond



Figure: Earthen Graded Bond



Figure: Stone Bond



Figure: WHS



Figure: Sub-surface Dyke

Figure: Sub-surface Dyke





Figure: WHS

The details measures taken under SMC is furnished at Annexure -XXIV.

5.2 Duration of Water flow in the Selected Seasonal Streams

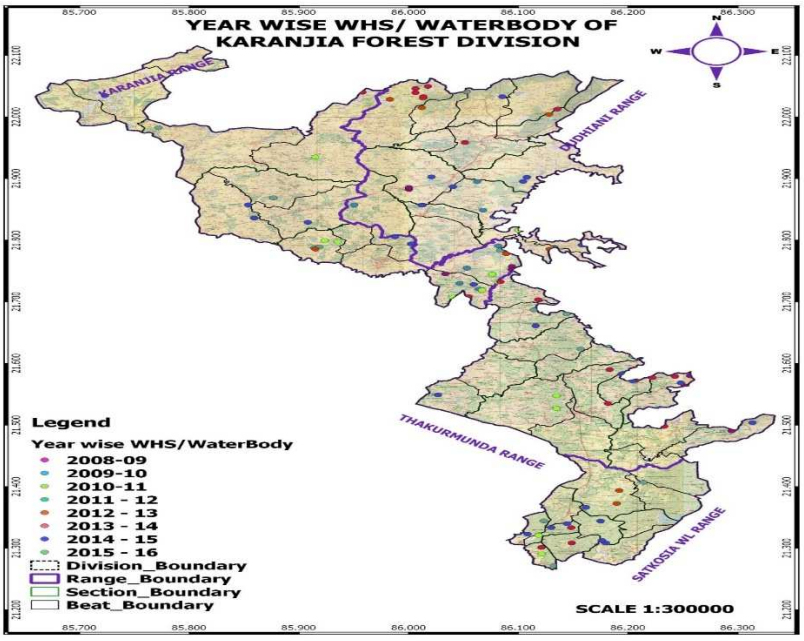
The main source of water regime of this Division comprises of the drainage system of river, nallas and some perennial streams. Khairi, Bhandan, West Deo, Salandi, Goharjhora, Tel and Sim flow ultimately into the Baitarani. The rivers are known by different names in different regions through which it passes and are perennial in nature due to their origin from Similipal hills. Many Nallas and Streams enrich the above river system.

5.3 Wetlands in Forest Areas

A **wetland** is a distinct ecosystem that is inundated with water, either permanently or seasonally. The primary factor that distinguishes wetlands from other landforms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric

soil. Wetlands play multiple roles, sometimes referred to as functions. Among these are water purification, water storage, processing of carbon and other nutrients, stabilization of shorelines, and support of plants and animals. Wetlands are also considered the most biologically diverse of all ecosystems, serving as abode to a wide range of plant and animal life. Whether any individual wetland performs these functions, and the degree to which it performs them, depends on characteristics of that wetland and the lands and waters near it. There exists a number of wetland either man made or natural and reaching the water regime of this division.

Hatibari Dam is being constructed over river Deo on the foot hill of Similipal surrounded by forest which would from a major part of wet land in Karanjia division. Apart from this Kumudabari minor irrigation project, Chemundia irrigation project and different water bodies created inside forest areas add to the wetlands in Karanjia division. List of waterbodies created in last 10 years is furnished as **Annexure-XVI**.



5.4 Water Level in the wells in the vicinity (up to 5km) of forest area

Groundwater Exploration

As per Ground water booklet of Mayurbhanj district, the depth to water level map for pre and post monsoon periods 2011 are prepared based on the ground water monitoring data of 77 No.s of National Hydrograph Stations of C.G.W.B. monitored during the month of April and November 2006 are presented in Plate 2 Plate 3 respectively. The pre and post monsoon depth to water levels in the district range from 3.54 to 14.50 m below ground level and 1.39 to 8.20 m below ground level respectively. It is observed that during pre-monsoon about 75% of the total areas show the water level varying between 5 to 10 m below ground level. During post

monsoon nearly 60% of the area has water levels within 2 to 5 m, while the 10 rest part has between 0 to 2 and 4 to 6 m below ground levels.

As per the ground water resources assessed during 2009, the net ground water resources availability in the district are 148194 ham. The block wise ground water resources are given in Table 3. 6365 ham of the total ground water is used in domestic and industrial water supply. The existing gross ground water draft for irrigation in net terms is 33963 ham. The Net ground water availability for future irrigation development 106150 ham. Over all the present level of ground water development is only 27.21 percent in the district with the maximum in Badasahi block viz. 64.65% and minimum in Bijatala block (9.79%). Hence the district as well as all the blocks come under the white category.

Sl. No.	Block	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic & Industrial Supply	Existing Gross Ground Water Draft for all uses	Provision for domestic & industrial requirement supply for next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development
		(ham)	(ham)	(ham)	(ham)	(ham)	(ham)	(%)
1	2	3	4	5	6	7	8	9
1	Badasahi	7739.00	4675.07	327.99	5003.00	472.00	2592.00	64.65
2	Bahalda	5809.00	1227.00	385.51	1612.00	273.00	4309.00	27.75
3	Bangiriposi	4185.00	1095.00	283.61	1379.00	334.00	2755.00	32.95

Sl. No.	Block	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic & Industrial Supply	Existing Gross Ground Water Draft for all uses	Provision for domestic & industrial requirement supply for next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development
		(ham)	(ham)	(ham)	(ham)	(ham)	(ham)	(%)
4	Baripada	5546.00	898.00	457.65	1356.00	562.00	4086.00	24.45
5	Betnoti	8837.00	3780.00	319.42	4099.00	468.00	4589.00	46.38
6	Bijatala	8388.00	640.00	180.18	821.00	223.00	7524.00	9.79
7	Bisoi	4049.00	398.00	174.05	572.00	240.00	3411.00	14.13
8	Gopabandhu Nagar	3477.00	981.00	188.00	1169.00	240.00	2256.00	33.62
9	Jamda	2054.00	251.00	163.34	414.00	202.00	1601.00	20.16
10	Jashipur	6154.00	1329.00	228.12	1557.00	320.00	4505.00	25.30
11	Kaptipada	8477.00	1285.00	411.05	1695.00	478.00	6714.00	20.00
12	Karanjia	5227.00	847.00	295.03	1142.00	375.00	4005.00	21.85
13	Khunta	6673.00	1211.00	238.30	1449.00	246.00	5216.00	21.71
14	Kuliana	6169.00	1227.00	223.65	1451.00	319.00	4623.00	23.52
15	Kusumi	9054.00	853.00	208.46	1061.00	298.00	7903.00	11.72
16	Moroda	6778.00	1829.00	252.30	2082.00	338.00	4611.00	30.72
17	Rairangpur	6881.00	784.00	213.48	997.00	280.00	5817.00	14.49

Sl. No.	Block	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic & Industrial Supply	Existing Gross Ground Water Draft for all uses	Provision for domestic & industrial requirement supply for next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development
		(ham)	(ham)	(ham)	(ham)	(ham)	(ham)	(%)
18	Raruan	2699.00	684.00	155.00	839.00	213.00	1802.00	31.09
19	Rasgovindpur	7191.00	2763.00	223.00	2986.00	303.00	4125.00	41.52
20	Saraskana	4821.00	1221.00	244.00	1465.00	323.00	3277.00	30.39
21	Shamakhunta	7625.00	710.00	197.86	908.00	256.00	6659.00	11.91
22	Sukruli	2049.00	687.00	149.00	836.00	189.00	1173.00	40.80
23	Suliapada	5017.00	1911.00	253.79	2165.00	336.00	2770.00	43.15
24	Thakurmunda	7284.00	983.00	249.11	1233.00	332.00	5970.00	16.93
25	Tiring	1266.00	330.00	134.00	464.00	177.00	759.00	36.65
26	Udala	4745.00	1364.00	210.00	1574.00	283.00	3098.00	33.17
	District Total	**148194.00**	**33963.07**	**6365.90**	**40329.00**	**8080.00**	**106150.00**	**27.21**

Ground water Quality:

The chemical quality of ground water in the district has been assessed on the basis of chemical analysis of ground water samples collected during groundwater monitoring, Hydrogeological surveys and groundwater

exploration. The results of the chemical analysis are presented in Table below.

Showing chemical constituents in aquifers

Constituent	Shallow aquifer	Deeper aquifer
pH	6.97-8.25	6.84-8.25
Sp. Conductance (micromohs/cm at 25C)	53-974	92-867
TDS (mg/I)	58 – 1430	106 – 429
Calcium (mg/I)	6 – 92	16 – 86
Magnesium (Mg/I)	0.6 – 17	3.6 – 22
Sodium (Mg/I)	1.6 – 100	3.5 – 168
Potassium (Mg/I)	0.4-8	<1-6.4
Bicarbonate (mg/I)	15-256	49-366
Chloride (mg/I)	7 – 238	5.3-85
Sulphate (mg/I)	0.1 – 9	<1 – 82
Nitrate (mg/I)	<0.01 – 53	0.1 – 78
Fluoride (mgh/I)	0.08 – 20.3	0.21 – 0.61
Total hardness as calcium carbonate	10 - 245	35 – 285

In Mayurbhanj district the availability of irrigation facility is comparatively less in the district which is 15.2% of the cultivable area during Kharif season and 5.31% during Rabi season. There is no completed major irrigation project in the district. The Subarnarekha irrigation project is however under execution. There are at present 249 minor irrigation projects in the district. The groundwater development potentials in Mayurbhanj district generally limited to the vast buried pediment, valley fills,

intermontane valleys, laterites and alluvial plains. Exploration has revealed the dug cum bore wells and bore wells are also likely to be successful in the buried pediments, intermontane valleys when explored close to fracture lineaments.

Recommendations:

1) Intensive groundwater exploration should be taken up to delineate deeper potential water saturated fracture zones and to compute aquifer parameter.

2) Large scale planning for ground water development should be preceded by intensive hydrogeological and geophysical surveys aided by remote sensing studies.

3) Effective measures may be taken to conserve the surface run off by contour bunding at suitable sites. Also, proper maintenance of reservoir, tanks and spring channels by periodical desilting should be carried out.

4) Existing dug wells should be deepened to tap the maximum saturated thickness of the weathered mantle or vertical bores may be drilled through the bottom to enhance the well yield.

5) Energization of wells already constructed should be stepped up to ensure optimal utilization of the irrigation potential already created.

6) The farmers should be educated through agricultural extension services for adopting suitable cropping pattern for optimal utilization of available groundwater resources.

7) Programmes for artificial recharge may also be taken up for augmentation of groundwater through construction of percolation tanks, subsurface dykes, and check dams and through contour bunding etc.

8) An intensive network of groundwater monitoring stations is required to be established in the command areas of irrigation projects to monitor the changes in groundwater regime consequent on application of surface water irrigation.

5.5 Status of Aquifers

The aquifer parameter of shallow and deep aquifers were determined from the pumping test data conducted during the hydrogeological survey and exploratory drilling. Aquifer characteristics of shallow and deeper aquifers are noted below.

a) **Shallow Aquifers:** Near surface aquifer in which ground water occurs under unconfined (phreatic) condition and is mainly tapped by dug wells for ground water extraction is generally identified as shallow aquifer. The specific capacity and hydraulic conductivity in different formations are stated in table below.

Specific capacity and hydraulic conductivity in different formations

Formation	Specific capacity index (m^3/min/m)	Transmissivity (m^2/day)
Alluvium	0.0035 to 0.241	4.0 to 102
Laterite	1.1 – 2.89	3.66 – 9.23
Older metamorphic group	4 to 39	0.0013 to 0.0106
Proterozoic volcanic	Transmissivity and Specific capacity in this zone appears to be low	
Iron ore group (shales, BHJ, BHQ and Kolhans)	Transmissivity and Specific capacity in this zone appears to be low	
Singbhumi granite	1 to 28	0.0009 to 0.034

b) **Deeper Aquifers:** Aquifers, which occur below the phreatic zone and extends down to a greater depth, are termed as deeper aquifers. Ground water in deeper aquifers occurs under semi-confined to confined conditions. Deeper aquifers are tapped by tube/bore wells for ground water extraction. Characteristics of deeper aquifers are noted below.

Specific capacity and hydraulic conductivity in different formations in deeper aquifers

Formation	Specific capacity index (m^3/min/m)	Transmissivity (m^2/day)
Older metamorphic group	2.5 to 38	0.8 to 13
Proterozoic volcanics	0.4 to 80.66	0.24 to 25
Iron ore group (shales, BHJ, BHQ and Kolhans)	11.76 to 21.56	3.4 to 8.6
Singbhum granite	0.77 to 59	0.5 to 9

CHAPTER 6

Maintenance and enhancement of forest resource productivity

6.1. Growing stock of wood

While forest cover is the aerial extent of a country's forests, growing stock is a measure of the substance of its tree wealth. The growing stock as assessed by the NRSA Hyderabad after analysing the data collected from 406 sample points spread over the forest of Karanjia Forest Division are as in Table No.6.1 & 6.2.

Table No. 6.1
Range Wise Stand Table

1. RANGE: **KARANJIA**

RWC	Girth Class (cm)					Number of trees
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	729,717	203,012	38,902	12,833	14,557	999,021
Total	729,717	203,012	38,902	12,833	14,557	999,021
SWC						
Anogeissuslatifolia	5,205	1,129	834	1,132	72	8,372
Misc	111,067	23,549	8,805	2,705	4,140	150,266
Shorearobusta	315,399	91,647	6,985	1,702	3,413	419,145
Terminalia tomentosa	6,462	3,419	315	125	768	11,089
Total	438,134	119,743	16,939	5,664	8,392	588,872
KaranjiaTotal	**1,167,851**	**322,755**	**55,841**	**18,497**	**22,948**	**1,587,893**

2.RANGE: **DUDHIANI**

RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	1,111,115	255,315	78068	30093	13777	1,488,368
Total	1,111,115	255,315	78068	30093	13777	1,488,368
SWC						
Anogeissuslatifolia	437	241	132	46	17	873
Misc	7,198	1,199	511	158	121	9,187
Shorearobusta	11,155	1,853	389	263	159	13,819
Terminalia tomentosa	476	197	126	29	23	852
Total	19,266	3,490	1,159	497	321	24,732
DudhianiTotal	**1,130,381**	**258,805**	**79227**	**30,590**	**14,098**	**1,513,100**

3.RANGE: **THAKURMUNDA**

RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	150-300	
All trees	154,079	35,770	43,760	16,097	9,092	258,798
SWC						
Anogeissus latifolia	21,833	15,372	10,809	6,065	4,643	58,722
Misc	286,206	102,639	44,370	16,505	12,022	461,742
Shorea robusta	1,042,156	100,045	105,048	114,342	61,246	1,422,837
Terminalia tomentosa	69,537	22,836	12,521	6334	4187	115,415
Total	1,419,732	240,892	172,748	143,246	82,098	2,058,716
ThakurmundaTotal	**1,573,811**	**276,662**	**216,508**	**159,343**	**91190**	**2,317,514**

4.RANGE: **SATKOSIA**

RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	208,714	72,917	31,075	10,871	6,641	330,219
SWC						
Anogeissus latifolia	128,520	84,613	45,014	13,642	4,885	276,674
Misc	777,538	330,019	152,623	57,697	43,990	1,361,866
Shorea robusta	754,851	205,273	88,893	42,494	17,165	1,108,677
Terminalia tomentosa	171,928	91,189	31,541	8,475	8,456	311,590
Total	438,134	119,743	16,939	5,664	8,392	588,872
Satkosia Total	**1,832,838**	**711,094**	**318,071**	**122,308**	**74,496**	**3,058,807**

Table No.6.2

Stock Table Summary

1. RANGE: **KARANJIA**

RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	53,065	52,257	23,938	16,668	31,902	177,830
Total	53,065	52,257	23,938	16,668	31,902	177,830
SWC						
Anogeissus latifolia	580	409	579	1,520	161	3249
Misc	9,860	7,644	4,965	4,098	7,135	33,702
Shorea robusta	21,489	20,107	37,52	23,19	8,005	55,673
Terminalia tomentosa	365	905	210	155	2102	3737
Total	**32,294**	**29,064**	**9,506**	**8,093**	**17,404**	**96,361**
KaranjiaTotal	**85359**	**81321**	**33444**	**24760**	**49307**	**274191**

2.RANGE: **DUDHIANI**

RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	46,419	65,168	50,338	36,541	31,348	229,814
Total	46,419	65,168	50,338	36,541	31,348	229,814
SWC						
Anogeissus latifolia	40	84	99	62	44	330
Misc	584	343	351	186	267	1731
Shorea robusta	685	395	253	321	386	2040
Terminalia tomentosa	34	50	79	36	57	256
Total	1,343	872	782	606	754	4,357
Dudhiani Total	**47,762**	**66,040**	**51,120**	**37,147**	**32,102**	**234,171**

3.RANGE: **THAKURMUNDA**

RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	150-300	
All trees	12,291	10,808	15,707	19,520	21,125	79,451
SWC						
Anogeissus latifolia	4,662	10,034	13,813	14,655	16,435	59,599
Misc	54,424	57,472	57,873	33,286	46,883	249,938
Shorea robusta	34,169	25,239	70,053	138,967	145,478	413,906
Terminalia tomentosa	4528	5421	7485	7504	11479	36417
Total	97783	98166	149224	194412	220275	759860
Thakurmunda Total	**110074**	**108974**	**164931**	**213932**	**241400**	**839311**

4.RANGE: **SATKOSIA**

RWC	Girth Class (cm)					Volume in cum
MAJOR SPECIES	30 – 60	60-90	90-120	120-150	>150	
All trees	16584	20576	21784	12502	15265	86711
SWC						
Anogeissus latifolia	13934	30527	34920	18250	10964	108596
Misc	75358	90421	113124	68110	95702	442715
Shorea robusta	45567	52587	56647	52099	38798	245698
Terminalia tomentosa	12230	23998	19956	10709	21803	88697
Total	**163674**	**218109**	**246413**	**161671**	**182532**	**972417**

6.2 Growing stock of bamboo

In Karanjia Forest division, Bamboo area is very miniscule and inventory for the same is not drawn.

6.3 Increment in volume of identified timber species

These records are very old and generalized. The use of this literature for assessment of growth potential, Mean Annual Increment (MAI) and yield is not free from controversies. The volume and yield tables are generally based on crop composition and localities that substantially differed from current biophysical conditions of the forest crop in this division. A more pragmatic approach would call for developing local volume and yield tables. However, available resources and time constraints did not permit this exercise. Therefore, though the above literature has been consulted, it

has not been entirely relied upon. The objective is not merely to ascertain MAI and other parameters for use in the Smythes Safeguarding Formula for yield calculation but also to provide reliable estimates of number of stems and stand volumes, by species and by girth class, in sampled forest blocks and in the entire division. It also aims at creating a bench mark against which future inventory assessments can be better compared; conditions of future crops can be objectively assessed; and reliable estimates of growth potential, MAI and yield can be ascertained. This plan has made an attempt to assess the total volume of the growing stock with 1% systematic sampling method and by using the volume equations developed by the Forest Survey of India (FSI) for Odisha. For the purpose of this plan, the volume equations of different species developed by the FSI on the basis of data from the forests of Koraput, Sambalpur and Phulbani have been used. The local volume equations used in this Working Plan is presented in Table No.6.7.

Table No.6.7

Local Volume Equations of different species used in this plan.	
Species	***Local Volume Equations.***
Asan	$V = 0.103171 – 1.684599D + 10.107586D^2$
Bahada	$V = 0.035142 – 0.839708D + 8.157614\ D^2$
Bandhan	$V = 0.057424 – 1.153088D + 8.542648\ D^2$
Dhaura	$V = 0.015731 – 1.020606D + 9.656667D^2$
Jamun	$\sqrt{V}=0.08444 – 1.26801\ D + 8.75274D^2$
Kasi	$V = 0.035142 – 0.839708D + 8.157614D^2$
Kendu	$V=(-)0.009124 – 0.494103\ D + 8.157614\ D^2$
Kurum	$\sqrt{V}=(-)0.153360 + 2.802965D$
Mahula	$V = 0.030925 – 0.567037\ D +5.709471\ D^2$
Moi	$V = 0.057424 – 1.153088\ D + 8.542648D^2$

Mundi (Mitikinia)	$V = 0.030925 - 0.567037D + 5.7094710D^2$
Piasal	$V = 0.058424 - 1.233468D + 9.433633 D^2$
Sal	$V = 0.109884 - 1.804757 D + 10.297714D^2$
Salai	$\sqrt{V} = (-) 0.188655 + 3.021335D$
Simili	$V = 0.136196 - 2.076740D + 10.156600D^2$
Sissoo	$V = 0.00965 + 0.58546D - 2.5605D^2 + 24.34215D^2$
Other (Misc.)	$V = 0.088074 - 1.449236D + 8.760534D^2$

In the above volume equation 'V' refers to under bark round timber volume in cubic meter (cum), 'D' is dbh, diameter over bark at breast height in meter (m). For other tree species like Teak, Karada, Char, Sidha, Harida, Bheru, Sunari, Kusum etc. Volume equation applicable for miscellaneous species has been used.

6.4 Efforts towards enhancement of forest productivity through quality plantation activities

To increase the carbon Sequestration potential of the forest of this division, the following are to be addressed with prescription of suitable management techniques.

Effective implementation of good management practices ensures the multiple functions of forests and will increase forest carbon stocks. Specific management practices include silvicultural treatments, tending operations, enrichment of gaps with re-vegetation, soil and water conservation measure, species selection, modification of rotation cycles, etc. to enhance forest carbon stocks. Quality seedlings raised from seeds of good mother trees and 18 months seedlings having above height of 150 cm

are used for better survivability of the plantations. So far as genetically improved seedlings are concerned through tissue culture/ clonal propagation has not been started in this division.

Whether due to natural or anthropogenic activities, degradation of forest results in reduction of carbon stock and release of greenhouse gas to the atmosphere. Forest conservation endeavours to rectify deforestation and forest degradation. Forest management activities that conserve carbon stocks in forests include the following:

(i) Sustainable practices of forest management and use;
(ii) Integrated fire management;
(iii) Management of forest health and vitality;
(iv) Management of forest biodiversity;
(v) Management of forest and water sheds.

(i) **Sustainable practices of forest management** will ensure that productive or multipurpose forests continue to store carbon and maintain their capacity to provide goods and services for the benefit of current and future generations. Management practices need to be actively planned, tailored to each specific ecosystem and evolving situations, so as to avoid overexploitation and forest degradation. Forest management plans and practices need also be adapted to modifications caused by climate change, both gradual and abrupt. Adaptive forest management will

be essential to address challenges and reduce forest vulnerability. Adaptation measures will be likely to be: -

- Selection of pest-resistant or drought-tolerant varieties
- Use of planting stocks from a range of provenances
- Planting of indigenous species
- Under planting of genotypes of species adapted to expected new climatic conditions, or Assisted Natural Regeneration of functional species.

(ii) **Integrated fire management**: - Integrated forest fire management will be essential for forest conservation and as a part of climate change. Strengthening capacities to prevent forest fires can contribute to protecting storage and sequestration of carbon in natural or planted forests. Fire management practices will need to be intensified and adapted as in ongoing plan for the future plan period of the Division.

(iii) **Management of forest health and vitality: -** Increased temperatures and levels of atmospheric carbon dioxide as well as changes in precipitation and in the frequency and severity of extreme weather events (like harsh summer with mercury reaching beyond 42^0c for prolong period, reduced rainy days in certain years) are having notable impacts on the

condition of forests in general. Climate change, particularly extreme weather events will affect forest pests and the threat to their development, survival, reproduction and spread. Increased forest cover with high biodiversity will help in improving climatic condition of the Division and thus rejuvenate the health and vitality of the forests.

(iv) **Management of forest biodiversity**: - Biodiversity is the key to resilience of forest ecosystems to climate change, and therefore for conservation of forest carbon stocks. Forests are among the most important repositories of terrestrial biological diversity. The forests of this Division offer very diverse habitats for plants, animals and micro-organisms. In forests biological diversity and in particular genetic diversity allows species to adapt continuously to evolving environmental conditions (including climate change), to maintain the potential for selection and improvement to meet future needs and changing end-user requirements, and to support ecosystem functions along with carbon sequestration. Thus in the plan specific measures are to be prescribed to enhance the level of biodiversity of the Division.

(v) Management of forests and watersheds -. Sound forest management and afforestation of degraded areas along with soil and water conservation measures are required to reduce erosion, increase slope stability and hence contribute to the provision of essential environmental services such as a regulated water flow and protection against natural hazards. Sustainable development and collaborative and integrated approaches to watershed management are therefore vital for climate change mitigation and adaptation. Special site-specific treatment prescription like check dams, staggered trenching contour bunding etc will be accommodated in the plan to the strengthen the soil and water regime of the Divisional area.

6.5 Carbon Stock

Forests and Climate change are intimately intertwined. Forests regulate the climate, rain ground water and soil of the Earth. Forest is both sources and sink of Carbon. A growing forest captures carbon from the atmosphere and a mature forest is a store house of carbon. The world's forests and forest soil current store is more than 1 trillion tons of carbon which is twice the amount found floating in the year.

To tackle issue of climate change, the parties to the UNFCC (United Nations Frame work on CC) agreed to undertake common actions. At head

Conference of Parties (**CoP3**) held in 1997 Kyoto, Parties adopted the Kyoto protocol. Under the protocol, industrialized parties committed themselves to reducing their GHG (Green Houses Gases) emission by an average of 5.2% below the 1990 levels, by 2012. The protocol came into force in February 2005.

CoP - 11: -Montreal, a UNFCC CoP – 11 in 2005, the coalition rain forest nations, a group of parties spearheaded by Papua New Guinea (PNG) and Costa Rica tabled a motion to include the Reduction of Emission from Deforestation and forest Degradation (REDD) in the provision of the UNFCC.

Cop – 13: -Bali – December 2007: The parties agreed in the Bali Action Plan that provides a road map for negotiations towards a post 2012 climate arrangement. Among other things the parties agree to the establishment of Climate change adaptation fund and a simplification of Clean Development Mechanism (CDM) rules for afforestation and re-forestation projects. They also pass a resolution on reducing emission from Deforestation and forest Degradation (REDD). The Bali Action Plan proposes the Sustainable Forest Management (SFM) and reducing emission from Deforestation and forest Degradation be considered in the negotiation process for post 2012 Climate arrangement.

Cop – 15 Cancun, 2016: - Methodological guidelines were discussed for REDD+. The 5 activities namely,

a. Reducing emission from deforestation.
b. Reducing emission from forest degradation
c. Conservation of forest carbon stock
d. Sustainable Management of Forests.
e. Enhancement of Forest Carbon stock were added for REDD+.

Cop – 16: -The CoP -16 needs milestone decision on REDD+ encourages developing countries to develop a "National Forest Reference Emission Level" (REL) or RL if appropriate as interim measure, sub-national REL/RL in accordance with the national circumstances". REL/RL serve as a bench mark for accessing performance of implementation of REDD+ in a country.

In forest eco-system, enormous carbon is stored which is classified in five pools in GPG (Good Practice Guidance). The living portion of biomass carbon is classified in two pools, the Above Ground Biomass (AGB) and the Below Ground Biomass (BGB) which are stores of significant amount of carbon. The Dead Organic Matter (DOM) is also classified into two pools "Dead Wood" and "Litter". The fifth pool is Soil Organic Matter (SOM) which contains substantial amount of carbon.

Carbon Stock:

- UNFCCC recognizes following 5 pools

Living Biomass
1. Above ground
2. Below ground

Dead Organic Matter
3. Dead wood
4. Litter & forest floor

Soils
5. Soil Organic Carbon

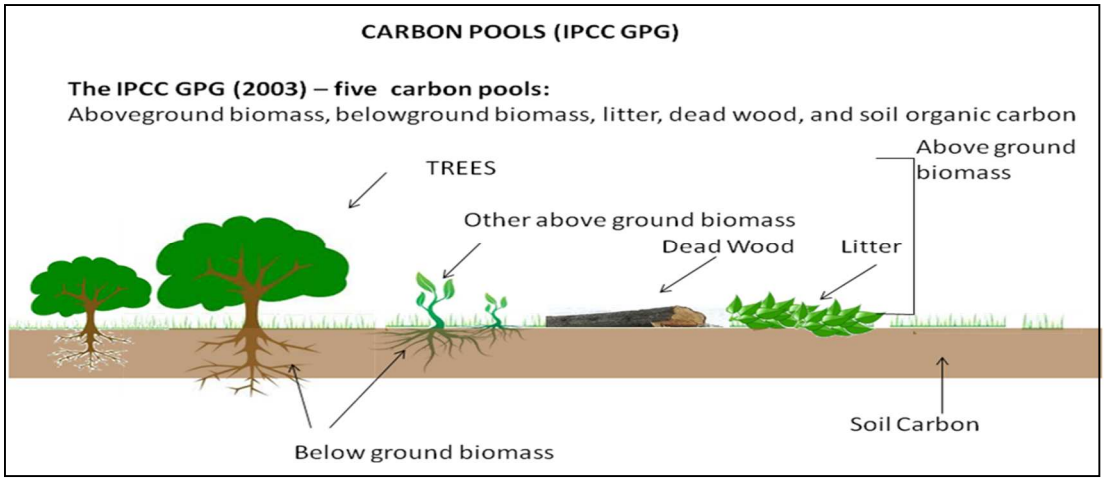


Figure: Carbon pools

Table No.6.8 Various carbon pools

Pools	Description	Biomass
Living Biomass	Above ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds and foliage
	Below ground biomass	All living biomass of live roots. Fine roots of less than 2mm diameter (country specific) are often excluded.
Dead Organic Matter	Dead wood	Includes all non-living woody biomass not contained in the litter, either standing or lying on the ground. (also includes dead roots and stumps larger than or equal to 10 cm in diameter or country specific (India – 5 cm).

	Litter	Includes all non-living biomass with a diameter less than a minimum diameter chosen by the country (India - 5 cm), lying dead, in various states of decomposition above the mineral or organic soil
Soil	Soil Organic Matter	Includes organic carbon in mineral and organic soils (including peat) to a specific depth chosen by the country (India - 30 cm) and applied consistently through the time series.

Different Forest Carbon Pools:

Above ground tree biomass

- This pool contribute maximum to carbon stock changes
- Part is measured if any forest inventory conducted
- Biomass of small wood, foliage and bark are not captured when volume equations are being used
- All trees < 10 cm dbh also are not accounted for

Belowground tree biomass

- One of the most difficult part to measure
- Belowground tree biomass (roots) is not measured in inventory
- Being included through a relationship (usually a root-to-shoot ratio) to aboveground biomass

Dead wood/Litter

- Dead wood stocks are usually assessed along a transect or
- By laying optimum number of sample plots in all the sub-population,
- With the simultaneous collection of data on weight
- Subsequent drying of samples for density.
- Then strata wise (sub-population) per unit of area biomass is assessed and converted to carbon stock.

Soil organic matter

- This component has become integral part of inventory
- Samples are collected from all the sample points
- Analysed in laboratory for percent of soil carbon
- If it is not a part of inventory, then optimum number of samples are decided
- Sample are collected from each strata
- Analysed in a laboratory for bulk density and percent soil carbon

Methodology used by FSI in estimating carbon stock

The calculation of carbon stock requires information on extent of area of an emission/removal category termed as 'Activity Data' and emission or removal of

GHG (Green House Gas) per unit area termed as 'Emission Factor' as per the GPG developed by IPCC. The methodology used by FSI for activity data and emission factors has been described in the following paragraphs.

Methodology for estimating activity data

Three different methodologies are advocated in GPG and are being used by different countries to assess the extent of area (activity data) under 'Forest land remaining forest' and 'Non-forest land converted to forest'. These methodologies are: Wall to wall mapping using remote sensing data; Mapping of sampled area using remote sensing data and, Using field survey methods. For activity data, FSI used remotely sensed (RS) data and adhere to the guidelines of GPG with respect to RS data. A hybrid approach combining automated digital classification techniques with visual interpretation was used. The technique is generally used as it is simple, robust and cost effective.

Stratification of Forest area

Stratification gains precision by dividing a heterogeneous population into relatively homogeneous sub-population based on certain

stratification variables. Since, carbon stored in the vegetation is largely depends upon canopy density and forest type; these two were considered as stratification variables.

Forest Type Mapping

Forest type wise extent of the forest cover is useful information for characterizing forests in terms of floristic composition and ecological value. FSI mapped forest types of India, according to Champion & Seth classification (1968) on 1:50,000 scale. Using the forest type maps, distribution of forest cover in different forest types has been determined for the country. Canopy density wise spatial information was available from the 'forest cover mapping.' This was supplemented with the forest type wise information generated under the national forest type mapping project carried out by FSI. This gave three canopy density classes and 17 type groups including plantation – thus yielding fifty-one classes in all. Using this classification, area statistic (activity data) was generated through GIS technique.

Methodology for estimating emission factors

To measure exchange of GHGs between forest eco-system and the atmosphere which is eventually change in carbon stock over time, FSI has used Stock-Difference method (inventory based approach or periodic accounting) for estimating various emissions factors as recommended by GPG. The emission factors have been estimated partly by using the NFI data collected during 2002 – 2008 and partly by conducting a special study between 2008 to 2010. The same factors have been used for estimation of carbon stock for 2017. The methodology followed in deriving these factors are given below:

Above Ground Biomass (AGB) of trees having dbh 10 cm and above and bamboo

Under the national forest inventory programme, FSI has been conducting a national forest inventory following a multistage sampling approach. As per the design, data from about 21,000 sample plots (size 0.1 ha) had been collected between years 2002 – 2008. At each sample plot, all trees of diameter 10 cm and above were measured. The woody volume of trees for each sample plot was calculated using volume

equations developed by FSI for various species. The volume equation provides i.e. above ground woody volume, which includes volume of main stem measured up to 10 cm diameter and volume of all branches having diameter 5 cm or more. Data of specific gravity and percentage carbon content of most of the trees species have been obtained from different published literature. For few species, percentage carbon content was ascertained by experimentation and for remaining an average of all other species was used. Standard formulae were used to calculated biomass and carbon content of each tree.

The estimates of bamboo biomass and carbon stocked in this resource has also been calculated from NFI data. For estimating volume of the bark, the double bark thickness of trees measured during forest inventory and volume equation of trees have been used. Using species-wise, dbh and bark thickness, bark volume equations were developed and were adjusted for 'bark void factor' which were utilized to estimate bark volume. With the help of the specific gravity of bark, the volume was converted into

biomass. Using carbon content percent of wood, carbon stored in bark was estimated.

Above ground biomass of trees having dbh less than 10 cm

This information was derived by FSI from a special study conducted during 2008 – 10 for SNC. On the basis of data collected between 2002 – 08, 20 important tree species were identified for each of 14 strata in NFI. For each of such species, 3 trees of diameters 1-9 cm (at 1.37 m. height) were felled. From the felled trees, separate biomass was calculated and recorded for wood, twigs and leaves in the prescribed format. Taking the dry biomass of wood/foliage as dependent variable and dbh as independent variable biomass equations were developed for each species. Using the plot level regeneration data from NFI i.e. recruits, un-established, established and all trees having dbh between 5 to 10 cm, biomass and carbon content at plot level is calculated.

Above Ground Biomass of shrubs, herbs, climbers and biomass of Dead Organic Matter (DDM: dead wood and litter)

For this purpose, the data of forest inventory conducted during 2002 – 08 was analysed to ascertain the optimum number of plots required for each combination of forest type and forest density. It revealed that about 15 cluster of 2 sample plots for each combination, would suffice for estimating the biomass/carbon factors for these components if 30% permissible error is considered. This survey was conducted in the districts on randomly selected points which were already inventoried during 2002 – 08 and for which forest type and density were known.

For the desired combinations of forest type and forest density, the exact geographical locations (latitude and longitude) of the optimum number of randomly selected sample plots were visited. Using this information, at the centre of sample point, three concentric plots of size 5m×5m, 3m×3m and 1m×1mwere laid out at a distance of 30m away from the centre of sample point in North and South direction. In 5m×5m plot, all dead wood above 5 cm diameter were collected, weighed and recorded. In 3m × 3m plot, all woody litter i.e. all branches below 5 cm diameter were collected, weighed and recorded. All

shrubs and climbers in 3m × 3m plots were uprooted, weighed and recorded in the prescribed format. In 1m × 1m plot, all herbs were uprooted, weighed and recorded. Dry biomass was converted to carbon stock.

Above Ground Biomass of branches, foliage of trees having dbh greater than or equal to 10 cm

This information was derived by FSI from a special study conducted during 2008 – 10 for Second National Communication (SNC). As described above, 20 important tree species in each stratum were identified. For each such species other than palm like trees, in each of the diameter class, three normal trees were selected. Its diameter, height, crown length, crown width in two directions, blank in canopy and shape of the crown were recorded.

For the purpose of biomass calculation, one normal tree of each diameter class of each species was selected. In the selected tree, partial destructive method was used to compute biomass of woody branches up to 5 cm diameter, twigs and leaves. Biomass of all these parameters was separately recorded in the prescribed formats. Taking the dry biomass of small wood/foliage as dependent variable and dbh as independent variable biomass equations

were developed for each species. Using the plot level data of NFI, species wise carbon content, the total biomass and carbon content at plot level was calculated.

Organic matter in soil and forest floor

During forest inventory, data on forest floor (non-woody litter and humus) and soil carbon is also collected from each sample plot. For collecting data on humus and soil carbon, two sub-plots of size 1m × 1m are laid out within the main plot. The forest floor from both the plots was first swept and material so collected was weighed and portion of same was kept for carbon analysis. Further, at the centre of these two sub-plots, a pit of 30cm × 30cm × 30cm was dug and a composite sample of soil of 200gm was kept for organic carbon analysis. Samples of soil and humus were got analysed from the standard soil labs and were used for the calculation.

Below ground biomass

This is most difficult pool to measure and generally not measured in forest inventory. It is being included using a relationship (usually a root – to –shoot ratio) to aboveground biomass which have been established

by various researchers. GPG also provide default ratios for six major global forest types. FSI has selectively used these defaults to arrive at the carbon number

Synthesizing Data for National Carbon Estimation

GIS techniques were used to intersect forest type map (2004) and forest cover map (2015 and 2017) resulting in two maps having 51 strata (forest type and canopy density intersections) on corresponding to each year. The real extent of these strata was ascertained using GIS techniques. The geographical location of each sample plot recorded with GPS during field visit s have created a GIS compatible point layer of the forest inventory plots. This NFI point layer map was overlaid on the above map having 51 forest type – canopy density strata. The NFI points falling in each stratum were identified. For each stratum, the plot wise information on all the parameters of each carbon pool, were aggregated to have generalized factor for that stratum. Biomass and carbon factors were specifically developed for each stratum lime, shrubs, herbs, climbers, dead wood and woody litter. Multiplying activity data with these factors, different

parameter wise total carbon for all the 51 strata were arrived at. This information was arranged into five carbon pools. Adding pool wise carbon contents, national carbon estimates were arrived at for the year 2017. Forests in Karanjia forest division belong to the type tropical moist deciduous type. Standard values for various carbon pools for this forest type as per FSI methodology are given in Table 6.7

Table No. 6.7

Forest Type Stratum	Density	Carbon (in tonnes/ha)					
		AGB	BGB	Dead wood	Litter	SOC	Total
Tropical Moist Deciduous	VDF	37.18	7.65	1.17	2.81	74.69	123.50
	MDF	25.37	5.22	0.82	3.44	61.73	96.58
	OF	11.87	2.44	0.40	1.81	50.56	67.07

Source:- FSI ,Dehradun

Table No.6.8

Abstract of forest type of Karanjia Forest Division		
Forest Type	**Density**	**Area in Ha**
Tropical Moist Deciduous Forest	VDF in Ha	8317.2
	MDF In Ha	32,279.99
	OF in Ha	21,773.02
	Total	**62,370.21**

Table No.6.9

Calculation of Carbon Stocks of Karanjia Forest Division in 2017 in 000' tones								
Type	**Density**	**Area in Ha**	**AGB**	**BGB**	**Dead Wood**	**Litter**	**SOC**	**Total**
Tropical Moist Deciduous Forest	VDF	8317.2	309.2334	63.626	9.7311	23.3713	621.2116	1027.173
	MDF	32,279.99	818.9433	168.5015	26.4695	111.043	1992.6437	3117.6
	OF	21,773.02	258.4457	53.1261	8.709	39.4091	1100.8438	1460.533
	Total	**62,370.21**	**1386.622**	**258.2536**	**44.9096**	**173.8234**	**3714.70**	**5605.306**

Forest block wise Carbon Stock of Karanjia Division is furnished in **Annexure- XV (c), XV (d) & XV (e)**

6.6. Carbon sequestration and mitigation

To increase the carbon Sequestration potential of the forest of this division, the following points are to be addressed with prescription of suitable management techniques.

- Prolonged rotations
- Increased thinning
- Continuous forest cover
- Supporting litter production.
- Natural ecological condition
- Keeping the right water level
- Preventing deforestation
- Forest Management usually focuses in increasing the forest productivity and growing stock.

Enhancement of forest carbon stocks Effective implementation of good management practices ensures the multiple functions of forests and can increase forest carbon stocks. Specific management practices – e.g. silvicultural treatments (tending operations, enrichment of gaps, etc.), species selection, modification of rotation cycles, can be adopted to enhance forest carbon stocks.



CHAPTER – 7

Optimization of forest resource utilization

7.1 Recorded removal of timber

In the previous plan 29065.78 ha. Forest was allotted to the Selection Working Circle. In the Stand and Stock table it was indicated that trees of five girth classes 30 cm to 60 com, 60-90, 90-120, 120-150 and 150 cm and above were available in the stand for management. As revealed from the field inventory by sample point enumeration the principal species present are *Shorearobusta* (Sal), *Terminaliatomentosa* (Asana), *Anogeissuslatifolia* (Dhaura),*Buchananialanzan (*Char) etc.

Selection system was prescribed for managing the forests assigned under this working circle with special emphasis on the regeneration and improvement of the stand. Looking into the drought proneness of the division special cares were taken during the removal of the mature trees to maintain the ecological and environmental stability.

Minimum girth at breast height of a tree was considered as one of the qualifying criteria for harvest. Silvicultural, ecological and genetically safeguarding factors of the trees were taken into consideration during harvest. The harvestable girths calculated at breast height for different species in the last plan period are given in **Table No. 7.1**

Table No. 7.1

Sl. No.	Name of the species	Harvestable girth at breast height in Cm.
1	Sal	150
2	Toon, Asan, Mango, Semal, Char, Gambhar, Bankhira, Koim, Piasal and Bhurkhund	120
3	Sissoo	90
4	All other species	90

The detail of yield analysis during the plan period achieved by the Division is tabulated as follows.

Table No. 7.2

Yield in the felling series of Regular coupes of the Division

Range	Year of working	Name of felling series	Coupe No.	Area In ha.	No. of trees marked	Production	
						Timber in cum	FW in stack (12'×3'×3')
1	2	3	4	5	6	7	8
Thakurmunda	2007-08	Taramara	XII	312.80	05	1.48	1
Kendumundi		Tikarpada	-do-	260.60	143	41.51	13
Karanjia		Podheidhara	-do-	102.00	04	4.70	2
Thakurmunda	2008-09	Taramara	XIII	315.35	11	4.34	--
Kendumundi		Tikarpada	-do-	262.60	10	3.80	--
Karanjia		Podheidhara	-do-	102.00	01	2.18	--
Thakurmunda	2009-10	Taramara	XIV	325.00	08	4.00	
Kendumundi		Tikarpada	-do-	262.80	02	1.14	
Range	**Year of working**	**Name of felling series**	**Coupe No.**	**Area In ha.**	**No. of trees marked**	**Production**	
						Timber in cum	**FW in stack (12'×3'×3')**
Thakurmunda	2010-11	Taramara	XV	324.60	19	4.04	3.5
Kendumundi		Tikarpada	-do-	260.00	06	3.75	--
Karanjia		Podheidhara	-do-	106.00	01	1.39	--

Satkosia	2011-12	Satkosia	XVI	673.60	23	11.79	12
Karanjia		Podhiedhara	-do-	106.00	02	0.99	-
Thakurmunda		Taramara	-do-	240.00	02	1.70	-
Kendumundi		Tikarpada	-do-	266.40	15	10.25	-
Satkosia	2012-13	Satkosia	XVII	702.80	26	10.52	06
Thakurmunda		Taramara	-do-	314.00	13	8.41	04
Kendumundi		Tikarpada	-do-	234.00	13	11.13	--
Satkosia		Satkosia	XVIII	666.00	53	21.00	12
Thakurmunda	2013-14	Taramara	-do-	287.08	09	3.06	02
Kendumundi		Tikarpada	-do-	237.42	05	5.61	03
Satkosia	2014-15	Satkosia	XIX	670.80	73	27.67	30
Thakurmunda		Tikarpada	-do-	336.40	10	8.97	06
Thakurmunda	2015-16	Taramara	XX	305.60	10	7.32	--
Karanjia	2016-17	Podheidhara	I	220.00	04	2.09	01
Kendumundi		Tikarpada	-do-	495.20	13	4.90	02
Satkosia	2017-18	Satkosia	II	715.60	06	1.22	01
Kendumundi		Tikarpada	-do-	265.56	11	5.74	02
Satkosia	2018-19	Satkosia	I	1304.80	33	13.21	01
Kendumundi		Tikarpada	-do-	530.00	26	12.06	01
Thakurmunda		Taramara	-do-	603.68	11	10.26	01
Satkosia	2019-20	Satkosia	IV	1462.00	15	2.04	01
Thakurmunda		Taramara	-do-	565.27	09	1.39	-
Kendumundi		Tikarpada	-do-	480.01	23	10.75	01
Satkosia	2020-21	Satkosia	V	1417.20	113	19.4743	02
Thakurmunda		Tikarpada	-do-	534.96	20	5.6406	01
		Taramara	-do-	628.20	02	1.0186	-

Table No. 7.3

Timber and fuel wood from irregular coupes Statement of Timber and Fuel wood of last 10 years in respect of Karanjia Forest Division						
Financial year	**Round Logs in Cum.**	**Poles in Nos.**	**Sawn timber in Cum.**	**Fuel wood in Qntl.**	**Fuel wood in Stack**	**Remarks**
2007-08	247.61	-	47.92	-	304.5 (8'×3'×3')	
2008-09	235.84	-	53.04	35.00	147(8'×3'×3')	
2009-10	232.68	02	51.58	79.50	314 (8'×3'×3')	
2010-11	441.63	12	61.71	12.56	96.50 (12'×3'×3') 83(6'×3'×3') 25(3'×3'×3') 65(8'×3'×3')	
2011-12	142.00	06	25.88	0.40	42.5(12'×3'×3') 1.0(6'×3'×3')	
2012-13	178.87	04	38.65	5.00	152(12'×3'×3')	
2013-14	149.43	116	18.33	-	06(12'×3'×3')	
2014-15	86.85	23	6.59	8.50	-	
2015-16	338.19	-	15.39	21.00	01 (9'×3'×3') 126 (12'×3'×3')	
2016-17	108.82	-	8.81	-	128(12'×3'×3')	
2017-18	85.89	21	8.53	10.2	58(12'×3'×3')	
2018-19	85.62	08	3.24	9.00	249.5 (12'×3'×3')	
2019-20	56.12	22	3.15	1.00	-	
2020-21	22.69	-	1.30	-	4 (12'×3'×3')	As on 28th February, 2021

Table No. 7.4

Area allotted to the Selection Working Circle is given below

Forest Block wise area allotted to Selection Working Circle

Sl. No. of the Forest Block	Name of the Range	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
1	Karanjia	Padheidhara	-	456.11		456.11
2	Karanjia	Tikasil	-	92.80		92.80
3	Karanjia	Chaturisahi	-	113.20		113.20
4	Karanjia	Singda-3	-	104.76		104.76
5	Karanjia	Kalakada	-	99.99		99.99
6	Karanjia	Kenjhra	-	117.60		117.60
7	Karanjia	Hatisalbeda	-	477.60		477.60
8	Karanjia	Balibhol	-	8.64		8.64
9	Karanjia	Miludihi	-	42.07		42.07
10	Karanjia	Kuliposi	-	24.00		24.00
11	Karanjia	Paudia	-	612.40		612.40
12	Karanjia	Sanbadposi	-	201.20		201.20
13	Karanjia	Srabhadi	-	52.10		52.10
14	Karanjia	Diajodi	-	56.40		56.40
15	Karanjia	Chandiahil	-	26.40		26.40
16	Karanjia	Jhardghosda	-	36.40		36.40
17	Karanjia	Khaprasahi	-	33.60		33.60
18	Karanjia	Ghosda	-	140.00		140.00
19	Karanjia	Badbil	-	107.20		107.20
20	Karanjia	Badsarei	-	44.80		44.80
21	Karanjia	Saranggarh	-	113.20		113.20
22	Karanjia	Chauthia	-	44.80		44.80
23	Karanjia	Ankura	-	75.70		75.70
24	Karanjia	Sandeuli	-	120.40		120.40
25	Karanjia	Bhanra	-	119.60		119.60

Sl. No. of the Forest Block	Name of the Range	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
26	Karanjia	Kasia	-	97.20		97.20
27	Karanjia	Champarei – I	-	22.26		22.26
28	Karanjia	Champarei – II	-	3.01		3.01
29	Karanjia	Sarubil	-	61.00		61.00
30	Karanjia	Kujiam	-	155.60		155.60
31	Karanjia	Pokharia - I	-	145.60		145.60
32	Karanjia	Pokharia - II	-	73.60		73.60
		Total:- Karanjia Range				**3879.24**
33	Thakurmunda	Mituani-1	-	106.80		106.80
34	Thakurmunda	Mituani-2	-	184.40		184.40
35	Thakurmunda	Mituani-3	-	98.08		98.08
36	Thakurmunda	Mandaljhari	-	32.98		32.98
37	Thakurmunda	Chirupada	-	23.49		23.49
38	Thakurmunda	Badbaliposi	-	27.57		27.57
39	Thakurmunda	Khudisila	-	83.60		83.60
40	Thakurmunda	Ghodabindha	-	168.40		168.40
41	Thakurmunda	Akhapalan	-	57.52		57.52
42	Thakurmunda	Sunida	-	23.93		23.93
43	Thakurmunda	Chainbainsi	-	70.96		70.96
44	Thakurmunda	Hatigoda	-	108.80		108.80
45	Thakurmunda	Bhadubeda	-	111.20		111.20
46	Thakurmunda	Jamnalia	-	20.17		20.17
47	Thakurmunda	Basantpur	-	38.62		38.62
48	Thakurmunda	Gahandia	-	14.15		14.15
49	Thakurmunda	Digdhar	-	45.10		45.10
50	Thakurmunda	Chamakpur	-	182.72		182.72
51	Thakurmunda	Kaliaposi	-	78.25		78.25

Sl. No. of the Forest Block	Name of the Range	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
52	Thakurmunda	Andharikhaman	-	48.48		48.48
53	Thakurmunda	Rugudibeda	-	58.58		58.58
54	Thakurmunda	Banamunda	-	176.40		176.40
55	Thakurmunda	Thakurmunda	-	250.27		250.27
56	Thakurmunda	Badbil	-	943.20		943.20
57	Thakurmunda	Handiphuta	-	305.89		305.89
58	Thakurmunda	Khejuri	-	641.60		641.60
59	Thakurmunda	Kathuanuagaon	-	68.00		68.00
60	Thakurmunda	Talpada	-	145.60		145.60
61	Thakurmunda	Baunsdiha	-	167.20		167.20
62	Thakurmunda	Chakulia	-	10.02		10.02
63	Thakurmunda	Khejuria	-	5.28		5.28
64	Thakurmunda	Purunapani-2	-	54.98		54.98
65	Thakurmunda	Mulapal	-	90.00		90.00
66	Thakurmunda	Nischintpur	-	7.47		7.47
67	Thakurmunda	Dakeipal	-	120.40		120.40
68	Thakurmunda	Taramara	-	649.60		649.60
69	Thakurmunda	Jarak	-	48.00		48.00
70	Thakurmunda	Dangadiha	-	44.52		44.52
71	Thakurmunda	Vejidiha-1	-	160.00		160.00
72	Thakurmunda	Dangadiha	-	97.20		97.20
73	Thakurmunda	Mankadbeda	-	208.40		208.40
74	Thakurmunda	Patrapada		73.86		73.86
75	Thakurmunda	Bisipur-1	-	421.20		421.20
76	Thakurmunda	Bisipur-2	-	74.00		74.00
77	Thakurmunda	Dangapani	-	104.80		104.80

Sl. No. of the Forest Block	Name of the Range	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
78	Thakurmunda	Kendumundi-1	-	147.60		147.60
79	Thakurmunda	Kendumundi- 2	-	647.96		647.96
80	Thakurmunda	Rengalbeda-1	-	67.20		67.20
81	Thakurmunda	Rengalbeda-2	-	42.67		42.67
82	Thakurmunda	Kendujiani	-	17.56		17.56
83	Thakurmunda	Patbil	-	154.78		154.78
84	Thakurmunda	Chheratangar	-	799.96		799.96
85	Thakurmunda	Saleibeda	-	125.60		125.60
86	Thakurmunda	Jodibil	-	187.60		187.60
87	Thakurmunda	Asankudar	-	11.86		11.86
88	Thakurmunda	Kadapani	-	145.20		145.20
89	Thakurmunda	Purunapani	-	452.80		452.80
90	Thakurmunda	Gourigoda	-	56.40		56.40
91	Thakurmunda	Kaliajiani-1	-	378.79		378.79
92	Thakurmunda	Majuraposi	-	144.80		144.80
93	Thakurmunda	Padiabeda	-	51.02		51.02
94	Thakurmunda	Tikarpada	-	89.20		89.20
95	Thakurmunda	Kaliajiani-2	-	147.58		147.58
96	Thakurmunda	Sanrugudibeda	-	212.80		212.80
97	Thakurmunda	Boring	-	275.20		275.20
		Total:- Thakurmunda Range				**10608.27**
98	Satakosia	Satkosia C/2	15	10276.00	1 to 9, 12, 13 & 17 to 20	10276.00
99	Satakosia	Bhaliadal-I		10.63		10.63
100	Satakosia	Bhaliadal-II	-	110.79		110.79
101	Satakosia	Bhaliadal-IV	-	17.67		17.67
		Total:- Satakosia Range				**10415.09**

Sl. No. of the Forest Block	Name of the Range	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
102	Dudhiani	Raitalia		44.60		44.60
103	Dudhiani	Kadambeda	-	75.44		75.44
104	Dudhiani	Chanchbani	-	55.66		55.66
105	Dudhiani	Kadadiha	-	89.20		89.20
106	Dudhiani	Panposi	-	23.60		23.60
107	Dudhiani	Malharpada	-	27.20		27.20
108	Dudhiani	Palsagadia–I	-	33.60		33.60
109	Dudhiani	Palsagadia-II	-	16.00		16.00
110	Dudhiani	Dumuria	-	169.80		169.80
111	Dudhiani	Mota	-	281.20		281.20
112	Dudhiani	Badampahar	5	2012.16	**10 & 12 to 15**	2012.16
113	Dudhiani	Kanthikana	-	126.95		126.95
114	Dudhiani	Budhipat	-	1137.77		1137.77
		Total:- Dudhiani Range				**4093.18**
				Division Total:-		**28995.78**

Recorded removal of Timber and Firewood of Karanjia Division during last plan period is given in Table No. 7.5.

Table No. 7.5

Recorded removal of Timber & Firewood (Recorded holding plots) during last plan period-Karanjia Forest Division				
Year	**No of Tenants**	**No. of Tree removed**	**Quantities of Timber removed in Cum**	**Quantities of Firewood removed in stake size 12'×3'×3'**
2008-09	--	-	-	-
2009-10	-	-	-	-
2010-11	-	-	-	-
2011-12	-	-	-	-
2012-13	02	27	16.807	02.50
2013-14	04	108	97.745	67.00
2014-15	03	87	71.348	55.50
2015-16	04	116	76.945	62.00
2016-17	03	113	63.295	19.50
2017-18	01	18	10.342	06.00
2018-19	-	-	-	-
2019-20	-	-	-	-
2020-21	-	-	-	-

7.2 Recorded removal of fuel wood

The recorded removal of the fuel wood in Karanjia Forest Division are submitted in **Table No 7.6**

Table No. 7.6

Fuel wood harvested from regular and Irregular coupes		
Year	**FW in stack (Irregular Coupes)**	**FW in stack (Regular Coupes) (12'×3'×3')**
2007-08	304.5 (8'×3'×3')	15
2008-09	147(8'×3'×3')	-
2009-10	314 (8'×3'×3')	-
2010-11	96.50 (12'×3'×3') 83(6'×3'×3') 25(3'×3'×3') 65(8'×3'×3')	3.5
2011-12	42.5(12'×3'×3') 1.0(6'×3'×3')	12
2012-13	152(12'×3'×3')	22
2013-14	06(12'×3'×3')	05
2014-15	-	36
2015-16	01 (9'×3'×3') 126 (12'×3'×3')	-
2016-17	128(12'×3'×3')	03
2017-18	58(12'×3'×3')	03
2018-19	249.5 (12'×3'×3')	03
2019-20	-	02
2020-21	4 (12'×3'×3')	03

Fuel wood removed from record holding plots in Karanjia Division is given in Table No. 7.7

Table No. 7.7

Fuel wood removed from Recorded holding plots		
Year	**No. of Tree removed**	**Firewood removed in stake size of (12'x3'x3')**
2008-09	-	-
2009-10	-	-
2010-11	-	-
2011-12	-	-
2012-13	27	02.50
2013-14	108	67.00
2014-15	87	55.50
2015-16	116	62.00
2016-17	113	19.50
2017-18	18	06.00
2018-19	-	-
2019-20	-	-

7.3 Recorded Removal of Bamboo / Rattans:

There is no bamboo cane in the forests of Karanjia Division.

7.4 Recorded removal of locally important NTFPs Including MAPs

Most of the available NTFP & MAP are now collected by the registered collectors under Gram Panchayat jurisdiction. Records of removal of NTFP except Sal leaf are not available.

Table No 7.8
Sal Leaf collection in Karanjia Division.

Sl. No.	Year	Sal Leaf Collection	
		Achievement in Qtls	Royalty
1	2015-16	48049	Rs. 3995872/-
2	2016-17	44837	Rs. 3855991-
3	2017-18	52941	Rs. 4552926/-
4	2018-19	39128	Rs. 1763344/-
5	2019-20	28290	No Royalty (As per notification No. 2400/F&E dtd. 04.02.2019 of Govt. of Odisha, the royalty has been waived out completely from 2019.

The importance of tapping of N.T.F.P resource of the forests has gained momentum as the most viable, sustainable and profitable source of income from forestry sector. Since fruit, flower, seed, leafs etc. of a variety of plants i.e. tree, shrubs, climbers, grasses etc. are used as N.T.F.P and these are scattered occurring throughout the Forest Division, the constitution of this separate overlapping working circle can serve the purpose of managing the production, collection and improvement of these crops in a meaningful manner.

This Division has a enormous potential of producing a large quantities of the products of NTFP like Tamarind (*Tamarindusindica*),Hill Broom or PhulJhadu (*Thysanolaena maxima*), Thorn Broom or KantaJhadu (*Aristidasetacea*), Amla-*Phyllanthusemblica*, Bahada-Bellericmyrobalan

(*Terminaliabellirica*), Harida- (*Terminaliachebula),* Char-*Buchananialanzan*), Mahua-*Madhucaindica*, Kusum-*Schleicheraoleosa*, Karanja-*Millettiapinnata*, Sal-*Shorearobusta*, Neem-*Azadirachtaindica*, Dhataki-*Woodfordiafruticosa*, Satabari-*Asparagusrecemosus,* Honey etc. Since the regulation of the production is kept away from the purview of the Forest Department it is very hard to assess the actual production. However, applying indirect methodologies of assessing the production of the aforesaid NTFP through socioeconomic studies of the forest fringe villages it is ascertained that the villagers are getting some livelihood from collecting the products and selling in the local market. They urge to master the art of Value addition of these products better the income.

Table No. 7.9

Species requiring focussed attention for processing, value addition and marketing during the plan period on priority basis locality wise		
Name of the NTFP item	**Locality**	**Name of the Range**
Sal Leaves	Kendumundi, Baliposi, Kendujiani, Champajhar, Thakurmunda, Bisipur	Thakurmunda
	Tangabilla, Dari, Tato	Dudhiani
	Satkosia	Satkosia
	All the sections except Ghagarbeda and Raruan	Karanjia
Tamarind		Almost all the Ranges
Hill Broom	Badampahar, adjoining parts of Similipal	Dudhiani

Harida/Bahada/Amla		Collection is very less in all the Ranges
Mahula Flower/Seed		Almost all the Ranges
Honey	Jashipur, Ektali, Khandiadhar	Dudhiani
Char Seed	Jashipur, Bhanda, Dari	Dudhiani

Value addition and storage in respect of major NTFP items need to be done individually along with marketing strategy with the involvement of local stake holder with storage facility.

VSS shall be induced to take up cultivation of medicinal herbs as an Income Generating Activity (IGA). The Range Officers should assess the feasibility while examining the Micro Plan for Joint Forest Management and recommend species suitable for the locality. This will serve the dual purpose of cultivation and propagation of medicinal plants as well as augmenting to the earning of the people. In Karanjia, there are numbers of Vaidyas i.e. traditional healers who depend on the forests for their precursors. So, it is prescribed to explore this bearing while making the Micro Plan of the VSS. These traditional healers need right training on sustainable harvesting of medicinal plants.

After transfer of control over collection and trade NTFP from Forest Department to Gram Panchayats an indifferent situation is developed for its control and management. There is virtually no control over the Traders to purchase the commodities at minimum purchase price from the gatherers.

Earlier the agencies entrusted for procurement was forced to collect the available quantity at the fixed price.

At present the Traders are free to purchase according to their suitability and profitability. It is almost a buyer's market.

7.5 Demand and supply of timber and important Non-Timber Forest Produce

No systematic survey has been taken up to assess the demand of timber & firewood in the division. Due to urbanization, UjjalaYojana of Govt. of India, about 40% house hold is using alternate source of energy for cooking purpose. The balance house hold are depending on Fuel wood. The minimum use of Firewood per house hold per month is 1.00 quintal or say around 1.25 lakh Tons of fuel wood is required annually.

In case of Timber, after use on Plywood, Molded furniture dependency on timber has been greatly reduced. Considering 10% of Family constructing new houses for residential / commercial purpose at least 17430 houses is being constructed every year. Considering minimum use of 5 cum of timber for house construction a minimum use of 87150 cum timber is required. Supply from Forest is zero against demand of 57150 Cum of Timber and 1.25 Lakh Tons of Fires wood.

The requirement is partly fulfilled through sale of timber and fire wood by OFDC Ltd. There is acute shortage of timber / fire wood in the division.

7.5.1 Timber / Firewood depot:

The timber requirement of the households in Karanjia Division is somewhat attained from the timber depot at Badampahar of Rairangpur Division managed by OFDC Ltd. There is one firewood depot at Karanjia Division managed by OFDC Ltd.

7.5.2 Important MAPs collected

During the socioeconomic studies of the survey made in the 43 forest fringe villages of this division, it is revealed that using the traditional ethnobotanical knowledge the people of this division use a number of plants and plant products for healing different physiological ailments.

The checklist of such Medicinal and Aromatic Plants are given below.

Table No. 7.10

MAP (Medicinal and Aromatic plants) and their usage of Karanjia Division

Sl. No.	Local Name	Scientific Name	Family	Target Disease
1	Pedipedika	*Abutilionindicum*	Malvaceae	Jaundice, Piles
2	Dholanki	*Alangiumsalvifolium*	Alangiaceae	Rheumatism
3	Madranga	*Altemantherasessilis*	Amaranthaceae	Jaundice
4	Bhuin nimbi	*Andrographispaniculata*	Acanthaceae	Malaria
5	Kadamba	*Anthocephaluschinensis*	Rubiaceae	Chronic ulcer
6	Sahajmari	*Ardisiasolanacea*	Myrsiniaceae	Back pain
7	Pannoari	*Aristolochiaindica*	Aristolochiaceae	Stomatitis, piles bleeding
8	Nimba	*Azadirachtaindica*	Meliaceae	Viral fever
9	Daskerenta	*Barleriaprionitis*	Acanthaceae	Stomach cancer

Sl. No.	Local Name	Scientific Name	Family	Target Disease
10	Kontaikoli	*Ziziphusoneoplia*	Rhamnaceae	UTI (Urinary Tract Infection) & STD (Sexually Transmitting Disease)
11	Salapa	*Caryotaurens*	Areaceae	Spermatorrhoea
12	Gopakanu	*Caryplolepisbuchananii*	Periplocaceae	Ottis
13	Nirmuli	*Casythafiliformis*	Lauraceae	Ascites.
14	Sadabihari	*Catharanthusroseus*	Apocyanaceae	Diabetes
15	Hadasinkuda	*Cissusqudrangularis*	Vitaceae	Asthma
16	Madanga	*Dendropthoe falcate*	Loranthaceae	Leucorrhea
17	Luduru	*Desmodiumtrifolium*	Fabaceae	Bone fracture
18	Chitachori	*Diplocyclospalmatus*	Cucurbitaceae	Snake bite
19	Dimiri	*Ficushispida*	Moraceae	Diarrhoea in infants
20	Kurdu	*Gardenia turgid*	Rubiaceae	Enhancing memory power
21	Chauldhua	*Glycosmispentaphylla*	Rutaceae	Severe diarrhoea, Leucorrhoea, Rheumatoidsarthritis , Migrane
22	Raktapiculi	*Gounanialeptostachya*	Rhamnaceae	Body pain due to internal injuries
23	Homolapata	*Grewiarothii*	Tiliaceae	Oedema
24	Madhavilata	*Hiptagebenghalensis*	*Malpighiaceae*	Tuberculosis
25	Kurei	*Holarrhenapubescens*	Apocynaceae	Tuberculosis
26	Dudhilata	*Ichnocarpusfrutescens*	Apocynaceae	Conjuctivitis
27	Jagal	*Ludwigiaadscendens*	Onagraceae	Eczema
28	Guadhuni	*Millettiaextensa*	Fabaceae	Wounds
29	Sajana	*Moringaoleifera*	Moringaceae	Rheumatism
30	Bhadabhadalia	*Olaxscandens*	Olaceae	Bone – fracture
31	BhuinKakharu	*Pueraria tuberose*	Papilionaceae	Tuberculosis
32	Badionla	*Phyllanthusamarus*	Euphorbiaceae	Malaria
33	Badionla	*Phyllanthusfratemus*	Euphorbiaceae	Paralysis
34	Jhar	*Phyllanthuslawii*	Euphorbiaceae	Lung cancer

Sl. No.	Local Name	Scientific Name	Family	Target Disease
35	Jandaki	*Phyllanthus reticulates*	Euphorbiaceae	Filarial swellings
36	Ghantiana	*Pygmaeopremnaherbaceae*	Verbenaceae	Rheumatism
37	Muturi	*Smilax zeylanica*	Smilacaceae	Diarrhoea
38	Bhejibaigan	*Solanumvirginiaum*	Solanacee	Asthma & cold
39	Rohini	*Soymidafebrifuga*	Meliaceae	Asthama
40	Sahada	*Streblusasper*	Moraceae	Conjunctivitis
41	Mahasindu	*Symphoremapolyandrum*	Verbenaceae	Rheumatism
42	Arjuna	*Terminaliaarjuna*	Combretaceae	Blood in Urine
43	Bichuati	*Tragia involucrate*	Euphorbiaceae	Tuberculosis
44	Bona piaja	*Urgineaindica*	Liliaceae	Rheumatism
45	Pokasungha	*Vemoniacinerea (L)*	Asteraceae	Filariasis
46	Kantamali	*Ventilago denticulate*	Rhamnaceae	Mumps
47	Begunia	*Vitexnegundo*	Verbenaceae	Asthma
48	Muria	*Vitexpinnata*	Verbenaceae	Nephritis
49	Parsukedar	*Zingiberzerumbet*	Zingiberaceae	Snake bite
50	Sunthi (Adda)	*Zingiberofficinale*	Zingiberaceae	Pre-natal diseases and labour pain
51	Kantaikoli	*Ziziphusoenoplia*	Rhamnaceae	Headache

Table No. 7.11

USE OF MEDICINAL PLANTS FOR VARIOUS AILMENTS		
Sl. No	**Common Disease**	**No of MAP Species Used**
1	Common cold & cough	8
2	Stomach disorder	10
3	Tooth ache	5
4	Ear problem	3
5	Eye problem	5
6	Boils, Burns & Blisters	2
7	Piles	5
8	Gynec Problem	4
9	Veterinary medicine	9
10	Ascarises	5
	Total:-	**56**

The data indicated that for 10 different ailments, around 56 species can be used as medicinal plants. Some of the common ailments like stomach disorder, common cold etc. are treated with a number species which are present in local forest.

7.6 Imports and export of wood and wood products

There is no record of import or export of timber from Karanjia Division.

7.7 Import and export of NTFPs

Non-timber forest products available inside forest area can be classified under various heads. (a) Fibre and flosses; (b) grass, bamboo and canes;

(c) edible MFPs; (d) essential oil including those from grasses; (e) medicinal plants; (f) tans and dyes; (g) gums and resins; (h) leaves, fruits and seeds. Some of these are very useful to the local population for meeting their subsistence consumption need while other is of commercial importance. The ethno botanical resources not only provide the three basic needs of life, i.e. food, shelter and clothing but also strengthen the economic status of the forest dwellers. These resources provide incentives to rural poor for maintaining the sustainability of forest ecosystem and help to preserve biological diversity and traditional knowledge. The important NTFP's are sal leaf, tasar, myrobolans, honey, wax, resin, mahua flowers, mahula seeds, kusum seeds, sal seeds, sunari bark, siali fibre, lac, tamarind and different types of other fruits and seeds. It is noted that except a few, most of the NTFPs are restricted to a particular season and they are not common to all seasons. Normally, the tribal women along with their children collect the NTFPs in different pockets of Mayurbhanj district.Trading of the MFP items is generally done at Gurguria (near Jashipur), Jashipur, Kendumundi, Thakurmunda, Sarat, Karanjia and Udala weekly market. Apart from local consumption, NTFPs are exported to different parts of India. There are a large number of medicinal fruits, seeds, roots and barks that are collected and exported. The quantity of non-timber forest products collected by the tribals depends upon several factors. The economic status remains one of the important criteria. The very poor and poor tribal with small land holdings collect maximum quantity of NTFPs i.e. 28% and 22% respectively and

sell a large quantity of the product in the market. The medium collects only 9% and higher income group (2%) rarely depend upon NTFPs. Most of the non-timber forest products are transported away from the area due to lack of processing facilities locally, resulting in loss of value that could have been added to them by village and cottage industries.

Table No. 7.12

Table: 7.12 NTFP items collected and send to outside the State.

Sl. No.	Local name	Botanical name	Family	Parts usually collected.
1	Aonla	*Phyllanthusemblica*	Euphorbiaceae	Fruits
2	Bahada	*Terminaliabellirica*	Combretaceae	Fruits
3	Bhuinneem	*Andrographispaniculate*	Acanthaceae	Whole plant
4	Char	*Buchananialanzan*	Anacardiaceae	Seeds
5	Datepalm	*Pheonixdactylifera*	Palmae	Leaves
6	Dhatki	*Woodfordiafructicosa*	Lythraceae	Flower
7	Harida	*Terminalia chebula*	Combretaceae	Fruits
8	Kochila	*Strychnosnuxvomica*	Loganiaceae	Fruits
9	Mahula	*Madhucalongifolia*	Sapotaceae	Flowers
10	Sal	*Shorea robusta*	Dipterocarpacae	Leaf
11	Siali	*Bauhinia vahlii*	Caesalpiniaceae	Leaf / fiber
12	Tentuli	*Tamarindusindica*	Caesalpiniaceae	Fruits

These NTFP items are mostly collected in Dudhiani, Satkosia and Thakurmunda Range in forest blocks near to Similipal Hill Range.

It has also a good local market. The rate is usually fixed by Price fixation Committee in each block. The market price is mainly controlled by demand & supply.

The market rate of some NTFP is furnished in **Table 7.13**

Table 7.13 Value of NTFP

Sl. No.	Name of product	Unit	Sale Price in Rs.	Source of information.
1	Mahula	Per Kg	50/-	Weekly Market
2	Kochila	Per Kg	19/-	
3	Char	Per Kg	120/-	
4	Kusuma	Per Kg	15/-	
6	Kendu	Per Kg	12/-	
7	Anantamula	Per Kg	90/-	
8	Phanphana	Per Kg	300/-	
9	Dombhurulu	Per Kg	15/-	
10	Piasal	Per Kg	18/-	
11	Sal Leaf	Per Kg	30/-	
12	Patalgaruda	Per Kg	40/-	
13	Ramdantuni	Per Kg	80/-	
14	Tentuli	Per Kg	30/-	
15	Gaichira	Per Kg	800/-	
16	Ratna	Per Kg	15/-	
17	Anla	Per Kg	90/-	
18	Harida	Per Kg	8/-	
19	Bahada	Per Kg	12/-	
20	Resin	Per kg	100/-	
21	Honey	Per ltr.	280/-	

Most of NTFP items are marketed within the State and outside the State. There is no record of export / import of NTFP in this division.

7.8 Removal of fodder

Grazing in forests is a common sight. Rearing of Goat is extensively adopted in villages. They usually feed on forests. The ground floor of forest is highly disturbed and there is lack of grasses for herbivorous in forest. There is also lopping of trees for feeding to goats. It has a very adverse effect on plant growth. Physically there is no removal of fodders for cattle / domestic animals by removal by way of grazing are rampant.

7.9 Valuation of the products

As per the NTFP Policy 2000, most of the NTFP items are being regulated by Gram Panchayat. There are no records on collection of NTFP in various Panchayat / Blocks. It is not practically possible to quantify the products being collected and its valuation effect on family income of this Division.

CHAPTER – 8

MAINTENANCE AND ENHANCEMENT OF SOCIAL, ECONOMIC, CULTURAL AND SPIRITUAL BENEFITS.

8.1 Number of JFM committees and area (s) Protected by them

In connection with the participatory forest management this Division has formed 272 numbers of VanaSurakshyaSamitis (VSS) along the fringe forest villages earmarking 20686.50 ha of forest area for their joint protection and management. The detailed list of VSS Range wise with assigned area is furnished in **Annexure-XX**. The abstract of Range wise number of VSS and the area assigned are in **Table No. 8.1**

Table No. 8.1

No. of VSS and their area

Name of the Range	No. of VSS	Type of Forest Land					Revenue forest land (Outside Plan Area)
		RF	PRF	DPF	VF	Total plan area under JFM (O) C	
Satkosia	24	3750.00	0	0	0	3750	0
Thakurmunda	74	5425.92	105	98.37	10.52	5639.81	0
Dudhiani	81	3693.8	1024.6	100	210.91	5029.31	30.21
Karanjia	93	6258.6	200	0	179.78	6638.38	0
Total: -	**272**	**19128.32**	**1329.6**	**198.37**	**401.21**	**21057.5**	**30.21**

Govt. of Odisha issued a resolution vide No. 10F (Pron.)47/88/17240/FFAH dt. 01.08.1988 assigning a specific role to villagers in protection of peripheral reserved forests adjoining to their villages with simultaneous permission to meet their bonafide requirement of firewood and small timber from such forest areas. This resolution was

amended vide Resolution No. 10F (Pron.) 47/88/23638/FFAH dt. 13.10.1988 prescribing the procedure for constitution of a village level forest protection committee.

The Government of India basing on provisions contained in National Forest Policy' 1988 emphasising active participation of people in protection, conservation and management of forests, have issued direction to all State Governments for implementation. Though Odisha has taken steps in this matter much earlier i.e. during 1988, still issued another resolution vide No. 10F (Pron.) 4/90/29825/FFAH dt. 11.12.1990 containing an elaborate guideline in this direction superseding the earlier two resolutions state above.

In fact, the process of involving people in protection, conservation and management of forests got an impetus during 1990 with issuance of a detailed guideline on constitution of VanaSurakshyaSamitis and their Executive Committees, duties & responsibilities of VSSs and Executive Committees, preparation of Micro Plan, usufruct benefits of VSS and provision of MOU etc. vide Resolution No. 10F (Pron.) 20/93-16700/F&E dated 03.07.1993 With a view to consolidate all developments in joint forest management and address legal matters those came up in the management process, JFM Resolution 2011 was formulated (**Annexure-XXI**). Subsequently amendment has been made to provisions of JFM Resolution 2011 vide Notification No 9182/ F&E dated 1st June 2015 and 2019 (copy at **Annexure-XXIa and XXIb**).

8.2 Status of empowerment of JFMCs

The empowerment of JFMC is at a medium to higher level. The Villagers are taking interest in Protection & Management of Forest assigned to them. Under National Afforestation Program, the involvement of VSS is of Participation level-V i.e.

i) They resolve what operation to be taken up along with work programme.

ii) They prepare the Micro plan and work accordingly.

iii) Funds directly are transferred from MoEF&CC to FDA at Division Level. There after it is transferred to VSS account.In another project called OFSDP funded by JICA, funds are received from Project Management Unit(PMU) of OFSDP to Divisional ManagementUnit (DMU). There are after it is transferred to VSS.

iv) They withdraw and furnish account directly to the Secretary of FDA/DMU chief i.e. Divisional Forest Officer.

v) The account is audited by Chartered Accountant & passed by the General Body of the VSS.

vi) Training camps are being organized to disseminate knowledge to VSS on forest management and allow them to become technically sound to manage plantations / Forest/ wildlife etc.

The VSS functions as an independent decision taking body.

In case of VFC, the functioning requires augmentation to come over to a participation level of IV / V.

8.2.1 Odisha Forestry sector Development Project Phase-II

Odisha Forestry Sector Development Project Phase-II is an externally aided project with the financial assistance of Japan International Cooperation Agency (JICA) being implemented since 2017. OFSDP-II will cover 1200 Vana Surakshya Samitis (VSSs) from 50 Field Management Units (Forest Ranges) from 12 Territorial Divisions in 10 Districts of Odisha and 2 Wildlife Divisions in phases (300 VSSs in first Batch, 400 VSSs in second Batch, 350 VSSs in third Batch and 150 VSSs in fourth Batch). This project will be implemented for 10 years starting from 2017-18 to 2026-27. Odisha Forestry Sector Development Project-II is to enhance forest ecosystem along with sustainable livelihood of local people by improving sustainable forest management, sustainable biodiversity conservation and community development, thereby contributing to harmonization between environmental conservation and socio-economic development in the Project area in Odisha.

Karanjia Divisional Management Unit will cover 80 Vana Surakshya Samities (VSS) from 3 Field Management Unit (FMU) (Forest Ranges) such as Dudhiani, Karanjia and Thakurmunda. All 80 VSS are categorised in four batches i,e. Batch-I covering 20 VSSs (Dudhiani FMU), Batch-II covering 20 VSSs (Dudhiani FMU), Batch-III covering 20 VSSs (Karanjia

FMU) and Batch-IV covering 20 VSSs (Thakurmunda FMU-18 and Dudhiani FMU-2) taken up under OFSDP-II.

Project Goal

The envisaged approach to achieve the overall goal in a sustained manner under the project includes restoration of degraded forests and augmentation of forest resources through people's participation; securing sustainable forest management by improving community participation; capacity building of community organizations and other stakeholders; conservation and scientific management of the biodiversity; promote Alternative Income Generation Activities, promotion to inter-sectoral convergence for better livelihood and improvement of income of the targeted forest dependent communities. The households living in the project villages are largely from Schedule Tribe and Schedule caste Category and highly dependent on forest for their livelihood. Under the above circumstances, project has a mandate to enhance and strengthen livelihood of forest fringe communities, who are largely dependent upon forest.

Project Approach:

a) Micro Plan

To be developed as a Community Development Plan by Strengthening convergence, Selection of village, formation of VSS, formation of Women Working Group, formation Executive Committee (EC), Formation of Working Group.

b) IGA Support to Self Help Groups (SHGs)

Enhanced Support for cluster business development and partnership ecosystem

c) Cluster development:

The cluster development approach of LRC aims to support the trajectory growth of the SHGs. It will not only achieve the scale, but will help in leveraging support services and make the value addition efforts sustainable.

d) Economies of scale:

This approach is expected to achieve the required volume through aggregation, which will not only make the primary producer a player in the value chain, but also give an edge to add value and negotiate at a higher and remunerative market.

e) Pro-poor Value Chain Maximization:

This approach will strive maximize value chain of products across sectors, keeping SHGs and its members in the centre so that the primary producer gain from the value chain maximization.

8.2.2 Gender Mainstreaming Creating Models for CMRV:

Community Based Measurement, Reporting, Verification system for Sustainable Forest Management for Odisha.

Project Objective:

- Restore degraded forest and augment forest resources.
- Secure sustainable forest management by improving forest administration, community organizations and other stakeholders.
- Conservation and scientific management of the biodiversity.

- Promoting inter-sectoral convergence.
- Improve income of target forest dependents and their livelihood options.
- To promote vibrant product clusters.
- To promote pro-poor value chain maximization.
- To facilitate Collective marketing and processing.
- To build the capacity of the stakeholders.
- To manage funds mandated under OFSDP-II and provide Business Development Services including R&D.

Project Strategy:

The duration of the Project is 10 years, starting from 2017-18 to 2026-27 in consideration of capabilities of stakeholders and time required to conduct activities in sustainable manners. 10 years comprises of (i) Preparation Period, (ii) Implementation Period, and (iii) Phase-out Period.

Sustainable Forest Management:

Sustainable forest management in JFM mode includes Assisted Natural Regeneration (ANR), Block Plantation, Soil and Moisture Conservation measures and Fire Protection measures. Under non JFM mode, the works proposed are consolidation and demarcation of forest boundaries, construction of High-Tech Nurseries and ex- situ SMC works. In order to improve the tree cover outside the forest area, Farm-forestry activities will be taken up over 10000 Ha of land and 10000 beneficiaries selected through the VSS within their village area.

8.3 Labour welfare:

For up liftmen of labourers, occasional health camps, Skill up-gradation training camps are being conducted by the department. Now LPG connection, Gas Stove, LED bulb and water filter are being distributed in various villages of the division.

8.4. Use of Indigenous Knowledge:

The people in Odisha were more traditional in nature believing the faith and practices of the local communities. They happened to manage their livelihood through agriculture and maintained an indigenous life with their own knowledge system. They used to maintain the long-standing traditions from their ancestors and spread the knowledge in different spheres of livelihood. Such socially generated knowledge is popularly called as local knowledge. The on-going practice of using such knowledge for indigenous communities established the belief that such knowledge used in traditional manner was fruitful for the people.

In course of time such personalized knowledge took the shape of Indigenous Knowledge (IK) which was confined to a particular community and locality. Specific knowledge seekers find the effective use of such traditional knowledge for indigenous people and are interested to preserve the knowledge for the communities. It is an established fact that India has long and strong racial, cultural and ethnic groups that generate a traditional knowledge system for its people.

The ethnic minorities, rural and tribal populations, women and other disadvantaged communities in India who are deprived of economic, political and social benefits are more dependable upon such knowledge system for their livelihood.

With the modernization of the present society, the needs of those disadvantaged populations were brought to the limelight and their knowledge system was given the importance. Similar phenomenon is gaining ground in other countries of the world where the local knowledge of the communities are treated as the real knowledge for survival. The concept of indigenous knowledge gained its worldwide recognition through the United Nations Conference on Environment and Education in 1992, World Conservation Strategy of International Union and Conservations of Natural Resources in 1980, Brundtland Commission, and World Commission on Environment and Development, 1987. These events recognized the existence of indigenous knowledge in every country, society, culture. Since India has a long history and much enriched culture there is abundant reservoir of indigenous knowledge in every part of the country. Similarly, Odisha is a historical land having enriched cultural heritage which has varied communities and immense resources. Its flora and fauna are vast and varied in nature. The State has a large number of tribal communities who appear to live on their own knowledge system.

8.4.1 Concept and Definitions of Indigenous Knowledge:

The term indigenous knowledge has different connotations such as, traditional knowledge, local knowledge, community knowledge, rural people's knowledge, farmer's knowledge. Although the concept has different forms the meaning appears to be synonymous. Indigenous knowledge is the traditional knowledge of the local community existing within and developed around the specific conditions of women and men indigenous to a particular geographical area. The concept and expansion of its scope in that the term indigenous knowledge is not confined to tribal groups or the original inhabitants of an area. It is not confined to the rural people rather any community possessing indigenous knowledge- rural or urban, settled or nomadic, original inhabitants and migrants. Indigenous knowledge is referred to not only to the knowledge of indigenous people but also the intellectual property of other communities. There are many facets involved in the indigenous knowledge such as, information of the communities, beliefs on religious faiths, tools of using in agriculture, materials in house construction work, experimentation in farming and healthcare, natural resources in flora and fauna, human resources and expertise in skilled artisans, education and learning and communication of information.

Indigenous knowledge is found in people's memories and activities and is expressed in the form of stories, songs, folklores, proverbs, dance myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment's, materials, plantspecies, and

animal breeds. Significance of Indigenous Knowledge Indigenous knowledge is primarily inherited from the ancestors through generations of the community. Such knowledge stands as the main source of utilization and management of resources. It is not only a self-centred knowledge but also accumulated knowledge, the collection of phenomena and experiences which the older people have. Such knowledge is confined to few people who influenced others in a restricted manner. In a particular tribal society Jani is the master of all religious ideas and practices. Other people are imparted to know the religious ideas and practices by Jani which is ultimately used for individual welfare of the common people. The knowledge with personal perseverance of Jani is self-centred. On the other hand, that common knowledge is about the general livelihood pattern of that community which is more or less to all in the society. Those are very practical knowledge which is primarily earned his livelihood. The making of household artefacts, knowledge about cultivation, health care etc. are major arena of the indigenous knowledge development. Indigenous Knowledge is primarily referred to the long-standing traditions, belief and practices of certain regional, local and indigenous communities.

The people in older times were more spiritual, religious, God- fearing and believing in virtuous livelihood. They believed that their living will be happy and prosperous if they work in a systematic manner with certain beliefs and practices. Such beliefs of a locality bear fruits for their existence. Indigenous Traditional Knowledge is developed and adopted continuously to a changing environment and passed on from generation to

generation. The livelihood of rural population mainly depends on certain experience-based knowledge which is essential for their survival. Such knowledge system has embraced many areas of the people activities such as health, education, agriculture, animal husbandry, handicrafts, religion, culture and tradition of a local community. The people in those days used to practice such knowledge for sustainable development. The knowledge is basically used to cure diseases of human as well as animal and to develop nutrition, to bring out better agricultural systems in farming, to improve the arts and craft, and to maintain the religious practices and astrological beliefs. Indigenous knowledge is embedded in community practices, institutions, relationships and rituals. It provides the basis for problem solving strategies for the communities.

8.4.2 Sources of Indigenous Traditional Knowledge:

The sources of the traditional knowledge mainly derived from the human experiences, beliefs and practices which are collected from several sources. There is also semi-recorded information such as manuscripts, photographs, and folk literature and grey literature. Ancient people had developed the Vedas, Puranas, religious books, grey literature, ethno-botanical texts and archaeological deposits were the sources of knowledge for those people. Those sources give detail account of the life of the ancient people and the method of living in a prosperous way. Again, those sources also give information about bio techniques, medicinal knowledge, breeding techniques, agricultural farming systems, healthcare techniques, religious

and astrological guidelines and cultural artifacts. Some of the indigenous traditional knowledge are available in written form in primary, secondary and tertiary sources of information. But most of the indigenous traditional knowledge are undocumented and are available orally or in memory of the group of the community of a region or area. Indigenous Traditional Knowledge in this region is widely scatted and fragile and there is a need to integrate those distributed sources of information in concrete form. Although religious books which give a lot of information about indigenous traditional knowledge are least used in present time. There is greater need to accumulate and acquire to collect information and make documentation of such knowledge. While tribal communities frequently use such knowledge, which is essential to trace the sources of information of indigenous traditional knowledge among tribal communities.

8.4.3 Documenting the Indigenous Knowledge:

The origin of indigenous knowledge can be traced back to the ancient period. People used such knowledge from generation to generation for their livelihood in an unaccounted manner. There are no such written documents for recording and dissemination of such knowledge. Such knowledge system is essential for development. It must be gathered and documented for a particular community. Collection and storage of indigenous knowledge should be supplemented with adequate dissemination and exchange among interested parties.

A systematic approach requires to be taken up to document such knowledge in Karanjia area / area adjacent to Similipal hill range.

8.5 Extent of cultural / sacred groves Cultural and Ecological Importance of Sacred Groves of Tribals:

Jahira (Sacred groves) are the place of worship of Adivasis, where they offer their prayer for nature. One can find the existence of natural forests in the Jahiras where cutting of tree and branches including collection is prohibited. The Jahira are managed by their religious leader called as Dehuri and Majhi Hadam to whom all the Adivasi recognizes and pays respect as their leader and what he speaks and instructs is accepted by all. For taking assistance of the Adivasis for conservation of Jahira culture and spreading of its impacts to the nearby natural forest, Govt. has taken steps for protection and conservation of the traditional place of worship of Adivasii.eJahira culture through various scheme of forest department under CAMPA and other sources by which the Jahiras have been well protected and conserved and for involvement of Adivasis in forest protection, management by way of persuasion, motivation, awareness and Jahira development, the adjoining degraded natural Sal forests are also being well protected by the Adivasis.

The sacred groves are well managed by a set of unwritten vocal laws with which all the villagers are familiar. Hunting of birds and animals are prohibited.

While medicinal plants and fruits can be collected in a non-destructive manner, felling of trees is a taboo. Even dead wood is allowed only to rot. However, this practice is changing slowly. There are no punishments for the offender and it is left to be punished by God himself. Though the sacred grove by itself may not cover an impressible land area, in many cases, they facilitate the protection of their background vegetation.

8.6 Ecotourism areas and activities

After reorganization of division during 2019, there is only one designated Eco tourism area i.e. Bhimkund within the division as Gurguria and Kumari eco-tourism complexes have been included in Similipal North Division. The complex is managed by Boring VSS members. Tourist generally visit the Bhimkund ecotourism complex round the year for picnic purpose.

8.7 Social Customs (As relates to Forests):

Mayurbhanj is home to a number of tribal communities. Each community has distinct features. Each community has common ancestry, language and culture. The members of a community are related to one another through family, marriage and kinship. The communities are organized in certain characteristically organized social groups. The life-style, beliefs and values of the communities differ. Some of these tribes of the district like Santals and Saoras have developed their own scripts.

Each community has its unique settlement pattern and house type, which varies from scattered settlements to arranged patterns. The food and drinking habits of the tribal communities are almost alike, but the methods

of preparation of food vary. Many social customs relevant to forest are prevalent in Mayurbhanj district in Panchapir sub division of Karanjia division. The major ones include Phulbhaguni Puja during Flowering season of forest trees shrubs and herbs etc. MagheParab during February and March, Sargi Puja during March to worship Sal tree and flower and the traditional Akhandasikar festival where people en masse from forest fringe villages enter to the nearby forest including Similipal tiger reserve for the purpose of hunting wild animal and bring their blood for use in the agricultural crop field for better yield.

8.8 Status of compliance of Forest Right Act (FRA)

Many forest lands including Reserve Forest(RF), Proposed Reserve Forest(PRF), Protected Forest (PF), Demarcated Protected Forest (DPF), Un Demarcated Protected Forest (UDPF), Village Forest (VF), Revenue Forest Land have been encroached by Adivasis for their cultivation and habitation purposes since long in Pachphir sub division of Mayurbhanj district since long. After enactment of the scheduled tribes and other traditional forest dwellers (Recognition of Forest Rights) ACT, 2006 effort has been taken to settle their case taking the base year and date as 13.12.2005 and 9363 number of individual forest right (IFR) claims, 454 number of community Forest Right Act (CFR) and 454 number of community rights (CR) have been settled in Karanjia Division.

Table No. 8.2

List of IFR and CFR relating to Karanjia Forest Division.

Name of the Sub-Division	No. of claims approved earlier			No. of claims to be considered and approved			Progressive if claims approved by DLC			Area in ac approved	No. of title distributed so far	Area in ac.
	IFR	CFR	CR	IFR	CFR	CR	IFR	CFR	CR			
Karanjia	9363	454	454	200	0	0	95630	454	454	0	9036	8221.79

8.9 Other Rights and Concessions

Besides various rights & concessions given under Joint Forest Management Resolution, Forest Rights Act, 2006 and Reserved Forest Notifications, there is no other rights & concessions allowed in favour of people of this division.

8.10 Dependency of local people on NTFPs

The important NTFP collected from forests of Karanjia division are Sal leaf, Sal seed, Myrobalans (Harida, Bahada and Amla), Honey, Mahula, Char, Kendu etc. The collection is decreasing year after year as it is not remunerative due to poor abundance. On an average NTFP contributes up to 24% of tribal people's income in this region.

8.11 Other aspects

Banjara communities coming from outside the state have been seen camping at Karanjia, Tangabila, Jashipur, Tato with their traditional Ayurvedic products made of roots, fruits and oil etc. for their livelihood throughout the year moving from one location to another.

The labour communities around the foot hill of Similipal many times migrate into adjoining Bhadrak district areas and city like Panikoili, Cuttack and Bhubaneswar etc. in search of work, where they are engaged in agricultural field, industrial estates and building construction works with higher remuneration. Generally, after sowing of paddy in the agricultural field from April to June, the labourers tend to migrate for a month or two and again return back for transplanting and weeding work, then again, they migrate to the above districts for search of work. They used to camp at the worksite in temporary sheds in group provided by the labour contractor. During crop harvesting season from November to December the labourers used to return and immediately after completion of crop harvesting, they again proceed back to their camp site.

CHAPTER – 9

ADEQUACY OF POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

9.1 Existing policy & legal framework and their compliance

Various acts, rules and regulations, policies have been framed for management of forests, regulation of forest produce, protection of wildlife, collection & use of NTFP by the Central Government and State Government. These are:

i) The Odisha Forest Act,1972 and rules thereof;

ii) The Wildlife (Protection) Act, 1972 and Rules thereof;

iii) The Environment (Protection) Act, 1986 and Rule 1986,

iv) The Air (Prevention& Control of Pollution) Act, 1981,

v) The Water (Prevention& Control of Pollution) Act, 1981

vi) The Forest (Conservation) Act, 1980 & Rules.

vii) The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 & Rules,

viii) EIA, Notification, 2006

ix) NTFP Collection Policy-2000

x) Orissa Gram Panchayats (Minor Forest Produce Administration) Rules 2002,

xi) The Orissa Kendu Leaves (Control of Trade) Act, 1961 and Rules.

These rules and regulations are duly being implemented by the Forest Department for better management of Forests.

9.2 Status of approved working plan and compliance

After needful consideration from all such angles and also consistent with the provisions of National Working Plan Code 2014 following Working Circles have been constituted for management of forest area covered in this plan duly approved by the Working Plan Committee.

i. Selection Working Circle
ii. Rehabilitation Working Circle
iii. Plantation Working Circle
iv. N.T.F.P (Overlapping) Working Circle
v. Wildlife (Overlapping) Working Circle
vi. Joint Forest Management (Overlapping) Working Circle.

Out of aforesaid 6 (Six) working circles, 3 (Three) are overlapping working circles.

The forest area covered in this plan has been distributed primarily among 3 (Three) mandatory working circles i.e. Selection Working Circle, Rehabilitation Working Circle and Plantation working circle. Whereas the forest area of all the Overlapping Working Circles are secondarily allotted from the area of main working circles for emphasizing the required functional aspects.

The NRSA, Hyderabad has computed the yield adopting Smythie's safeguarding formula indicating Coupe wise/ Compartment wise nos. of trees available for harvest per Hectare in Selection Working Circle.

The outturn may be more than prescription due to availability of large Nos. of dead and uprooted trees in coupe area. The trees are removed as per prescribed marking rule. With reference to coupe wise trees available for harvest as per yield table,

there is no excess removal of trees during the plan period.

9.3 Number of forest offences

The Forest Offences are mainly classified into three categories i.e.

(i) For Violation of the Odisha Forest Act, 1972 & Rules framed thereof.

(ii) For Violation of the Wildlife (Protection) Act, 1972 & Rules framed thereof.

(iii) For the Forest (Conservation) Act, 1980.

The total number of offence cases booked in last 10 years pertaining to this division is furnished in Table No. 9.1 and Table No. 9.2. There is no case of violation under Forest (Conservation) Act, 1980.

Table No. 9.1

Offence Cases booked from 2011-12 to 2019-20
(Timber/WL/Encroachment cases are included)

Year	No. of cases booked			No of cases Compounded and disposed
	OR	UD	Total	
2011-12	1246	342	1588	1156
2012-13	893	443	1336	855
2013-14	968	139	1107	730
2014-15	1074	231	1305	842
2015-16	1042	144	1186	680
2016-17	1036	114	1150	1007
2017-18	1006	92	1098	992
2018-19	916	76	992	905
2019-20	795	51	846	770

Table no. 9.2

Wildlife Crime Case (OR Cases Only)

Year	Wildlife Cases	
	OR Case in No	Person arrested in No
2011-12	14	29
2012-13	09	30
2013-14	10	21
2014-15	09	21
2015-16	05	08
2016-17	09	35
2017-18	07	18
2018-19	05	16
2019-20	06	11

9.4 Status of research and Development

No research activities have been taken up by this Division.

9.5 Human resource capacity building efforts.

The Forest staff needs to be both technically trained and extension oriented. The training of the initial recruits as well as orientation training for in-service personnel are extremely important. Updating knowledge on new emerging topics of different aspects of forestry, forest management and forest research is essential to augment the efficiency and skill of forestry personnel. During the last plan period many such training has been imparted to the front-line staff of this division. Some of these are as in **Table No. 9.3**

Details of Training imparted during last plan period in Karanjia Division

Year	Name of the Training	Range	No. of Trainee	Theme
2013-14	Range level training	Karanjia	2	Capacity Building training
		Dudhiani	2	
		Gurguria	2	
		Kendumundi	2	
		Thakurmunda	2	
		Satkosia	2	
	Division level training		1	
2014-15	Fire training	Karanjia	1	Control of forest fire
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	

Details of Training imparted during last plan period in Karanjia Division				
Year	**Name of the Training**	**Range**	**No. of Trainee**	**Theme**
2014-15	Division level weapon training		1	Computer training
	Division level computer training			
	Range level Forest law training	Karanjia	1	Law training
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	
2014-15	Range level Forestry operation training	Karanjia	1	
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	
2014-15	Range level Conservation & Protection training	Karanjia	1	
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	
2015-16	Fire training	Karanjia	1	Control of forest fire
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	

Year	Name of the Training	Range	No. of Trainee	Theme
2016-17	Fire training	Karanjia	1	Control of forest fire
		Dudhiani	1	
		Gurguria	1	
		Kendumundi	1	
		Thakurmunda	1	
		Satkosia	1	
2019-20	Human Resources Dev. Training programme	Karanjia	1	
		Thakurmunda	1	

9.6 Forest Resource Accounting

The forests have various protective, productive, regulative and accessory functions. They generate a large variety of goods and services which are beneficial to the mankind. The economic valuation of these services is related to the individual's willingness to pay for these services.

However, the willingness to pay is determined by various motivations which may range from self-interest to concern for future generations and concern for environment and other living beings. These values can be classified as Goods: Direct usage of services - consumptive and non-consumptive usage, e.g. timber, 79 fuel wood, tourism; Services: Indirect usage - watersheds, groundwater recharge, oxygen production, carbon storage, etc.

During Last Plan Period, no systematic approach has been developed and adopted for accounting Forest Resource of the Division.

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 Karanjia Forest 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 Karanjia Forest Division comes under broadly in 2 categories such as -

1. Tropical moist deciduous forest
2. Tropical Dry deciduous forest

The NPV value of forests of Karanjia Forest Division comes under eco class I & eco class III

NPV of forests of Karanjia Forest 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	31199.89	325414.85
	40 to 70% MDF (Moderately Dense Forest)	9.39	46313.89	434887.42
Eco class I	10 to 40% Open Forest (OF)	7.30	22729.44	165924.91
Eco class III	<10% (Scrub)	6.26	1025.79	6421.44
			Total	**9,32,648.63**

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 Karanjia Forest Division have been furnished in the tabular statement given below.

Valuation of Environmental service of forest of Karanjia Forest 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	31199.89	31199.89	2.53	78935.72
40 to 70%	0.55	46313.9	25472.64	2.53	64445.78
10 to 40%	0.25	22729.4	5682.36	2.53	14376.37
Below 10%	0.05	1025.79	51.2895	2.53	129.76
				Total:-	**1,57,887.63**

Total Valuation: The capital value of the forests of Karanjia Forest Division has been computed as taking sum total of NPV and valuation of Environmental Services per Ha. Forest.

Tangible (NPV)	9,32,648.63
Intangible Environmental value	1,57,887.63
Total:-	1090536.26

9.7 Budgetary allocations to the forestry sector

Budget provisions made during the last plan period which have been efficiently utilised are given in the **Table No. 9.4**

Table No. 9.4

Budget provision made during last Plan Period

Five year Plan	Year	Revenue collected in Lakh	Expenditure incurred in lakh		
			Non - Plan (AE)	Plan (PE)	Total
11th FYP (2007-12	2007-08	38.10752	184.0248	150.76875	**334.79355**
	2008-09	78.40377	235.88055	117.1214	**353.00195**
	2009-10	106.63747	38.8623	109.4543	**148.3166**
	2010-11	68.85771	31.9766	152.644	**184.6206**
	2011-12	88.58735	38.695	135.9205	**174.6155**
Total:-		**380.59382**	**529.43925**	**665.90895**	**1195.3482**
12th FYP 2012 - 17	2012-13	87.96921	46.77185	282.54721	**329.31906**
	2013-14	66.98459	151.9126	350.07827	**501.99087**
	2014-15	95.4382	164.20905	371.68108	**535.89013**
	2015-16	114.4915	38.04	459.17438	**497.21438**
	2016-17	151.36935	66.885	585.33504	**652.22004**
Total:-		**516.25285**	**467.8185**	**2048.81598**	**2516.63448**
13th FYP 2017-22	2017-18	58.60119	31.84644	520.05824	**551.90468**
	2018-19	62.10191	25.95	364.50377	**390.45377**
	2019-20	6.58731	27.16354	690.93146	**718.095**
Total:-		**127.29041**	**84.95998**	**1575.49347**	**1660.45345**

9.8 Existence of monitoring, assessment and reporting mechanism

For monitoring the implementation of various programs and assessment of success rate, standard monitoring mechanism has been developed in the Forest department. Online transmission of progress report, pay bills & payments, payment of wages to labour through Bank accounts are being implemented. All payments pertaining to CAMPA, MGNREGS, and FDA are 100% through bank accounts.

9.9 Public awareness and education

Public awareness on various Forest & Environment matters is regularly being conducted by the division. World Wetlands Day, World Forestry day, Earth Day, World Environment Day, Elephant Day, VanMahotsav week, Mass tree Planting Program, Wildlife Week are being celebrated at Division Level & Range Level. The usual features associated are

- Essay, Drawing, Debate, Paragraph writing Competitions being conducted involving School Children, Eco-clubs etc.
- Awareness through Rally, Nature camps etc are being conducted.
- Eco clubs are being promoted and various leaflets distributed among school children.
- Display of hoardings at public places to educate people,
- Conducting Meetings followed by Tree Planting Program,
- VSS members / NGO are motivated against Forest Fire.

9.10 Adequate manpower in forest Division

The details of sanctioned, permanent, temporary, and seasonal posts of Karanjia Forest Division are given in **Table No. 9.5**

Table No. 9.5

Sanctioned Strength of Karanjia Division				
Sl. No.	**Post Name**	**Sanctioned Strength**	**Men in Position**	**Vacancy**
1	Divisional Forest	01	01	00
2	Asst. Conservator	01	00	01
3	ACF, (Admn.	01	01	00
4	Forest Ranger	01	00	01
5	Forest Ranger	01	00	01
6	Forest Ranger	06	06	00
7	Dy Ranger	05	02	03
8	Forester (Ch)	01	01	00
9	Forester Enf)	01	00	01
10	Forester (Sec)	25	25	00
11	Forester (Affn)	06	06	00
12	Forester (VFW)	10	01	09
13	Forest Gurad	76	69	07
14	Forest Guard	12	00	12
15	Forest Guard (Ch)	06	00	06
16	Head Clerk	01	01	00
17	Junior Accountant	07	02	05
18	Junior Clerk	09	04	05
19	Junior	01	01	00
20	Driver	02	02	00
21	Office Chowkidar	01	01	00
22	Bungalow	04	02	02
23	Watchman	04	02	02
24	Dak-Runner	03	03	00
Total:-		**186**	**131**	**55**

Besides the regular staff, there are protection squads, fire fighting squads, elephant trackers to assist the regular staff in the field. Considering the workload, various schemes under implementation, it is felt that more ministerial and technical staffs at grass root level (Forest Guards and Foresters) are required to be deployed for better management of forest & wildlife. It is also felt to have full-fledged computer cell and GIS Cell to monitor the work, prepare maps and study the growth of plantations through satellite imagery.

Forestry sector provides a greater avenue in employment generation through engagement of different category of labours in various departmental works like Nursery & Afforestation, Felling and Regeneration, Subsidiary Silvicultural operation, SMC activities, repair and maintenance of forest roads, Construction and maintenance of building, engagement of various supporting staffs / squad etc. Mostly Un-skilled and Semi-skilled labourers are employed in the forestry sector for Protection, Conservation, and Management of forests and wild life. The labourers are paid wages as per prescribed rate under Minimum wage Act declared by the government from time to time which is being revised in different years. The wage rate of different category of labourers of past and present are furnished in the following table.

Sl. No	Notification Date (Month/Year)	Past and Present Wage Rate (In Rs.)			
		Un Skilled	Semi-Skilled	Skilled	High Skilled
1	13.12.1995	30.00	36.00	42.00	48.00
2	29.04.1999	40.00	48.00	56.00	64.00

Sl. No	Notification Date (Month/Year)	Past and Present Wage Rate (In Rs.)			
		Un Skilled	Semi-Skilled	Skilled	High Skilled
3	14.02.2002	50.00	60.00	70.00	80.00
4	15.02.2006	75.00	85.00	90.00	100.00
5	14.07.2009	90.00	103.00	116.00	129.00
6	06.10.2012	150.00	170.00	190.00	205.00
7	30.04.2015	200.00	220.00	240.00	260.00
8	Apr-17	213.50	233.50	253.50	273.50
9	Nov-18	280.00	320.00	370.00	430.00
10	May-19	286.30	326.30	376.00	436.30
11	Jul-20	298.00	338.00	388.00	448.00
12	Jul-20	303.40	343.40	393.40	453.40
13	Oct-20	308.00	348.00	398.00	458.00
14	May-21	311.00	351.00	401.00	461.00
15	Nov-21	315.00	355.00	405.00	465.00

CHAPTER 10

FIVE-YEAR PLANS

10. Five Year Plans

Since independence, regular five-year plan (Five Year Plan) has been made except for few Annual Plans in between. At the time of revision of the plan 12th Five Year Plan has been into its 5th year.

10.1 Planning in India

Post-independence during 1947, the planners of India thought overall social and economic development in a systematic way. To accomplish this mission planning commission was constituted in 1950. The main objectives of the planning in India are derived from The Directive Principles of State Policy enshrined in the constitution. The basic element of formulating the plan people centric.

10.1.1 Planning Process

Planning is an organised and coordinated effort to achieve certain self-define objectives within a fixed time frame through optimum utilisation of community resource so as to promote its general wellbeing. The two main constituents of the concept of planning are (i) a system of ends to be pursued and (ii) knowledge as to the available resources and their optimum allocations. So the main components of planning process are as follows: -

(a) Formulation of objectives to achieve within a fixed time frame.

(b) Setting of targets and priorities for different sectors.

(c) Mobilisation of funds and resources for execution of the plan.

(d) Identifying the executing agency.

(e) Setting of monitoring and evaluation of the progress.

So in nutshell, planning is a systematic arrangement of conceiving, initiating, controlling and regulating various developmental activities by a central authority to achieve definite targets and goals.

10.1.2 Planning Commission & National Development Council

India being a union of states has the onus of economic planning both for its Central and State Government. After formation of planning commission in March 1950, the necessity of a coordinating agency between the planning commission and various states was felt. Thus the National Development Council was set up by Government of India on 6th August 1952. The planning was drafted by planning commission but the same is finally approved by National Development Council. The planning commission is headed by the Prime Minister of India as the Chairperson having other members. Similarly, the National Development Council is also headed by the Prime Minister of India and the Chief Ministers of all the States of Indian Union are its member along with others.

10.2 Five Year Plan

Since the time frame is fixed five years for accomplishing the objectives, it is popularly known as Five Year Plan. The salient features of five-year plan are both central plan and state plans. They are prepared separately. Further five separate annual plan components are also prepared. This is suitable for realizing the definite target and also making necessary modification as and when required. Opinion of various tiers of government, institutions, and experts, public are taken for formulating the plan. India having a mixed economy, the outlay for public sector and private sector are earmarked separately in each plan. Attainment of higher rate of economic growth, reducing economic inequalities, developing various infrastructures etc. are the major objectives. In short, growth with social justice is the main theme of planning. Meanwhile twelve five year plans have already been implemented. The synopsis of individual five year plans is furnished in succeeding paras.

10.3 First Five-Year Plan (1951-52 to 1955-56)

Keeping in view the large scale inputs of food grains in 1951, the 1st Five Year Plan accorded highest priority to Agriculture including irrigation and power

This is the first five-year plan of independent India. The objective of this plan was mainly to correct the disequilibrium in economy caused by World War-II and partition of the pre-independence India and to initiate the process of all-round balanced development. So it was aimed at removing food crisis

and shortage of raw material, to develop economic and social infrastructures such as roads, railways, and irrigation and power projects. Efforts have also been made to lay a foundation for future development economy and to attain social justice. The budget allocation in this plan was 9.6 crores for forest development. The forest under private ownership was brought to the fold of state control. Welfare of the tribals mostly the forest dwellers have been given importance. The Indian Board of Wildlife was constituted in 1952 during this plan period for preservation of wildlife. The Second forest policy (first of independent India) was formulated in 1952.

10.4 Second Five Year Plan (1956-57 to 1960-61)

2nd Five Year Plan laid emphasis on industrialisation.

This plan was a bit more ambitious and bolder in comparison to the first plan. It emphasised on industrial progress along with rural development to achieve socialistic pattern of society. Development of basic and heavy industries was given much priority for creation of large employment opportunities. In view of formulation of forest policy in 1952, some emphasis was given on the proposal of the said policy during second plan. These are as under.

(a) Plantation of species of commercial and industrial value.
(b) Afforestation and improvement of poorer areas in forest and extension forestry.
(c) Promotion methods for increased production and availability of timber and other forest produce.
(d) Conservation of wildlife.

(e) Forest research and technical personnel.

The Central Government paid special attention to research education and training of technical personnel while State Government carried out other developmental projects. The total outlay for forest sector in this plan was about 27 crores.

10.5 Third Five Year Plan (1961-62 to 1965-66)

3rd Five Year Plan had major objective of achieving self-sufficiency in food grains.

This plan accorded greatest importance to the achievement of a balanced regional development. So importance was given for development of agriculture and rapid industrialization. To achieve self-sufficiency in food grain was given much priority. While promoting the agriculture, it was necessary to develop the forests since forest is the foster mother of agriculture. This plan had an outlay of 51 crores for various development programmes in forestry sector by the states. Few important ones are the following.

(a) Village and extension forestry.
(b) Large-scale programme for raising economic plantation.
(c) Development of minor forest produce and increase production of other forest produce.
(d) Survey and demarcation of forestland.
(e) Improvement of forest roads.
(f) Establishment of timber treatment plants.

10.6 Annual Plan (1966-67 to 1968-69)

Though the third plan was started with much hope but a number of difficulties faced mainly due to financial crisis. Foreign Exchange Crisis, Adverse weather, Chinese Aggression and Indo-Pakistan War are some important factors in creating bottlenecks for smooth implementation of third plan. So the fourth plan could not be launched immediately for which Annual Plans were carried out for three years. The strategy adopted in these annual plans was to eliminate the stresses and strains arising out of unforeseen events of third plan and also to secure a reasonable growth rate without creating any additional inflationary pressures in the economy. Greater emphasis was laid on full utilisation of existing install capacity of the industries. Simultaneously priorities were accorded to various social service schemes related to education, scientific research, family planning, water supply and sanitation. Forestry technique on harvesting and raising profitable plantation technique were adopted in these annual plans.

10.7 Fourth Five Year Plan (1969-70 to 1973-74)

The 4th Five Year Plan aimed at accelerating the tempo of development to take care of fluctuations in agricultural production and impact of uncertainties of foreign aid.

The strategy adopted during the annual plans was continued in the fourth plan. It gave highest priority to agricultural and irrigation development with a

special emphasis to support small farmer. It also aimed at increasing exports and reducing imports thereby gradually phase-out of the reliance on foreign aid. In the forestry sector the increase of productivity, forest development vis-à-vis forests based industry and to develop forest to support a rural economy are the area of focus in this plan period. The production from forests in India per annum was estimated at 0.53 cubic meters per Hectare as against the world average of 2 cubic meters per hectare. It was required to be enhanced. Large scale plantation of valuable quick growing species of both economic and industrial importance were required to meet the long term need of both agriculture and industrial sector. Management of national parks and sanctuaries were given much importance for ecological conservation.

It is observed that much emphasis was given on economic plantation for meeting the demand of industry and other commercial sector. Another notable investment is on farm forestry cum fuel wood plantation to meet the demand of local people but the quantum of expenditure is comparatively less.

10.8 Fifth Five Year Plan (1974-75 to 1978-79)

The 5th Five Year Plan stipulated achieving self-reliance and adopting measures for raising the consumption standard of people living Below Poverty Line (BPL).

The strategy of the fifth plan was the eradication of poverty with attainment of economic self-reliance. In agricultural sector, attempts were made to boost the production through adoption of modern technique and multiple cropping programme while on industrial front production of mass consumption goods

and agro based industries were encouraged. Minimum Needs Programme was launched for the first time during this plan period to provide a minimum level of social consumption to all sections of the people throughout the country. In forestry sector, emphasis was given to take up a dynamic programme of production forestry. Creation of large-scale man made forests with the assistance of institutional financing were taken up. The most notable programme was the social forestry and economic plantation. Forestry with the participation of the local people was the call of that period. It was aimed to provide fuel and fodder to the local people by raising plantation mostly on non-forestland thereby reducing pressure on natural forest. Project Tiger was also taken up to enhance the tiger population. On the whole the production from the forestry sector was aimed for boosting in order to cater to the growing demand of both local people and industrial sector. Though the fifth plan was scheduled to complete by 1978-79, it was terminated at the end of March 1978 i.e. a year ahead of its full term due to change of government at centre.

10.9 Sixth Five Year Plan (1980-81 to 1984-85)

Whereas removal of poverty was the foremost objective of the Sixth Five Year Plan. This plan even laid emphasis on active involvement of people at local level in formulating and implementing the scheme. This laid the foundation for peoples' participation even in protection of forests. The Orissa Village Forest Rules 1985 also came into existence. So far all the Five Year Plans had given thrust to agriculture and Industry.

After two years the sixth plan came for implementation by the new government at centre. The strategy adopted in this plan was to launch a direct attack on the problems of unemployment, under employment and massive low-end poverty. Special emphasis was given for employment in rural areas and unorganized sector. Increase in production through proper land water management was of prime concern. Ecological security and preservation of genetic and bio-diversity was given due importance. While social forestry continued to gain momentum, the conservation of forest was also highlighted. The Forest Conservation Act 1980 came into force during this plan period. Indiscriminate diversion of forestland for non-forestry purpose was controlled. The Orissa Social Forestry Project with the financial assistance from SIDA (Swedes International Development Agency) was launched during this plan period.

10.10 Seventh Five Year Plan (1985-86 to 1989-90)

The 7th Five Year Plan aimed at rapid growth in food grain production and increase employment opportunity the Jawahar Rojogar Yojona (JRY) was launched during this plan which even earmarked funds for afforestation activities. In fact, from this plan onwards, substantial funds started pouring in for forestry works from other Departments as well. And the National Forest Policy 1988 was formulated giving more emphasis on the indirect benefits from the forests than the monetary returns.

This plan was mainly devoted to carry on ceaseless works on food and productivity. Generation of employment for maximum utilisation of human

resource and solving the problem of unemployment through agricultural and industry sector was prime concern. It also laid emphasis on decentralised planning for ensuring full participation of the local people. In forest and environment sector, land reclamation, afforestation, cleaning of water bodies etc. were prioritized to restore the degraded eco-system. Sustainable development in harmony with environment was felt. Emphasis on research and training was given. The Botanical Survey of India and Geological Survey of India were reoriented to harmonize the Man and Biosphere Programme. The implementation of biosphere programme was started during this plan period with the Department of Environment as the nodal agency. Social Forestry Project was also expanded to Karanjia in its second phase during this plan period. Rural fuel wood plantation was in operation in 157 districts of the country in this plan to address the fuel wood crisis areas. National Wasteland Development Board was also established to formulate prospective plans for management and development of wasteland in the country. The National Forest Policy was revised during 1988.

10.11 Annual Plans (1990-91 to 1991-92)

After completion of the seventh plan by March 1990, the eighth plan could not be started immediately due to change of government at centre for which two annual plans were implemented.

10.12 Eighth Five Year Plan (1992-93 to 1996-97)

The 8th Five Year Plan laid emphasis on the Basic minimum services including safe drinking water and rural connectivity Number of Forest Roads were improved during this period under Food for Work Programme besides launching the schemes like Integrated Afforestation and Eco-development project (IAEP). Area oriented Fuelwood and fodder Project (AOFFP), Association of Schedule Tribe (ST) and Rural poor in regeneration of Degraded Forests on usufruct basis (ASTRP) and Non-Timber Forest Produce including Bamboo Plantation and Medicinal Plantation (NTFP).

This plan has main focus on human development. The major thrust areas are expansion of employment opportunity; a faster and geographically diversified growth in agriculture, development of infrastructure and marketing arrangement for agro based and allied activities, development of wasteland crop cultivation and forestry etc. The emphasis in forest sector was the following.

(a) To regenerate and restore the degraded eco-system.
(b) To increase productivity and generate employment.
(c) Protection of natural environment and ensure intergraded

Co-ordination between conservation of nature and sustainable use of natural resources

.

The bio-diversity conservation was initiated during 1991-92. Considerable attention was given for pollution control during this plan period. The National Wasteland Development Board was bifurcated during 1992 and National Afforestation & Eco-Development Board was created. The investment made so far in forestry sector starting from first plan period till eighth period was reviewed and it is observed that the investment is less than 1% of the plan outlay as revealed from the following table.

10.13 Ninth Five Year Plan (1997-98 to 2001-02)

The 9th Five Year Plan laid emphasis on the Basic minimum services including safe drinking water and rural connectivity. Number of Forest Roads was improved during this period under Food for Work (FFW) Programme besides launching the schemes like Integrated Afforestation and Eco-development Project (IAEP). Area oriented Fuel Wood and fodder project (AOFFP), Association of ST & Rural Poor in regeneration of Degraded Forests on usufruct basic (ASTRP) and Non Timber Forest Produce including Bamboo Plantation and Medicinal Plantation (NTFP).

The important objectives of this plan are the following.

(a) Accelerating the rate of economic growth with stable price.
(b) Priority to agriculture on rural development to generate productive employment and to eradicate poverty.
(c) Food and nutritional security for all particularly the vulnerable sections of the society.

(d) Ensuring environmental sustainability of development process through social mobilization and participation of people at all level.

(e) Providing basis minimum service of safe drinking water, primary health care, universal primary education and connectivity to all in a time bound manner.

(f) Strengthening efforts to build self-reliance.

10.14 Tenth Five Year Plan (2002-03 to 2006-07)

The 10th Five Year Plan aims at harnessing the benefits of growth to improve the quality of life of the people by setting targets in reduction in poverty, universalisation of primary education etc. It even targets increase in forest/tree cover to 25% by the end of the Five Year Plan besides, clearing of major polluted review stretches. Bamboo missions Bio-fuel Projects and National Afforestation Programme through Forest Development Agency are other major project undertaken.

This was approved by National Development Council on 1st September 2001 setting the growth rate at 8%. Focus on private sector growth, elimination of poverty and the strategies to improve the national growth were important thrust areas. The free economy creating a conductive atmosphere for huge foreign investment was given top most priority. While gearing up the growth and development, due care to safeguard the environment was emphasised. Social service like education, drinking water facilities, basic sanitation was

also included in the plan objectives. In forestry sector the important objectives are as given below.

(a) To address the livelihood needs of the forest fringe villagers.
(b) JFM to be accelerated for regeneration of degraded forest.
(c) Developmental work to be implemented along with forestry operations through Forest Development Agency under National Afforestation Programme of National Afforestation & Eco-Development Board.
(d) Conservation and protection of medicinal plants and promotion of bio-diesel plantation like Jatropha, Pongamia etc.
(e) Watershed approach to develop and maintain forest cover.
(f) Last but not least to bring 1/3rd of total geographical area under forest cover.

10.15 Eleventh Five Year Plan 2007-12

- It was in the period of Manmohan Singh as a prime minister.
- It aimed to increase the enrolment in higher education of 18–23 years of age group by 2011–12.
- It focused on distant education, convergence of formal, non-formal, distant and IT education institutions.
- Rapid and inclusive growth (poverty reduction).
- Emphasis on social sector and delivery of service therein.

- Empowerment through education and skill development.
- Reduction of gender inequality.
- Environmental sustainability.
- To increase the growth rate in agriculture, industry and services to 4%, 10% and 9% respectively.
- Reduce total fertility rate to 2.1.
- Provide clean drinking water for all by 2009.
- Increase agriculture growth to 4%.

10.16 Twelfth Five Year Plan 2012-17

The Twelfth Five-Year Plan of the Government of India has been decided to achieve a growth rate of 8.2% but the National Development Council (NDC) on 27 December 2012 approved a growth rate of 8% for the Twelfth Plan.

With the deteriorating global situation, the Deputy Chairman of the Planning Commission Montek Singh Ahluwalia has said that achieving an average growth rate of 9 percent in the next five years is not possible. The Final growth target has been set at 8% by the endorsement of the plan at the National Development Council meeting held in New Delhi.

The objectives of the Twelfth Five-Year Plan were:

- To create 50 million new work opportunities in the non-farm sector.
- To remove gender and social gap in school enrolment.
- To enhance access to higher education.
- To reduce malnutrition among children aged 0–3 years.
- To provide electricity to all villages.

- To ensure that 50% of the rural population have accesses to proper drinking water.
- **To increase green cover by 1 million hectares every year.**
- To provide access to banking services to 90% of households.
-

10.17. Plan Expenditure in Karanjia Forest Division

The plan expenditure of the division from seventh plan onwards has been furnished in the Table No.10.3.

Table No.10.3

Five year Plan	Year	Revenue collected in Lakh	Expenditure incurred in lakh		
			Non - Plan (AE)	Plan (PE)	Total
11th FYP (2007-12	2007-08	38.10752	184.0248	150.76875	**334.79355**
	2008-09	78.40377	235.88055	117.1214	**353.00195**
	2009-10	106.63747	38.8623	109.4543	**148.3166**
	2010-11	68.85771	31.9766	152.644	**184.6206**
	2011-12	88.58735	38.695	135.9205	**174.6155**
Total		**380.59382**	**529.43925**	**665.90895**	**1195.3482**
12th FYP 2012 - 17	2012-13	87.96921	46.77185	282.54721	**329.31906**
	2013-14	66.98459	151.9126	350.07827	**501.99087**
	2014-15	95.4382	164.20905	371.68108	**535.89013**
	2015-16	114.4915	38.04	459.17438	**497.21438**
	2016-17	151.36935	66.885	585.33504	**652.22004**
Total		**516.25285**	**467.8185**	**2048.81598**	**2516.63448**
Annual Plans	2017-18	58.60119	31.84644	520.05824	**551.90468**
	2018-19	62.10191	25.95	364.50377	**390.45377**
	2019-20	6.58731	27.16354	690.93146	**718.095**
Total		**127.29041**	**84.95998**	**1575.49347**	**1660.45345**

It is revealed from the above table that the quantum of plan expenditure has been increased during tenth plan period substantially due to the

implementation of various afforestation scheme. The revenue has been decreased to a great extent due to the moratorium on felling of trees since 1988.

10.17.1 Feedback for Future Management:

As narrated above as well as in the earlier chapters strengthening of VSS through vesting more power on them and bringing them towards the mainstream of nature management by adopting Community Based Ecotourism coupled with the rehabilitation of degraded forest to improve the stand quality and quantity. Special focus should be given to make the forest free from invasive weeds, along with the efforts to achieve zero tolerance to the carbon release by combating forest fire and enhance the capacity of the carbon sequestration in the Forest Carbon Pool. Intensification of protection of wildlife and biodiversity to be considered as a top priority along with the use of new technology to enhance the water regime of the forest.

CHAPTER-11

Past System of Management

11.1 General history of the Forests:

Prior to 1885 some timber leases of matured and exploitable Sal trees only had been given from Plain Forests of Mayurbhanj District / Similipal Forests. It caused more damage to the forest than it gave revenue. The lease expired on 1885-86 and Mr. C.C. Hart described the expiry of lease as **"fortunate ending".**

11.1.1 Working from 1885-86 to 1904-05:

It appears that exploitation was done departmentally and round timber were floated down the Budhabalanga and also transported in cartsto Balasore for Sale in Depots maintained by State. By this time outside market for Mayurbhanj timber got established due to railways. Leasing out of several coupes in west Similipal Hills to traders at concessional rates during 1904-05 for working on selection pattern and leasing of five coupes on plains (one kept for tenants) resulted due to this reason. The objective was to exploit Sal trees of girth above 6' at breast height in selection system which would otherwise become unsound and plain forests under coppice system to check unregulated felling in these forests. For Selection Coupes the rate of Royalty was Rs 7.06 per cum. This low rate was kept to encourage lessee to construct roads for extraction inside the forests. First systematic exploitation of Similipal Reserve was taken up through contractors find its place in A.A.R

1906-07 (Annual Administrative Report 1906-07). The exploitation was carried out as per Working Plan Report of Mr. C.C. Hart. Eight Contractors in West Similipal Working Circle and four in East Similipal Working Circle were allowed. Subsequently M/s B. Barooah & Co was added to make it thirteen in 1906-07. The timber extraction is summarized as below.

Table No 11.1
Past timber working (1905-06 & 1906-07)

Year	Timber Exploited	Royalty	Kurias exported	Royalty	Timber in Stack.
1905-06	N. A	39649-13-10	---	---	--
1906-07	5021.6 cum	43708-9-0	7227	8241-12-3	5240.0 Cum at Jashipur and Manada Depot.

System of work under leases up to 1916 and Their result.

The Leases from 1904-05 to 1916 were based on the working plan Report of Mr. C.C. Hart. The principles laid down for exploitations were

I. Selection –cum- Improvement Felling of Sal trees above 6' Girth which was likely to deteriorate otherwise in Hill Reserve.

II. Coppice felling in plains to check unregulated felling's in plain forests. M/s B. Barhooah & Co was entitled to remove all trees of 6' Girth and above at breast height in all leases granted for 10 years. The following restrictions were also prescribed for regulating felling.

These species are are not to be removed / harvested.

1. All Kusuk, Kasafala, Kochila, Bahara, Simili, Far and Asana.

2. All edible fruit bearing trees viz Mahula, Chara, Kendu etc.
3. All Bamboo Clumps.
4. All trees on or along bank of streams and nallahs.
5. All other trees which were 6' in Girth at Breast Height with bark except marked by Forest Department.

Out Turn:

Anticipated Annual out turn: 1, 00,000 cft.

Though the result of the lease was considered as very satisfactory at that time, the defects were noticed.

i) Details of exploitation, its sequence etc.were not furnished in the Working Plan Report by Mr. C.C. Hart.

ii) Marking did not have any Silvicultural consideration except the Girth at Breast Height, trees on Nallaha / stream banks which were not to be marked.

iii) Neither any previous enumeration was done nor was any yield was prescribed.

iv) No subsidiary silvicultural operation was prescribed or appears to be taken place.

Therefore, the increase in revenue was the only criteria for satisfaction of lease and subsequently the lease was extended for 30 years i.e. 1946.

Execution System of Exploitation of 30 years Lease:

The history of lease in favour of M/s B. Barooha& Co (Renamed as Barhooah Timber Company ltd in 1919) from 1916- to 1946 is the most

significant part of the Forest management of Mayurbhanj during the pre- independence period. The salient points of Lease are given below.

- The lease covered whole Similipal forest
- East Similipal Range was relinquished later "**on mutual consent"**.
- The lease was for species Sal only.
- Stipulated annual outturn is 3.00 lakh cft with maximum 5 lakh ft converted Sal timber for export which was increased latter to 8.00 lakh cft.
- Exploitable GBH reduced to 5'
- Exploitation in N.W. and three Similipal Ranges were heavy due to the increased annual out turn.
- By 1939 both W and N Ranges were worked and exploitation in the ranges was behind the Schedule due to inaccessibility of the area.
- To cover the stipulated quantity exploitable girth at Breast Height was reduced from 5' to 4 & ½' in N. W Ranges.
- The company was always ahead of schedule for their perfect organization of sawing and transportation.
- Division of whole Similipal Reserve in to four ranges i.e. East, West, North and South ranges. Division of each range boundary to permanent line was not made permanent.

Results:

The following results of this lease can be easily distinguished.

- The period of lease was the period of ruthless exploitation of the Similipal Forest. The World War-II is within this period when there is a great demand for timber for railway line and ship construction.
- Reduction of exploitable Girth from 5' to 4½' in 1939 allowed exploitation of young crop on one hand and reworking of previously worked out coupes in N & W Range is in bad management practice.
- In view of the concessions under above two criteria, the company / lease holder agreed to do improvement felling and climber cuttings. In the name of improvement felling trees below 4& ½' GBH were also exploited and the climber cutting which should have given the priority was given a very low priority.
- An annual outturn of of 8.00 lakh cft from lease area (3 of Similipal Reserve Area 836.48 Sq. Miles) 4, 01,684 Acre is calculated to be 2cft / acre/ annum. Though it looks moderate this includes blank areas, savana land, River and nalla beds, plateau above 2800' and un-productive area where either no marking was done or there were no exploitable trees. The actual area from which timber was extracted was much less than the gross area and thus the exploitation was extremely heavy.
- Before operation of lease the crop was congested with preponderance with trees of higher girth class and defective trees. This was because of no proper working and for this reason no normal increment to trees added.
- When the lease objectives were to extract salable sawn timbers only which was in form of railway sleepers at that period, extraction of 8.00

lakh cft sawn sizes may be equivalent to about 10 to 12 lakh cft round timber.

- Felling was not controlled and regulated by any systematic plan. The result was haphazard felling all over the area. The area couldn't afford as a sustained yield basis without control over the yield and method of working.
- After 1920 these forests were worked under coppice with standard system with a rotation of as low as 15 years. The defect of the system of extraction and its ill effect was not recognized and therefore no attempt was made to correct the system and check deterioration.

11.1.2 Working plan By Sri B.M. Dasgupta: (1947-48 to 1952-53)

The Past System of Treatment of Panchpir and Bamanghati forests are not available. Based on Scanty records available, it has been pointed out in JEE's Plan that large area of Badampahar Reserved Forests was jumped in past and later worked for large sized timbers. In lease of B. Barooah & Co of Badampahar Reserved Forests and in lease of B. Barooha, Sri R.D. Nadal and Sri S.S. Das of forests of Thakurmunda, Rairangpur, Baripada, Karanjia and parganas, all big trees above 4' girth were exploited. Other forests of Bamanghati sub division were also similarly worked.

Result:

Mr. R.C. Ramsay, political agent of Odisha Foundary States reported (1920-21) that the State would soon face with a longer period where there will be no Sal of mercantile size and the forest also contained as enormous number of states headed hollow badly grown trees dry rot in common and value fewer young trees. This report reflected the result of working during the lease period.

Mr. Dasgupta's comment that the lease land experience exploitation of mature sal trees and steady encroachments of miscellaneous species could not be studied quantitatively and it was mater of observation only. Since felling was continued only to Sal trees and removal of miscellaneous species in proportion could not be ruled out.

After completion of Dasgupta's Plan 10% enumeration of available crop was conducted.

The result is reproduced below.

Table No 11.2
Ratio between Sal / Non-Sal after harvesting.

Coupe Selected for enumeration	Criteria for enumeration	Availability of number of trees / Acre Sal	Availability of number of trees / Acre Non Sal
C.C- I	Trees above 5' GBH	0.367	0.917
G.C.-II	Above 4 ½' up to 5' GBH	0.729	1.027
G.C-III	Between 3' to 4½' GBH	7.180	5.570
G.C. –I, II& III	Sal Ratio	1:2:20	
	Non sal ratio	1:1:6	

	Sal Non sal taken together	1:2:3	

11.1.3 Working plan By Sri Shree pal Jee, IFS (1953-54 to 1972-73):

After merger of Mayurbhanj Ex-state in the year 1949, it was felt that Working Plan of Similipal Forest prepared by Sri Dasgupta was having inadequate provisions to meet silvicultural requirements of forests. Further the reserved forests in plains being worked out under sketchy schemes were only tabular statements of felling was required to be covered under a comprehensive plan consistent with the Govt. Policy and management. Hence this Plan was prepared by Sri S. Jee, IFS for Reserved forests of Mayurbhanj District for a period of 20 years i.e. from 1953-54 to 1972-73.

The Plan prescribed five Working circles namely

1) Selection Working circle (SWC),
2) Improvement Working circle (IWC),
3) Coppice Working Circle (CWC),
4) Bamboo Working Circle (BWC) &
5) Protection Working Circle (PWC)

Selection WC:

All valuable high forests situated in Similipal Hills, Natto and Satkosia Blocks and Part of Badampahad Blocks were included in **"Selection Working Circle".** Twelve felling Series were formed. The silvicultural system adopted was **Selection – cum- Improvement** with a felling cycle of 20 years. Yield was regulated by area with retention percentage of 33% of exploitable trees. Thus, two trees out of three available exploitable trees were to to be removed. The exploitable Girth at Brest Height (GBH) as fixed in the Sri S. JEE Plan is furnished below.

Table No 11.3 -Exploitable Girth prescribed in Jee's Plan. (SWC)

Species	Exploitable GBH for all FS except Natto, Satkosia and Jashipur.	Exploitable GBH for Natto, Satkosia and Jashipur.
A. Principal Species		
Sal	5'	3'6"
Piasal, Koim	6'	4'
Banakhira, Gambhari	6'	3'6"
Champa	7'	3'
Pangan	3'	3'
Sisoo	4'	3'
Nageswar	5'	3'
B. Usefull Species		
Asan	5'6"	3'6"
GudiKoim	6'	6'
Jamu	5'	3'6"
Simuli	6'	4'
Toon	6'	3'
Chhachinam, Charala, Bhurtudam, PaniGambhari	6'	3'
Sidham Sal, Salai,Nimili, Kadam	5'	3'
C. Others (inferior Species)		
Mahul	5'	3'6"
Dhaw	5'	2'6"
All others	5'	3'

Improvement working circle

All good quality plain Sal Forest of Karanjia, Kendumundi and Thakurmunda Ranges were put in this Working Circle. Light improvement felling was prescribed with 30 years felling Cycle. Three Felling Series were prescribed with **"Selection –Cum – Improvement System"** for future working for conversion to uniform system. Choice of Species with exploitable girth as prescribed is given below.

Table No 11.4
Exploitable Girth (Improvement WC)

Species	Exploitable Girth (GBH)
Principal Species	
Sal	5'
Piasal	5'
Banakhira	5'
Gambhari	3'6"
Sisoo	3'6"
Pangon	3'
Useful Species	
Asan	5'
Inferior Species	
All other Species	5'

Coppice WC:

All the remaining forest areas except Sabai Plantations in Jamsola Compartment-I, Bamboo Plantation areas, areas with poor growth and included in Protection WC were assigned to Coppice Working Circle. Total 88 Felling Series were constituted with a rotation period of 40 years. The yield is regulated by Area only. Retention of 10 trees per acre of Sal, Piasal, Sisoo and Gambhari along with all edible fruit bearing species like Mango, Mahul, and Char

numbering to five per Acre was prescribed. Thus, total retention is up to maximum 25 trees per acre.

Bamboo WC:

All Bamboo bearing forests and Bamboo plantation area allotted to Bamboo Working Circle. A cutting Cycle of 3 years was suggested with clump selection basis.

Protection WC:

Forest having no bamboo, Mining areas, Poor growth forest blocks and Sabai Grass plantations were included in Protection WC. Protection against grazing, illicit felling was prescribed.

11.1.4 Result of Sri S. Jee Plan:

In fact, the Working Plan by Sri S.JEE, IFS was the first comprehensive plan for management of all Reserved Forests of Mayurbhanj district. Result of prescriptions working Circle wise is discussed below.

Selection WC

1) Exploitable girth prescribed for Natto, Satkosia and Jashipur Felling Series was on lower side and no retention was prescribed. As a result, heavy marking was taken up with revenue earning intension / trend.
2) The 33% retention percentage prescribed in other F.S. is also in a lower side. It would have been better if it was minimum 50%.
3) Though the prescriptions were to have a better managed forest, the interpretation was of revenue oriented only.

4) After timber working Subsidiary Silvicultural Operation was neglected as the produce obtained from such operation is found uneconomical.

5) No attention was given to Wildlife management aspect.

Improvement WC:

1) The objective was to improve the crop through set of Silvicultural practices by way of removing dead / defective / suppressed trees. In fact, the prescription was interpreted as a new relaxed marking rules and heavy exploitation took place.

2) In practice there was no difference in between Selection System and Improvement system.

3) Cyclone occurred in 1971 and lot of damage was caused top the standing crop.

4) After end of plan period, the crop was found in a degraded stage than where it has started. It may be due to poor Subsidiary silvicultural operation and lack of established regeneration.

5) No steps taken to protect forests / regeneration against grazing and encroachment. It had a very adverse effect on Forest.

Coppice WC:

1) The Author of the Plan Sri S. JEE, IFS realized that the rotation Felling Cycle should be 60 years but ultimately prescribed a felling cycle / rotation of 40 years. Due to lack of adequate protection measures against grazing, illicit felling, protection to standards etc. the desired

establishment of regeneration out of coppice shoots in the forest not noticed as expected.

2) The yield consideration was not proper.

Bamboo WC:

The Cutting cycle of three years found to be too early harvesting practices and adequate time for establishing the regeneration (Culms). Heavy browsing / lopping of branches for fodders resulted in denudation of Bamboo clumps.

Protection WC:

In practice no protection could be provided to the forests assigned to this Working Circle except Sabai Plantation of Jamsola Block.

Conclusion:

The S. JEE's Plan though considered the forest on a holistic view and aimed at improving the forest including Bamboo and Sabai Grass plantation, due to various reasons, the desired result is not obtained. The very good crop monumental to the region was ruthlessly harvested.

Further Wildlife Conservation and related matters not addressed in the plan as desired.

11.1.4.1 Working Plan by Sri R. Mishra, IFS (1973-74 to 1992-93)

On expiry of JEE's Plan forests of Baripada Division and Karanjia Division were managed by separate plans for two separate division. The Working Plan for Baripada Division was prepared by Sri S. Bose, IFS and for Karanjia Division by Sri R Mishra, IFS for a period of 20 years.

11.1.4.2 General outline of the Sri R. Mishra, IFS Plan:

The basic objectives of this plan were to maintain and improve the forest cover. Maximum production consistent with with the objectives was taken as future yield. Five Working circles were constituted to regulate various working. These are

i) Selection Working Circle,
ii) Sal Conversion Working Circle,
iii) Coppice Working Circle,
iv) Rehabilitation Working Circle,
v) Plantation Working Circle,

All the forests of Karanjia Division those were worked under Selection WC of last plan were to Selection WC of this plan also except

(i) seven compartments included in Project Tiger core area – to be managed under Wildlife management Plan. (ii) Satkosia –Compartment no 6 in Coppice

WC, (iii) Satkosia-I and Noda block were assigned to Selection WC. The total area under Selection WC was 1256 Sq. Km.

Areas assigned to Improvement WC of last plan were assigned to Sal Conversion WC with an aim to manage under conversion to uniform system. The area assigned to this WC was 135 Sq. Km.

Area worked under Coppice system in last plan were assigned to the same WC i.e. Coppice WC. The area assigned to this WC was 222 Sq. Km.

Areas with Sal rooted waste and previously worked under Coppice System were assigned to Rehabilitation WC. Total area assigned to RWC was 105 Sq. Km

Area having no substantial growth and large blank areas were put to Plantation WC. The area assigned was 67 Sq. Km.

11.1.4.3 Prescriptions & Result of Working.

a) <u>Selection WC:</u>

The Silvicultural System prescribed for this Working Circle was Selection cum Improvement. 13 Felling Series with 20 years felling cycle were constituted to facilitate smooth working. Retention of Sound Sal trees above exploitable girth was fixed to

25% for Gurguria, Kaliani, Jamuna, Dudhiani, Kendumundi and Ankurbasa FS. In case of Jamuni, Bareipani and Champajharan FS 33% of Sal trees above exploitable Girth was prescribed. 50% of Sal trees above Exploitable GBH were prescribed for Talabandha and Kusuktola F.S. The exploitable Girth Prescribed for various Species is given below.

Table No 11.5
Exploitable Girth Prescribed for various Species

Sl. No.	Species	Exploitable GBH in cm for all except Satlodia and Jashipur FS.	Exploitable GBH in cm for Satlodia and Jashipur FS.
A. Principal Species			
1	Sal, Piasal	150, 180	90,120
2	Sisoo	120	120
3	Champa	270	90
B. Useful Species			
4	Banbhira	180	120
5	Panjan	105	90
6	Gambhar	180	120
7	Nageswar	150	90
8	Koim	180	120
9	Asan	165	120
10	Toon	180	90
11	Sidha	150	90
12	Simil	180	90
13	Salai, Kadam	150	90
14	Chachina	180	90
C. Inferior Species			
15	Mango, Godikoim	180	90
16	Charla, Bhukundi	180	90
17	Mahul, Jamu, Dhaura	150	120
18	All Others	150	90

Provisions were kept for protection against grazing, fire and special provisions for frost affected area.

Sal Conversion WC.

Three felling Series were constituted i.e. one for each Range namely Karanjia, Kendumundi and Thakurmunda. The area of each Felling series was divided to six periodic blocks of 20 years each. The conversion period was fixed to 120 years. Yield in PB-I is regulated by area only.

Method of Exploitation:

Clear felling with retention of Advance Growth with 60 cm gbh and retention of 10 best tree per hectare of Sal and Piasal between 60-90 cm girths.

Subsidiary Silvicultural operation:

Cleaning & Climber cutting in the year following the main felling. First thinning was prescribed on 10^{th} year after main felling and subsidiary Silvicultural operation taken up. Light Crown thinning was prescribed in PB-II area. For other PB, 'C' grade thinning was prescribed.

In rest of the periodic blocks-controlled grazing was allowed.

a. Coppice WC:

The Silvicultural system prescribed was "Coppice with Standard" on 60 year Rotation in 13 those are in hilly area. On rest 5 FS in plain; the rotation was fixed at 40 years. Yield was regulated by area. 25 number of Standard within Girth Class 30cm- 60cm was required to be retained. Retention of fruit bearing species maximum 10 numbers per hectare was suggested in addition to the prescribed standard. Standard trees so retained should be well evenly distributed all over the area. In case of hill slopes, instead of clear-felling selection marking above 90cm GBH was prescribed. Sal, Piasal, Sisoo, Gambhar and Panjam were considered as principal species, Barkhira, Asan, Koim, Karada, Sidha and Dhaw were considered as secondary Species and rest were considered as inferior species. Fruit bearing species were considered as protected species. Climber cutting, Cleaning, Soil Working, Sowing & Planting and closure to grazing, fire protection was prescribed along with the subsidiary operation.

Thinning was prescribed on 10^{th} year, 20^{th} year and 30^{th} year for forests with 60-year rotation period.

Rehabilitation WC:

The area assigned to Rehabilitation was aimed to improve through Aided Natural Regeneration. Five Treatment Series with 20-year cycle was constituted. The activities recommended were Silvicultural Cleaning with

fencing, removal of Dead trees, thinning in congested patches and climber cutting. Protection against grazing, fire was also prescribed.

Plantation WC:

Existing Plantation and fresh blank areas were included in this Working Circle. It was proposed to plant Eucalyptus hybrid, Acacia and Bamboo mixed with other indigenous species. 15-year rotation was prescribed. Thinning in 8th Year was also suggested.

Result Analysis:

Selection WC:

Permissible exploitation prescribed i.e. 75% of available trees in 4 FS, 66% in 3FS and 50% in 2 FS was considered to be very high with the existing crop condition. On interpretation of average diameter of Approach class, the value of (i) Smith's Formula was taken as 2 against 40 years. This resulted in high removal percentage of available trees for removal. The regeneration expected to follow was not come up as desired.

Sal Conversion WC:

The result of Sal Conversion through Coppicing with Reserve was proved to be detrimental to Forest Cover.

i) For Sal Forests of Thakurmunda, Kendumundi and Karanjia situated on gentle slopes were of Quality Class

II to IV with average Quality Class-III. These forests were in Improvement WC in the S. JEE's Plan. It would have been wiser if it was managed under Selection System than Conversion System.

ii) The reason given for adopting conversion to uniform system i.e. increase in demand for poles etc. are just not convincing for adopting conversion to uniform system.

iii) The worked-out coupes suffered a lot and instead of a uniform crop, the areas needed rehabilitation and plantation to restock the forest.

iv) The objectives of Working Circle to convert the forest to even aged forest and to attain normal forest as fast as possible have miserable failed.

Coppice WC:

The system had failed because the Standard trees retained were subsequently removed by people illegally and area which consists small scattered blocks could not be protected from biotic interference. As a result, the system failed miserably. The crop was degraded to such an extent that rehabilitation measures with strict protection can only improve the situation.

Rehabilitation WC:

The prescriptions of the plan were just not followed either due to financial or field constrains. Attempts so far made were remained half hazard, fragmented and not oriented towards result of improvement.

The area remained as degraded as before and to be included for rehabilitation.

Plantation WC:

Successful plantations of Eucalyptus hybrid and Acacia were raised in most of the area included in the Working Circle. The Rotation period of 15 years was found to be in a higher side as the intention is of biomass production. Schedule of thinning and harvesting was not followed. The harvesting Schedule was required to be implemented.

In an over view, the prescriptions of Sri R. Mishra's plan ended with further degradation of forests than it improved the lot.

11.1.5 Working plan By Sri A.O.F Bakhla, IFS (1996-97 to 2015-16)

The outgoing plan is by Sri A.O.F. Bakhla, IFS which will be followed by this plan after approval. All Reserved Forests of the Division were included in the plan. No DPF were included for comprehensive management with the general objective of: -

i) To protect the existing forest and forest lands from illicit cutting,
Encroachments, fire, grazing and shifting cultivation.

ii) To improve the productivity of forests.

iii) To promote afforestation in blank, barren and waste lands with the active participation of local people.

To check land degradation and to regenerate degraded forest lands as well as vegetative cover and augment the production of fuel wood, fodder and forest produce, especially from community and degraded forest lands by involving village community/ local people on the programme such as tree planting, agro-forestry, silvipasture development, horticulture and soil-moisture conservation.

iv) The working plan aims at conservation and improvement of Minor forest produce/ non-wood forest produce including medicinal plants by effective protection and silviculture practices. The minor forest produce, or non-timber forest produce provides employments, sustenance and income to tribal and other communities residing in and around forests.

v) To conserve diversity, and integrity of plants, wildlife and micro-organisms by providing facilities for education, awareness and training for effective participation of people living in and around sanctuary and national parks.

vi) To encourage the use of alternatives of timber substitute of fuel wood and planting of trees on private lands like farm bunds, furrow lands, or non-forest lands and all possible unused agricultural lands, in order to develop self-reliant sustainable timber, fodder and fuel wood production system.

vii) To promote and maintain watershed models in order to improve adequate soil cover in the forest area, which will be a safeguard against soil erosion and rapid run-off by rain-water by adopting soil and water conservation measures.

The Village Forests as declared u/s 30 of the Odisha Forest act, 1972 were not declared then.

Sri Bakhla stressed upon the formation of the following 4 Working Circle in Karanjia Forest Division for the management of the forest.

i) Selection Working Circle (29651.04 Ha)
ii) Rehabilitation Working Circle (34594.25 Ha)
iii) Plantation Working Circle (6693.50 Ha)
iv) Wildlife Management (Overlapping) Working Circle (70938.79 Ha)

Table No 11.6

Area Allotment to Selection Working circle as per Outgoing Plan.

Sl. No	Name of the Range	Name of the Reserved Forest	Area in Ha.
1	Thakurmunda	Mituani-1	106.80
2	Thakurmunda	Mituani-2	184.40
3	Thakurmunda	Mituani-3	98.08
4	Thakurmunda	Khejuria	641.60
5	Thakurmunda	Baunsdiha	167.20
6	Thakurmunda	Talapada	145.60
7	Thakurmunda	Gahandia	14.15
8	Thakurmunda	Nischintpur	7.47
9	Thakurmunda	Chakulia	10.02
10	Thakurmunda	Andharikhaman	48.48
11	Thakurmunda	Rugudibeda	58.58
12	Thakurmunda	Badabaliposi	27.57
13	Thakurmunda	Kaliaposi	78.25
14	Thakurmunda	Panasadiha	8.81
15	Thakurmunda	Basantpur	38.62
16	Thakurmunda	Taramara	649.60
17	Thakurmunda	Jarak	48.00
18	Thakurmunda	Kathuanuagaon	68.00
19	Thakurmunda	Banamunda	176.40
20	Thakurmunda	Khumthan	240.00
21	Thakurmunda	Bharandia	97.60
22	Thakurmunda	Gouriabahali	182.40
23	Thakurmunda	Khudisila	83.60
24	Thakurmunda	Mandaljhari	32.98
25	Thakurmunda	Mulapal	90.00
26	Thakurmunda	Bhejidiha-1	160.00
27	Thakurmunda	Bhejidiha-2	17.88
28	Thakurmunda	Khejuria	15.28
29	Thakurmunda	Suninda	23.93
30	Thakurmunda	Bhadubeda	111.20

Table No 11.6

Area Allotment to Selection Working circle as per Outgoing Plan.

Sl. No	Name of the Range	Name of the Reserved Forest	Area in Ha.
31	Thakurmunda	Dakeipal	120.40
32	Thakurmunda	Mankadabeda	208.40
33	Thakurmunda	Dangadiha	97.20
34	Thakurmunda	Khuntaposi	3.66
35	Thakurmunda	Digdhar	45.10
36	Thakurmunda	Purunapani-2	55.77
37	Thakurmunda	Chainbansi	70.96
38	Thakurmunda	Chirupada	23.49
39	Thakurmunda	Ghorabindha	168.40
40	Thakurmunda	Handiphuta	306.00
41	Thakurmunda	Thakurmunda	250.80
42	Thakurmunda	Akhapalan	57.52
43	Thakurmunda	Chamkpur	182.80
44	Thakurmunda	Hatigoda	108.80
45	Thakurmunda	Jamunalia	20.17
46	Thakurmunda	Badbil	943.20
47	Satkosia	Satkosia	13732.80
48	Satkosia	Noda	352.00
49	Karanjia	Padheidura	457.60
50	Karanjia	Tikasil	92.80
51	Karanjia	Paudia	639.20
52	Karanjia	Hatisalbeda	487.60
53	Karanjia	Kuliposi	24.00
54	Karanjia	Chaturisahi	113.20
55	Karanjia	Kenjhara	117.60
56	Karanjia	Kalakad	100.00
57	Karanjia	Singda-3	112.40
58	Kendumundi	Rengalbeda-1	67.20
59	Kendumundi	Sarubil-1	162.00
60	Kendumundi	Sarubil-2	83.36

Table No 11.6

Area Allotment to Selection Working circle as per Outgoing Plan.

Sl. No	Name of the Range	Name of the Reserved Forest	Area in Ha.
61	Kendumundi	Bisipur-1	421.20
62	Kendumundi	Bisipur-2	74.00
63	Kendumundi	Rengalbeda-2	42.67
64	Kendumundi	Boring	275.20
65	Kendumundi	Sanaandharikhaman	120.00
66	Kendumundi	Gourigoda	66.40
67	Kendumundi	Padiabeda	51.02
68	Kendumundi	Tikarpada	89.20
69	Kendumundi	Sanarugudibeda	212.80
70	Kendumundi	Majuraposi	144.80
71	Kendumundi	Jadbil	187.60
72	Kendumundi	Purunapani	452.80
73	Kendumundi	Patbil	154.80
74	Kendumundi	Kendumundi-1	147.60
75	Kendumundi	Kaliajiani-1	378.80
76	Kendumundi	Kaliajiani-2	147.6
77	Kendumundi	Chheratangar	800.00
78	Kendumundi	Saleibeda	125.60
79	Kendumundi	Kendumundi-2	648.00
80	Kendumundi	Dangapani	104.80
81	Kendumundi	Kadapani	145.20
82	Kendumundi	Asankudar	11.86
83	Gurguria	Badampahar	2012.16
		Total:-	**29651.04**

Table No 11.7

Area Allotment to Rehabilitation Working circle as per Outgoing Plan.

Sl. No.	Name of the Range	Name of the Reserved Forest	Area in Ha.
1	Thakurmunda	Satkosia	925.30
2	Thakurmunda	Handiphuta	215.76
3	Dudhiani	Rugudi	55.20
4	Dudhiani	Palasgadia	49.60
5	Dudhiani	Kadadiha	89.20
6	Dudhiani	Ranipat	20.00
7	Dudhiani	Malharpada	27.20
8	Dudhiani	Khandabandha	34.00
9	Dudhiani	Panposi	33.60
10	Dudhiani	Badnai	23.20
11	Dudhiani	Sannai	9.20
12	Dudhiani	Siramanipur	110.00
13	Dudhiani	Kuita	164.80
14	Dudhiani	Pantho	176.00
15	Dudhiani	Masinabila	77.60
16	Karanjia	Ankura	77.60
17	Karanjia	Sandeuli	120.40
18	Karanjia	Baddeuli	227.60
19	Karanjia	Bhanra	119.60
20	Karanjia	Chauthia	44.80
21	Karanjia	Andharjhari	132.80
22	Karanjia	Sanbadposi	201.20
23	Karanjia	Jhaddumuria	56.80
24	Karanjia	Nuagaon	142.00
25	Karanjia	Pokamunda	190.00
26	Karanjia	Sarabahali	55.20
27	Karanjia	Diajodi	56.40
28	Karanjia	Bala	25.20
29	Karanjia	Ghodaghaguri	141.20

Table No 11.7

Area Allotment to Rehabilitation Working circle as per Outgoing Plan.

Sl. No.	Name of the Range	Name of the Reserved Forest	Area in Ha.
30	Karanjia	Karanjia	109.20
31	Karanjia	Sarubali	83.20
32	Karanjia	Jharbeda	152.80
33	Karanjia	Rasamtala	162.80
34	Karanjia	Kadambeda	79.20
35	Karanjia	Gudidiha	329.20
36	Karanjia	Chanchabani	63.20
37	Karanjia	Salarapada	89.20
38	Karanjia	Kunjia	125.20
39	Karanjia	Sialinai	84.00
40	Karanjia	Biunria	146.00
41	Karanjia	Tato	104.00
42	Karanjia	Hatimundi	147.60
43	Karanjia	Dari	70.80
44	Karanjia	Purunadeogaon	59.60
45	Karanjia	Dumuria	174.80
46	Karanjia	Mota	281.20
47	Karanjia	Ghosda	159.20
48	Karanjia	Sunaposi	108.80
49	Karanjia	Chandiahill	26.44
50	Karanjia	Kusunpur	61.20
51	Karanjia	Gharamabeda	188.80
52	Karanjia	Jambani	107.20
53	Karanjia	Khaparasahi	33.60
54	Karanjia	Jharghosda	36.40
55	Karanjia	Pokharia	219.20
56	Karanjia	Haldia	113.60
57	Karanjia	Singda	77.20
58	Karanjia	Kasia	97.20

Table No 11.7

Area Allotment to Rehabilitation Working circle as per Outgoing Plan.

Sl. No.	Name of the Range	Name of the Reserved Forest	Area in Ha.
59	Karanjia	Dumbisahi	42.00
60	Karanjia	Sarangagarh	113.20
61	Karanjia	Pingua	39.20
62	Karanjia	Phulguntha	103.60
63	Karanjia	Badasurei	44.80
64	Karanjia	Barbil	107.20
65	Karanjia	Ghagi	227.20
66	Karanjia	Sarubil	99.60
67	Karanjia	Kujiamba	155.60
68	Karanjia	Bhanjabeda	145.20
69	Karanjia	Bhramarposi	157.60
70	Karanjia	Kendua	152.00
71	Karanjia	Nuabeda	18.80
72	Karanjia	Maricha	24.00
73	Karanjia	Digiposi	82.40
74	Karanjia	Buruhatu	14.00
75	Karanjia	Sarasposi	115.20
76	Karanjia	Fullcomp	42.80
77	Gurguria	Badampahar	1241.68
78	Gurguria	Begunia	736.80
79	Gurguria	Kudarbisida	388.00
80	Bisoi	-	5900.09
81	Badampahar	-	3497.00
82	Rairangpur	-	14053.98
		Total:-	**34594.25**

Table No 11.8
Area Allotment to Plantation Working circle as per Outgoing Plan.

Name of the Range	Sl. No.	Name of the Reserved Forest	Area in Ha.
Rairangpur	1	-	3380.44
Badampahar	2	-	586.26
Karanjia	3	Panaptria	1520.00
	4	Adipur	39.20
	5	Mahadevdeuli	37.20
	6	Panideuli	98.40
	7	Halpur	122.80
	8	Kanika	24.80
	9	Jhumkapal	38.00
	10	Budhamara	8.80
	11	Salgara	54.80
	12	Chhelianali	44.80
	13	Sankeswari	56.40
	14	Tulasipur	28.00
	15	Tangia	30.00
	16	Mahuliasole	153.60
	17	Galusahi	26.40
	18	Denua	28.40
	19	Jauntia	260.00
	20	Hindola	23.60
	21	Gambharia	40.80
	22	Naksara	20.40
	23	Kudarsahi	20.80
	24	Deodhipa	32.00
	25	Santabandha	17.60
		Total:-	**6693.5**

11.1.5.2 Prescriptions of Working.

A. Selection Working Circle:

The Selection WC was constituted with objectives such as

a. To increase the proportion of Sal and other valuable species. The existing sal crop should be conserved and maintained in the interest of soil, water and environment.

b. Consistent with environmental protection and ecological balance, action will be taken for production of big sized timber in order to cater the requirement of the people.

c. To improve the density, condition and composition of forest cover with due emphasis on soil and water conservation.

d. Tending of growing stock to obtain maximum possible increment, consistent with environment and artificial regeneration techniques are to be adopted wherever necessary for the purpose.

e. Ban on felling of trees should be imposed in order to give rest to sal crop. If required exploitation of silviculturally available exploitable sized trees on sustained yield basis will be taken up.

f. To restock and to regenerate the all blank patches and existing regeneration respectively by planting two years old sal seedlings raised in polythene bags.

g. To improve the ecological conditions and to improve the sanitation condition of the forest by removing dead, dry and uprooted trees.

h. To improve the stocking of low density forest by planting species of fuel, fodder and timber.

i. To protect the hill slopes from erosion and to regulate the local water system by conserving and improving the forest standard.

j. To protect the sal forest from fire, illicit felling, lopping and uncontrolled grazing.

Within the above objectives the area allotted were assigned to 5 Felling series namely Taramara Felling series, Satkosia Felling series, Padeidhura felling Series, Tikarpada Felling Series and Gurguria Felling series with a felling cycle of 20 years which is coterminous with the plan period.

Choice of Species

a. Principal Species:

Sal, Piasal, Kasi, Dhaura, Sisoo, Gambhar and Champa.

b. Useful Species:

Fruit bearing and M.F.P yielding species, Bankhira, Panjan, Nageswar, Koim, Asan, Jamun, Toon, Sidha and softwood like Simal, Salai, Kadamba, Rimuli, Bhurkund, Panigambhari and mango.

c. Inferior Species:

All other Species not listed.

Exploitable Girth

Table No 11.9
Exploitable Girth (Selection WC)

Species	Exploitable Girth (GBH)
Sal	150cm
Bandhan (Panjam)	105cm
Sissoo	90cm
Toon, Asan, Mango, Semal, Char, Gambhar, Bankira, Koim, Piasal, Bhurkhund	120cm
All other Species not listed	90cm

The principal, useful and inferior species shall be exploited if dead, dry and up-rooted.

Subsidiary Silvicultural Operations

a. Cutting back of high stumps and damaged stems of valuable species, to give good coppice growth. Singling out of coppice shoots will be carried out every year.

b. Regeneration cleaning i.e. cutting all malformed and defective saplings in multiple shoots of established regeneration of principal and other species for facilitating healthy growth.

c. The shrub cutting after rainy season must be done in regeneration areas until regeneration is fully established.

d. Controlled burning shall be carried out in whippy regeneration areas latest by mid-February.

e. All climbers except endangered and medicinal species shall be cut down.

f. SSO shall not be taken up in 50m radius left around any precipitous area or any key habitat if wild animal such as drains, nalas, saltlicks, wallows, water holes, gametanks etc.

g. The left over lops and tops after felling and subsidiary operation shall be collected and heaped at places on the coupe line boundary in 2m×1m×1m dimension which may provide shelter to small wild animals.

h. Blank areas, low density forest areas deficient in regeneration shall be identified and their extent to be determined for filling of the gaps.

Such blanks will be planted with two years old saplings of suitable species.

A. Rehabilitation Working Circle:

The Rehabilitation WC was constituted with objectives such as

a. To re-stock the degraded forests quickly by inducing natural regeneration, supplement through artificial regeneration,
b. To increase the productivity of the forest through various silvicultural methods.
c. To cover the forest land with indigenous species to meet local demand and high biomass production per hectare per year
d. To enhance moisture regime through Soil & Moisture Conservation, Checking of accelerated soil erosion.
e. To regulate the surface water runoff for enhance percolation and water availability down the stream.
f. To partner with the local community in protection and management of the forests.
g. To restore and improve the microclimate and micro edaphic condition.
h. To increase the biodiversity and heterogeneity in the forest crop by encouraging natural regeneration.

i. Reduce the biotic pressure, grazing and forest fire so as to give a favourable condition to establish the natural regeneration of both seed & coppice origin.

j. To meet bonafide requirement of people for household articles, building materials.

k. To enhance growing of palatable fodder to animals both wild &domestic.

l. Suppression & eradication of obnoxious weeds and improve the habitat quality.

Within the above objectives the area allotted were assigned to different treatment series (Rehabilitation Series) with a Rehabilitation cycle of 10 years in order to rehabilitate the areas within this working plan.

The prescription includes Silvicultural Cleaning with Gap planting, Soil & Moisture Conservation, Fencing, Protection against Fore, Grazing and illicit felling.

B. Plantation Working Circle:

The area allotted to this working Circle is 6693.5 ha. The special objectives of the management of the Plantation Working Circle are as follows: -

i. To reforest the barren land and depleted areas with suitable indigenous species to meet the local need of timber, firewood, MFP, fodders, industries etc. with participation of local people.

ii. To check the soil erosion on barren hills through effective soil and water conservation measures along with plantation.

Rotation & Harvestable Girth

In the outgoing plan it is suggested a 15 years rotation Cycle for Eucalyptus hybrid and 12 years for *Acacia auriculiformis* and San-Chakunda.

Table 11.10
Age and exploitable girth of Species as suggested

Sl. No.	Species	Exploitable Girth in cm	Age of attaining exploitable girth.	Remark
1	*Acacia auriculiformis*	60	12 years	The purpose of Exploitation is to get firewood, small timber and pulp for industry.
2	*Eucalyptus hybrid*	75	15 years	
3	San-Chakunda (*Cassia siamia)*	60	12 years	
4	Sisoo (*D. Sisoo*)	145	60 ears	

C. Wildlife (Overlapping) Working circle:

This is an overlapping Working Circle. The entire area has been assigned to this Working Circle. The objectives of this Working Circle are

i) Conservation, preservation and protection of the wildlife habitat and biodiversity.

ii) Socio-Economic developments of local community are stressed upon.

iii) Adequate protection of Water holes and creation of Check dams.

iv) Natural Salt licks identified.

v) Enrichment planting of favorable species of wildlife & planting of grasses.

vi) Strict protection against fire, grazing, illicit felling & poaching.

vii) Maximum importance on improvement of floral composition and density.

viii) Soil & Water conservation measures taken up.

ix) Involvement of Wildlife Protection Committee stressed.

x) Implementation of Tourism and Publicity.

xi) Scientific Study and wildlife Census.

The objectives of management of forest having rich wildlife potential are mainly concentrated on protection and its conservation. Further, this includes areas like Mayurbhanj Elephant Reserve, Elephant Corridor and Tiger Corridor.

Result of Prescriptions:

Selection WC:

During the plan period, moratorium on felling was in force from 1992 to 2004. After lifting of the aforesaid moratorium vide Notification No. 10F (TF) 26/203-16498/ F&E dt. 20.09.2005 the implementation of the prescription has been done in this working circle. Dead and dying trees are available silviculturally for felling. It is found that no green tree has been marked during the last plan period due to the restrictions imposed by Govt. of Odisha. So, the harvesting of silviculturally available trees in accordance with the prescribed marking rule has not been carried out during last plan period, but hygienic felling i.e. removal of dead and wind fallen tree has been done for upkeep of the health of the forest.

The forests were protected against the fire, illicit removal and encroachment. But, due to heavy biotic pressure from adjoining areas for firewood, timber and grazing, the desired level of the objective of improving the productivity of Sal forest species composition and established regeneration could not be achieved.

Rehabilitation WC:

a. Qualitative coppice grew up after malformed and defective stumps and unwanted coppice shoots removed.
b. Useful coppicing developed from malformed shoots
c. Less fire hazard in Silvicultural operation implemented areas in forest blocks.
d. Fire hazard reduced with the involvement of VSS in the areas where Silvicultural operation was taken up.
e. More natural regeneration of species like *Terminalia alata, Anogeissus latifolia, Lagerstomia parviflora, Madhuca indica, Boswellia serrata* and *Diospyros melanoxylon* species observed as the Rehabilitation area was protected from fire hazard and biotic interference.
f. The area developed remarkably after implementation of soil and moisture conservation in the form of gulley plugging, LBCD, half-moon trench, contour trench etc.

Plantation WC:

The species planted are of mixed species i.e. of fuel wood, timber and NTFP in nature. The growth pattern is not as expected.

Wildlife Management (Overlapping) WC

During the current plan (1996-97 to 2015-16) it is experienced gradual rise of Man-elephant conflict, attack of wild bear on human being, death of wild lives and death of human beings crop damage by elephants, wild boars and poaching of animals etc.

Due to biotic pressure mining and other development activities the wild lives are disturbed, their corridor is fragmented. The activities taken up in Elephant Corridor and water bodies excavated to improve wildlife habitat and to reduce wildlife depredation are detailed below.

1. Creation of Water body. Table no. 11.11

Year	Name of the Range	Name of the Scheme	Name of the Site	Expenditure incurred
2009 – 10	Gurguria	CP – SBR	Barigaon	3,00,000
	Dudhiani	CP-SBR	Ranipat	3,00,000
		SP – EMP	Mota	3,00,000
		CP - SBR	Tulsiposi	2,50,000
	Dudhiani	CP – SBR	Baghalata	3,00,000
	Karanjia	SP – EMP	Ghosda RF	3,00,000
		NREGS	Kuliposi R.F.	3,00,000
		NREGS	Paudia R.F.	3,00,000
		NREGS	Padeidhuda R.F.	3,00,000
2010-11	Thakurmunda	CAMPA (WL)	Khejuria	3,00,000
	Dudhiani	CAMPA (WL)	Purunapani	3,00,000
	Karanjia	SP – EMP	Baddeuli R.F.	3,00,000
		CP – SBR	Nuagaon R.F.	3,00,000
		CP – SBR	Bhrmarposi R.F.	3,00,000

Year	Name of the Range	Name of the Scheme	Name of the Site	Expenditure incurred
		CP – SBR	Tikasil R.F.	3,00,000
		CP – SBR	Hatisalbeda R.F.	3,00,000
		SP – EMP	Kalakad R.F.	3,00,000
		SP – EMP	Hatisalbeda R.F.	3,00,000
	Satkosia	CP - SBR	Satkosia RF – I – B	2,18,000
		SP – EMP	Satkosia RF – I – B	3,00,000
2011 – 12	Gurguria	CP – EMP	Khejuri	3,00,000
	Kendumundi	CAMPA (WL)	Kendumundi	3,00,000
		CAMPA (G)	Sanranibhol	3,00,000
		CAMPA (WL)	Khaparkhai	3,00,000
		CAMPA (G)	Dangapani	3,00,000
		CAMPA (WL)	Asankudar	3,00,000
	Karanjia	CAMPA (G)	Baddeuli R.F.	3,00,000
		CAMPA (WL)	Baddeuli R.F.	3,00,000
		CAMPA (G)	Sunaposi R.F.	3,00,000
		CAMPA (WL)	Kendua R.F.	3,00,000
		CAMPA (WL)	Paudia R.F.	1,00,000
	Satkosia	CAMPA (WL)	Satkosia RF – I – B	1,00,000
		CAMPA (G)	Satkosia RF Compt. – No - 5	3,00,000
		CAMPA (WL)	Satkosia RF Compt. No. – 20	3,00,000
2012 – 13	Dudhiani	CAMPA (WL)	Badramchandrapur	
	Kendumundi	CP – EMP	Bisipur RF – II	4,00,000
	Gurguria	SP – Corridor	Nawana	2,00,000
		SP – Corridor	Ramasahi	2,00,000
		SP – Corridor	Nuhamalia	2,00,000
		SP – Corridor	Niunti	2,00,000
	Karanjia	CP - SBR	Baddeuli R.F.	2,50,000
		CP – SBR	Paudia R.F.	3,50,000
	Satkosia	CAMPA (G)	Satkosia RF Compt. No. – 13	3,00,000
		CAMPA (G)	Satkosia RF Compt. No. – 13	3,00,000
	Satkosia	CAMPA (G)	Satkosia RF Compt. No. – I – B	2,50,000
2013 – 14	Gurguria	SP – Corridor	Jamda	2,50,000
		CP – SBR	Gurguria	2,50,000
		CP – SBR	Jharbeda	2,50,000
		CP – SBR	Batisahi	2,50,000
		CP – SBR	Ramasahi	2,50,000
		CAMPA (G)	Genteisahi	2,50,000
		CAMPA (G)	Tangurusahi	2,50,000

Year	Name of the Range	Name of the Scheme	Name of the Site	Expenditure incurred
		CAMPA (G)	Nuhamalia	2,50,000
	Dudhiani	CAMPA (G)	Gudidiha	2,50,000
		CAMPA (G)	Mota	2,50,000
	Kendumundi	CAMPA (G)	Badranibhol	2,50,000
		CAMPA (G)	Burusahi	2,50,000
		CAMPA (G)	Bisipur RF – II	2,50,000
	2013 – 14 Thakurmunda	CAMPA (G)	Mandaljhari	2,50,000
		CAMPA (G)	Karkatbeda	2,50,000
		SP EMP	Sudarsanpur	2,50,000
		SP EMP	Hatigoda	2,50,000
		CAMPA (WL)	Chirupada	2,50,000
		CAMPA (WL)	Sunida	2,50,000
		CAMPA (WL)	Khediaposi	2,50,000
		CAMPA (WL)	Purunapani	2,50,000
	Karanjia	CAMPA (G)	Balasahi	2,50,000
	Satkosia	CAMPA (G)	Satkosia Rf compt. No. – 6	2,50,000
		CAMPA (G)	Satkosia Rf compt. No. – 1	2,50,000
		CAMPA (WL)	Satkosia Rf compt. No. – 1b	2,50,000
2014 – 15	Karanjia	CAMPA (G)	Sarangoard R.F.	2,50,000
		CAMPA (WL)	Jamubani R.F.	2,50,000
		CAMPA (G)	Sarbhadi R.F.	2,50,000
		CAMPA (G)	Baddeuli RF	2,50,000
		CAMPA (WL)	Kalakada	2,50,000
		CAMPA (G)	Panpatria RF	2,50,000
		SP – EMP	Ghosda RF	2,50,000
		SP EMP	Ghagi RF	2,50,000
	Thakurmunda	CAMPA (G)	Ghadabindha	2,50,000
		CAMPA (G)	Hatikana	2,50,000
		CAMPA (G)	Patrapada	2,50,000
		CAMPA (G)	Gudurubani	2,50,000
		CAMPA (G)	Khediaposi	2,50,000
2014 – 15	Kendumundi	CAMPA (G)	Boring	2,50,000
		CAMPA (G)	Khadidamak	2,50,000
		CAMPA (G)	Khaparkhai	2,50,000
		CAMPA (G)	Rugudisahi	2,50,000
	Dudhiani	CAMPA (G)	Barapanposi	2,50,000
		CAMPA (G)	Pokamunda	2,50,000
		CAMPA (G)	Bankati RF	2,50,000
		CAMPA (G)	Surubil	2,50,000
		CAMPA (G)	Pahadmadak	2,50,000
		CAMPA (G)	Dudhiani	2,50,000

Year	Name of the Range	Name of the Scheme	Name of the Site	Expenditure incurred
	Gurguria	CAMPA (G)	Kuanribil	2,50,000
		CAMPA (G)	Ektali DPF	2,50,000
		SP – Corridor	Chemundia	2,50,000
		SP – Corridor	Ektali DPF	2,50,000
		SP – Corridor	Dhulia	2,50,000
	Satkosia	CAMPA (WL)	Satkosia Rf compt. No. – 06	2,50,000
		CAMPA (WL)	Satkosia Rf compt. No–05	2,50,000
		CAMPA (WL)	Satkosia Rf compt. No. – 08	2,50,000
		CAMPA (WL)	Satkosia Rf compt. No. – 07	2,50,000
		SP – Corridor	Satkosia Rf compt. No. – 12	2,50,000
2015 – 16	Gurguria	SP – Corridor	Dhulia	2,50,000
2016 – 17	Karanjia	PE- EMP	Sanbadposi	4,00,000
	Karanjia	PE - SBR	Chitraposi	4,00,000
	Gurguria	PE – SBR	Gudurubani	4,00,000
	Thakurmunda	PE – SBR	Kerketabeda	4,00,000
	Satkosia	PE – SBR	Satkosia RF	4,00,000
	Satkosia	PE – Corridor	Kundei RF	4,00,000
	Thakurmunda	CAMPA (WL)	Sirkasahi	4,00,000
	Dudhiani	CAMPA (WL)	Kaikasahi	4,00,000
2017 – 18	Satkosia	CAMPA (WL)	Majuraposi	4,00,000
	Thakurmunda	CAMPA (WL)	Khediaposi	4,00,000
	Satkosia	PE – SBR	Dhatikidiha	10,00,000
	Kendumundi	PE – SBR	Jadbil	10,00,000
	Satkosia	PE – SBR	Nakjhari	5,00,000
	Satkosia	PE – SBR	Godbhanga	5,00,000
	Satkosia	PE – SBR	Benudhar	5,00,000
	Satkosia	PE – SBR	Mundasahi	5,00,000
	Dudhiani	PE – SBR	Sanramchandrapur	4,00,000
	Dudhiani	PE – SBR	Gudidiha	4,00,000
	Gurguria	PE – SBR	Rangamatia	5,00,000
	Dudhiani	PE – SBR	Tainsira	4,00,000
	Gurguria	PE – Corridor	Batisahi	4,00,000
2018 – 19	Gurguria	PE – Corridor	Kanthikana	4,00,000
	Kendumundi	PE – EMP	Kendumundi RF	4,50,000
	Thakurmunda	PE – EMP	Sudarsanpur	4,50,000
	Satkosia	PE – SBR	Nunkhai	10,00,000
	Gurguria	CAMPA (WL)	Thakurgoda	3,00,000
	Thakurmunda	CAMPA (WL)	Talpada	3,00,000
2019 – 20	Karanjia	PE – SBR	Chaturisahi	10,00,000
	Thakurmunda	PE – SBR	Khediaposi	5,00,000
	Karanjia	PE – SBR	Sarngarh	5,00,000
	Dudhiani	CAMPA (WL)	Kaleitumba RF	5,60,000

Year	Name of the Range	Name of the Scheme	Name of the Site	Expenditure incurred
	Thakurmunda	CAMPA (WL)	Mankadbeda RF	5,60,000
2020 – 21	Satkosia	PE – Corridor	Kumbalor	6,00,000
	Thakurmunda	PE – EMP	Badbil RF	5,96,000
	Thakurmunda	PE – EMP	Ghodabindha RF	5,96,000
	Thakurmunda	PE – EMP	Mandaljhari RF	5,96,000
	Karanjia	PE – EMP	Panpatria RF	5,96,000
	Karanjia	CAMPA –WL	Ankura RF	10,00,000
	Dudhiani	CAMPA-WL	Ektali PRF	10,00,000
	Thakurmunda	CAMPA-WL	Mandaljhari RF	5,96,000
	Thakurmunda	CAMPA-WL	Khediaposi RF	5,96,000
	Thakurmunda	CAMPA-WL	Keshdiha RF	5,96,000
	Thakurmunda	CAMPA-WL	Keshdiha RF	5,96,000
	Satkosia	CAMPA-WL	Satkosia RF Comp 13	5,96,000

2. Elephant Trench & Solar Fencing:

Table no. 11.12

Year	Name of the Site	Scheme	Length of Elephant Trench	Length of Solar fencing	Amount spent
2010 – 11	Jamunalia	SP – EMP	---	4 Kms.	4,00,000
	Chitraposi	CAMPA (WLM) APO 2009- 10		1 Kms.	75,000
2011 – 12	-	---	---	--	--
2012 – 13	Khadan Sahi to Nawana	SP – Management of Elephant Corridor	2 Kms.		8,00,000
2013 – 14	Ramasahi to Dayaposi	SP – Management of Elephant Corridor		20 Kms.	30,00,000
2014 – 15	Baliposi to Bhonra	CP – EMP		4 Kms.	6,00,000
2015 – 16	-	---	---	--	--

Table no. 11.12

Year	Name of the Site	Scheme	Length of Elephant Trench	Length of Solar fencing	Amount spent
2016 – 17	Talpada RF	PE-EMP	2.5 Kms.		7,50,000
	Batisahi	PE – Management of Elephant Corridor	1.5 Kms.		8,25,000
	Kiajhari		0.4 Kms.		2,20,000
	Khandiadar		1.1 Kms.		6,05,000
2017 – 18	Sagada – Baitarani River Bank	PE-CSS-EMP		4 Kms.	8,00,000
	Talpada RF	PE-CSS-EMP		4 Kms.	8,00,000
2018 – 19	Taramara RF	PE-CSS-EMP	3 Kms.		18,51,000
2019 – 20	Nuabeda to Angarpada	CAMPA (WL) APO 2019-20		3.05 Kms.	25,00,000
2020 – 21	--	--	--	--	--

Table no. 11.13
List of Anti-Poaching Camps

Year	Name of the Scheme	Name of the Range	Location	Amount
2015 – 16	SP – STR	Thakurmunda	Sadananda	6,00,000
2016- 17	--	--	--	--
2017 – 1 8	SP – STR	Dudhiani	Kaleitumba	8,00,000
	SP – Corridor	Gurguria	Ramasahi	8,50,000
2019 - 20	PE – STR	Satkosia	Dhatikidiha,	6,42,000
		Satkosia	Bhaliadal	6,42,000

11.2 Special works of improvement undertaken

During the last plan period many special work of improvement were undertaken for demarcation of forest through GPS PDA device, for survey of

plantation area by GPS system and asset mapping by diverting from traditional prismatic compass and chain survey. Due to adaptation of GPS device the survey has been more accurate, time saving, easier and less cumbersome. Likewise, protection of forest through foot patrolling by using GPS PDA has enhanced quantitatively and qualitatively. Facilitating the supervising officer for proper monitoring of the forest areas from his desktop.

To prevent and monitor Elephant depredation the use of Elephant app increases the capacity of field and supervise officer properly. The use of satellite date through MODIS and SNPP facilitates early detection of forest fire in dense hilly un-accessible areas of forest for effective fire prevention and control measures. The introduction of fire blowers for creation of advance fire line has a tremendous impact on control of forest fire as it is very handy and effective in forest areas for its quick service. Further use of drone camera facilitates detection of timber smugglers and poachers who enter in mass inside forest for timber smuggling and hunting of wild animals so as to take immediate remedial steps and to counter them effectively. Standard operating procedures have been developed to deal with forest fire prevention and management, DGPS survey of forest lands, depredation of tiger & leopard etc. and post-mortem of wild animals.

Further during tiger estimation both pre and post monsoon GPS PDA are being put to use through online and offline mode making the process very transparent through introduction of forestry Apps in android mobiles sets provided to the field functionaries.

11.3 Working Schemes from the year 2015-16 to 2020-21 (5 years)

As the previous plan by Sri A.O.F Bakhala expired in 2015-16, the working schemes were formulated and approved by MoEF pending preparation of current working plan. Hence, the schemes have been discussed as follows.

11.3.1 The working schemes for the years 2016-17, 2017-18.

In the year 2016-17 & 2017-18 working circles as mentioned below were constituted.

Year		2016-17	2017-18	Total
Sl. No.	**Name of the Working Circle**	**Proposed Area (In Ha.)**	**Proposed Area (In Ha.)**	**Proposed Area (In Ha.)**
1	Selection Working Circle	715.20	1217.27	1932.47
2	Rehabilitation Working Circle	509.33	726.94	1236.27
3	Plantation Working Circle	14.00	0	14.00
4	Improvement Working Circle	556.92	0	556.92
5	Protection Working Circle	2708.31	2684.31	5392.62
	Total:-	**4503.76**	**4628.52**	**9132.28**

Each working circle is discussed below for above working schemes

Selection Working Circle: -

The areas (1932.47) which were under Selection Working Circle of previous working plan were proposed to be continued in the above Working schemes. These 7 Nos. of forest blocks are having the potentiality of forest for selection working circle. These forest blocks require treatments in silvicultural operation, protection of natural regeneration and Artificial Natural Regeneration through gap planting in the proposed Working Schemes. In the proposed schemes 7 Nos. of forest blocks have been proposed with area 1932.47 ha. The marking should be conservation oriented than commercial harvesting oriented with prescription of removal of dead, dry and fallen trees only. Also proper samplings and accurate yield calculation be made. There should be specific prescription of improvement in selection forests to improve the growth of principal and secondary species.

Regular climber cutting and other subsidiary silvicuiltural operation (SSO) should be done in extensive manner where timber operation has completed. The coupes which have not been worked also be treated with SSO work. Sufficient fire protection measures should be prescribed to help the seedlings and saplings to establish.

Headings	Particulars of prescriptions
General constitution of working circle	High forests having more crown density, good natural regeneration and also crop of different age class are the constituents of Selection Working Circle. The area of 1932.47 ha covering 7 forest blocks have been allotted to this WC to facilitate silvicultural operations and eradication of weeds.

<table>
<tr><td>Felling Series: -</td><td>To be decided by the Working Plans Officer</td></tr>
<tr><td>Special objectives of management</td><td>1. To Stabilise the environment and ecology with enrichment of the vegetation both in quality and quantity through proper silvicultural treatment.
2. To Encourage and establish the natural regeneration of the crop with special emphasis on hill slopes and other eco-fragile areas.
3. To Limit the harvest of mature crop to silviculturally and environmentally permissible extent through selection felling in consonance with provision under TCP of STR.
4. To Ensure the general hygiene of the forests through removal of causative substance like dead and uprooted trees and strangulating climbers.
5. To Conserve the moisture and soil through appropriate measures for ensuring the streams, nalas and ultimately the rivers to become perennial and fertility of the soil
6. To Tackle the biotic interference effectively to protect and promote the forests.
7. To ensure eradication of weeds in the forests where ever those are required.</td></tr>
<tr><td>Silvicultural system</td><td>It should be selection system and ANR gap planting may be made wherever it is required.</td></tr>
<tr><td>Exploitable girth classes</td><td>
<table>
<tr><th>Sl. No.</th><th>Name of the species</th><th>Harvestable girth at breast height in Cm.</th></tr>
<tr><td>1</td><td>Sal</td><td>150</td></tr>
<tr><td>2</td><td>Asana, Kuruma, Bija, Mundi,</td><td>180</td></tr>
</table>
</td></tr>
</table>

			Champa, Sirisa and Kasi	
		3	All other species	150
		4	Teak	120
Felling Cycle	The felling cycle shall be fixed as 10 years coinciding with that of the plan period to provide the management work for the allotted area in entirety.			
Calculation of Yield	Yield must be regulated by area with a riding factor on the number of silviculturally available trees of exploitable girth class basing on Smythie's safeguarding formula.			

Sequence of Felling	The felling shall be phased and sequential in the forest blocks to maintain the order of rotation for the next plan period. The sequence of felling in different years indicating the coupe, forest block area shall have to be furnished in a tabular statement for each felling series.
Demarcation of Coupes	The Section Forester or any higher officer shall demarcate the coupe in the field during the month of January i.e. well ahead of the starting of work in the month of October.
Marking Rules	1. All dead and uprooted trees excluding the retention of those absolutely necessary for congenial habitat of Wild Life shall be marked for felling throughout the entire coupe area. 2. Marking is strictly prohibited in the areas where slope of the terrain is more than 30^0 except for dead and uprooted trees. 3. No live standing tree shall be marked within 50 meters of roadside and either side of the bank of nallas, streams, rivers and other water bodies.

	4. Marking shall not be done within 50 meters radius around the key habitats of wild animals such as den, saltlick, wallows, game tank and water holes. 5. No fruit bearing trees namely Mahula, Mango, Tamarind, Kusuma, Karanja, Amla, Harida, Bahada, Chara, Bela, Ambada, Kendu, Jamu etc. having significant importance shall be marked. 6. Trees above the prescribed exploitable / harvestable girth at breast height are eligible for marking, but the number and location of the trees to be marked for felling shall be controlled by the prescribed ceiling of number of trees for the coupe as per yield calculation and the silvicultural permissibility. 7. Notwithstanding the general principle and practice of silviculture, a tree is considered as silviculturally permissible / available for marking on following criteria:- a. That its removal shall not create a permanent gap in the canopy. b. That it removal will not affect the regeneration and fauna particularly the habitat of wild animals. c. That its removal will not allow the invasion of weed growth. d. That its removal will promote the growth of crop of middle and under storey. e. That its removal will encourage regeneration. f. That it is not putting on a valuable increment and has become unsound, diseased and deformed. 8. Climbers strangulating the growth of tree crop shall be cut to facilitate the development of the crop. 9. For areas coming under Similipal Tiger Reserve, marking to be carried out as per prescription of Tiger Conservation Plan.

	Instead of species preference, growing vigour, dominance and healthy conditions shall be taken into considerations while choosing among the trees of exploitable girth for retention.
Marking Officer	A Forest Officer not below the rank of a Forest Ranger shall mark the trees for felling and the same will be checked as per the provisions of Orissa Forest Department Code 1979 as modified by the Government from time to time.

Area of Selection Working Circle

Year			2016-17	2017-18
Sl. No.	**Name of the Range**	**Felling Series**	**Area in Ha**	**Area in Ha**
1	Karanjia	Padheidhara	220.00	236.11
2	Kendumundi	Tikarpada	495.20	265.56
3	Satkosia	Satkosia	0	715.60
		Total:-	**715.20**	**1217.27**

Rehabilitation Working Circle:-

In this schemes period, 19 forest blocks, 1 no. PRF, 1 no. DPF and 3 no. VF are included with 1236.27 ha. of forest land.

Headings	Particulars of prescriptions
General Constitution	Depleted forest blocks having adequate potentiality to rejuvenate requiring the restriction on degradation along with the measures of rehabilitation for restoration are taken to constitute this working circle with assignment of 1236.27 ha. of area.
Rehabilitation Series	The W.P.O. shall decide the nos. of series of working.
Special Objective of Management	1. To **Re**strict the degradation by reducing the biotic interference to barest minimum and reverse the trend towards the process of restoration. 2. To **D**evelop the forest by providing site-specific required silvicultural treatment and planting with indigenous species.

	3. To **F**acilitate the boosting of natural regeneration and ensure its establishment. 4. To take up soil and moisture conservation measures to improve the soil and moisture regime with special emphasis on upper reaches of the hill slope to ensure the perennial nature of the streams, nallas etc. 5. To conserve the area for bio diversity. 6. To improve the microclimate of the area as a whole, thereby ensuring environmental stability.
Rehabilitation Cycle	A 1 (one) year Rehabilitation Cycle is adopted coinciding with the plan period.
Preparation of Rehabilitation Plan	The rehabilitation plan shall be prepared by Range Officer, scrutinized by the Assistant Conservator of Forests and approved by the Divisional Forest Officer. This is a site-specific plan containing the operation to be taken up.
Silvicultural Operations	It is the most vital component of the rehabilitation work which shall be carried out scrupulously and meticulously. These operations are mostly cleaning intended to induce or augment the natural regeneration and tending the existing crop for promoting its growth and development.
Soil & Moisture Conservation Measures (SCM)	Appropriate soil and water conservation measures shall be taken up to reduce the velocity of the water flow and to retain the topsoil. Measures like gully plugging, loose boulder check dams, contour bunds, nalla bunding and vegetative bunds suitable to the site 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.

Area of Rehabilitation Working Circle

Year			2016-17	Year			2017-18
Sl. No.	**Name of the Range**	**Name of felling Series**	**Total proposed area(in Ha.)**	**SL No.**	**Name of the Range**	**Name of felling Series**	**Total proposed area (in Ha.)**
1	Karanjia	Andharjhari	51.20	1	Karanjia	Sunaposi	72.80
		Karanjia	92.57			Pahadbhanga	64.20
		Bhanjabeda	74.76			Panpatria	152.00
		Singda	72.00	2	Satkosia	Duarsuni	104.27
		Sunaposi	62.80	3	Dudhiani	Mota	59.60
		Sarasposi	24.00			Jharbeda	82.00
2	Dudhiani	Jharbeda	82.00			Pantho	41.00
3	Kendumundi	Tikarpada	50.00			Tato	83.87
		Total:-	**509.33**			**Total :-**	**726.94**

Plantation Working Circle:-

As per direction of the MoEF while approving the working schemes of Karanjia Division, these AR plantation areas done from 1996-97 to 2015-16 on need not be worked out in Plantation working circle in view of less survival percentage in the ensuing working Schemes period.

In the proposed schemes period 14.00 ha covering 1 forest block have been proposed**.**

The special objectives of this Working Circle will be as follows: -

(i) To restock the degraded and blank areas with artificial regeneration/Artificial Natural regeneration by uprooting weeds if available.

(ii) To enhance the land productivity through soil and moisture conservation.

(iii) To increase the bio-diversity for improvement of local ecology.

(iv) To reduce the grazing pressure on forest by supply of fodder grasses.

(v) Old matured plantation should be proposed for removal and restocked.

Headings	Particulars of prescriptions
General Constitution	In view of tackling of blank areas through planting and areas in need of protection and tending/thinning operations. These areas overlap mainly the area of Rehabilitation Working Circle and to some extend that of Selection Working Circle.
Special Objectives of Management	1. To **P**romote the growth of existing plantation through suitable tending/thinning operations. 2. To **L**essen the biotic interference to the barest minimum with the active participation of VSS and ensure proper protection. 3. To **A**dopt suitable soil and moisture conservation measures to enhance the moisture regime of the area for nourishment and improvement of the plantation. 4. To **N**urture the suppressed plants till reaching the desired growth. 5. To treat the failure blank patch with planting seedlings suitable to the site preferably with indigenous species.
Tending Cycle	A 1 (one) year Cycle is prescribed.

Preparation of Tending Plan	A site-specific plan for each plantation shall be prepared by the Range Officer which will be scrutinized by Assistant Conservator of Forests and approved by the Divisional Forest Officer.
Tending Operations	The operations like weeding, pruning, climber cutting, thinning etc. shall also be carried out as envisaged in the Tending Plan.
Thinning Operation	As thinning is to be done very sparingly with meticulous application of mind and extreme silvicultural restraint, this should be assessed by the Range Officer, scrutinized by the Assistant Conservator of Forests and finally approved by the Divisional Forest Officer prior to the execution of this operation.

Area of Plantation Working Circle

Year			**2016-17**	**2017-18**
SL. No.	**Name of the Range**	**Felling Series**	**Total proposed area**	**Total proposed area**
1	Karanjia	Sarasposi	14.00	0

Improvement Working Circle

Under Improvement Working Circle works like SSO work, climber cutting, unwanted growth misc. cutting and singling works are to be taken up during Working Schemes period.

Area of Improvement working Circle

Year			2016-17	2017-18
SL. No.	**Name of the Range**	**Felling Series**	**Total proposed area in Ha.**	**Total proposed area in Ha.**
1	Thakurmunda	Taramara	**556.92**	0

Protection Working Circle

For improvement of Protection Working Circle, the work like fencing, watch and ward, digging of trench, fire line creation, fire line maintenance and engagement of Anti-depredation squad are to be taken up during the working Schemes period.

Area of Protection Working Circle

Year			2016-17	Year			2017-18
SL No.	**Name of the Range**	**Felling Series**	**Total proposed area**	**SL No.**	**Name of the Range**	**Felling Series**	**Total proposed area**
1	Karanjia	Sunaposi	11.60	1	Karanjia	Andharjhari	50.00
		Pahadbhanga	70.70			Karanjia	69.02
		Badadeuli	59.80			Bhanjabeda	55.51
		Jamuti	135.12			Sarasposi	41.80
2	Kendumundi	Tikarpada	52.46			Singda	49.00
	Dudhiani	Siramanipur	37.00			Badadeuli	60.70
		Mota	70.80			Jamuti	132.46
		Tato	74.00	2	Thakurmunda	Taramara	599.60

		Pantho	40.00	3	Kendumundi	Tikarpada	152.76
3	Gurguria	Gurguria	201.60	4	Dudhiani	Siramanipur	37.00
		Kudarbisida	31.20	5	Gurguria	Gurguria	201.60
		Begunia	73.58			Kudarbisda	39.00
		Bhanda	266.85			Begunia	74.00
		Jashipur	15.00			Bhanda	269.06
						Jashipur	16.20
4	Satkosia	Satkosia	1568.60	6	Satkosia	Satkosia	715.60
						Duarsuni	121.00
		Total:-	**2708.31**			**Total:-**	**2684.31**

11.3.2 Working Schemes for the years 2018-19, 2019-20 & 2020-21

Basis of constitution of Working Circle:-

As per discussion and approval by the Standing Consultative Committee meeting held on dt. 26.10.2016 the working schemes of this Division has been revised. Accordingly, instead of Selection Working Circle, Selection-cum-Improvement Working Circle has been created by transferring degraded area of Selection Working Circle and improved area of Rehabilitation Working Circle where it attained pole crop and part of Plantation Working Circle in to it with required management prescriptions i.e. silvicultural operation, protection of natural regeneration and soil moisture conservation for

improvement without gap plantation. For Rehabilitation Working Circle, importance has been given for protection, root stock management, soil moisture conservation and gap plantation. As there is less feasibility or scope for plantation the Plantation Working Circle has been reduced. It is proposed to have 06 Working Circles in this Working Schemes which include the objectives as outlined below.

Year		2018-19	2019-20	2020-21	Total
Sl. No.	**Name of the Working Circle**	**Proposed Area (in Ha.)**	**Proposed Area (in Ha.)**	**Proposed Area (in Ha.)**	**Proposed Area (in Ha.)**
1	Selection-cum-Improvement WC	3174.08	3464.19	3345.56	**9983.83**
2	Rehabilitation Working Circle	1381.56	1218.29	1178.67	**3778.52**
3	Plantation Working Circle	49.62	49.34	49.69	**148.65**
4	N.T.F.P. Overlapping Working Circle	0	0	0	**0**
5	Wildlife Overlapping Working Circle	0	0	0	**0**
6	J.F.M. Overlapping Working Circle	0	0	0	**0**
Total:-		**4605.26**	**4731.82**	**4573.92**	**13911.00**

Selection-cum-Improvement Working Circle:-

The areas (9983.83 ha.) which were under Selection Working Circle and Rehabilitation Working Circle in the existing Working Schemes has been proposed

with a little deviation in the proposed working schemes. In this working circle 44 no. of forest blocks are having the potentiality of forest included for Selection-cum-Improvement Working Circle. These forest blocks require treatments in silvicultural operation, protection of natural regeneration and soil moisture conservation without gap planting in the proposed Working Schemes. The special objective of management will be same as in the past management of the S.W.C. with various measure of improvements. The marking should be strictly conservation oriented than commercial harvesting oriented with prescription of removal of dead, dry and fallen trees with proper samplings and accurate yield calculation. There should be specific prescription of improvement in selection-cum improvement felling series to improve the growth of principal and secondary species. Regular climber cutting and other subsidiary silvicuiltural operation (SSO) along with soil moisture conservation should be done in extensive manner. Sufficient fire protection measures should be prescribed to help the seedlings and saplings to be established and the regeneration to be stabilized.

44 no. of forest blocks in the ongoing plan have been taken into proposed schemes.

The difference of the area is due to the ongoing schemes having GIS data and the proposed schemes having the notified data.

Headings	**Particulars of prescriptions**
General constitution of working circle	High forests having more crown density, good natural regeneration and also crop of different age class are the constituents of Selection-cum-Improvement Working Circle. The area of 9983.83 ha covering 44 no. of forest blocks have been allotted to this WC to facilitate silvicultural operations and eradication of weeds.
Improvement Series:	To be decided by the Working Plan Officer
Special objectives of management	1. To **S**tabilize the environment and ecology with enrichment of the vegetation both in quality and quantity through proper silvicultural treatment. 2. To **E**ncourage and establish the natural regeneration of the crop with special emphasis on hill slopes and other eco-fragile areas. 3. To **E**nsure the general hygiene of the forests through removal of causative substance like dead and uprooted trees and strangulating climbers. 4. To **C**onserve the moisture and soil through appropriate measures for ensuring the streams, nalas and ultimately the rivers to become perennial and to increase fertility of the soil. 5. To **T**ackle the biotic interference effectively to protect and promote the forests. 6. To ensure eradication of weeds in the forests where ever those are required. 7. To conserve the bio-diversity of the area. 8. To ensure environmental stability by improving the micro climate of the area as a whole.

Silvicultural system	It should be selection-cum-improvement system without gap planting may be made wherever it is required.
Improvement Cycle	The improvement cycle shall be fixed as 1 year coinciding with that of the plan period to provide the management work for the allotted area in entirety.
Preparation of Improvement plan	The improvement plan shall be prepared by the Range Officer scrutinized by Asst. Conservator of Forests and duly approved by Divisional Forest Officer. Plan should be site specific.
Prescriptions	1. All dead and uprooted trees excluding the retention of those absolutely necessary for congenial habitat of Wild Life shall be marked for felling wherever necessary. 2. Marking is strictly prohibited in the areas where slope of the terrain is more than 30^0 except for dead and uprooted trees. 3. No live standing tree shall be marked for felling. 4. Silvicultural operation shall be carried out scrupulously and meticulously. These operations include cleaning and tending operation to augment the natural regeneration and to promote growth and development of existing crops. 5. Climbers strangulating the growth of tree crop shall be cut to facilitate the development of the crop. 6. Operation like pruning, cutting of green high stump shall be done to encourage better growth of existing crop and regeneration. 7. Appropriate soil and moisture conservation measure shall be taken to regulate velocity of water flow and to reduce soil erosion. Measures like contour bonding, staggered trenches, loose bolder check dams, and vegetative bonds should be prefer for maximum soil and moisture conservation.

Area of Selection -Cum- Improvement Working Circle

Year			2018-19	2019-20
Sl. No.	**Name of the Range**	**Felling Series**	**Area in Ha**	**Area in Ha**
1	Karanjia	Padheidhara	206.00	204.75
		Andharjhari-Pahadbhanga	108.50	96.40
		Bhanjabeda	61.00	52.00
2	Thakurmunda	Taramara	603.68	565.27
3	Satkosia	Satkosia	1304.80	1462.00
4	Kendumundi	Tikarpada	530.00	480.01
5	Dudhiani	Mota-Siramanipur	55.66	89.20
6	Gurguria	Badampahar	304.44	514.56
		Total:-	**3174.08**	**3464.19**

Year			2020-21
SL. No.	**Name of the Range**	**Felling Series**	**Area in Ha**
1	Karanjia	Padheidhara	228.24
		Andharjhari-Pahadbhanga	140.00
		Bhanjabeda	52.00
2	Thakurmunda	Taramara	628.20
		Tikarpada	534.96
3	Satkosia	Satkosia	1417.20
4	Dudhiani	Mota-Siramanipur	60.80
		Badampahar	284.16
		Total:-	**3345.56**

Rehabilitation Working Circle:-

The objectives and treatment of Rehabilitation Working Circle shall be change as in the existing Working Schemes. In the proposed Working Schemes, 44 forest blocks, and 09 nos. PRF are included with 3778.52 ha. of forest land.

Headings	Particulars of prescriptions
General Constitution	Depleted forest blocks having adequate potentiality to rejuvenate requiring the restriction on degradation along with the measures of rehabilitation for restoration are taken to constitute this working circle with assignment of 3778.52 ha of area.
Rehabilitation Series	The W.P.O. shall decide the 44 nos. of series of working.
Special Objective of Management	1. To **Re**strict the degradation by reducing the biotic interference to barest minimum and reverse the trend towards the process of restoration. 2. To **D**evelop the forest by providing site-specific required silvicultural treatment and planting with indigenous species. 3. To **F**acilitate the boosting of natural regeneration and ensure its establishment. 4. To take up soil and moisture conservation measures to improve the soil and moisture regime with special emphasis on upper reaches of the hill slope to ensure the perennial nature of the streams, nallas etc. 5. To conserve the area for bio diversity. 6. To improve the microclimate of the area as a whole, thereby ensuring environmental stability.

Rehabilitation Cycle	A 1 (One) years Rehabilitation Cycle is adopted coinciding with the plan period.
Preparation of Rehabilitation Plan	The rehabilitation plan shall be prepared by Range Officer, scrutinize by the Assistant Conservator of Forests and approved by the Divisional Forest Officer. This is a site specific plan containing the operation to be taken up.
Silvicultural Operations	It is the most vital component of the rehabilitation work which shall be carried out scrupulously and meticulously. These operations are mostly cleaning intended to induce or augment the natural regeneration and tending the existing crop for promoting its growth and development.
Soil & Moisture Conservation Measures (SCM)	Appropriate soil and water conservation measures shall be taken up to reduce the velocity of the water flow and to retain the topsoil. Measures like gully plugging, loose boulder check dams, contour bunds, nalla bunding and vegetative bunds suitable to the site 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.
Gap Planting	To rehabilitate the degraded area of forests under this working circle gap plantation of indigenous species shall be done @ 200 nos. of plants per ha so as to restock the forest.

Area of Rehabilitation Working Circle

Year			2018-19	2019-20
Sl. No.	**Name of the Range**	**Felling Series**	**Area in Ha**	**Area in Ha**
1	Karanjia	Karanjia	142.00	190.00
		Panpatria	194.80	158.00
		Jamunti	260.00	148.40
2	Satkosia	Duarsuni	208.27	175.00
3	Thakurmunda	Taramara	97.60	81.69
4	Kendumundi	Sarubil	54.37	42.00
5	Dudhiani	Tato	205.44	197.00
6	Gurguria	Gurguria	219.08	226.20
		Total:-	**1381.56**	**1218.29**

Year			2020-21
Sl. No.	**Name of the Range**	**Felling Series**	**Area in Ha**
1	Karanjia	Karanjia	81.14
		Panpatria	119.43
		Jamunti	188.00
2	Satkosia	Duarsuni	178.83
3	Thakurmunda	Taramara	74.12
		Sarubil	59.83
4	Dudhiani	Tato	251.60
		Gurguria	225.72
		Total:-	**1178.67**

Plantation Working Circle:-

As per direction of the MoEF while approving the working schemes of Karanjia Division, these AR plantation areas done from 1996-97 to 2015-16 need not be worked out in Plantation working circle in view of less survival percentage in the ensuing working schemes period.

In the proposed schemes 148.65 ha covering 18 nos. VF have been proposed.

The special objectives of this Working Circle will be as follows:-

(vi) To restock the degraded and blank areas with artificial regeneration/Artificial Natural regeneration by uprooting weeds if available.

(vii) To enhance the land productivity through soil and moisture conservation.

(viii) To increase the bio-diversity for improvement of local ecology.

(ix) To reduce the grazing pressure on forest by supply of fodder grasses.

(x) Old matured plantation should be proposed for removal and restocked.

Headings	Particulars of prescriptions
General Constitution	In view of tackling of blank areas through planting and areas in need of protection and tending/thinning operations. These areas overlap mainly the area of Rehabilitation Working Circle and to some extend that of Selection Working Circle.
Special Objectives of Management	To **P**romote the growth of existing plantation through suitable tending/thinning operations. 6. To **L**essen the biotic interference to the barest minimum with the active participation of VSS and ensure proper protection. 7. To **A**dopt suitable soil and moisture conservation measures to enhance the moisture regime of the area for nourishment and improvement of the plantation. 8. To **N**urture the suppressed plants till reaching the desired growth. 9. To treat the failure blank patch with planting seedlings suitable to the site preferably with indigenous species.
Tending Cycle	A 1 (One) year Cycle is prescribed.
Preparation of Tending Plan	A site specific plan for each plantation shall be prepared by the Range Officer which will be scrutinised by Assistant Conservator of Forests and approved by the Divisional Forest Officer.
Tending Operations	The operations like weeding, pruning, climber cutting, thinning etc. shall also be carrie mnd out as envisaged in the Tending Plan.
Thinning Operation	As thinning is to be done very sparingly with meticulous application of mind and extreme silvicultural restraint, this should be assessed by the Range Officer, scrutinized by the Assistant Conservator of Forests and finally approved by the Divisional Forest Officer prior to the execution of this operation.

Area of Plantation Series

Year			2018-19	2019-20	2019-20	Total
Sl. No.	**Name of the Range**	**Plantation Series**	**Area in Ha**	**Area in Ha**	**Area in Ha**	**Area in Ha**
1	Karanjia	Karanjia	49.62	49.34	49.69	148.65
		Total:-	**49.62**	**49.34**	**49.69**	**148.65**

11.3.3 Result of Prescriptions during working Schemes period.

1) Selection Working Circles / Selection-cum-Improvement working circle.

During the five year scheme periods, in the absence of approval final working plans, no green felling was done, Only dead and dying trees were removed. The forests were protected against fire.

2) Rehabilitation Working Circle.

a. Qualitative coppice grew up after malformed and defective stumps and unwanted coppice shoots removed.

b. Useful coppicing developed from malformed shoots.

c. Less fire hazard in Silvicultural operation implemented areas in forest blocks.

d. Fire hazard reduced with the involvement of VSS in the areas where Silvicultural operation was taken up.

e. More natural regeneration of species like *Terminalia alata, Anogeissus latifolia, Lagerstomia parviflora, Madhuca indica, Boswellia serrata* and *Diospyros melanoxylon* species observed as the Rehabilitation area was protected from fire hazard and biotic interference.

f. The area developed remarkably after implementation of soil and moisture conservation in the form of gulley plugging, LBCD, half-moon trench, contour trench etc.

3) Plantation Working Circle.

Under this working circle, Village Forests were proposed. These areas are already stocked with species such as Acacia, Eucalyptus planted by Social Forestry Divisions. These have now matured. Hence, clear felling followed by artificial regeneration is to be adopted. However, as per guideline of MoEFCC, no green felling can be taken up unless working plan is approved. Hence, the clear felling has not been undertaken and areas new have been proposed afresh for working from 2021-22 onwards**.**

11.3 Past yield, revenue and expenditure

As there was moratorium on green felling upto 2005-06. So coupe works have subsequently taken up. The year wise yield is furnished in **table 7.2** of chapter **7** of this part. The revenue and expenditure during last ten years are furnished in **Annexure-XXI** to provide an indication of expenditure level in the Division.

CHAPTER 12

STATISTICS OF GROWTH AND YIELD

12 Statistics of growth and yield

For the purpose of growth, volume and yield for some of the important species, the following literatures are of much importance.

SAL *(Shorea robusta):*

(i) Yield and stand tables for Sal (*Shorea robusta)* High forests, by A.L. Griffith and Bakshi Santram, Indian Forest Records (New Series). Silviculture, Volume 4(A), No.4, 1943.

(ii) Yield tables for clear felled Sal (*Shorea robusta)* coppice by S.H. Howard, Indian Forest Records (Silviculture Series), Volume, Part – IV, 1962.

(iii) General volume Tables for Sal (*Shorea robusta)* by S.H. Howard, Indian Forest Records (Silviculture Series) Volume – X, Part – IV, 1924.

(iv) Volume and out-turn tables for Sal (*Shorea robusta)* by S.H. Howard, Indian Forest Records (Silviculture Series) Volume – XII, Part – I, 1925.

(v) "The uneven aged Sal Forests of Ramnagar Forest Division, Uttar Pradesh their constitution, rate of growth etc. along with empirical yield and stands table for selection type of Sal crop by Sri G.S. Mathanda, Indian Forester, Volume – 84, 1958.

The quality classes for Sal laid down in the All India Yield and Volume table for Sal are as follows, and has been adopted in this plan.

Quality – I = Localities where the height growth of the crop exceeds 33 Mtrs.
Quality – II = Localities where the height growth of the crop lies between 27 Mtrs. to 33 Mtrs.
Quality – III = Localities where the height growth of the crop lies between 15 Mtrs. To 27 Mtrs.
Quality – IV = Localities where the height growth of the crop is less than 15 Mtrs.

TEAK (*Tectona grandis*):

Yield and stand tables for plantation of Teak (*Tectona grandis*), Indian Forest Records (New series), Silviculture, Volume – IX, No.4, 1959.

The volume table for teak for Madhya Pradesh prepared by V.K. Maitland and published as Indian

Forest Records (Silviculture series), Vol. XI, Part VII in 1925

General standard volume tables and height diameter relationship for teak by A.N. Chaturvedi, published as Indian Forest Records (New Series), Silviculture, Volume – XII No.8 (1973).

PIASAL/*Bijasal* (*Pterocarpus marsupium)*

General volume table for Bija based on data procured from Andhra Pradesh, Maharastra, Odisha and Bihar published as Indian Forest Records (New Series) Silviculture Volume – II, No.7, 1969.

Standard and commercial volume tables for Pterocarpus marsupium by S.N. Dabral, P.K. Bhattacharya, Tarlok Singh, D.S. Rawat.

ASANA *(Terminalia tomentosa):*

General standard and commercial Volume tables for Asana (*Terminalia tomentosa)* by A.L. Griffth and Bakshi Santram, Indian Forest Records (New Series). Silviculture, Volume – 4(A), No.5, 1947.

HALAND *(Haldina cordifolia):*

An approximate volume table for Haldu (*Haldina cordifolia*) by H.C. Mobbs, Uttar Pradesh Forest Leaflet No.6.

KHAIR ***(Acacia catechu):***

(i) Commercial timber (Katha) and heart wood volume tables for Khair (*Acacia catechu)* in North India by H.G. Champion, I.D. Mahendru and P.N. Suri, Indian Forest Records (Silviculture Series), Volume – 13, Part – IX, 1929.

(ii) Standard commercial and heartwood Volume tables (Factory working) for Khair *(Acacia catechu)* in North India by H.G. Champion and I.D. Mahendru, Indian Forest Records (Silviculture Series), Volume – XV, Part – III, 1931.

SISOO ***(Dalbergia sissoo):***

(i) Preliminary yield table for *Dalbergia sissoo* by Forest Bulletin No.52, (Silviculture), 1925.

(ii) Provisional yield tables for *Dalbergia sissoo* in the irrigated plantation of the Punjab by

Bakshi Santram, Indian Forest Records (New Series) Silviculture, Volume – 4(A), No.2, 1941.

(iii) Standard and commercial volume tables for *Dalbergia sissoo* by M.A. Kazi, Indian Forest Records (Silviculture, New Series), Volume – II, No.2, 1936.

SEMAL *(Bombax ceiba):*

Volume tables and diameter growth for Semal *(Bombax ceiba)* by I.D. Mahandra, Indian Forest Records (Silviculture Series) Volume – XV, Part – IV, 1932.

MOI *(Lannea coromandelica):*

Standard volume tables for Moi (*Lannea coromandelica*) by S.N. Dabral and D.C. Sharma, Indian Forest Records (New Series) Silviculture, Volume – II, No.7

Dhauranga *(Holoptelea integrifolia)* & PANI GAMHAR *(Trewia nudiflora):*

Provisional volume tables and diameter growth for *Holoptelea integrifolia)* & *Trewia nudiflora* by I.D. Maahendru, Indian Forest Records (Silviculture Series), Volume – XV, Part – VII, 1933.

KARADA *(Cleistanthus collinus),* PIASAL (*Pterocarpus marsupium*), MOI (*Lannea coromandelica):*

(i) Standard and commercial volume tables for (*Cleistenthus collinus)* by S.N.Dabral, P.K. Bhattacharya, R.C. Jain and Tarlok Singh.

(ii) Standard and commercial volume tables for *Pterocarpus marsupium* by S.N. Dabral, P.K. Bhattacharya, Tarlok Singh and D.S. Rawat.

(iii) Standard volume tables for *Lannea* coromandelica by S.N. Dabral, and D.C. Sharma, Indian Forest Records (New Series), Silviculture, Volume – II, No.7.

As local volume table is not available for Karanjia Forest Division, the volume equation to compute volume of wood in predominant trees prepared by Forest Survey of India (FSI) may be referred to.

Local Volume Equations of different species used in this plan.	
Species	***Local Volume Equations.***
Asan	$V = 0.103171 – 1.684599D + 10.107586D^2$
Bahada	$V = 0.035142 – 0.839708D + 8.157614 D^2$
Bandhan	$V = 0.057424 – 1.153088D + 8.542648 D^2$
Dhaura	$V = 0.015731 – 1.020606D + 9.656667D^2$
Jamun	$\sqrt{V}=0.08444 – 1.26801 D + 8.75274D^2$
Kasi	$V = 0.035142 – 0.839708D + 8.157614D^2$
Kendu	$V=(-)0.009124 – 0.494103 D + 8.157614 D^2$
Kurum	$\sqrt{V}=(-)0.153360 + 2.802965D$
Mahula	$V = 0.030925 – 0.567037 D +5.709471 D^2$
Moi	$V = 0.057424 – 1.153088 D + 8.542648D^2$
Mundi (Mitikinia)	$V =0.030925 – 0.567037D + 5.7094710D^2$
Piasal	$V =0.058424 – 1.233468D + 9.433633 D^2$
Sal	$V =0.109884 – 1.804757 D + 10.297714D^2$
Salai	$\sqrt{V} =(-) 0.188655 + 3.021335D$
Simili	$V =0.136196 – 2.076740D + 10.156600D^2$
Sissoo	$V =0.00965 + 0.58546D – 2.5605D^2 + 24.34215D^2$
Other (Misc.)	$V = 0.088074 – 1.449236D +8.760534D^2$

12.1 Statistics of forest carbon stock.

12.1.1 Methodology used by FSI in estimating carbon stock

The calculation of carbon stock requires information on extent of area of an emission/removal category termed as 'Activity Data' and emission or removal of GHG (Green House Gas) per unit area termed as 'Emission Factor' as per the GPG developed by IPCC. The methodology used by

FSI for activity data and emission factors has been described in the following paragraphs.

Three different methodologies are advocated in GPG and are being used by different countries to assess the extent of area (activity data) under 'Forest land remaining forest' and 'Non-forest land converted to forest'. These methodologies are: Wall – to wall mapping using remote sensing date; Mapping of sampled area using remote sensing data and, Using field survey methods. For activity data, FSI used remotely sensed (RS) data and adhere to the guidelines of GPG with respect to RS data. A hybrid approach combining automated digital classification techniques with visual interpretation was used. The technique is generally used as it is simple, robust and cost effective.

Stratification of Forest area

Stratification gains precision by dividing a heterogeneous population into relatively homogeneous sub-population based on certain stratification variables. Since, carbon stored in the vegetation is largely depends upon canopy density and forest type; these two were considered as stratification variables.

Forest Type Mapping

Forest type wise extent of the forest cover is useful information for characterizing forests in terms of floristic composition and ecological

value. FSI mapped forest types of India, according to Champion & Seth classification (1968) on 1:50,000 scale. Using the forest type maps, distribution of forest cover in different forest types has been determined for the country. Canopy density wise spatial information was available from the 'forest cover mapping.' This was supplemented with the forest type wise information generated under the national forest type mapping project carried out by FSI. This gave three canopy density classes and 17 type groups including plantation – thus yielding fifty one classes in all. Using this classification, area statistic (activity data) was generated through GIS technique.

Methodology for estimating emission factors

To measure exchange of GHGs between forest eco-system and the atmosphere which is eventually change in carbon stock over time, FSI has used Stock-Difference method (inventory based approach or periodic accounting) for estimating various emissions factors as recommended by GPG. The emission factors have been estimated partly by using the NFI data collected during 2002 – 2008 and partly by conducting a special study between 2008 to 2010. The same factors have been used for estimation of carbon stock for 2017. The methodology followed in deriving these factors are given below:

Above Ground Biomass (AGB) of trees having dbh 10 cm and above and bamboo

Under the national forest inventory programme, FSI has been conducting a national forest inventory following a multistage sampling approach. As per the design, data from about 21,000 sample plots (size 0.1 ha) had been collected between years 2002 – 2008. At each sample plot, all trees of diameter 10 cm and above were measured. The woody volume of trees for each sample plot was calculated using volume equations developed by FSI for various species. The volume equation provides i.e. above ground woody volume, which includes volume of main stem measured up to 10 cm diameter and volume of all branches having diameter 5 cm or more. Data of specific gravity and percentage carbon content of most of the trees species have been obtained from different published literature. For few species, percentage carbon content was ascertained by experimentation and for remaining an average of all other species was used. Standard formulae were used to calculated biomass and carbon content of each tree.

The estimates of bamboo biomass and carbon stocked in this resource has also been calculated from NFI data. For estimating volume of the bark, the double bark thickness of trees measured during forest inventory and volume equation of trees have been used. Using species-wise, dbh and bark thickness, bark volume equations were developed and were adjusted for 'bark void factor' which were utilized to estimate bark volume. With the help of the specific gravity of bark, the volume was

converted into biomass. Using carbon content percent of wood, carbon stored in bark was estimated.

Above ground biomass of trees having dbh less than 10 cm

This information was derived by FSI from a special study conducted during 2008 – 10 for SNC. On the basis of data collected between 2002 – 08, 20 important tree species were identified for each of 14 strata in NFI. For each of such species, 3 trees of diameters 1-9 cm (at 1.37 m. height) were felled. From the felled trees, separate biomass was calculated and recorded for wood, twigs and leaves in the prescribed format. Taking the dry biomass of wood/foliage as dependent variable and dbh as independent variable biomass equations were developed for each species. Using the plot level regeneration data from NFI i.e. recruits, un-established, established and all trees having dbh between 5 to 10 cm, biomass and carbon content at plot level is calculated.

Above Ground Biomass of shrubs, herbs, climbers and biomass of Dead Organic Matter (DDM: dead wood and litter)

For this purpose, the data of forest inventory conducted during 2002 – 08 was analysed to ascertain the optimum number of plots required for each combination of forest type and forest density. It revealed that about 15 cluster of 2 sample plots for each combination, would suffice for estimating the biomass/carbon factors for these components if 30% permissible error is considered. This survey was conducted in the districts on randomly selected points which were already inventoried during 2002 – 08 and for which forest type and density were known.

For the desired combinations of forest type and forest density, the exact geographical locations (latitude and longitude) of the optimum number of randomly selected sample plots were visited. Using this information, at the centre of sample point, three concentric plots of size 5m×5m, 3m×3m and 1m ×1m were laid out at a distance of 30m away from the centre of sample point in North and South direction. In 5m×5m plot, all dead wood above 5 cm diameter were collected, weighed and recorded. In 3m×3m plot, all woody litter i.e. all branches below 5 cm diameter were collected, weighed and recorded. All shrubs and climbers in 3m × 3m plots were uprooted, weighed and recorded in the prescribed format. In 1m × 1m plot, all herbs were uprooted, weighed and recorded. Dry biomass was converted to carbon stock.

Above Ground Biomass of branches, foliage of trees having dbh greater than or equal to 10 cm

This information was derived by FSI from a special study conducted during 2008 – 10 for Second National Communication (SNC). As described above, 20 important tree species in each stratum were identified. For each such species other than palm like trees, in each of the diameter class, three normal trees were selected. Its diameter, height, crown length, crown width in two directions, blank in canopy and shape of the crown were recorded.

For the purpose of biomass calculation, one normal tree of each diameter class of each species was selected. In the selected tree, partial destructive

method was used to compute biomass of woody branches up to 5 cm dia, twigs and leaves. Biomass of all these parameters was separately recorded in the prescribed formats. Taking the dry biomass of small wood/foliage as dependent variable and dbh as independent variable biomass equations were developed for each species. Using the plot level data of NFI, species wise carbon content, the total biomass and carbon content at plot level was calculated.

Organic matter in soil and forest floor

During forest inventory, data on forest floor (non-woody litter and humus) and soil carbon is also collected from each sample plot. For collecting data on humus and soil carbon, two sub-plots of size 1m × 1m are laid out within the main plot. The forest floor from both the plots was first swept and material so collected was weighed and portion of same was kept for carbon analysis. Further, at the centre of these two sub-plots, a pit of 30cm × 30cm × 30cm was dug and a composite sample of soil of 200gm was kept for organic carbon analysis. Samples of soil and humus were got analysed from the standard soil labs and were used for the calculation.

Below ground biomass

This is most difficult pool to measure and generally not measured in forest inventory. It is being included using a relationship (usually a root – to –shoot ratio) to aboveground biomass which have been established

by various researchers. GPG also provide default ratios for six major global forest types. FSI has selectively used these defaults to arrive at the carbon number.

Synthesizing Data for National Carbon Estimation

GIS techniques were used to intersect forest type map (2004) and forest cover map (2015 and 2017) resulting in two maps having 51 strata (forest type and canopy density intersections) on corresponding to each year. The real extent of these strata was ascertained using GIS techniques. The geographical location of each sample plot recorded with GPS during field visits have created a GIS compatible point layer of the forest inventory plots. This NFI point layer map was overlaid on the above map having 51 forest type – canopy density strata. The NFI points falling in each stratum were identified. For each stratum, the plot wise information on all the parameters of each carbon pool, were aggregated to have generalized factor for that stratum. Biomass and carbon factors were specifically developed for each stratum lime, shrubs, herbs, climbers, dead wood and woody litter. Multiplying activity data with these factors, different parameter wise total carbon for all the 51 strata were arrived at. This information was arranged into five carbon pools. Adding pool wise carbon contents, national carbon estimates were arrived at for the year 2017. Forests in Karanjia forest division belong to the type tropical moist deciduous type. Standard values for various carbon pools for this forest type as per FSI methodology are given in Table 6.7.

Table No. 12.1

Forest Type Stratum	Density	Carbon (in tonnes/ha)					
		AGB	BGB	Dead wood	Litter	SOC	Total
Tropical Moist Deciduous	VDF	37.18	7.65	1.17	2.81	74.69	123.50
	MDF	25.37	5.22	0.82	3.44	61.73	96.58
	OF	11.87	2.44	0.40	1.81	50.56	67.07

Source: - FSI, Dehradun

Table No.12.2

Abstract of forest type of Karanjia Forest Division		
Forest Type	**Density**	**Area in Ha**
Tropical Moist Deciduous Forest	VDF in Ha	8317.2
	MDF In Ha	32,279.99
	OF in Ha	21,773.02
	Total	62,370.21

Table No.12.3

Calculation of Carbon Stocks of Karanjia Forest Division in 2017 in 000' tones								
Type	**Density**	**Area in Ha**	**AGB**	**BGB**	**Dead Wood**	**Litter**	**SOC**	**Total**
Tropical Moist Deciduous Forest	VDF	8317.2	309.2334	63.626	9.7311	23.3713	621.2116	1027.173
	MDF	32,279.99	818.9433	168.5015	26.4695	111.043	1992.6437	3117.6
	OF	21,773.02	258.4457	53.1261	8.709	39.4091	1100.8438	1460.533
	Total	**62,370.21**	**1386.622**	**258.2536**	**44.9096**	**173.8234**	**3714.70**	**5605.306**

Forest block wise Carbon Stock of Karanjia Division is furnished in **Annexure- XV (c), XV (d) & XV (e)**

WORKING PLAN OF KARANJIA FOREST DIVISION PART -2



For the Period 2021-22 to 2030-31

By

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CHAPTER 13
BASIS OF PROPOSALS

13.1 Objectives of management

The general objects to be followed for managing the forests in this revision are in conformity to the National Forest Policy and priorities laid down in this regard. Within the last couple of decades' numbers of conferences on Environment conservation, combating greenhouse gas (GHG) emission and REDD+ have guided the planners around the world to look into the role of forest in combating global warming and climate change and management is oriented accordingly.

In addition to the global and national concept of change forest management, the Odisha state has made a lot of alteration in its concept of sustainable forest management (SFM).

Thus, circulars and guidelines of Government of India as well as the Government of Odisha published from time to time have been taken into considerations while doing the revision of this plan. The increase in population and economic status of people, increase the demands for small timber, fire wood, bamboo and other forest produces. Further the forestry sector of Karanjia provides massive livelihood opportunity to labourers. Considering all these facts the approach should revolve round the restoration of forest cover, as well as to create employment opportunities in rural areas. The objectives of the revision are calibre by looking upon the said factors.

It has been extensively explained in Part I of this Plan that increasing demography, changing lifestyle and alleviated demands have exerted tremendous pressure on forests, resulting in rapid disappearance of quality forests of this Division,

Hence the principles of National Forest Policy, in addition to the ground realities as briefly mentioned above (detailed explained in Part I) have been the guiding factors for calibration of the General Objective of management under this Plan.

The result of the past management has been elaborately discussed in Part-I of this Plan. The said analysis clearly indicates that degradation of Natural Forest has dwindled the biodiversity of the region. The main reasons of such degradation are biotic interferences, increased pressure on forest etc. So, the thrust of management strategy has to be on conserving and restocking the forest for maintaining ecological balance with active participation of the stakeholders in the process of regeneration and development.

Keeping in view the above-mentioned aspects the objectives of the plan are as follows

(I) ***Dynamics of Forests and Stands*****:**

Stands structure can be defined in many ways depending on region, objectives or other biological and non-biological factors. Silvicultural choices may be thought of as determining what kind of stand development process or stage of natural succession is

most desirable in a particular situation. Silvicultural practices often focus on actively encouraging stands to develop towards structures that are in short supply, recognizing that stands will become increasingly more valuable as they accumulate attributes of the desired structure.

Once the forest is established it reaches the climax stage, during this process of achieving the climax state the plants is to undergo different successional stages. No plant starts or accelerates its growth unless something dies or killed freeing up growing space (physical space, above / below ground, light, water, nutrient, carbon dioxide etc.). All silvicultural procedures are in part a simulation of natural processes. New stand initiation events are fire, pest outbreaks, wind storms, landslides and other atmospheric agents. The basic objectives are:

- To maintain tree species diversification,
- To maintain perpetual closed canopy on the hill slopes and catchments.
- To arrest soil erosion to maintain hydrological balance and regulate water yield of the streams, rivulets and the rivers.
- To improve the composition and productivity of these forests by increasing investment and through appropriate scientific management.
- To restock barren degraded and depleted forest using appropriate technology and prescriptions.

- To improve the quality and density of growing stock by suitable silvicultural practices catering the basic needs of forest dwellers, local people and industries on sustainable basis.
- To treat the forest as a renewable natural resource not a source of revenue.
- To maintain the environmental stability through preservation of forests and also restoration of ecological balance ensuring the sustainable growth of the forest.

(II) ***Forests and Soil:***

- To maintain the soil structure and texture by arresting erosion.
- To boosts up soil vitality by facilitating the growth of microorganism, like earthworm and termites to piles up humus in the forest floor.
- To maintain the soil nutrient productivity in particular and boost up the pedogenesis in large.
- To protect the soil and stream degradation from catastrophic forest fires.
- To increase forest and vegetative cover on hill slopes, in catchment of rivers, lakes and reservoirs to check soil erosion.

(III) ***Forests and Water:***

- To protect the existing riparian areas by guiding the rainwater to percolate inside the earth by adopting suitable means and recharging the groundwater in perpetuity.

- To protect road/stream interfaces.

(IV) ***Forest Biodiversity***

- To prevent further degradation of ecosystem by restricting the cutting of trees and stress upon the conservation and protection of the flora and fauna.
- To protect and manage wildlife with view to conserve biodiversity.
- To maintain the amounts of all habitats at all times.
- To maintain critical habitats for key species.
- To maintain reserve areas, Old forest reserves,
- To protect the natural forests which serve as a gene pool resource and help to maintain ecological balance?
- To delineate and maintain the existing corridor for the migration of the mega fauna.
- To protect, manage and develop the wild life resource of the Division in conformity with the National Forest Policy with the ultimate goal of biodiversity conservation.

(V) ***Climate and Forests:***

- To improve the knowledge and understanding of the impact of climate change on forests by studying changes in the different aspects of the forest ecosystem, including biodiversity, phonological (life-cycle timing) responses and tree growth.
- To adapt forest management to this changing context by concrete action and raising the awareness of forestry managers and the

wider public by setting up demonstration plots and devising information and awareness-raising tools.

- To maintain low wind and fire risk.
- To maintain the carbon budget by adopting integrated effort to sink more and release less carbon.

(VI) ***Socioeconomic considerations and generation of forest-based employment opportunities and livelihood options:***

- To create employment opportunities for rural people and weaker section, particularly for those who are totally dependent on forests by taking up a number of forestry activities that will develop and improve the forest cover.
- To ensure people's participation in forestry activities.
- To meet the needs of the forest produce of local people to the permissible extent subject to previously mentioned imperatives.
- To educate children and the wider public about the forest.
- To promote Joint Forest Management with clear understanding of the concept of responsibilities and sharing the usufructs benefits.

(VII) ***Tool for integrated development:***

- To enhance the forest cover and productivity of the forests through application of scientific and technical inputs
- To meet the growing needs for essential goods and services which the forests provide.

- To manage the forest for sustainable production to meet the demand in perpetuity

13.2 Method of treatment to be adopted.

To achieve the above objectives, there will be certain shift in the approach of management as compared to working plan of the past. In creating working circles and suggesting prescriptions, following points have been taken into consideration.

A. Specific treatment has been prescribed on the basis of forests, water shed, composition of crop, crown density, types of soil, configuration of ground, nature of degradation, ecological succession, biodiversity of the area, climate, biotic interference and other facts operating in the area.

B. Following assumptions are further made: -

(i) Population of man and cattle has to be regulated.

(ii) Sufficient budgetary allocation is provided to implement the prescriptions of the plan.

(iii) Staffing and legal support is given.

(iv) Appropriate support to agricultural sector to increase the land productivity especially through irrigation (Minor tube well, check dam etc.) and agro forestry activity and diversion of forest land for non-forest activity to the minimum extent possible.

13.3 Constitution of Working Circles.

It is proposed to have six Working Circles in the revised Working Plan for meeting the objectives as outlined above. The abstract of the working circle is given in Table No. 1.1

Table No. 1.1

Abstract of Working Circle			
Sl. No.	**Name of Working Circle**	**Nos. of forest blocks**	**Area (in ha)**
1	Selection Working Circle	115	28995.78
2	Rehabilitation Working Circle	143	12854.23
3	Plantation Working Circle	110	1411.82
4	N.T.F.P. Overlapping Working Circle	335	43261.83
5	Wildlife Overlapping Working Circle	335	43261.83
6	J.F.M. Overlapping Working Circle	335	21087.71

The details of forest blocks proposed to be covered under working plan is furnished in **Annexure –XIII**

The Selection Working Circle: -

The Working Circle has been formed with a view to improve further the growing stocks. The blocks covered under the working circle are mostly miscellaneous uneven aged with fare growth and can be broadly classified into two categories.

a. With good growth and mature trees available for harvest, where in selection felling is prescribed.

b. Consists of blocks having mostly the young to middle aged crop needing only improvement felling. Majority of the block included under this working circle are of this category.

The total area allotted to this working circle is **28995.78 ha.**

The Rehabilitation Working Circle (RWC): - This includes mainly degraded miscellaneous forests (other than those already covered under plantation working circle) having adequate rooted stocks which can be improved by cultural operations supplemented with artificial regeneration. These areas are actually in need of urgent rehabilitation and restoration measure. As such, areas found to be close proximity to the human habitation and thus local people will be motivated to involve themselves in the protection and regeneration of the degraded forests. An area of **12854.23 ha** has been allotted to this working circle.

Plantation Working Circle: -

This working circle includes all the forest blocks, which either have permanent blanks or have existing plantation needing tending operation. The blank areas have generally no forest growth due to dominant negative drivers working upon and cannot be restocked naturally within a reasonable period. They need intensive artificial regenerations measures. The existing plantation raised in different blocks during the previous working plans

is included in this working circle. The total area allotted to this working circle is **1411.82 Ha.**

N.T.F.P. Overlapping Working Circle: - This Working Circle is also an overlapping Working Circle covering the entire plan area other than that prescribed under the Protection Working Circle. The total area under this overlapping Working Circle **43261.83 ha.**

Wildlife Overlapping Working Circle: - This is an overlapping Working Circle covering over **43261.83 ha** area. Special management prescription is provided for some forest blocks where there is adequate care of wildlife is needed.

J.F.M. Overlapping Working Circle: -

Joint Forest Management is sharing of responsibilities, authority, and usufructs between the Village Community or the Forest User Group and the Forest Department on the basis of an agreement between the two.

The management of the jointly managed forest is done through the provision of a micro-plan prepared as per (**Annexure-XXI**) by the Community on PRA basis and with the technical help of the officials of the Forest Department. Since the micro-plan is prepared with the technical guidance of Foresters, there are little chances of any conflict

between the working plan and micro-plan prescriptions. One thing which has to be ensured is that the micro-plan prescriptions do not violate the silvicultural prescriptions of the working plan especially those related to sustainable management of forests and regulation of yield of major forest products. Approval of JFM micro-plan from Ministry of Environment & Forests is not necessary as they are covered by the macro level prescriptions of working plan of the forest division. Any deviation from the macro level prescriptions will require prior approval of the Regional CCF (MoEF & CC). Total area allotted to this Working Circle is 21087.71 ha.

13.4 The Period of Working Plan is from 2021-22 to 2030-31 and necessity for intermediate revision.

The intermediate revision of the prescription is not expected during this Working Plan period. But, if necessary, the Regional Chief Conservator of Forests in consultation with the Chief Conservator of Forests (Working Plan) would send necessary proposal for approval from RAP (MoEF & CC).

CHAPTER 14

Selection Working Circle

14.1 Name of working circle

The name of the working circle is Selection working circle

14.2 General constitution of working circle

In selection system, the felling and regeneration are not confined to certain parts of the area but are distributed all over it**.** The felling consisting of the removal of single tree or small group of trees scattered throughout the forest. Felling carried out in this manner are termed as selection felling; they result in an uneven-aged type of forest in which all age-classes are mixed together over all parts of the area. This completely uneven-aged forest is termed as 'selection forest' or 'forest of the selection type', whether it has actually been produced by selection felling or not.

An area of **28995.78 Ha.** is allotted to Selection Working Circle in this revision. The above area was managed under Selection Working Circle and Rehabilitation Working Circle of A.O.F. Bakhla's plan.

In this working circle 102 numbers of Reserved Forest, 12 numbers of Proposed Reserved Forest and 01 number of Demarcated Protected Forest are included. The above 115 number of Forest blocks are having the potentiality of selection forest and therefore included for selection working circle. These forest blocks require treatments in silvicultural operation, protection of natural regeneration and soil moisture conservation without gap planting in the proposed Working

Plan. The special objective of management will be same as in the past management of the Selection Working Circle of A.O.F. Bakhla's plan with various measures of improvements. The marking should be strictly conservation oriented than commercial harvesting oriented with prescription of removal of dead, dry and fallen trees with proper samplings and accurate yield calculation. Regular climber cutting and other Subsidiary Silvicuiltural Operation (SSO) along with soil moisture conservation should be done in extensive manner. Sufficient fire protection measures should be prescribed to help the seedlings and saplings to be established and the regeneration to be stabilized.

The forest blocks and Compartment wise allotment to this Working Circle is given in

Table No. 14.1

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Karanjia	1	Padheidhara	-	456.11		456.11
Karanjia	2	Tikasil	-	92.80		92.80
Karanjia	3	Chaturisahi	-	113.20		113.20
Karanjia	4	Singda-3	-	104.76		104.76
Karanjia	5	Kalakada	-	99.99		99.99
Karanjia	6	Kenjhra	-	117.60		117.60
Karanjia	7	Hatisalbeda	-	477.60		477.60
Karanjia	8	Balibhol	-	8.64		8.64
Karanjia	9	Miludihi	-	42.07		42.07
Karanjia	10	Kuliposi	-	24.00		24.00
Karanjia	11	Paudia	-	612.40		612.40
Karanjia	12	Sanbadposi	-	201.20		201.20

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Karanjia	13	Srabhadi	-	52.10		52.10
Karanjia	14	Diajodi	-	56.40		56.40
Karanjia	15	Chandiahil	-	26.40		26.40
Karanjia	16	Jhardghosda	-	36.40		36.40
Karanjia	17	Khaprasahi	-	33.60		33.60
Karanjia	18	Ghosda	-	140.00		140.00
Karanjia	19	Badbil	-	107.20		107.20
Karanjia	20	Badsarei	-	44.80		44.80
Karanjia	21	Saranggarh	-	113.20		113.20
Karanjia	22	Chauthia	-	44.80		44.80
Karanjia	23	Ankura	-	75.70		75.70
Karanjia	24	Sandeuli	-	120.40		120.40
Karanjia	25	Bhanra	-	119.60		119.60
Karanjia	26	Kasia	-	97.20		97.20
Karanjia	27	Champarei – I	-	22.26		22.26
Karanjia	28	Champarei – II	-	3.01		3.01
Karanjia	29	Sarubil	-	61.00		61.00
Karanjia	30	Kujiam	-	155.60		155.60
Karanjia	31	Pokharia - I	-	145.60		145.60
Karanjia	32	Pokharia - II	-	73.60		73.60
				Total Karanjia Range:-		**3879.24**
Thakurmunda	33	Mituani-1	-	106.80		106.80
Thakurmunda	34	Mituani-2	-	184.40		184.40
Thakurmunda	35	Mituani-3	-	98.08		98.08
Thakurmunda	36	Mandaljhari	-	32.98		32.98
Thakurmunda	37	Chirupada	-	23.49		23.49
Thakurmunda	38	Badbaliposi	-	27.57		27.57
Thakurmunda	39	Khudisila	-	83.60		83.60
Thakurmunda	40	Ghodabindha	-	168.40		168.40

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Thakurmunda	41	Akhapalan	-	57.52		57.52
Thakurmunda	42	Sunida	-	23.93		23.93
Thakurmunda	43	Chainbainsi	-	70.96		70.96
Thakurmunda	44	Hatigoda	-	108.80		108.80
Thakurmunda	45	Bhadubeda	-	111.20		111.20
Thakurmunda	46	Jamnalia	-	20.17		20.17
Thakurmunda	47	Basantpur	-	38.62		38.62
Thakurmunda	48	Gahandia	-	14.15		14.15
Thakurmunda	49	Digdhar	-	45.10		45.10
Thakurmunda	50	Chamakpur	-	182.72		182.72
Thakurmunda	51	Kaliaposi	-	78.25		78.25
Thakurmunda	52	Andharikhaman	-	48.48		48.48
Thakurmunda	53	Rugudibeda	-	58.58		58.58
Thakurmunda	54	Banamunda	-	176.40		176.40
Thakurmunda	55	Thakurmunda	-	250.27		250.27
Thakurmunda	56	Badbil	-	943.20		943.20
Thakurmunda	57	Handiphuta	-	305.89		305.89
Thakurmunda	58	Khejuri	-	641.60		641.60
Thakurmunda	59	Kathuanuagaon	-	68.00		68.00
Thakurmunda	60	Talpada	-	145.60		145.60
Thakurmunda	61	Baunsdiha	-	167.20		167.20
Thakurmunda	62	Chakulia	-	10.02		10.02
Thakurmunda	63	Khejuria	-	5.28		5.28
Thakurmunda	64	Purunapani-2	-	54.98		54.98
Thakurmunda	65	Mulapal	-	90.00		90.00
Thakurmunda	66	Nischintpur	-	7.47		7.47
Thakurmunda	67	Dakeipal	-	120.40		120.40
Thakurmunda	68	Taramara	-	649.60		649.60
Thakurmunda	69	Jarak	-	48.00		48.00

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Thakurmunda	70	Dangadiha	-	44.52		44.52
Thakurmunda	71	Vejidiha-1	-	160.00		160.00
Thakurmunda	72	Dangadiha	-	97.20		97.20
Thakurmunda	73	Mankadbeda	-	208.40		208.40
Thakurmunda	74	Patrapada		73.86		73.86
Thakurmunda	75	Bisipur-1	-	421.20		421.20
Thakurmunda	76	Bisipur-2	-	74.00		74.00
Thakurmunda	77	Dangapani	-	104.80		104.80
Thakurmunda	78	Kendumundi-1	-	147.56		147.60
Thakurmunda	79	Kendumundi- 2	-	648		647.96
Thakurmunda	80	Rengalbeda-1	-	67.20		67.20
Thakurmunda	81	Rengalbeda-2	-	42.67		42.67
Thakurmunda	82	Kendujiani	-	17.56		17.56
Thakurmunda	83	Patbil	-	154.78		154.78
Thakurmunda	84	Chheratangar	-	799.96		799.96
Thakurmunda	85	Saleibeda	-	125.60		125.60
Thakurmunda	86	Jodibil	-	187.60		187.60
Thakurmunda	87	Asankudar	-	11.86		11.86
Thakurmunda	88	Kadapani	-	145.20		145.20
Thakurmunda	89	Purunapani	-	452.80		452.80
Thakurmunda	90	Gourigoda	-	56.40		56.40
Thakurmunda	91	Kaliajiani-1	-	378.79		378.79
Thakurmunda	92	Majuraposi	-	144.80		144.80
Thakurmunda	93	Padiabeda	-	51.02		51.02
Thakurmunda	94	Tikarpada	-	89.20		89.20
Thakurmunda	95	Kaliajiani-2	-	147.58		147.58
Thakurmunda	96	Sanrugudibeda	-	212.80		212.80
Thakurmunda	97	Boring	-	275.20		275.20
	Total Thakurmunda Range:-					**10608.27**

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Satakosia	98	Satkosia C/2	15	10276.00	1 to 9, 12, 13 & 17 to 20	10276.00
Satakosia	99	Bhaliadal-I		10.63		10.63
Satakosia	100	Bhaliadal-II	-	110.79		110.79
Satakosia	101	Bhaliadal-IV	-	17.67		17.67
				Total Satkosia Range:-		**10415.09**

Name of the Range	Sl. No. of the Forest Block	Name of the Forest Block	Total No. of Comptt.	Total area of the Forest Block in Ha.	Selection Working Circle	
					Comp No.	Area in Ha.
Dudhiani	102	Raitalia		26.39		26.39
Dudhiani	103	Raitalia A		18.21		18.21
Dudhiani	104	Kadambeda	-	75.44		75.44
Dudhiani	105	Chanchbani	-	55.66		55.66
Dudhiani	106	Kadadiha	-	89.20		89.20
Dudhiani	107	Panposi	-	23.60		23.60
Dudhiani	108	Malharpada	-	27.20		27.20
Dudhiani	109	Palsagadia–I	-	33.60		33.60
Dudhiani	110	Palsagadia-II	-	16.00		16.00
Dudhiani	111	Dumuria	-	169.80		169.80
Dudhiani	112	Mota	-	281.20		281.20
Dudhiani	113	Badampahar	5	2012.16	10 & 12 to 15	2012.16
Dudhiani	114	Kanthikana	-	126.95		126.95
Dudhiani	115	Budhipat DPF	-	1137.77		1137.77
				Total Dudhiani Range:-		**4093.18**
				Division Total:-		**28995.78**

14.3 General characteristics of vegetation

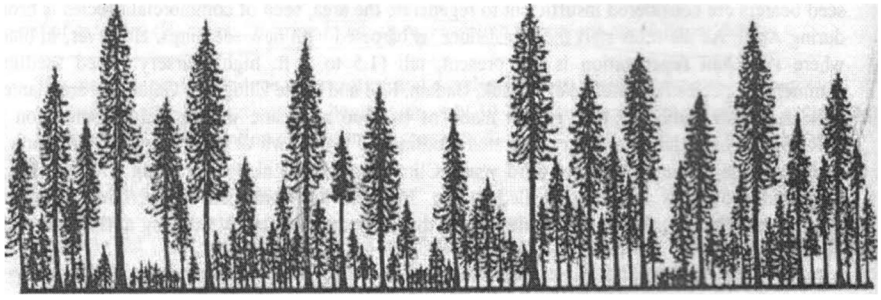
High forests having more crown density, perfect natural regeneration and crop of different age classes are the constituents of Selection Working Circle. The details of the characteristics of the forests have been discussed in Part I.



14.4 Felling series, cutting sections and JFM areas

Unlike the forests created under systems of concentrated regeneration in which trees of different age-classes are found in different areas, natural forests are composed of trees of various ages mixed together. In due course mature trees die out and replaced by new ones. The Selection System follows nature in Felling &regeneration in respect of its pattern of felling. Under the Selection

System scattered single trees or small groups of trees are selected over the whole area and removed, where conditions are favourable, natural regeneration springs up in the gaps so created. Under ideal conditions this process goes on year after year over the whole forest, the volume being removed being fixed by rules of management; this results in the constant maintenance throughout the whole area of an uneven-aged type of forest (Selection forest) in which trees of all ages are mixed together. Theoretically, a forest worked under the selection system should contain all age-classes distributed over the area in correct proportion of stems. Such regularity is seldom actually found, the age-classes occurring more usually in small groups resulting from groups of regeneration springing up in gaps. The typical look of forest worked under the selection system is shown in figure below.



Forest worked under the selection system

In forests of larger size as in India, it is customary to divide the area into a number of more or less equal blocks (known as coupes), in one of which selection fellings are carried out each

year, so that the whole forest is worked over during a period of years equal to the number of blocks into which the area is divided. This period is known as the 'felling cycle', which is defined as the time that elapses between successive main felling's on the same area. Under this arrangement felling's are more concentrated, there being an accumulation of mature trees during the interval between two successive visits to the same block, so that a larger volume per unit area is available for felling over the annual coupe than in the case of annual felling extending over the whole forest.

The term 'ideal selection system' is sometimes employed in reference to felling scarried out over the whole area each year, while the term, periodic selection system refers to fellings carried out under a felling cycle.

The entire area assigned to this working circle has been categorized into eight felling series namely

a. **Padheidhara Felling Series**

Comprises of Padheidhara RF, Tikasil RF, Chaturisahi RF, Singda- 3 RF, Kalakada RF, Kenjhara RF, Balihol PRF, Hatisalbeda RF, Miludihi RF, Kuliposi RF, Paudia RF.

b. **Andharjhari - Pahadbhanga Felling Series**

Comprises of Sanbadposi RF, Srabhadi RF, Diajodi RF, Chandiahil RF, Jhardghosda RF, Khaprasahi RF, Ghosda RF,

Badbil RF, Badsarei RF, Saranggarh RF, Chauthia RF, Ankura RF, Sandeuli RF, Bhanra RF.

c. **Bhanjabeda Felling Series**

Comprises of Kasia RF, Champarei-I PRF, Champarei-II PRF, Sarubil RF, Kujiam RF, Pokharia-I RF, Pokharia-II RF.

d. **Taramara Felling Series**

Comprises of Mituani-1 RF, Mituani-2 RF, Mituani-3 RF, Mandalijhari RF, Chirupada RF, Badbaliposi RF, Khudisila RF, Ghodabindha RF, Akhapalan RF, Sunida RF, Chainbainsi RF, Hatigoda RF, Bhadubeda RF, Jamnalia RF, Basantpur RF, Ghandia RF, Digdhar RF, Chamakpur RF, Kaliaposi RF, Andharikhaman RF, Rugudibeda RF, Banamunda RF, Thakurmunda RF, Badbil RF, Handiphuta RF, Khejuri RF, Khathuanuagaon RF, Talpada RF, Baunsdiha RF, Chakulia RF, Khejuria RF, Purunapani-2 RF, Mulapal RF, Nischintpur RF, Dakeipal RF, Taramara RF, Jarak RF, Dangadiha PRF, Vejidiha-1 RF, Patarpada PRF, Dangadiha RF, Mankadbeda RF.

e. **Satkosia Felling Series**

Comprises of Satkosia Comptt. No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 17, 18, 19 and 20, Bhaliadal-I PRF, Bhaliadal-II PRF and Bhaliadal-IV PRF.

f. **Tikarpada Felling Series**

Comprises of Bisipur-1 RF, Bisipur-2 RF, Dangapani RF, Kendumundi-1 RF, Kendumundi-2 RF, Rengalbeda-1 RF, Rengalbeda-2 RF, Kendujiani PRF, Patbil RF, Chheratangar RF, Saleibeda RF, Jodibil RF, Asankudar RF, Kadapani RF, Purunapani RF, Gourigoda RF, Kaliajiani-1 RF, Majuraposi RF, Padiabeda RF, Tikarpada RF, Kaliajiani-2 RF, Sanrugudibeda RF and Boring RF.

g. **Mota-Siramanipur Felling Series**

Comprises of Raitalia PRF, Kadambeda RF, Chanchbani RF, Kadadiha RF, PanposiRF, Malharpada RF, Palsagadia-I RF, Palsagadia-II RF, Dumuria RF and Mota RF.

h. **Badampahar Felling Series**

Comprises of Badampahar Compartment No. 10, 12, 13, 14, 15, Kanthikana PRF and Budhipat DPF.

14.5 Blocks, compartments and JFM area (marked on GIS based maps)

Not required for this Working Circle.

14.6 Special objectives of management

- To stabilize the environment and ecology with enrichment of the vegetation both in quality and quantity through proper silvicultural treatment.

- To encourage and establish the natural regeneration of the crop with special emphasis on hill slopes and other eco-fragile areas.
- To ensure the general hygiene of the forests through removal of causative substance like dead and uprooted trees and strangulating climbers.
- To conserve the moisture and soil through appropriate measures for ensuring the streams, nalas and ultimately the rivers to become perennial and to increase fertility of the soil
- To tackle the biotic interference effectively to protect and promote the forests.
- To ensure eradication of weeds in the forests where ever those are required.
- To conserve the bio-diversity of the area.
- To ensure environmental stability by improving the micro climate of the area as a whole.

I. Removal of trees of and above the exploitable diameter: -

Trees of and above the exploitable diameter are marked up to numerical limit fixed by the working plan provided they are silviculturally available. A selection tree is considered silviculturally available if its removal: -

i) does not create a permanent gap in the canopy;

ii) tends to improve the remaining crop in terms of volume production; or

iii) Helps the growth of groups of young trees down to the sapling stage of any of the valuable species.

II. Thinning in trees below the exploitable diameter:

In order to nurse all trees below the exploitable diameter under best conditions of growth, thinning is carried out therein.

In the year following the main felling, usual cultural operations are carried out to minimize the after-effect of felling. The following cultural operations shall be carried out with attending the natural regeneration: -

i. Cutting back all badly grown saplings and suppressed poles if there is reasonable hope of obtaining good coppice shoots.

ii. Removal of undergrowth hindering the growth of Sal regeneration.

iii. Fencing of compact groups of young regeneration spread over about 10 hectares or more in accessible areas.

14.6.1 Analysis of the crop

The density of the crop of the forest block included in this working circle has already been narrated earlier along with the basis of such inclusion. These allotted areas comprise of the best quality stand.

The entire forest area of the Division was stratified on the basis of the forestsand. On the stratified layer, sample points were allotted in compartments and blocks for carrying out 0.1 ha field inventory. 406 numbers of sample points earmarked by NRSA in different strata in the whole forest division were navigated by the GPS PDA and the inventorization was done in different parameters in each 0.1 ha plot and the data were uploaded in the instrument. NRSA, Hyderabad analyzed the crop from the data and supplied the stock and stand table Inventory along with some other information. Details of Sampling Intensity are given in **Table 14.2**

Table 14.2 Sampling Intensity

SFC				
Sl. No.	**Strata**	**Area (Ha.)**	**Plots**	**Sampling Intensity**
1	>70	1,315	12	0.091%
2	40 – 70	11,649.57	141	0.121%
3	10 – 40	9.515.90	110	0.116%
4	<10	1.863.29	7	0.038%

NON -SFC				
Sl. No.	**Strata**	**Area (Ha.)**	**Plots**	**Sampling Intensity**
1	>70	533.91	4	0.075%
2	40 – 70	4,255.99	43	0.101%
3	10 – 40	9,005.74	66	0.073%
4	<10	1,312.21	2	0.015%

OVERALL

Sl. No.	**Strata**	**Area (Ha.)**	**Plots**	**Sampling Intensity**
1	>70	1,819.88	16	0.086%
2	40 – 70	15,905.56	184	0.116%
3	10 - 40	18,521.64	176	0.095%
4	<10	3,175.50	9	0.028%

Considering the input provided by the NRSA, Hyderabad as well as the field observation and other ancillary factors the forest blocks and compartments have been kept under this Working Circle. As analyzed by the NRSA, the sample data of this division reveals the following inferences in the form of Stand Table in **Table No. 14.3** and, Stock Table in **Table No. 14.4** are given.

Stand Table of Karanjia Range						
RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**150-300**	
All trees	729717	203012	38902	12833	14557	999021
Total:-	729717	203012	38902	12833	14557	999021
SWC						
Anolat	5205	1129	834	1132	72	8372
Misc	111067	23549	8805	2705	4140	150266
Sho rob	315399	91647	6985	1702	3413	419145
Ter tom	6462	3419	315	125	768	11089
Total:-	438134	119743	16939	5664	8392	588872
Karanjia Total:-	**1167851**	**322755**	**55841**	**18497**	**22948**	**1587893**

Table 14.3 Stand table

Stand Table Dudhiani Range						
RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**>150**	
All trees	1,111,115	255,315	78068	30093	13777	1,488,368
Total:-	1,111,115	255,315	78068	30093	13777	1,488,368
SWC						
Anogeissuslatifolia	437	241	132	46	17	873
Misc	7,198	1,199	511	158	121	9,187
Shorearobusta	11,155	1,853	389	263	159	13,819
Terminaliatomentosa	476	197	126	29	23	852
Total:-	19,266	3,490	1,159	497	321	24,732
Dudhiani Total:-	**1,130,381**	**258,805**	**79227**	**30,590**	**14,098**	**1,513,100**

Stand Table of Thakurmunda Range						
RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**150-300**	
All trees	154,079	35,770	43,760	16,097	9,092	258,798
SWC						
Anogeissuslatifolia	21,833	15,372	10,809	6,065	4,643	58,722
Misc	286,206	102,639	44,370	16,505	12,022	461,742
Shorearobusta	1,042,156	100,045	105,048	114,342	61,246	1,422,837
Terminaliatomentosa	69,537	22,836	12,521	6334	4187	115,415
Total:-	1,419,732	240,892	172,748	143,246	82,098	2,058,716
Thakurmunda Total:-	**1,573,811**	**276,662**	**216,508**	**159,343**	**91190**	**2,317,514**

Stand Table of Satkosia Range						
RWC	**Girth Class (cm)**					**Number of trees**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**>150**	
All trees	208,714	72,917	31,075	10,871	6,641	330,219
SWC						
Anogeissuslatifolia	128,520	84,613	45,014	13,642	4,885	276,674
Misc	777,538	330,019	152,623	57,697	43,990	1,361,866
Shorearobusta	754,851	205,273	88,893	42,494	17,165	1,108,677
Terminaliatomentosa	171,928	91,189	31,541	8,475	8,456	311,590
Total	438,134	119,743	16,939	5,664	8,392	588,872
Satkosia Total:-	**1,832,838**	**711,094**	**318,071**	**122,308**	**74,496**	**3,058,807**

Table No. 14.4 Stock table

1. Dudhiani Range						
RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**>150**	
All trees	46419	65168	50338	36541	31348	229814
Total:-	46419	65168	50338	36541	31348	229814
SWC						
Anogeissuslatifolia	40	84	99	62	44	330
Misc	584	343	351	186	267	1731
Shorearobusta	685	395	253	321	386	2040
Terminaliatomentosa	34	50	79	36	57	256
Total:-	1343	872	782	606	754	4357
Dudhiani Total:-	**47762**	**66040**	**51120**	**37147**	**32102**	**234171**

2. Karanjia Range						
RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**>150**	
All trees	53065	52257	23938	16668	31902	177830
Total:-	53065	52257	23938	16668	31902	177830
SWC						
Anogeissuslatifolia	580	409	579	1520	161	3249
Misc	9860	7644	4965	4098	7135	33702
Shorearobusta	21489	20107	3752	2319	8005	55673
Terminaliatomentosa	365	905	210	155	2102	3737
Total:-	32294	29064	9506	8093	17404	96361
Karanjia Total:-	**85359**	**81321**	**33444**	**24760**	**49307**	**274191**

3. Thakurmunda Range						
RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**150-300**	
All trees	12291	10808	15707	19520	21125	79451
SWC						
Anogeissuslatifolia	4662	10034	13813	14655	16435	59599
Misc	54424	57472	57873	33286	46883	249938
Shorearobusta	34169	25239	70053	138967	145478	413906
Terminaliatomentosa	4528	5421	7485	7504	11479	36417
Total:-	97783	98166	149224	194412	220275	759860
Thakurmunda Total:-	**110074**	**108974**	**164931**	**213932**	**241400**	**839311**

4. Satkosia Range						
RWC	**Girth Class (cm)**					**Volume in cum**
MAJOR SPECIES	**30 – 60**	**60-90**	**90-120**	**120-150**	**>150**	
All trees	16584	20576	21784	12502	15265	86711
SWC						
Anogeissuslatifolia	13934	30527	34920	18250	10964	108596
Misc	75358	90421	113124	68110	95702	442715
Shorearobusta	45567	52587	56647	52099	38798	245698
Terminaliatomentosa	12230	23998	19956	10709	21803	88697
Satkosia Total:-	**163674**	**218109**	**246413**	**161671**	**182532**	**972417**

The above tables indicated the number of trees available species wise in five girth classes like 30 cm. to 60 cm, 60 cm. to 90 cm, 90 cm. to 120 cm, 120 cm. to 150 cm. and 150 cm. & above. The principal species as revealed from the field inventory in the forests of this working circle are Sal, Asana, Dhaura, Kendu, Tangan etc. Computation of volumes and growing stock estimates has been doneby the NRSA. The yield table has been prepared by using Smithies' safeguarding formula taking the subsidiary data supplied by the NRSA, Hyderabad. The same is furnished in Block wise hereunder.

14.6.2 Silvicultural System

The Silvicultural System prescribed for this working circle is selection felling. Only those silviculturally available trees in or above the exploitable girth class shall be felled as would be admissible according to the Smithies' Safeguarding Formula with a further reduction of 50% to offset biotic and other factors like steep terrain, harsh climatic condition site quality crop density etc. The tending and subsidiary cultural operations shall be taken up to boost up the growing stock and to induce sustainable regeneration.

14.6.3 Rotation period

Rotation is the planned number of years between the formation or regeneration of a crop and its final felling. In case of a selection forest, the

average age at which a tree is considered mature for felling. A tree becomes mature when it is capable of reproducing itself by seed and has attained its full height. Such stage of a tree or crop is treated as the exploitable age. Silvicultural rotation is the stage at which a species retains satisfactory vigor of the growth and reproduction on a given site. Such rotation age of crop is crucial to ensure the proper condition of the forests. Though there are different aspects to determine the rotation, the practice in vogue is the age at which maximum volume production is obtained. That means, it yields the greatest annual quantity of materials. Accordingly, period of rotation is determined as the age corresponding to intersection point of Current Annual Increment (C.A.I) and Mean Annual Increment (M.A.I) graph basing on the site quality.

14.6.4 Harvestable diameters

Sal forest of Karanjia Forest Division are mostly of quality III and IV. General soundness is observed in the neighborhood is up to 120 cm Girth at breast height. Same criteria may also be applied to other species. NRSA has fixed 120 cm as standard exploitable diameter for all species. The following criteria are considered to fix the exploitable size for Sal and other species in different forest blocks.

A. The size above which the unsoundness develops
B. The site quality
C. Data available in the yield table for different species

D. Enumeration figures available for different RF and Forest Blocks

E. Growth and market demand

The exploitable girth & approach classes at breast height of different species is provided in the **Table No. 14.5.**

Table No. 14.5

Exploitable girth at breast height for different species of Karanjia Forest Division			
Sl. No.	**Species**	**Exploitable Girth at Breast Height**	**Approach Class Breast Height**
1	Sal, Piasal, Sissoo, Gambhar, Asan, Kasi, Mundi, Kusum & Jamun	120 cm and above	90 cm <120 cm
2	Bandhan	90 cm & above	60 cm <90 cm
3	Simili	150 cm	120 cm <150 cm
4	Miscellaneous	120 cm and above	90 cm <120 cm

14.6.5 Reducing factors and reduced areas

Uninterrupted yield in equal proportion is the most ideal aspect of the management. Since a number of factors is involved in determining the yield, it is extremely difficult to ensure this exactly. However, this consideration has been taken utmost care of while estimating the yield of the annual coupe, for which reducing factor and the reduced area are resorted to make the coupes more or less equip-productive.

Reducing factor for an area is calculated as under.

R_d= d/0.5

R_q= Vq/ V_{III}

Where **'R_d'** is the reducing factor for density

'd' is the density of the compartment

'R_q' reducing factor for quality

'V_q' is the volume of exploitable tree

'V_{III}' is the volume of exploitable tree in site quality III

R= R_d*R_q

Reduced Area is determined with the following formula.

RA= A x R

Where '**RA'** is the reduced area

'**A'** is the area of the compartment

'R' is reducing factor

14.6.6 Felling cycle

A felling cycle of 10 years is fixed in order to coincide with the plan period.

14.6.7 Division into periods and allotment to periodic blocks (PB)

Not necessary in this Working Circle

14.6.8 Calculation of the yield and its regulation

Yield must be regulated by area with a riding factor on the number of silviculturally available trees of exploitable girth class basing on Smythies'

safeguarding formula. This formula was evolved by Smythies for sustainable yield from the Sal forest of Uttar Pradesh. Certain assumptions considered for the above formula also hold good for the forest blocks allotted to this working circle and the same are furnished below.

The yield shall be regulated by area with a percentage check on the removal of exploitable trees as per the Smythies' Safe Guarding Formula.

As per rate of growth and other statistics pertaining to Sal and other species are not available for the state of Odisha. The All India Yield Table has been referred to calculate the yield.

As per Smythies' safe guarding formula the yield available during the felling cycle is regulated by the number of sound trees of the next lower girth class (Approach/Class II) that may survive and pass on to next higher girth class (Exploitable/Class I) during the felling cycle. This increment is expressed by the following formulae

$$X = F/T \times (II - Z\%II)$$

Where

X= The increment occurring in the entire felling series during the felling series during the felling cycle i.e. number of approach class trees that pass to class I during the felling cycle

F= Felling Cycle (10 Years)

II = Number of trees in the approach class

Z = percentage of mortality i.e. the percentage of approach class which will disappear in T years

T = Time in years taken by a tree to pass from the approach class to exploitable class.

The annual yield (percentage of trees available for exploitation) Y is computed by the following formula

$$Y = \frac{X * 100}{\pm C (I + X/2)}$$

Where

I = the number of trees of and above exploitable size

C= an arbitrary value used for rounding off the percentage of removal figure (Y)

Or on substitution of value of X

$$Y = \frac{2F * II (100-z)}{200 * I * T + F * II (100-Z)} \times 100 \pm C$$

As the growth statistics for Sal etc. are not available for Odisha on the basis of All India Yield Table and local factors the value of T is taken as 40 years, the value of Z is taken as 40 % for all the species. Putting the above value off (Felling Cycle), T and Z (mortality rate) we get for Sal and others

$$Y = \frac{2 * 10 * II(100-40)}{200 * I * 40 + 10 * II(100-40)} \times 100$$

Or

$$Y = \frac{600 * II}{40 * I + 3 * II} \pm C$$

The NRSA, Hyderabad after analysing the inventory data of the sampling points computed the total number of trees in different girth class. From which the yield of different forest blocks was calculated indicating the number of trees available for harvest per ha. Adopting Smythies' Safeguarding Formula using values as indicated above. Forest block wise yield calculation is furnished in **Annexure No. XXIII.**

14.6.9 Table of felling

The felling shall be phased and sequential in the forest blocks of this Working Circle to maintain the order of rotation for the next plan period. Apart from that, the felling is to be evenly distributed instead of concentrating en-block for facilitating the smooth working, induce regeneration, maintaining age class distribution of crop as well as canopy cover in a proportionate manner. Accordingly, the entire area of the working circle has been divided into eight nos. of felling series. Care has been taken to restrict the area of felling series within the jurisdiction of a Range for better implementation of the prescription and administrative convenience. Each felling series has been further divided into sub-units called Annual Coupes for working in a particular year. There are 10 annual coupes @ one per year to cover the entire area of the felling series within 10 years of the plan period. Not only the equi-

productivity, the usual criterion but also the convenience for effective execution of the prescription is taken in to consideration together to constitute the coupe. Such annual coupes have been delineated in the map by taking natural features like nallas, rivers, Hill ridges, roads and compartment boundaries etc. into consideration. The sequence of felling in different years indicating the coupe, forest block area has been furnished in the table given below for each felling series separately. Felling series wise area allotted to this Working Circle along with trees to be marked is given in **Table No. 14.6**

1. Padheidhara Felling Series (PDH)

Range	Forest Block	Compt No.	Notified Area	Area Alloted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
Karanjia	Miludihi RF		42.07	42.07	246.07	21	115	PDH-VI(1)	2021-22
	Hatisalbeda RF(P)		204.00	204.00		94			
	Kuliposi RF		24.00	24.00	195.6	8	91	PDH-VII(2)	2022-23
	HatisalbedaRF(B)		171.60	171.60		83			
	Paudia RF (P)		200.20	200.20	200.2	118	118	PDH-VIII(3)	2023-24
	Paudia RF (P)		212.00	212.00	212	127	127	PDH-IX(4)	2024-25
	Paudia RF (P)		200.20	200.20	200.2	116	116	PDH-X(5)	2025-26
	PadheidharaRF(P)		220.00	220.00	220	112	112	PDH-I(6)	2026-27
	PadheidharaRF(P)		236.11	236.11	236.11	127	127	PDH-II(7)	2027-28
	Tikasil RF		92.80	92.80	206	41	92	PDH-III(8)	2028-29
	Chaturisahi RF		113.20	113.20		51			
	Singda-3 RF		104.76	104.76	204.75	44	101	PDH-IV(9)	2029-30
	Kalakada RF		99.99	99.99		57			
	Kenjhra RF		117.60	117.60	228.24	60	108	PDH-V(10)	2030-31
	Hatisalbeda RF (P)		102.00	102.00		54			
	Balibhol PRF		8.64	8.64		4			
Total:-			**2149.17**				**1107**		

2. Andharjhari – Pahadbhanga Felling Series (A/P)

Range	Forest Block	Compt No	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No	Year of Working
	Badbil RF		107.20	107.20	107.20	44	44	A/P –VI (1)	2021-22
	Badsarei RF		44.80	44.80	158	16	68	A/P -VII(2)	2022-23
	Saranggarh RF		113.20	113.20		52			
	Chauthia RF		44.80	44.80	120.5	25	58	A/P -VIII(3)	2023-24
	Ankura RF		75.70	75.70		33			
	Sandeuli RF		120.40	120.40	120.40	67	67	A/P -IX(4)	2024-25
	Bhanra RF		119.60	119.60	119.60	16	16	A/P -X(5)	2025-26
	Sanbadaposi RF(P)		101.20	101.20	101.20	53	53	A/P -I(6)	2026-27
	Sanbadaposi RF (B)		100.00	100.00	100.00	50	50	A/P -II(7)	2027-28
	Sarbhadi RF		52.10	52.10	108.50	29	58	A/P -III(8)	2028-29
	Diajodi RF		56.40	56.40		29			
	Chandiahil RF		26.40	26.40	96.40	5	52	A/P -IV(9)	2029-30
	Jharghosda RF		36.40	36.40		15			
	Khaparsahi RF		33.60	33.60		32			
	Ghosda RF		140.00	140.00	140.0	54	54	A/P -V(10)	2030-31
Total:-			**1171.8**				**520**		

3. Bhanjabeda Felling Series (BJB)

Range	Forest Block	Compt No	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No	Year of Working
Karanjia	Kujiam(B) RF		51.60	51.60	51.60	36	36	BJB –VI (1)	2021-22
	Pokharia –I RF (P)		72.00	72.00	72.00	28	28	BJB -VII(2)	2022-23
	Pokharia- I RF(B)		73.60	73.60	73.60	16	16	BJB -VIII(3)	2023-24
	Pokharia –II RF (P)		35.00	35.00	35.00	2	2	BJB -IX(4)	2024-25
	Pokharia-II RF(B)		38.60	38.60	38.60	25	25	BJB -X(5)	2025-26
	Kasia RF		97.20	97.20	97.20	45	45	BJB -I(6)	2026-27
	Champrei-I PRF		22.26	22.26	25.27	4	5	BJB -II(7)	2027-28
	Champrei- II PRF		3.01	3.01		1			
	Sarubil RF P)		61.00	61.00	61.00	44	44	BJB -III(8)	2028-29
	Kujiam RF(P)		52.00	52.00	52.00	40	40	BJB -IV(9)	2029-30
	Kujiam RF(P)		52.00	52.00	52.00	40	40	BJB -V(10)	2030-31
Total:-			**558.27**				**281**		

4. Taramara Felling Series (TM)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
Thakur munda	Handiphuta RF		305.89	305.89	626.89	450	947	TM-VI (1)	2021-22
	Khejuri RF(P)		321.00	321.00		497			
	Kathuanuagaon RF		68.00	68.00	534.20	99	694	TM-VII (2)	2022-23
	Khejuri RF(B)		320.60	320.60		369			
	Talpada RF		145.60	145.60		226			
	Baunsadiha RF		167.20	167.20	455.35	120	493	TM-VIII (3)	2023-24
	Chakulia RF		10.02	10.02		15			
	Khejuria RF		5.28	5.28		16			
	Purunapani -2 RF		54.98	54.98		65			
	Mulapal RF		90.00	90.00		87			
	Nischintpur RF		7.47	7.47		11			
	Dakeipal RF		120.40	120.40		179			
	Taramara		649.60	649.60	649.60	650	650	TM-IX (4)	2024-25
	Jarak		48.00	48.00	631.98	49	862	TM-X (5)	2025-26
	Vejdiha-1 RF		160.00	160.00		216			
	Dangadiha RF		97.20	97.20		138			

4. Taramara Felling Series (TM)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
	Mankadabeda RF		208.40	208.40		296			
	Dangadiha PRF		44.52	44.52		59			
	Patrapada PRF		73.86	73.86		104			
	Mituani-1 RF		106.8	106.8	556.92	149			
	Mituani- 2 RF		184.40	184.40		275			
	Mituani -3 RF		98.08	98.08		145			
	Mandaljhari RF		32.98	32.98		50	822	TM-I (6)	2026-27
	Chirupada RF		23.49	23.49		28			
	Badabaliposi RF		27.57	27.57		25			
	Khudisila RF		83.60	83.60		150			
	Ghodabindha RF		168.40	168.40	599.60	210			
	Akhapalan RF		57.52	57.52		78			
	Sunida RF		23.93	23.93		22			
	Chainbainsi RF		70.96	70.96		86	780	TM-II (7)	2027-28
	Hatigoda RF		108.80	108.80		166			
	Bhadubeda RF		111.20	111.20		140			
	Jamnalia RF		20.17	20.17		28			

4. Taramara Felling Series (TM)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
	Basantpur RF		38.62	38.62		50			
	Gahandia RF		14.15	14.15	603.68	15	676	TM-III (8)	2028-29
	Digdhar RF		45.10	45.10		35			
	Chamakpur RF		182.72	182.72		258			
	Kaliaposi		78.25	78.25		111			
	Andharikhaman RF		48.48	48.48		74			
	Rugudibeda RF		58.58	58.58		63			
	Banamunda RF		176.40	176.40		120			
	Thakurmunda RF		250.27	250.27	565.27	290	693	TM-IV (9)	2029-30
	Badabil RF (P)		315.00	315.00		403			
	Badbil RF (B)		628.20	628.20	628.20	741	741	TM-V(10)	2030-31
Total:-			**5851.69**				**7358**		

5. Satkosia Felling Series (S)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
Satkosia	Bhaliadal –I PRF		10.63	10.63	139.09	21	264	S-VI (1)	2021-22
	Bhaliadal-II		110.79	110.79		228			
	Bhaliadal –IV PRF		17.67	17.67		15			
	Satkosia RF	17	673	673	673	1036	1036	S-VII (2)	2022-23
	Satkosia RF	18	702.80	702.80	1368.8	1188	2393	S-VIII (3)	2023-24
	Satkosia RF	19	666	666		1205			
	Satkosia RF	20	670.80	670.80	670.80	879	879	S-IX (4)	2024-25
	Satkosia RF	1.	621.20	621.20	621.20	441	441	S-X (5)	2025-26
	Satkosia RF	2	626.40	626.40	626.40	413	1715	S-I (6)	2026-27
	Satkosia RF	3	700	700	700	1302			
	Satkosia RF	4	715.60	715.60	715.60	1653	3070	S-II (7)	2027-28
	Satkosia RF	5	715.60	715.60	715.60	1417			
	Satkosia RF	6	646.80	646.80	646.80	1552	2723	S-III (8)	2028-29
	Satkosia RF	7	658	658	658	1171			
	Satkosia RF	8	728.40	728.40	728.40	1100	1921	S-IV (9)	2029-30
	Satkosia RF	9	733.60	733.60	733.60	821			
	Satkosia RF	12	725.60	725.60	725.60	1560	2922	S-V (10)	2030-31
	Satkosia RF	13	691.60	691.60	691.60	1362			
Total:-			**10414.49**				**17364**		

6. Tikarpada Felling Series (TK)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
Thakur munda.	Saleibeda RF		125.60	125.60	470.26	119	598	TK –VI (1)	2021-22
	Jodibil RF		187.60	187.60		255			
	Asankudar RF		11.86	11.86		16			
	Kadapani RF		145.20	145.20		208			
	Prunapani RF		452.80	452.80	452.80	552	552	TK –VII (2)	2022-23
	Gourigoda RF		56.40	56.40	435.19	92	446	TK –VIII (3)	2023-24
	Kaliajiani-I RF		378.79	378.79		354			
	Manjuraposi RF		144.80	144.80	144.80	184	605	TK –IX (4)	2024-25
	Padiabeda RF		51.02	51.02	51.02	69			
	Tikarpada RF		89.20	89.20	89.20	137			
	Kaliajiani-II RF		147.58	147.58	147.58	215			
	Sanrugudbeda RF		212.80	212.80	212.80	311	652	TK –X (5)	2025-26

6. Tikarpada Felling Series (TK)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
	Boring RF		275.20	275.20	275.20	341			
	Bisipur –I RF		421.20	421.20	495.2	412	481	TK –I (6)	2026-27
	Bisipur –II RF		74	74		69			
	Dangapani RF		104.80	104.80	437.56	147	634	TK –II (7)	2027-28
	Kendumundi –I RF		147.56	147.56		224			
	Kendumundi-II RF (P)		118	118		162			
	Rengalibeda-I RF		67.20	67.20		101			
	Kendumundi RF–II(B)		530	530	530	800	800	TK –III (8)	2028-29
	Rengalbeda-2 RF		42.67	42.67	480.01	64	685	TK –IV (9)	2029-30
	Patbil RF		154.78	154.78		176			
	Chheratangar RF(P)		265	265		421			
	Kendujiani PRF		17.56	17.56		24			
	Chheratangar RF(B)		534.96	534.96	534.96	599	599	TK –V (10)	2030-31
Total:-			**4756.58**				**6052**		

7. Mota- Siramanipur Felling Series (MS)

Range	Forest Block	Compt No.	Notified Area	Area Allotted to this Working Circle in Ha.	Total Area	Trees to be marked	Sub Total of Trees to be marked	Coupe No.	Year of Working
Dudhiani	Palsagadia –I RF		33.60	33.60	49.6	2	3	MS –VI (1)	2021-22
	Palsagadia-II RF		16.00	16.00		1			
	Dumuria RF (P)		85.00	85.00	85.00	9	9	MS –VII (2)	2022-23
	Dumuria RF (B)		84.80	84.80	84.80	11	11	MS –VIII (3)	2023-24
	Mota RF (P)		140.00	140.00	140.00	130	130	MS –IX (4)	2024-25
	Mota RF (B)		141.20	141.20	141.20	130	130	MS –X (5)	2025-26
	Raitalia PRF		26.39	26.39	44.60	14	23	MS –I (6)	2026-27
	Raitalia A PRF		18.21	18.21		9			
	Kadambeda RF		75.44	75.44	75.44	22	22	MS –II (7)	2027-28
	Chanchabani RF		55.66	55.66	55.66	62	62	MS –III (8)	2028-29
	Kadadiha RF		89.20	89.20	89.20	37	37	MS –IV (9)	2029-30
	Panposi RF		23.60	23.60	50.80	8	44	MS –V (10)	2030-31
	Malharpada RF		27.20	27.20		36			
Total:-			**816.3**				**471**		

8. Badampahar Felling Series(BDP)

Range	Forest Block	Compt No.	Notified Area	Area allotted to this Working Circle		Trees to be marked	Coupe No.	Year of Working
Dudhiani	Kanthikana PRF		126.95	126.95		56	BDP –VI (1)	2021-22
	Budhipat DPF (P)		280.00	280.00		40	BDP –VII (2)	2022-23
	Budhipat DPF (P)		280.00	280.00		36	BDP -VIII(3)	2023-24
	Budhipat DPF (P)		280.00	280.00		55	BDP -IX(4)	2024-25
	Budhipat DPF (B)		297.77	297.77		67	BDP -X(5)	2025-26
	Badampahar RF	10	547.84	547.84		354	BDP -I(6)	2026-27
	Badampahar RF	12	361.16	361.16		234	BDP -II(7)	2027-28
	Badampahar RF	13	304.44	304.44		260	BDP -III(8)	2028-29
	Badampahar RF	14	514.56	514.56		54	BDP -IV(9)	2029-30
	Badampahar RF	15	284.16	284.16		126	BDP -V(10)	2030-31
Total:-				**3276.88**		**1282**		

Abstract of SWC							
Name of Range	**RF**	**Area in ha.**	**PRF**	**Area in ha.**	**DPF**	**Area in ha.**	**Range wise total area.**
Karanjia	29	3845.3	3	33.91	0	0	3879.24
Dudhiani	10	2783.86	3	171.55	1	1137.77	4093.18
Thakurmunda	62	10472.33	3	135.94	0	0	10608.27
Satkosia	1	10276.00	3	139.09	0	0	10415.09
Division Total:-	**102**	**27377.49**	**12**	**480.49**	**1**	**1137.77**	**28995.78**

Abstract of Treatment series											
Treatment Series	**Area allotted (Year wise)**										
	21-22	**22-23**	**23-24**	**24-25**	**25-26**	**26-27**	**27-28**	**28-29**	**29-30**	**30-31**	**total**
Padheidhara	246.07	195.6	200.2	212	200.2	220	236.11	206	204.75	228.24	2149.17
Andharijhari	107.2	158	120.5	120.4	119.6	101.2	100	108.5	96.4	140	1171.8
Bhanjabeda	51.6	72	73.6	35	38.6	97.2	25.27	61	52	52	558.27
Taramara	626.89	534.2	455.35	649.60	631.98	556.92	599.6	603.68	565.27	628.20	5851.69
Satkosia	139.09	673	1368.8	670.80	621.20	1326.4	1431.2	1313.4	1454	1417.2	10415.09
Tikarpada	470.26	452.80	435.19	432.6	488	495.2	437.56	530	480.01	534.96	4756.58
Mota-Siramanipur	49.6	85	84.80	140	141.20	44.6	75.44	55.67	89.20	50.8	816.3
Badampahar	126.95	280	280	280	297.77	547.84	361.16	304.44	514.56	284.16	3276.88
Total:-	**1817.66**	**2450.6**	**3018.44**	**2540.4**	**2538.55**	**3389.36**	**3266.34**	**3182.69**	**3456.19**	**3335.56**	**28995.78**

14.6.10 Method of executing the felling

14.6.10.1 Demarcation of Annual Coupes

The annual coupes shall be demarcated in the month of October preceding the year in which the felling is due. If any portion of the coupe lines coincides with the compartment or sub-compartment lines, it would not be laid on the ground. The compartment and sub-compartment line should be maintained by putting double coal tar rings over the trees standing on the boundary at a visible distance. The rest of the coupe lines shall be laid by clearing 1.5-meter-widestrip along with the coupe and stacking stones cairns painted with white varnishes. Clearance of the lines should be restricted for sighting purposes only and thus no major clearance is allowed.

In case of overlapping coupes two or more compartments, each compartment shall be treated as a special entity and thus ensure proper maintenance of compartment histories. In all these cases the lot line should be demarcated with single coal tar ring on the trees standing along the compartment and sub compartment line.

Sign boards should be posted at strategic places like cross road, inspection path or Reserved Forest boundary lines. The sign board should depict the name of the felling series, the number of the coupe its area year of working and the compartment numbers etc.

Annual coupes shall be demarcated by a forest officer not below the rank of a Forest Ranger and shall be checked by an officer not below the

rank of an Assistant Conservator of Forests before the marking is taken up.

14.6.10.2 Marking Rules

The marking officer shall assess the illicit felling inside the annual coupes before the marking. The quantum of marking shall be reduced by the extent of trees removed illicitly. The net trees to be marked should be the difference between the permissible number of trees due to marking and the number of trees illicitly removed during the period between the last felling and the subsequent felling. In case of difference is negative, then there would be no marking at all in the coupe. The following rules shall be adhered to during marking.

- All dead, dying seriously diseased uprooted and fallen trees shall be marked for felling. A tree whose top one third is already dead shall be treated as a dying tree. However, 2-3 such trees per hectare shall be retained for shelter to the wildlife like owls etc.
- Out of the trees above exploitable girth class available only prescribed numbers of Sal and non-Sal trees which are silviculturally available shall be marked for felling. (A selection tree is considered silviculturally available if its removal: -
  - i) does not create a permanent gap in the canopy;
  - ii) tends to improve the remaining crop in terms of volume production; or

iii) Helps the growth of groups of young trees down to the sapling stage of any of the valuable species.)

- The trees retained (reserved trees) should be vigorous and well grown. They shall be painted with single white paint ring at the breast height and at the base, and shall be serially numbered in each coupe. The list of such trees shall be maintained in the compartment history and coupe register.
- If a tree is forked below the breast height, it shall be taken as two trees. If it is forked above the breast height it shall be taken as one tree.
- All trees to be marked for felling shall be given two blazes of size 15 cm × 15 cm.
- One at breast height and the other at a place as close to the ground as possible in the opposite site of the first one and marked with a marking hammer and numbered serially.
- Marking shall be prohibited within 50 meters of roadside and either side of nalla banks. Similarly marking shall not be done within 50-meter radius of the key habitat of wild animals such as den, salt lick, wallows, game tank and the water holes.
- If a tree is marked for felling no other tree shall be marked within 15- meter radius of that tree.
- Marking should to be done in areas where the slope of terrain is more than 30^0, except for dead and uprooted trees.

- Only those trees shall be marked whose removal shall not have adverse effect on the regeneration of the Principal species.
- The fruit bearing trees such as Mahua, Mango, Tamarind, Amla, Chara, Kendu, Harida, Bahada, Bela, Kusum etc. shall not be marked for felling.
- Prior to the marking all the climbers shall be severed.

14.6.10.3 Marking of Trees

Before marking the trees for felling, the Marking Officer shall do the following exercise to assess the number of trees to be marked.

- To determine the maximum number of trees that can be marked for felling in the coupe as per the yield calculation and say the figure is 'A'.
- To assess the irregular removal of trees after the last felling through illicit felling, salvage of dead / uprooted trees and fire burnt etc. and say the figure is 'B'.
- To enumerate the existing dead and uprooted tree in the coupe after allowing the retention for wildlife habitat and say the figure is 'C' which is to be removed definitely.

- To enumerate the available standing live trees of exploitable / harvestable girth as per Marking Rule and say the figure is 'D'.
- To add 'B' (already removed) and 'C' (to be removed definitely) and obtain the quantum of total removal and say the figure is 'E'.
- To compare between 'A' and 'E' and if 'E' is more than 'A' then no further marking of standing live tree is necessary since it is exceeding the prescribed limit of removal.
- Only the dead and uprooted trees shall be marked for removal.
- To determine the number of standing live tree to be marked say 'F' = 'A' – 'E' in the event of 'E' is less than 'A'.

The Marking Officer shall exercise utmost care to properly select the required number of standing live tree i.e. 'F' in the coupe following the marking rules scrupulously and the marking on the trees shall be done by following the marking rules prescribed using the marking hammer issued to the Marking Officer shall be branded along with numbering the trees serially with mechanical digit on these two blazes. The sound, dominant and vigorously growing trees of exploitable girth retained in the coupe shall be

painted with single white paint ring at the breast height and at base and serially numbered in each coupe.

The list of such trees shall be maintained in the compartment history and coupe register.

14.6.10.4 Working Agency

Though Odisha Forest Development Corporation Limited (OFDC) is entrusted with the working of timber coupes of this Division at present, but the discretion lies with the Government / Higher Authorities of Forest Department whose decision shall be followed for assigning the task to any working agency.

14.6.10.5 Execution of Felling

1. Method of disposal of trees marked for felling shall be as per the provisions laid down in Chapter-XIV of Odisha Forest Department Code 1979 or as modified by the Government from time to time and also as the instruction of the Government and Higher Authorities of Forest Department.
2. Prior to felling, a reconnaissance survey shall be done by the felling party to decide the direction of felling to ensure the least damage to the surrounding crop,

maximum outturn of timber and smooth logging and dragging to tractable point.

3. Trees shall be lopped before felling for preventing damage to the nearby standing crop and young regeneration.
4. In hilly terrain, felling shall be started from upper portion of a slope and proceed in a downward manner. Felling during cyclonic weather i.e. strong wind period shall be avoided as it may not fall in the desired direction.
5. Power saw shall be used for felling and logging of trees.
6. Trees shall be felled as close to the ground as possible leaving the lower blaze impressed with marking hammer, felling hammer and digit number impression intact.
7. Felling and extraction shall be allowed from 1st October to 30th June. No felling, logging, passing and dragging shall be allowed between the periods of 1st June to 30th September.
8. The competent authority shall consider any proposal for extension of time only after the recommendation of Divisional Forest Officer.

9. Works undertaken, number of lots formed, detailed passing list, deviations if any must be mentioned in the compartment history and control forms.

14.6.11 Subsidiary silvicultural operations, cleaning and thinning

In general, it denotes all operations carried out immediately after the main felling to induce the growth and development of the crop. This is the most vital operation for the forests allotted to Selection Working Circle and usually carried out in the year following the main felling. Removal and disposal of slash and debris of main felling coupled with some hygienic operations like climber cutting, soil conservation measures etc. are the major components of this operation. However, the details are furnished below.

- A systematic approach shall be adopted through preparation of treatment plan and treatment map of the coupe well in advance.
- All fallen pieces of branches, lops and tops, small woods left during the main felling which would cause fire hazard shall be removed.
- All marked trees left standing shall be felled and removed.

- All the trees damaged in the main felling and having no scope for survival shall be felled and removed.
- All high stumps shall be cut flush to the ground.
- The left-over climbers creating hindrance to the growth of the crop shall be cut.
- Soil and moisture conservation measure shall be taken up after assessing the requirement for individual nalla / stream basis. Loose boulder check dams / dry stone packing / gully plugging etc. shall be taken up starting from the upper end of the nalla towards down side.
- Blank area of more than half hectare shall be tackled through gap planting of indigenous species and fencing of such area shall be considered as part of silvicultural operation as this measure can improve existing natural regeneration as well as newly planted area to establish at the earliest.

Wildlife habitat if disturbed during the main felling shall be restored as per the prescription of Wildlife Overlapping Working Circle with special emphasis on water holes, salt licks, meadows and special and unique habitats.

14.6.12 Regeneration

Regeneration shall be ensured as per existing stand dynamics. All the negative drivers should be mollified through simultaneous silvicultural operations to ensure the establishment of the existed regeneration. Assisted Natural regeneration shall be carried out which include de-weeding of invasive weeds, clearing of debrises from the forest floor, Soil and moisture conservation activities, Climber cutting and Multiple shoot cutting to minimize the competition and enhance the rate of growth.

14.6.13 Associated regulations and measures

The associate regulation and measures are necessary to fulfil the objectives of Managements.

Fire Protection: -

During summer season, the forest crop is susceptible to fire hazards. So, it is essential to protect the crop from fire by maintaining the fire lines on the boundaries of each coupe during the month of January since the incidence of fire is usually started during February in Karanjia. The Odisha Forest Fire Protection Rules, 1979 and provisions of Chapter-XVII of Odisha Forest Department Code shall strictly be followed. Further fire fighting squads shall be deployed to prevent and neutralise fire hazards.

Grazing: **-**

Grazing is another negative driver. So, the coupe shall be closed for grazing at least for 5 (five) years including the year of working, grazing shall be regulated according to the carrying capacity in other areas on basis of rotation. The VSS wherever functioning should also be involved in this process of management.

Establishment of Saw Mill: -

At present, there is no Saw Mill at Karanjia for which the local people are facing a great difficulty in getting sawn size timber for their bonafide requirement. The OFDC Ltd. should take steps to establish a Saw Mill for catering the local need on priority basis. This will not only prevent the wastage of timber but also reduce the requirement.

Maintenance of Record: - Compartment histories, control forms and other relevant records shall be maintained for each coupe/ compartment and felling series in accordance with the provisions of working plan code.

CHAPTER 15

Rehabilitation Working Circle

15.1 Name of theworking circle

Rehabilitation Working Circle.

15.2 General constitution of working circle

The depleted forest blocks having potency to rejuvenate, need immediate ceasing of degradation coupled with execution of rehabilitation measures are taken to constitute this Working Circle. In this revision area assigned to the Rehabilitation Working Circle is **12854.23 Ha** of area covering parts and full of 143 nos. of forest blocks. This includes 103 nos. RF, 33 nos. PRF, and 07 nos. of DPFs. The Range wise detail is furnished in **Table No. 15.1.**

Table No. 15.1

Name of Range	RF	Area in ha.	PRF	Area in ha.	DP F	Area in ha.	Range wise total area.
Karanjia	59	4802.2	03	15.46	4	79.27	4896.97
Dudhiani	28	4447.7	04	237.94	1	4.41	4690.14
Thakurmunda	10	702.49	24	691.62	2	123.04	1517.15
Satkosia	06	1699.7	02	50.24	0	0	1749.94
Division	**10**	**11652**	**33**	**995.26**	**7**	**206.72**	**12854.23**

15.3 General characteristics of vegetation

In view of the large extension of area, this Working Circle needs an integrated approach for quick resilience. Due to the predominate negative drivers, the forests vegetation suffers heavy degradation and need immediate attention for rejuvenation. The negative drivers causing the poor established regeneration, needs to be addressed immediately.

The principal tree species according to their distribution in different forest blocks are given in the following **Table No. 15.2**

Table No. 15.2

Distribution of Trees		
Sl. No.	**Species**	**Range**
1	*Shorearobusta*	Karanjia, Dudhiani, Satkosia, Thakurmunda
2	*Dalbergiasissoo*	
3	*Terminaliatomentosa*	
4	*Mangiferaindica*	
5	*Buchananialanzan*	
6	*Gmelinaarborea*	
7	*Buteamonosperma*	
8	*Albizialebbeck*	
9	*Sterculiaurens*	
10	*Brideliaretusa*	
11	*Scleicheraoleosa*	
12	*Pterocarpusmarsupium*	
13	*Madhucaindica*	

Crop density of the forest blocks assigned to this working circle are variable and categorized under three groups i.e. <10%, 10-25% and 25-40%. This belongs to open category i.e. below 0.4% of crown density and these forest blocks are geographically located in close to human habitation. Although these

forests are mostly open but the root stocks present promise rejuvenation with little intervention.

15.4 Felling series, cutting sections and JFM areas

Not relevant to this Working Circle**.**

15.5 Blocks, compartments and JFM area (marked on GIS based maps)

Not relevant to this Working Circle.

15.6 Special objectives of management

As the principal aim of the management is to regenerate the degraded forests, the special objectives are as follows:-

- To enhance soil productivity through Soil and Moisture Conservation Measures.
- To boost up the existing natural growth by appropriate cultural operations.
- To restock barren areas through assistance regeneration of most desirable species.
- To meet the bonafide requirements of local inhabitants from re-stocked areas and ensuring active participation of such communities in the entire process of Management.

- To create and develop water tanks, contour trenches, contour bunds, check dams, and gully plugging, construction of Loose Boulders Check Dams as measures to arrest soil erosion.
- To alleviate the moisture regimes of the area selected and promote natural regeneration in the area susceptible to soil and moisture erosion.
- To take up site-specific soil and moisture conservation measures and in the vicinity of rivers and streams.
- To improve soil strata in degraded forest areas lying in the steep slopes.

15.6.1 Analysis of the crop

The crop composition along with major species has already been described in Chapter – 3 of Part - I. The major portion of the Working Circle is open forest category. Massive rehabilitation measure is necessary to promote natural regeneration and also boosting the growth of existing crop so that they can smoothly pass to dense category. The stand and stock table (SFC) of the blocks allotted to this working circle are furnished in **Table No-6.1 & 6.2 of Chapter 06 of part-I.**

15.6.2 Silvicultural system

As the forest included in the Working Circle are in different stages of degradation and that the prime objective is to re-stock such areas by tending operations supplemented by gap-planting and protection

measures (including JFM),no formal silvicultural system is prescribed. However, to achieve the major objectives, the broad operations prescribed are regeneration cleaning (inclusive of even thinning where ever necessary) Soil and Moisture Conservation, gap-plantation of desired species and the protection from biotic interference.

15.6.3 Rotation period

As no harvest of timber is prescribed, the rotation and conversion period are not applicable for this working circle. However, as part of the rehabilitation measures removal of dead and uprooted trees along with thinning of congested pole crop can be considered while approving the site-specific treatment plan by the Divisional Forest Officer from time to time. A ten years' cycle has been prescribed synchronizing with the plan period.

15.6.4 Harvestable diameters

As no harvest of timber is prescribed, the harvestable diameter is not applicable for this Working Circle.

15.6.5 Reducing factors and reduced areas

As no harvest of timber is prescribed, the reducing factors and reduced areas are not applicable for this Working Circle.

15.6.6 Felling cycle / Rehabilitation Cycle

A 10 (ten) years Rehabilitation Cycle is to be adopted coinciding with the working plan period.

After detailed field verification, different rehabilitation series have been constituted and each such series further divided into annual rehabilitation coupes. While constituting such series care has been taken to restrict the series as far as possible within the Range jurisdiction to which the particular forest belongs. This has been done mainly for administrative convenience and better implementation of the prescription. Eleven numbers of such series have been constituted.

15.6.7 Division into periods and allotment to periodic blocks (PB)

Not applicable to the Working Circle.

15.6.8 Division into Annual Rehabilitation Coupe:-

The trend of rehabilitation measures of different blocks and compartments shall be taken up as per the Annual Coupes, which have been constituted by dividing each series into 10 segments intending to take up one such segment per year so that the entire area can be treated during the plan period. Care has been taken to constitute such Annual Coupe taking the permanent features like Nallas, Ridges, Compartment lines etc. into consideration. Such coupes have been delineated on the management map. Care has been taken to treat the area on micro watershed basis. The objective in doing so to ensure that there should be

a regular continuity in treating the micro watershed phase wise. The block and compartments included in the coupe have been shown rehabilitation series wise for each Range and the same are furnished in the following eleven Tables. These Tables give the annual coupe for each rehabilitation series with its number and the year of treatment along with the name of the forest block, its compartment number and area included in the coupe.

15.6.9 Method of treatment:-

Keeping the major objectives of Management of this Working Circle in view appropriate Soil & Moisture Conservation measure shall form an integral part of all annual site-specific treatment plans. In addition, the following prescriptions shall be applied.

- High stumps shall be cut back to encourage young coppice shoots.
- Singling out the multiple coppice shoots shall be taken up to retain only the most promising one.
- Whenever there is congestion in the crop cleaning operation shall be undertaken to boost up natural growth of local species.
- The forest shall be strictly protected against uncontrolled grazing, forest fires and unauthorised removal only dead, dry & fallen trees shall be allowed to remove.

There are 08 Nos. of Rehabilitation series which are given in **Table No. 15.3**

Table No. 15.3

1. Karanjia Rehabilitation Series (K)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Comptt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Karanjia	2021-22	K-I	Ghadaghaguri RF		141.20	141.20
	2022-23	K-II	Dumbisahi RF		42.00	52.00
			Singda – II RF		10.00	
	2023-24	K-III	Haldia RF		113.60	113.60
	2024-25	K-IV	Badadeuli RF (P)		117.00	117.00
	2025-26	K-V	Badadeuli RF (B)		110.60	110.60
	2026 – 27	K-VI	Jharddumuria RF		56.80	130.91
			Bhalughera PRF		2.08	
			Balisahi DPF		40.47	
			Milu DPF		19.02	
			Majuraposi DPF		12.54	
	2027 – 28	K-VII	Andharjhari RF		132.80	132.80
	2028 – 29	K-VIII	Nuagaon RF		142.00	142.00
	2029 – 30	K-IX	Pokamunda RF		190.00	190.00
	2030 – 31	K-X	Sarubali RF		81.14	81.14
	Total Karanjia Rehabilitation Series: -					**1211.25**

2. Panpatria Rehabilitation Series (PP)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Karanjia	2021 – 22	PP-VI	Panpatria RF (P)		234.00	234.00
	2022 – 23	PP-VII	Panpatria RF (P)		234.00	234.00
	2023 – 24	PP-VIII	Panpatria RF (P)		234.00	234.00
	2024 – 25	PP-IX	Panpatria RF (P)		234.00	234.00
	2025 – 26	PP-X	Panpatria RF (B)		254.00	254.00
	2026 – 27	PP-I	Bharmarposi RF		157.60	157.60
	2027 – 28	PP-II	Bhanjabeda RF		145.20	183.80
			Sarubil RF		38.60	
	2028 – 29	PP-III	Kendua RF		152.00	194.80
			Maricha RF		24.00	
			Nuabeda RF		18.80	
	2029 – 30	PP-IV	Fulcomp RF		42.80	158.00
			Sarasposi RF		115.20	
	2030 - 31	PP-V	Digposi RF		82.4	135.83
			Buruhatu RF		4	
			Gambharia III RF		12.4	
			Chhelianali RF		34.40	
			Champrei-III PRF		2.63	
	Total Panpatria Rehabilitation Series: -					**2020.03**

3. Jamunti Rehabilitation Series (JM)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
Karanjia	2021 – 22	JM -VI	Deodhipa RF		32.00	180.8
			Santhbandh RF		17.60	
			Kudarsahi RF		10.80	
			Halpur – III RF		11.60	
			Sunaposi RF		108.80	
	2022 – 23	JM -VII	Mahuliasole RF		78.6	78.6
	2023 – 24	JM-VIII	Jambani RF		90.90	221.70
			Ghosda – I RF		9.20	
			Kusunpur – I RF		18.00	
			Phulguntha RF		103.60	
	2024 – 25	JM -IX	Gharmabeda RF		136.80	219.91
			Hindola RF		8.6	
			Singda – I RF		23.20	
			Pingu RF		31.20	
			Haldia – I PRF		5.34	
			Haldia – II PRF		7.49	
			Singda DPF		7.28	
	2025 – 26	JM -X	Ghagi RF		227.20	227.20
	2026 - 27	JM -I	Panideuli RF		48.4	151.40
			Konika RF		24.80	
			Budamara RF		08.80	
			Sankesari-I RF		18.00	
			Tangia RF		30.00	
			Galusahi RF		21.40	
	2027 – 28	JM -II	Denua RF		18.40	170.80
			Karanjia RF		109.20	
			Kusunpur-II RF		43.20	
	2028 – 29	JM -III	Jamunti RF		125.00	125.00
	2029 – 30	JM -IV	Halpur-I RF		47.20	143.40
			Halpur-II RF		64.00	
			MahadevdeuliRF		32.20	
	2030 – 31	JM -V	JhumkapalRF		8.00	149.60
			Sagada-I RF		18.00	
			Sagada-II RF		36.80	
			Chhelianali-I RF		4.40	
			Sankeshri-II RF		38.40	
			TulasipurRF		15.00	
			Gambharia-I RF		14.40	
			Gambharia-II RF		14.00	
	Total Jamunti Rehabilitation Series: -					**1667.81**

4. Duarsuni Rehabilitation Series (DS)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Satkosia	2021 – 22	DS -VI	Goudibahali RF		182.40	182.40
	2022 – 23	DS-VII	Khumthan RF (P)		120.00	120.00
	2023 – 24	DS-VIII	Khumthan RF (B)		120.00	120.00
	2024 - 25	DS -IX	Noda RF (P)		200.00	200.00
	2025 - 26	DS -X	Noda RF (B)		152.00	202.24
			Mahuldiha–I PRF		23.67	
			Mahuldiha–II PRF		26.57	
	2026 – 27	DS -I	Satkosia–I RF (P)		200.00	200.00
	2027 – 28	DS -II	Satkosia–I RF (B)		163.20	163.20
	2028 – 29	DS -III	Satkosia – II RF		208.27	208.27
	2029 – 30	DS -IV	Satkosia–III RF (P)		175.00	175.00
	2030 – 31	DS -V	Satkosia–III RF (B)		178.83	178.83
	Total Duarsuni Rehabilitation Series: -					**1749.94**

5. Taramara Rehabilitation Series(TM)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Thakurmunda	2021 - 22	TM -VI	Kaliaposi– II PRF		08.82	66.53
			Kaliaposi–III PRF		15.68	
			KeshdihaPRF		42.03	
	2022 - 23	TM-VII	KhadiapalPRF		06.87	98.90
			Mituani – III PRF		19.51	
			Kirkichpal PRF		34.09	
			Purunapani PRF		26.87	
			Ghadabindha DPF		11.56	
	2023 – 24	TM-VIII	Mituani – IV PRF		97.41	97.41
	2024 – 25	TM -IX	Nuadiha PRF		82.72	82.72
	2025 – 26	TM -X	Mayurposi DPF		111.48	111.48
	2026 – 27	TM -I	Handiphuta A RF		61.32	61.32
	2027 - 28	TM -II	Handiphuta B RF		154.44	154.44
	2028 – 29	TM -III	Bharandia RF		77.60	77.60
	2029 – 30	TM -IV	Khuntaposi RF		03.66	81.69
			Pansadiha RF		08.81	
			Vegidiha –II RF		17.32	
			Andharikhaman PRF		28.45	
			Basantpur PRF		23.45	
	2030 - 31	TM -V	Bharandia PRF		29.26	74.12
			Deliganj PRF		25.84	
			Gahandia PRF		19.02	
	Total Taramara Rehabilitation Series: -					**906.21**

6. Sarubil Rehabilitation Series (SB)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Thakurmunda	2021 – 22	SB-V	Ambabeda		19.6	62.96
		SB-VI	Sarubil-2 (B) RF		43.36	
	2022 – 23	SB-VII	Sanandharikhaman		30.00	82.09
			Kuchikudar(P) PRF		20.00	
			Kalasira PRF		32.09	
	2023 – 24	SB-VIII	Sanandharikhaman		30.00	78.09
			Kuchikudar(P) PRF		25.00	
			Keloposi PRF		23.09	
	2024 – 25	SB-IX	Sanandharikhaman		30.00	85.12
			Kuchikudar(B) PRF		20.72	
			Salaibeda PRF		34.40	
	2025 – 26	SB-X	Sanandharikhaman		30.00	43.98
			Majuraposi RF		13.98	
	2026 – 27	SB-I	Sarubil-1 (P) RF		40.00	52.46
			Bhairanibeda PRF		12.46	
	2027 - 28	SB-II	Sarubil-1 (P) RF		40.00	47.96
			Khuntakata PRF		07.96	
	2028 – 29	SB-III	Sarubil-1 (P) RF		40.00	54.37
			SunariposiPRF		14.37	
	2029 - 30	SB-IV	Sarubil-1 (B) RF		42.00	42.00
	2030 – 31	SB-V	Sarubil-2 (P) RF		40.00	59.83
			Khandbandh PRF		19.83	
	Total Sarubil Rehabilitation Series: -					**608.86**

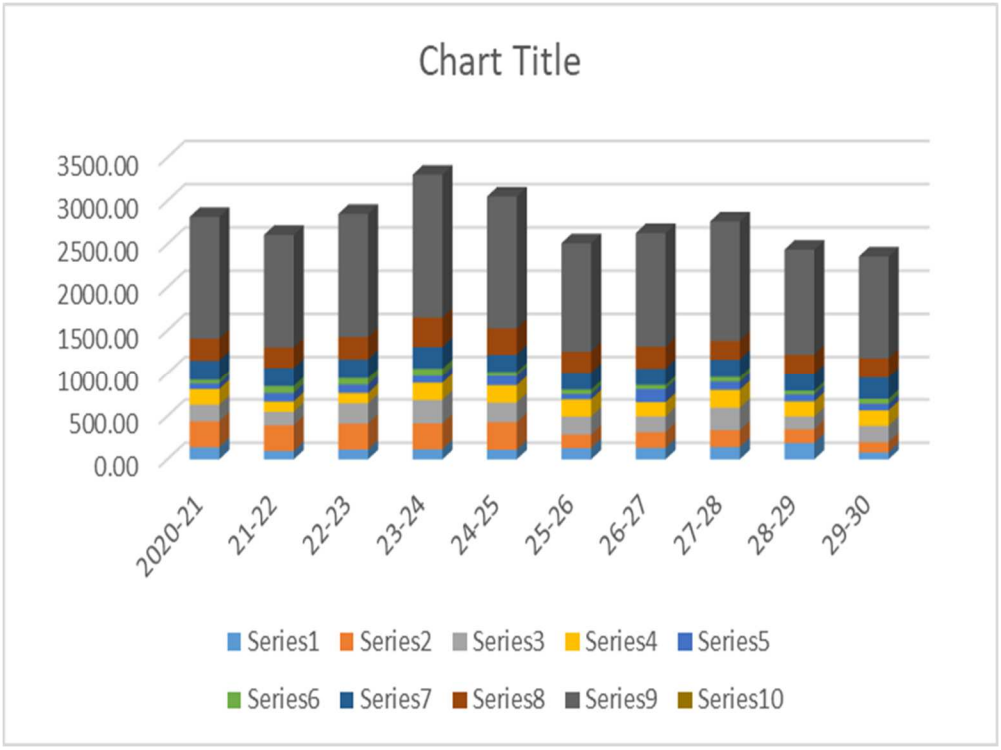
7. Tato Rehabilitation Series (T)

Name of the Range	Year of Operation	Coupe No.	Name of the Forest Block	Compt. No.	Area in Ha.	Coupe Area in Ha.
1	2	3	4	5	6	7
Dudhiani	2021 – 22	T-VI	Sialinai		84.00	226.23
			Biunria		142.23	
	2022 – 23	T-VII	Salarpada		87.14	212.34
			Kunjia		125.20	
	2023 – 24	T-VIII	Kuita		164.80	220.00
			Rugudi – I		19.20	
			Rugudi – II		36.00	
	2024 – 25	T-IX	Pantho		176.00	253.60
			Masinabila		77.60	
	2025 – 26	T-X	Siramanipur		100.00	192.70
			Khandbandh		34.00	
			Badnoi		23.20	
			Sannoi		09.20	
			Ranipat		19.65	
			Bakartala – I		04.46	
			Bakartala – II		02.19	
	2026 - 27	T-I	Gudidiha(P)		200.00	200.00
	2027 – 28	T-II	Gudidiha (B)		123.66	194.46
			Dari – I		19.60	
			Dari – II		51.20	
Dudhiani	2028 - 29	T-III	Jharbeda		145.84	205.44
			Purunadeogaon		59.60	
	2029 - 30	T-IV	Rasamtola		155.81	201.41
			Bala		25.20	
			Dumuria		4.41	
			Purunapani		15.99	
	2030 – 31	T-V	Hatimundi		147.60	244.60
			Tato		97.00	
	Total Tato Rehabilitation Series:-					**2150.78**

8. Gurguria Rehabilitation Series(G)						
Name of the Range	**Year of Operation**	**Coupe No.**	**Name of the Forest Block**	**Compt. No.**	**Area in Ha.**	**Coupe Area in Ha.**
1	**2**	**3**	**4**	**5**	**6**	**7**
Dudhiani	2021 – 22	G-VI	Badampahar – 8a RF		133.20	256.78
			Begunia – I RF (P)		123.58	
	2022 – 23	G-VII	Badampahar– 8b RF (B)		125.00	240.48
			Badampahar– 7b RF (P)		115.48	
	2023 – 24	G-VIII	Badampahar– 7b RF (B)		115.00	260.00
			Badampahar– 7a RF (P)		145.00	
	2024 - 25	G-IX	Badampahar– 7a RF (B)		144.20	342.20
			Begunia – I RF (P)		198.00	
	2025 - 26	G-X	Begunia – I RF (B)		290.60	290.60
	2026 – 27	G-I	Kudarbisida – I RF		11.20	226.50
			Ektali PRF		215.30	
	2027 – 28	G-II	Kudarbisida – II RF (P)		231.80	231.80
	2028 – 29	G-III	Kudarbisida – II RF (B)		120.00	239.08
			Badampahar- II RF (P)		119.08	
	2029 – 30	G-IV	Badampahar – II RF (B)		119.00	226.20
			Begunia – II RF		107.20	
	2030 – 31	G-V	Badampahar – 9a RF		197.20	225.72
			Badampahar – 8b RF (P)		28.52	
	Total Gurguria Rehabilitation Series: -					**2539.36**

Abstract of RWC							
Name of Range	**RF**	**Area in ha.**	**PRF**	**Area in ha.**	**DPF**	**Area in ha.**	**Range wise total area.**
Karanjia	59	4802.2	03	15.46	4	79.27	4896.97
Dudhiani	28	4447.7	04	237.94	1	4.41	4690.14
Thakurmunda	10	702.49	24	691.62	2	123.04	1517.15
Satkosia	06	1699.7	02	50.24	0	0	1749.94
Division	**103**	**11652.**	**33**	**995.26**	**7**	**206.72**	**12854.23**

Table No .8(19) Abstract of Treatment series											
Treatment Series	**Area allotted (Year wise)**										
	21-22	**22-23**	**23-24**	**24-25**	**25-26**	**26-27**	**27-28**	**28-29**	**29-30**	**30-31**	**Total**
Karanjia	141.20	52.00	113.60	117.00	110.60	130.91	132.80	142.00	190.00	81.14	1211.25
Panpatria	234.00	234.00	234.00	234.00	254.00	157.60	183.80	194.80	158	135.83	2020.03
Jamuti	180.80	78.6	221.70	219.91	227.20	151.40	170.80	125.00	143.40	149	1667.81
Dusaruni	182.40	120.00	120.00	200.00	202.24	200.00	163.20	208.27	175.00	178.83	1749.94
Tramara	66.53	98.90	97.41	82.72	111.48	61.32	154.44	77.60	81.69	74.12	906.21
Surubali	62.96	82.09	78.09	85.12	43.98	52.46	47.96	54.37	42.00	59.83	608.86
Tato	226.23	212.34	220.00	253.60	192.70	200.00	194.46	205.44	201.41	244.60	2150.78
Gurguria	256.78	240.48	260.00	342.20	290.60	226.50	231.80	239.08	226.20	225.72	2539.36
Total:-	**1350.9**	**1118.41**	**1344.8**	**1534.55**	**1432.8**	**1180.19**	**1279.26**	**1246.56**	**1217.7**	**1149.07**	**12854.24**


Chart Title
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29-30
Series1
Series2
Series3
Series4
Series5
Series6
Series7
Series8
Series9
Series10

15.6.10 Calculation of the yield

It is not applicable for this working circle in absence of any prescription for harvest.

15.6.11 Table of felling

Not applicable to this Working circle.

15.6.12 Method of executing the felling

It is not applicable for this working circle in absence of any prescription for felling.

15.6.13 Subsidiary silvicultural operations cleaning and thinning

Method of executing the operation: -

Prior to the working a full proof planning is needed. The Range Officer concerned is assigned with this responsibility to get this work programme prepared and approved by the Divisional Forest Officer beforehand.

Demarcation of Annual Rehabilitation Coupe

The Annual Rehabilitation Coupe shall be demarcated on the ground in the preceding season of treatment with small stone cairns of half meter height erected at visible distance on the periphery in case of blank patches or by painting coal-tar rings on the trees standing on the coupe line in the manner as prescribed for Selection Working Circle.

Preparation of Rehabilitation Plan

Site specific plan is required to be formulated taking the local factors and site conditions into consideration. These plans will not only result oriented but also suitable to address the issues perfectly. The Range Officer shall prepare the plan for each annual rehabilitation coupe in consultation with the VSS if operating in that area. Efforts shall be made to constitute VSS in all the areas where it is feasible.

The plan prepared by the Range Officer shall be scrutinised by Assistant Conservator of Forests and will be approved by the Divisional Forest Officer. All these works shall be completed in the previous year of the implementation.

The plan shall include the following components.

a. Preparation of a rehabilitation map in the copy of the management map indicating the SCM work, gap planting, silvicultural cleaning etc. as far as practicable.
b. The current site condition narrating the terrain, slope, drainage, soil type and depth.
c. Vegetation and the status of natural regeneration.
d. Watershed number.
e. Details of operations proposed to be taken up.
f. Cost norm and the schedule of operations.

Rehabilitation Measures

Though the rehabilitation plan will specify the details of operations to be carried out for a particular site but the following major operations are prescribed in general as the rehabilitation measure to restock the degraded forests.

Silvicultural Operations

The following prescriptions are made for the working circle.

High stumps will be cut back for the good coppicers like *Shorearobusta*, *Haldinacordifolia*, *Lanneacoromandelica*, *Dalbergiasissoo* to get promising coppice shoot. The number of such high stumps cut shall be recorded on the relevant compartment history and on each such coppiced stump a coal tar cross marking should be given for identification. Multiple coppice shoots on any stump shall be cut, retaining the one that is the most promising shoot for faster growth. The number of all such stumps with multiple shoots which are subjected to singling out operation shall be recorded in the relevant compartment history.

- Wherever a climber is creating hindrance in the growth of a promising pole/ tree, the said climber shall be severed are close to the ground and the second at a height of 3'.
- *Combretumdecandrum* (Atundi) climber should be eliminated. So also, invasive species shall be uprooted before flowering/seedling period for their complete elimination.

- Wherever there is a congested patch of pole crop of Sal and its associate species, light thinning should be carried out to retain stems according to the formula

  ..**D=0.5 X (G/10 + 2)**

  Where D = Distance between two adjacent stems in meters, and

  G = Average girth of the stems in cms.

  In the congested crops where thinning is required, the area is to be demarcated by GPS. Prior approval of the Regional Chief Conservator of Forests shall be taken for such thinning and the grade of thinning. Number of such poles removed in thinning shall be mentioned in the compartment history.
- Fruit bearing species like Mahua, Mango, Tamarind, Char, Harida, Bahada, Kusum, Bel shall not be thinned out.
- Fencing of the area can be considered as part of silvicultural operation as such measure can save the site from biotic interference and allow natural regeneration as well as planted area to establish at the earliest.

  The seedlings to be planted in gaps shall be as tall as 3 ft. Soil and moisture conservation measures shall be carried out before the gap plantings.

Soil & Moisture Conservation Measures (SCM)

Site specific plan is required to be formulated taking the local factors and site conditions into consideration.

These plans shall not only result oriented but also suitable to address the issues perfectly.

The Range Officer shall prepare the plan for each annual rehabilitation coupe in consultation with the VSS if operating in that area. Efforts shall be made to constitute VSS in all the areas where it is feasible.

The plan prepared by the Range Officer shall be scrutinized by Assistant Conservator of Forests and will be approved by the Divisional Forest Officer. All these works shall be completed in the previous year of the implementation.

The plan shall include the following components.

a. Preparation of a rehabilitation map in the copy of the management map indicating the SCM work, gap planting, silvicultural cleaning etc. as far as practicable.
b. The current site condition narrating the terrain, slope, drainage, soil type and dept.
c. Vegetation and the status of natural regeneration.
d. Watershed number.
e. Details of operations proposed to be taken up.
f. Cost norm and the schedule of operations.

The following SMC measures may be incorporated in the integrated SMC plan and get it approved by the Divisional Forest Officer before execution of the work.

EROSION CONTROL AND DRAINAGE LINE TREATMENTS IN WATERSHED PROGRAMS

Soil erosion is the process of detachment and transports of soil from one place other place by water or wind. The water or wind first detaches the soil particle and then transports them from one place to another place with surface runoff. When this surface runoff becomes large enough to have significant dynamic force, then it starts cutting the bed and sides of the area of contact of flow and transports it further. Hence, the main objective of any erosion control practice / measure is to check or reduce the kinetic energy of falling rain drop and to reduce surface runoff (which can be achieved by increased the opportunity time for water to infiltrate down) and this is the principle behind all soil and water conservation practices/ measures. Erosion control measures can be grouped under biological measures, engineering or mechanical measures and bioengineering measures. Biological measures are normally adopted without any disturbance/ movement of surface soil or modification of land surface. However, the vegetation canopy dissipates the kinetic energy associated with the falling rain thus minimizing the detachment of soil particles which is the first process in soil erosion. The canopy also

does significant interception which then falls rather slowly to the ground surface. This helps in the increased infiltration which ultimately brings down the surface runoff. The roots of the vegetation bind the soil and develop soil fertility by way of adding humus in the soil and the stems above the ground retard the velocity of surface runoff. However, in situations where these biological measures are insufficient to check the erosion to a desired level, the arable lands are required to be treated with mechanical measures or combination of mechanical and biological measures. Mechanical erosion control measures break the slope length and degree of slope either through surface soil movement and change of land topography or through construction of some structures. These measures serve the dual purpose of arresting erosion and improving moisture regime of the area. The principles behind design of these structural measures are:

1. Increasing the time of concentration and thereby allowing more runoff to be absorbed and held in the soil profile.
2. Intercepting a long slope into several short ones so as to maintain the velocity of runoff water less than the critical velocity.
3. Protection against damage due to excessive runoff.

Mechanical Measures for Arable Lands:-

The choice of the structural measures is mainly dependent on the rainfall, vegetation and land characteristics. The storage type structures are required in low rainfall area where as the drainage type structures are preferred in high rainfall areas. The field slope also decides the type of the structure to be adopted.

Bunding:

This is adopted up to 8% land slope and therefore is an engineering measure for mildly sloping lands. The main objective of bunding is to reduce the slope length. Bunding or narrow based terracing is adopted normally at those places where rainfall is low and surface runoff is to be stored for inducing infiltration. It has a height up to 100 cm and the area under bunding is not available for cultivation.

These are constructed as bund on contour and are of two types.

The one which is laid on contour for storage and absorption of runoff is called as contour bunding and the one which is used for safe disposal of excess surface runoff is called graded bunding.

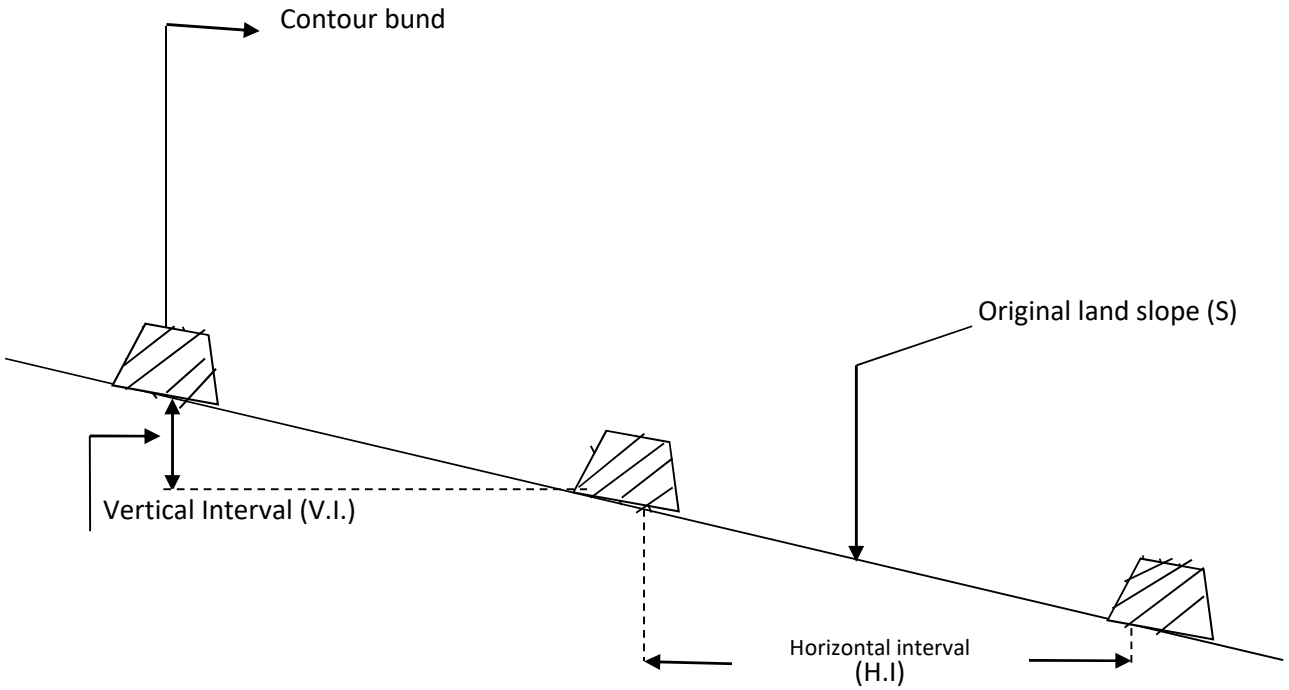
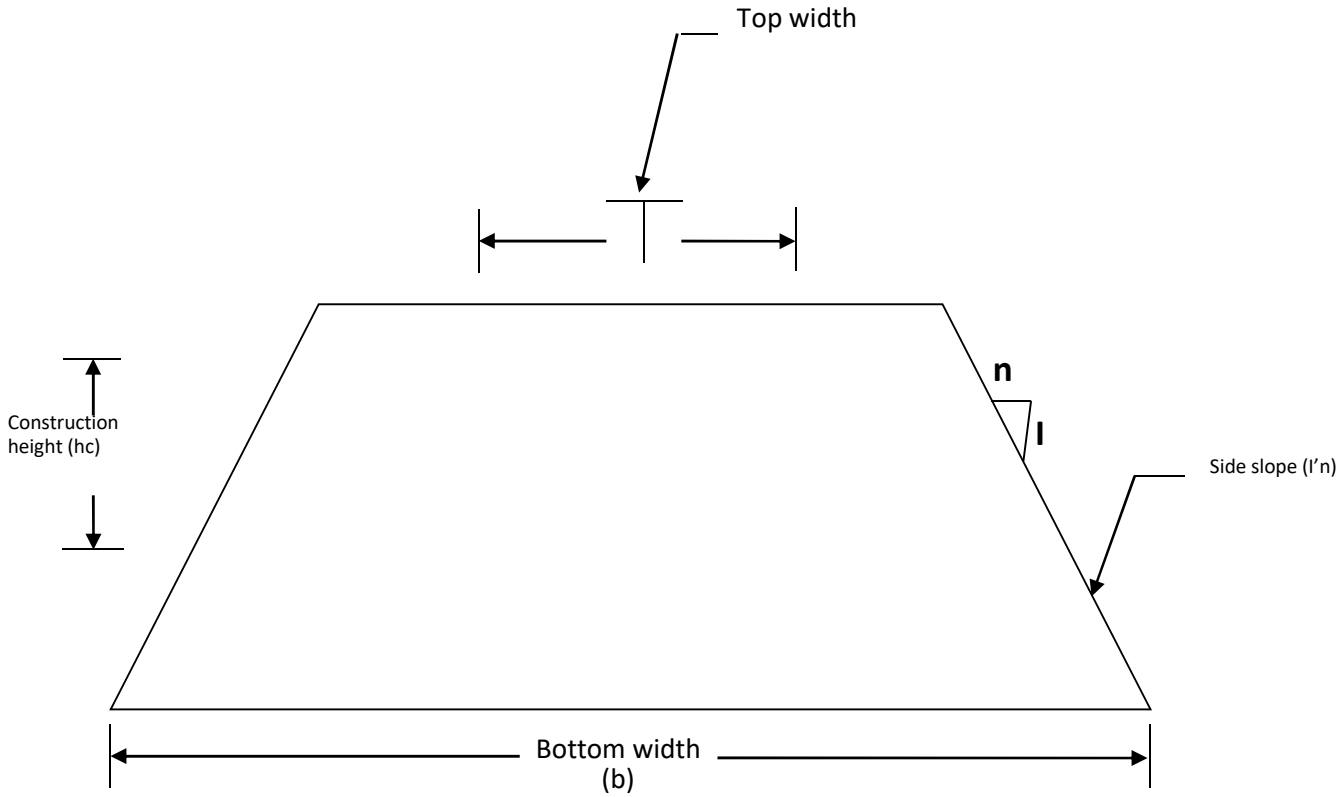


Figure: Contour Bund


Top width
Construction height (hc)
n
l
Side slope (l'n)
Bottom width (b)

Trenching:

Construction of any form of depression or micro pit or trench (Fig.2) over the land surface is done to arrest both excess surface runoff and silt carried with it.

Continuous contour trenches:

It is the trench along the contour (across the slope) at the specified horizontal interval depends upon the slope with the dimension of 0.45 m depth, 0.30 m width throughout the field width. The excavated soil has to be heap at a downstream side of the trench and the soil has to be spread uniformly for the surface width of 30 cm.

Continuous contour trenches are recommended for storage of water in low rainfall relatively flat areas receiving storms of mild intensity. These trenches demand high skill for construction and layout on contour.

Trenches on contour lines over long stretches is very difficult and they eventually become trenches with variable slopes. They may act as drainage system and induce non-uniform moisture conservation. Water from a major part of the trench generally collects into a small low lying portion followed by breaching. Subsequently many trenches downwards also get breached with more cumulative effect progressively. In this way instead of conserving rainwater they become drainage channels and prove

counterproductive. So, equalizers should be provided at regular intervals to prevent concentration of runoff in any part of the trenches.



Figure: Continuous Contour Trench

Staggered contour trenches: -

It is trench to be excavated along the contour in a staggered manner with the dimension of 2 m (L)×0.45 m(D)×0.30 m (W). The excavated soil has to be spread uniformly for the surface width of 30 cm.

In high rainfall areas with highly dissected topography staggered trenches are usually adopted. Since length of the trench is 2-3 m there are very little chances of deviating from the contour even by an unskilled worker and lack of supervision. Since breaches are very uncommon, they provide better as well as uniform in situ moisture conservation.

Figure: Staggered Contour Trench

Semi elliptical trenches: -

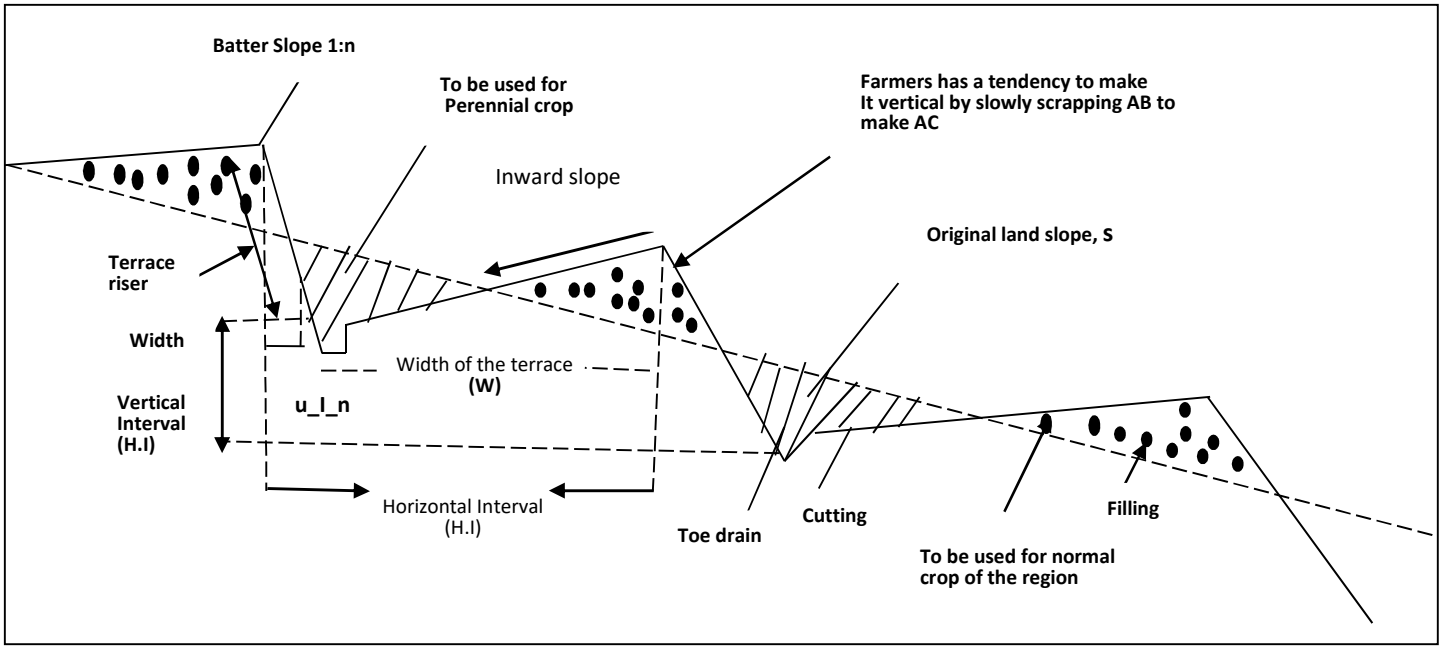
These trenches have to be excavated in respect to each plant at the upstream side of the plant at 1.5 m distance from the plant in a semi elliptical manner with the dimension of 2m (L) ×0.45m(D) × 0.30 m(W). The excavated soil has to be heap at downstream side of the trench and the soil has to be spread uniformly for the surface width of 30 cm.

Graded trenches: -The trenches for field length with the width of 0.30 m and depth of 0.45 m were made on 01 per cent grade. Side channels have to be provided for safe disposal of water. These are drainage type trenches for intercepting and safe disposal of surface flow in very high rainfall areas and impermeable black soil. Graded trenches are identical to

contour trenches in all respects, except in that they are excavated with a longitudinal bed grade.

Figure: Graded Trench

Terracing: -It is an engineering soil conservation practice, used to control soil erosion in highly sloping area [greater than (8%)].The effective length and degree of the slope is changed by constructing steps like structures across the land slope to check the flow of runoff and to reduce the soil loss. Large quantity of surface soil is moved from one place to another place.



***Fig*ure: Types of bench terraces**

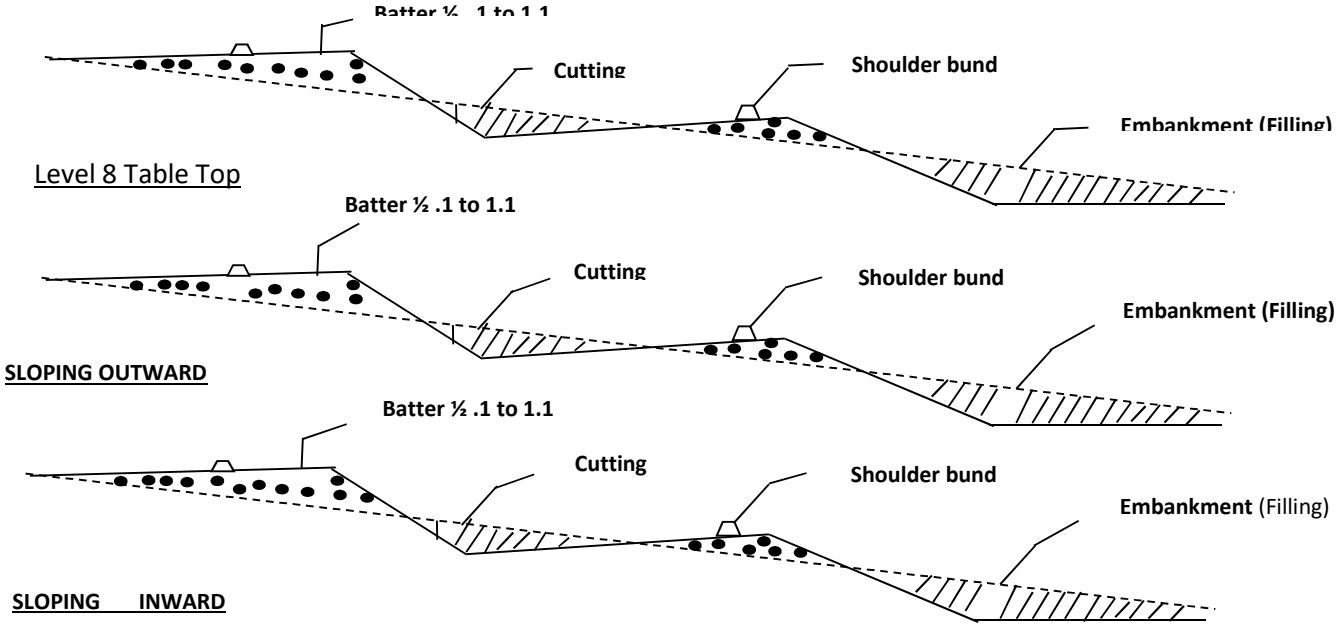


Figure: Types of bench terraces

Waterways or Disposal Drain: -

Safe disposal of excess surface runoff from any land / field is very necessary through waterways. If the excess surface runoff is not properly guided then it erodes the streams, which may lead to gully formation or widening of stream this damaging valuable land.

Revetment: -

In some cases, it becomes necessary to slope back the vertical cut and pitched it with stone which otherwise would have slided or slipped, this is known as revetment.

Selection of conservation measures: -

The selection of various erosion control measures is done basing on the

a. Land slope
b. Soil depth
c. Rainfall

The types of soil and moisture conservation measures to be taken are mentioned in the **Table No 3.4**

Table No. 15.4
Types of SMC measures

Slope in degree	Depth	Rainfall in mm	Types of measure prescribed
<8	Shallow and light	<700	Narrow based terracing (Contour bunding)
<8	Shallow and light	>700	Narrow based terracing (Graded bunding)
<8	Heavy clay	<700	
<8	Medium to deep	<1500	Contour Trenching (Continuous)
<8	Shallow	<800	Contour Trenching (staggered)
<33	Medium to deep but well drained	<2000	
<33	Medium to deep soil but well drained	2000-3000	Contour Trenching (Graded)
<33	Medium to deep	<2500-3000	Level Terracing
<33	Medium to deep	<2500-3000	Inward Slopping
<33	Shallow	<1200	Outward Slopping
<33	Shallow to deep	<1500	Puertorican Type
<33	Shallow to medium	<1500	Stonewall (Contour)
<33	Shallow to medium	1500-2000	Stonewall (Graded)
<33	Shallow to medium	<1200	Zing Terracing & Conservation Bench Terracing

The most common control measures for arable land are bunding, trenching and terracing. They have their own limitations with respective to design, layout, execution and cost. The specification regarding the suitability and adaptability of various engineering erosion control measures given here should be considered only as a guideline.

Slight or marginal modification / adjustment is necessary to suit the prevailing conditions at a particular location.

Non Arable Lands

The first principle in gully control is to reduce maximum possible amount of water running through them. Gully heads in particular have to be completely protected by interception ditches, which should spread the water over the area treated. Diversion ditches all along the gully walls at small intervals and in a herring bone pattern should further divert water from the gully side slopes, away from the gully walls and spread it over the same protected area /gully bed (Stream). If the gully is V shaped, this can easily be done, on U shaped gullies with straight walls, these ditches should start as close as possible to the upper edge of the vertical walls. On the gully floors, gully plugs and split traps should be used. Local materials found on the gully should be used to the maximum extent possible. Gabions may be one of the best uses of stone, both for the plugs and along the gully walls to prevent scouring. The installation of sophisticated engineering structure should be avoided except in very special cases. Special emphasis is again to the basic principles that the only way for gully control is from the top, the above gully head and along the walls on both sides. It should be left to the nature to heal the world with the assistance as necessary to

start the process, which may take years to complete. The gully control structures are normally used for

a. Gully grade control and stabilization
b. Sediment discharge
c. Water level control
d. Surface water disposal etc.

Stabilization of gully through vegetation is a difficult work as these are very much used for conveying runoff during the time plantation. Under such conditions mechanical or engineering measures have to be adopted to prevent washing away of the plantation by way of large volume of runoff. Such protective measures need to be only temporary as the vegetation once established will be able to take care of the gully.

Where mechanical measures are a necessary in badly degraded gully for its control and temporary structures are unlikely to serve the purpose, permanent structures such as masonry check dam or earth dams supplemented by vegetation should be provided to convey the runoff over critical portions of the gully.

Gully Control Structures: -

For control of gullies, the erosive velocities are reduced by flattering out the steep uniform gradients of the gully, by

constructing a series of checks which transforms the longitudinal gradients into a series of steps with low risers and long flat treads. When temporary structures are used, they are intended only to provide necessary protection until the vegetation becomes well established. Check dams of this type are usually made up brush wood, wire pole or loose rock. Substantial checks of masonry concrete or earth are built where it is necessary to relay upon these alone for permanent control. Temporary check dams constructed across the bed of a gully serve two purposes

a. To collect sufficient soil and water to enable the proper growth of vegetative cover and
b. To check channel erosion until sufficient stabilizing vegetation can be established at that critical point.

   The vertical interval between the check dams is equal to the height of a check dam. For stone check dam, it is usually 1 m. check dam can easily be applied in all gullies of less than 2 m depth and 5 m width. The gully control structures can be classified under

c. Temporary gully control structure
d. Semi-permanent gully control structure
e. Permanent gully structure.

Temporary gully control structure

These are temporary in nature and normally last for a very short period say upto 2 to 4 years i.e. till the vegetation is established. The first order and or second order streams where runoff contributing areas is within 20-40 ha, depth within 2 m and width within 5-6 m, the temporary gully control measure are very useful. They are usually made of wooden poles, wire, sand filled plastic bag, wooden plank, loose boulder etc. these have to be repaired annually or after every monsoon. Design details of this structure s are

a. One row or single row wooden post check dam
b. Two row or double row wooden check dam filled with brush wood.
c. Two row or double row wooden check dam filled with boulders.
d. Woven wire-wooden post check dam
e. Loose boulder check dam
f. Sand filled plastic bag check dam
g. Wooden plank / post check dam.

Semi-permanent gully control structure

These usually have a longer life, say of 10-15 years, and normally do not require regular maintenance. They do not enquire the assistance of vegetative growth for controlling

the gully by helps the vegetation to come up on gully sides. They are constructed in places where materials are available in sufficient quantity. These are very effective in steep gullies traversing hilly and mountainous region. They are also useful in ravines where passage for livestock has to be provided. These are very much suited in second and third order streams with a runoff contributing area of 40 to 100 ha. and where the depth of gully is usually less than 4 m. various types of semi-permanent gully control structures are:

1) Loose boulder check dam 2) Log check dam 3) Gabion Check dam

Concrete and masonry structures are efficient supplemental control measures. Good vegetative practices together with proper land use are indispensable in a sound soil and water conservation programme. But there are many instances where vegetative measures and simple practices alone are inadequate to handle a concentration of water. In such cases, permanent structure of masonry and concrete play an important part in reinforcing or supplementing the other practices.

The main function of the structure is to safely dispose the peak rate of runoff for a given frequency, from a higher elevation to a lower elevation. It should have arrangements

to dissipate the kinetic energy of discharge within the structure in a manner and degree that will protect both the structure and sown stream channel from damage.

There are also instances where a high degree of safety and permanence and desirable. Vegetative control measures are subjected to the influences of uncertain factors as climate, insects, etc and therefore, are not too dependable. On the other hand, properly designed and installed structures are of longer life and dependable.

Straight drop spillway: -

The drop spillway is a weir structure. Flow passes through the weir opening, drops to an approximately level apron or stilling basin and then passed into the downstream channel.

A. Functional use: Important uses of a straight drop spillway are as follows:

- Grade stabilization in lower reaches of water ways and outlet.
- Erosion control for protection of fields, roads, building and other improvements from gullies.
- Grade control stabilizing channel.
- Reservoir spillway where the total drop is relatively low.
- Protection of the outlet and of grassed water ways.

- Outlets for tile and surface at the upper reaches and along drainage ditches.

B. Adaptability: The drop spillway is an efficient structure for controlling relatively low heads, normally up to 3 m.

C. Advantages: The likelihood of serious structural damage is less than for other types of structure. The rectangular weir is less likely to be clogged by debris than the openings of other structures of comparative discharge capacities. It is relatively easy to construct.

D. Limitations: It is costlier than some other types of structures, where the required discharge capacity is less than 3 cum cusec, and the total head or drop is greater than 3.m It is not favourable structure: where temporary spillway storage is needed to obtain a large reduction in discharge. A stable grade below the structure is essential.

Drop inlet spillway.

A drop inlet spillway is a closed conduit generally designed to carry water under pressure from about an embankment to a lower elevation. An earthen embankment is required to direct the discharge through the spillway. Thus, the usual function of a drop inlet is to convey a portion of the runoff though or under an embankment without erosion. Vegetated or earth spillways around one of both of the embankment

should always be used in conjunction with drip inlet spillway.

A. Functional uses: Important uses of a drop inlet spillway are listed below.

- Grade stabilization.
- Disposal system at lower end
- Principal spillways for debris basins
- Flood prevention structures

B. Adaptability: It is a very efficient structure for controlling relatively high gully heads, usually above 3 m. It is well adapted to sites providing an appreciable amount of temporary storage above the inlet. It may also be used in connection with relatively low leads.

C. Advantages: For high heads, it requires fewer materials than a drop spillway. Where an appreciable amount of temporary storage is available, the capacity of the spillway can be materially reduced. Besides effecting a reduction in cost, this reduction of discharge results in a lower peak channel flow below, and can be favourable factor in downstream channel grade stabilization and flood prevention.

D. Limitations: Small drop inlets are subjected to blockage by debris. They are limited to locations where satisfactory earth embankment can be constructed.

E. Materials: the inlet of a drop inlet spillway may be of plain concrete, reinforced concrete blocks, masonry or pipe. The barrel may be of reinforced concretes, concrete or clay tile or corrugated or smooth metal pipe have water tight joints.

Chute spillway

A chute spillway is an open channel with a steep slope, in which flow is carried at supercritical velocities. It usually consists of an inlet, vertical curve section, steep-sloped channel and outlet. The major part of the drop in water surface takes place in a channel. Flow passes though the inlet and down the paved channel to the floor of the outlet.

A. Functional uses: Important uses of a drop inlet spillway are listed below:

- To control the gradient in either natural or constructed channel
- To serve as a spillway for flood prevention, water conservation and sediment collection structure.

B. Adaptability: The chute, specifically the concrete chute, is particularly adapted to high over fall, where a full flow structure is required and where site conditions do not permit the use of a detention type structure. It may also be used with detention dams, taking advantage of the temporary storage to reduce the required capacity and the cost of the chute.

C. Advantages: It is usually more economical than a drop inlet structure, when large capacities are required.

D. Limitations: There is a considerable danger of undermining of the structure by rodents. In poor drainage location, seepage may weaken the foundation. It must be placed on compacted fill or on undisturbed soil in an abutment.

E. Material: Reinforced concrete is the most widely used and safest material for large chutes, plain concrete and masonry, though not as suitable as reinforced concrete, can also be used.

Slope stabilization measures

Diversion drain is provided above the head of the slide or mined area, 3 to 5 m uphill side, to drain off the water safely away from the unstable area. A suitable grade is provided to the diversion drain, preferably around 0.5%.

Contour Vegetative Wattling

Wattling is a method of breaking the length of slope into shorter portion by providing contour wattles at 3 to 5 interval upto 33% slope. Trenches 0.3m wide and 1 m deep are dug up on contour and filled with brushwood bundles (5-6 cm diameter) lying horizontally. On the downhill side

of the trenches, posts of species whichsprouts on planting are placed at 100-125 cm spacing. Example – *Erythrinasuberosa*, Vitex*negundo*, *Ficusinfectoria*.,*Lanneacoromandelica*etc. if posts of the said species are not available, posts of any other hardwood species can be used.

The trench is then filled back with dug up earth till about 10 cm from the ground level. The posts are woven around with locally available shrubs up to about 20 cm above the ground level.

These are now live contour wattles and they obstruct movement of debris and allow runoff to pass through. These are preferred on fragile slopes where soil working for trenching is difficult.

Mulching and Planting: -The slide face in the inter wattle area or the inter trench area is further protected by spreading a thick layer of locally available grasses over the area. Wooden peg and binding wire can be tied to prevent displacing of mulch out of position. Recently geo-textiles (natural/ synthetic) have also been used for such purposes to support mulches and help initial establishment of plantation. Some of the grass may include *Chrysopogonfulvus*, *Tripsacumlaxum*, *Cymbopogonspp.*, *Pennisetumcladestinum, Cynodondactylon, Saccharumspp.*

*e*tc. in between the trenches, sowing / planting with the local species of grasses and shrubs and easy to establish with quick growth may be planted to provide reinforced protective cover over the slide face. The common species may *include Acacia spp., Eucalyptus, Bombaxceiba, Lanneagrandis, Erythrinaspp., Terminaliaspp., Cassia fistula. Etc.*

Brush Layering: -

The use of rooted layers is one of the best methods to stabilize loose rock slopes. Fresh, green cutting and rooted plants are layered on 1-1.5 m wide berms on the face of the slope. The berms should have an angle of inclination (sloping up) of 10-20 % to the outside and are dug out by hand or machine. Whenever there is a risk of slope failure, ditches should only be dug in short segments. The plants are placed close together and the tips or the leafy ends should be allowed to protrude slightly beyond the face of the slope. Rooted and unroofed plants should be used as vegetation and these should be resistant to rock fall and rubble and have the ability to produce adventitious root systems. The plants are buried with the

material from the next, above berm, so that 15-20 cm of the tips protrudes. Vertical spacing between layers is dictated by the erosion potential of the slope and may be between 1 and 2 m.

Vegetative stone wall: -

Vegetated stone walls are useful for the stabilization of slope toes or steep slope cuts. They are flexible, permeable and durable and can be adapted to every slope angle. During the building of the stone wall, live plants are placed into the joints between the stones so that they reach into the soil behind the stone.

The joints must be filled with soil material to ensure plant growth. Green Ficus branches and rooted plants, which have ability to produce adventitious rooting system, should be used as vegetation. The branches should not protrude from the wall more than 10 cm to prevent desiccation. Additionally, a greening with hydro seeding is possible.

Vegetative gabion: -

Vegetative gabion is used to stabilize slopes and slope toes where a lot of smaller stones are available. They are constructed with a fine wire mesh that is filled with

coarse gravel or smaller stones, earth, live cutting and container plants. To ensure that the plants are covered with material. It is necessary to lift the mesh and shake it to settle the gravel.

The plants should protrude slightly beyond the face of the gabion but not more than 10 cm to prevent desiccation. Finally, the wire mesh is pulled together and shut with wire. Moreover, vegetated gabions are a fast and simple construction to secure wet slopes because they are elastic and improve drainage through plant transpiration. Root systems form a mat that strengthens the soil and removes excess slope moisture**.**

Check Dams: -

First order gullies/ channels receiving small quantities of runoff can be stabilized by temporary check dams (loose masonry, brush wood, log wood check dam). The gabion checkdams may be constructed in middle and lower reaches of the gullies/channels for retention of debris and soil accumulation without ponding. The debris carrying capacity within the inter structure reach reduces due to reduction in channel gradient. Gabion structures are preferred in soil conservation works as they are

a. Flexible (bend without breaking)
b. Porous
c. Stable
d. Economical, as compared to cement structures.

Retaining Wall: -

A retaining wall works as revetment on steep slopes near the toe i.e. lower bank in protecting bank from erosion or deep cut on road side. It acts as a toe wall. as a rule of thumb, for gabion structures the bottom width is kept 2/3rd the height for walls up to 6m in height with 1 m top width and for stone wall it may be kept a minimum one third of the height. When there is surcharge, a 2 m top width may be adapted.

Stream Bank Protection: -

The most common measures are given below

Spurs: -

Spurs are commonly used for stream bank erosion control spurs are structures constructed at an angle to the stream flow, extending from the bank into the stream. Their main functions are to guide the stream flow along a desired alignment and to prevent bank erosion. A well designed

series of spurs build along an eroding bank will, firstly, check the erosion and secondly induce siltation in between the spurs. The silted banks may be put under perennial plantations subsequently.

Retards: -

The retards serve the purpose of dampening stream velocity sufficiently near the bank to prevent erosive velocity sufficiently near the bank to prevent erosion of the banks or scour its toe by inducing deposition. There are three types of retards.

Live hedges: -

Live hedges are commonly employed in small streams successfully. Shoots of *Ipomeacarnea, Arundodonax, Jatrophacurcas etc.* may be planted in trenches
(60 cm wide) to serve as live hedges. *Arundodonax* has very strong rood and shoot systems to resist the flood flows.

Jacks

Jacks are wooden posts of 8 cm dia and 2 to 3 m in length, which are placed in series along the eroding bank and are tied together.

Jetted Posts: -

These are green posts of 2 to 2.5 m in length and 6 to 12 cm dia which are erected along the actively eroding banks in two rows, 1.0 m apart. Fuel, fodder, fiber and even horticultural plantations can be raised in the reclaimed lands along the banks of the torrents.

Drainage channels / gullies in the arable and non-arable lands, natural waterways or streams are different forms of drainage line in a watershed. These drainage lines / systems are the carriers of runoff and sediment in a watershed. Network of these gullies, if not controlled or stabilized, may go on extending and render adjoining arable or forest lands degraded. Drainage Line Treatments (DLT) are therefore necessary for reducing the channel gradient (or bed slope) in order to reduce flow velocity, protect banks/side slopes from undercutting (or scouring) and protect adjoining lands and forest plantations. DLT forms a major component of any watershed development project.

ARTIFICIAL RECHARGE METHODS

Percolation ponds: - Percolation ponds are small storage structures constructed across natural streams and nalas to collect spread and impound surface runoff to facilitate infiltration and percolation of water into the sub-soil for augmenting ground water recharge.

The site should have highly porous soil and sites with heavy soils or impervious strata should be avoided. There should be a number of irrigation wells in the zone of influence upto about 1 km from the pond to benefit from the ground water recharge.

The ponds may be designed to store about one-third of the annual water yield from the catchments and 1 ½ to 2 fillings during the monsoon are assumed.

Sub-surface water harvesting pond

Some specific locations in the valley portions of undulating topography in the hilly region yield sub-surface runoff due to different monolith layers of soil profile. This provides an ample scope of harvesting sub-surface flow, which is free of sediments. Constructing diaphragm ponds and / or sub-surface barriers to arrest and store sub-surface runoff for storage and recycling can achieve this.

Springs are the manifestations of the ground water hydrology of hilly regions.

There are small or large springs depending upon the degree of concentration and seasonal or perennial springs in nature depending upon the whether the supply is variable or constant.

Sunken wells

Smaller shallow wells from 2 to 3 m deep with 2 to 3 m diameter, which has to construct where the springs or sub surface flow is available. The subsurface water can be harvested and can be used for irrigation.

Sunken ponds: - These pits are made to capture rainwater for recharging ground water.

These are usually created in small gullies where sediment discharge is less.

It can be also created upstream side of the wells in either common or private land. But, side of the drainage lines on the bunds should be avoided. The depth of pits is limited to 2.00 m, in most cases only 1.00 m. The width of pit depends upon gully bottom may vary from 1 m to 3 m. The length of pit may be 4.00 m or 2 m diameter in case of circular shape. The excavated soil is deposited in thin layers at downstream leaving provision of surplus arrangements.

- Suitable vegetation is planted around the pit.
- Silt trap is provided at upstream.
- Revetment is provided an inlet side.
- These are usually made in series.

Percolation trenches: -Medium size of trenches with the length of 4 to 6 m, width of 0.5 to 01 m and depth of up to 01 m can excavate at up streamside in common and community

lands. These trenches will recharge the ground water at down streamside.

Permanent structures

Permanent gully control structures are used in medium to large gullies carrying more runoff, especially in the lower reaches. Gully heads are generally steep and may even have almost vertical fall.

If the fall or drop at gully head is limited to 03 or 04 m straight drop structure is recommended to control gully head.
If the fall is more than 03 or 04 m and no impounding of water exist on upstream of the gully head, chute spillway is recommended.

The site with appreciable amount of temporary storage and a drop of over 3 m, may be provided with drop inlet or pipe spillway where satisfactory earth embankments or earthen gully plugs can be constructed.



Figure: Permanent structures

Planting

The blank area which has least chance of restocking through promotion of existing growing stock shall be covered through planting. Choice of species for planting shall be based on its suitability to the site, need of the local people and easy propagation. Though emphasis shall be given on indigenous species but NTFP, fruit bearing, medicinal and aromatic plant species shall be preferred

along with bamboo. Generally, species like Asana, Arjuna, Mahula, Bamboo, Teak, Khaira, Babool, Karanja, Amla, Sirisa, Bija, Champa etc. are suitable for different areas proposed in this working circle. In the areas close to villages Ficus species and fruit bearing species like Mango, Jackfruit, Tamarind, Mahula, Karanja, Neem, Kusum and others shall be tried. On much eroded and degrades sites species like *Acacia catechu, Acacia leucophloea*, *Zizyphus spp*., *Aeglemarmelos*, *Acacia nilotica* and *Agave Americana s*hall be tried along bunds and gullies. The species described above are only indicative; the particular species shall be specified while preparing treatment plan.

Sowing / Planting of Grasses

Apart from the tree species, the grasses are found more suitable for the exposed soils in eroded areas due to their soil binding capacity. Such grasses can be raised either through planting or dibbling of seeds or both depending on the degree of erosion.

Protection against Biotic interference

It is the most crucial component of rehabilitation measures. History reveals that though various operations are carried out successfully but the desired result is not obtained due to non-address ofbiotic interference. So adequate protection is needed. It is further observed that proper protection has enhanced the quality and quantity of the existing crops. This can be done combined with the involvement of VSS and engagement of

watchers up to five years from the year of initiating rehabilitation work. At least one watcher per 01 Km^2 of area shall be engaged to safe guard against fire, grazing, illicit removal and other biotic interference.

15.6.14 Regeneration

Gap planting shall be carried out whenever the blank / gap is a patch of minimum 0.2 ha. (0.5 Ac.) of area. Each such gap shall be assigned a serial number, which should be indicated by a metallic tag to be hung on an adjacent tree. The number of seedlings planted in the gaps should also be mentioned in the Plantation Journal. The Plantation Map in 01:50,000 scale should indicate the approximate location of each gap.

15.6.15 Associated regulations and measures

Other Regulations: -

Besides the prescriptions provided in the foregoing paras, some other regulations are necessary to augment the former for effective results. These are the following:

Fire Protection: -

During summer season, the forest crops are susceptible to fire hazard. So, it is essential to protect the crop from fire by maintaining the fire

lines on the boundaries of each coupe during the month of January since the incident of fire is usually started during February in Karanjia.The regeneration crop particularly ground flora and the pole crops to some extent are mostly the victim of fire, which is almost the ground fire in this locality. In addition to the crop, the soil condition is also deteriorated due to fire. It becomes hard, impermeable and infertile. So, it is necessary to prevent the fire. The Odisha Forest Fire Protection Rules, 1979 and provisions of Chapter-XVII of Odisha Forest Department Code shall be followed. Further Firewatchers should be engaged from month of February till June. VSS wherever existing shall also be motivated to prevent fire as well as to take instant steps to extinguish the same if occurs. The engagement of watcher shall form an integral component of subsidiary silvicultural operation.

Grazing: **-** Grazing is another obstacle for regeneration and further improvement of crop. So, the coupe shall be closed for grazing at least for 5 (five) years including the year of working. Grazing will be regulated according to the carrying capacity in other areas on basis of rotation. The watcher should be engaged to ensure the strict prohibition on grazing within the prescribed period mentioned above. The VSS wherever functioning shall also be involved in this process.

Artificial Barriers:**-**Perimeter barriers to keep off biotic interference in the form of hedge, stone walling or trench fencing should be attempted as far as possible.

Resource Mobilisation:**-**

The Divisional Forest Officer shall make efforts to secure funding from all possible sources (e.g. non-plan sector, State and Central Plan sector, District Plans Schemes) to ensure that sufficient funds to implement prescription of this working circle are available. He shall also include requirement of funds for this purpose in his annual budget and estimates.

Record Keeping: -

The journals and other records will be maintained for each coupe at Range level. The copy of such journal shall be submitted to Division Office for reference and record. In addition, necessary entries shall also be made in respective compartment history file indicating the details of operations carried out. The observations on the results should also be recorded for future.

CHAPTER-16

PLANTATION WORKING CIRCLE

16.1 Plantation working circle

Plantation is an important component in enriching vegetation and a tool in hands of foresters to increase basal area of the crop in a forest and increase biomass production per annum per hectare. Block plantations raised under various schemes in Reserved Forests, PRFs and Village forest need to be intensively managed. During last plan period plantations have been raised in assigned area to enrich the forest crop. These plantations are now part of the vegetation & to be managed as normal crop on the forest block. There are gaps that need to be planted up to cover up the land quickly.

Similarly, plantations raised under erstwhile Social Forestry Project and declared as Village Forest under provisions of Odisha Forest Act, 1972 are also in a scattered manner and no management practices has been initiated after reorganization of Forest Department and transformation of Social Forestry Project Divisions / Ranges to some other Divisions / Ranges.

It is proposed to manage Social Forestry Village woodlots and take up fresh plantations under this working Circle. The plantation Working circle covers **1411.82 ha.**

16.2 General Constitution:

This working Circle comprises erstwhile Social Forestry Village Woodlots declared as Village Forests under provisions of Odisha Forest Act, 1972 for planting and plantations raised in RF / PRF/ DPF during last working plan period, working schemes period for tending within next 10 years. The abstract of area allotted to this Working Circle is given in

Table No. 16.1

ABSTRACT			
Sl. No.	**Status of the block**	**No. of Blocks**	**Area allotted to P.W.C.**
1	RF	32	1000.61
2	DPF	1	10
3	Village Forests	77	401.21
	Total:-	**110**	1411.82

The details of Village Forests and identified area are furnished at Table No. 16.2 below.

Table No. 16.2

Forest Block Wise Area Allotted to Plantation Working Circle

Sl.	Name of the Range	Name of the Forest Block	Area available for Management in Ha	Area in PWC in Ha.
01	Karanjia	Adipur RF	32.20	39.20
02		Buruhatu RF	10	10
03		Chhelianali – I RF	6	6
04		Denua RF	10	10
05		Galusahi RF	5	5
06		Gharmabeda RF	52	52
07		Ghosda – I RF	10	10
08		Hatisalbeda RF	10	10
09		Hindola RF	15	15
10		Jambani RF	4	4
11		Jamunti RF	135	135
12		Jhumkapal RF	20	20
13		Kudarsahi RF	10	10
14		Mahadevdeuli RF	5	5
15		Mahuliasole RF	75	75
16		Naksara RF	20.40	20.40
17		Panpatria RF	330	330
18		Panideuli RF	50	50
19		Paudia RF	15	15
20		Pingu RF	8	8
21		Singda – II RF	44	44
22		Tulasipur RF	13	13
23		P.Jadunathpur VF	11.92	11.92
24		Halpur VF	2	2
25		Narsandha VF	1.08	1.08

Sl.	Name of the Range	Name of the Forest Block	Area available for Management in Ha	Area in PWC in Ha.
26	**Karanjia**	Chheliaposi VF	7.84	7.84
27		Kusunpur VF	3.94	3.94
28		Badposi VF	5	5
29		Nanduburu VF	1	1
30		Bamanposi VF	7.9	7.9
31		Bhramarposi – II VF	2.92	2.92
32		Nuabeda VF	4.75	4.75
33		Sarubil VF	5	5
34		Kasia VF	5	5
35		Bhramarposi – I VF	12	12
36		Mandua VF	5.01	5.01
37		Ankura VF	3	3
38		Pandarsil VF	1.58	1.58
39		Baliposi VF	5	5
40		Reghasahi VF	8	8
41		Saradha VF	6	6
42		Bangiriposi VF	6	6
43		Mahadevdeuli VF	5	5
44		Dhakata VF	6.08	6.08
45		Ghosda VF	15.61	15.61
46		B.Jadunathpur VF	6	6
47		Pokamunda VF	5	5
48		Kenjharapanposi VF	1.34	1.34
49		Mata VF	3.95	3.95
50		Rugudi – II VF	11.86	11.86
51		Badposi – III VF	4.18	4.18
52		Khadikudar VF	4.02	4.02
53		Nuagaon VF	2.8	2.8
54		Palsagadia VF	9	9
55	Dudhiani	Dumuria RF	5	5
56		Panposi RF	10	10
57		Siramanipur RF	10	10
58		Tato RF	7	7
59		Begunia-I RF	17	17
Sl.	**Name of the Range**	**Name of the**	**Area**	**Area in**

		Forest Block	available for Management in Ha	PWC in Ha.
60		Kudarbisida-I RF	20	20
61		Kudarbisida-II RF	5	5
62		Budhipat DPF	10	10
63		Nuagaon VF	4.4	4.4
64		Khandbandh VF	6	6
65		Sunamukhi VF	3.68	3.68
66		Badposi VF	1.59	1.59
67		Rugudi-I VF	5	5
68		Purunapani – I VF	3.02	3.02
69		B. Badposi VF	0.02	0.02
70		Bakartala VF	2.28	2.28
71		Bakartala – II VF	4.08	4.08
72		Khandbandh – II VF	9.37	9.37
73		Parbatipur VF	1.23	1.23
74	**Dudhiani**	Bagdafa VF	2.38	2.38
75		Jharbeda VF	1.89	1.89
76		Purunapani – II VF	4.24	4.24
77		Majurasahi VF	1.49	1.49
78		Nodhagadhia VF	0.18	0.18
79		Patua VF	5.3	5.3
80		Khandiadar VF	6.6	6.6
81		Ekghari VF	3.87	3.87
82		Kenjhrapanposi –II VF	1.91	1.91
83		Tikarpada VF	10	10
84		Tilabadi VF	5	5
85		Udaisahi VF	3.2	3.2
86		Kapand VF	5	5
87		Balanposi VF	8	8
88		Jashipur – I VF	2.5	2.5

Sl.	Name of the Range	Name of the Forest Block	Area available for Management in Ha	Area in PWC in Ha.
89	Dudhiani	Dhangdiposi VF	9	9
90		Kajala VF	1.04	1.04
91		Sanpalasa VF	5	5
92		Chainnebda VF	7	7
93		Godapalsa – II VF	10	10
94		Bisida VF	2.49	2.49
95		Balanposi VF	5	5
96		Balijodi VF	10	10
97		Rangamatia VF	10	10
98		Jashipur – II VF	5	5
99		Jamukeswar VF	0.49	0.49
100		Niunti VF	10	10
101		Bakala VF	5	5
102		Tingiria VF	0.66	0.66
103		Bhanda VF	10	10
104		Bhandaripsoi VF	4	4
105		Chhemundia VF	10	10
106		Balisudura VF	4	4
107	Thakurmunda	Gourigoda RF	10	10
108		BharandiaRF	20	20
109		KhejuriaRF	10	10
110		Hatibandha VF	10.52	10.52
Total Plan table area: -				**1411.82**

16.3 General characteristics of Vegetation:

The areas included from RF /PRF/DPF are basically old plantation areas as well as recent planted areas of working schemes. In many cases the area is infested with weeds and thorny bushes. In Village Woodlots of Social Forestry Project, the main crop is Eucalyptus, Acacia, Simaruba and San Chakunda. The growth is good on alluvial soils but stunted on dry stony soil. About 30% have achieved a girth of 60 cm and above. The crop is scattered.

16.4 Treatment Series

The area from VFs are assigned to one planting series i.e. Karanjia Planting Series. All the old plantations in RF/PRF/DPFs have been included in one tending series called Karanjia Tending Series.

16.5 Blocks, Compartments and JFM Area:

All the areas in planting series under this Working Circle have been assigned to JFM (VSS or VFC).

16.6 Special Objectives of Management:

The objectives of management of this working circle are in tandem with the general objectives of this Plan. The Special Objectives are as follows.

i) To cover the conspicuously available open space with plantations.

ii) To enrich existing forest crop.

iii) To bring the plantations raised here and there to a single management fold and scientifically managed to optimize the yield.

iv) To encourage participatory management of erstwhile Social Forestry Plantations and activate the VFC.

v) To Increase availability of Firewood and timbers in the locality and reduce pressure on forests for fuel wood and furniture wood.

vi) To increase the crop density of forests and improve the Carbon Sequestration.

vii) To develop a healthy usufruct benefit sharing mechanism in the villages and encourage natural resource management with a community approach method.

16.6.1 Analysis of the crop:

The existing crop on village Wood lots is of miscellaneous species. The important species are Eucalyptus, Acacia, Simaruba, San-Chakunda and NTFP species. The survival is above 60% in most of the cases. The average Girth is above 45 cm.

The existing crop in tending series is of miscellaneous species. The important species are Teak, Eucalyptus, Simaruba, Sisoo etc. The survival percentage varies from site to site.

16.6.2 Silvicultural System:

The village woodlots of erstwhile Social Forestry Plantation/ Village Forest will be managed with Silvicultural System **"Clear felling with standard followed by Artificial Regeneration by planting''** will be adopted. Wherever promising coppice shoots will be developed / come up; the same will also be retained to reduce the replanting cost. The number of standards per hectare will depend upon biotic interference, possibility of dispersal of seeds for a high forest system, fruit bearing species, having timber value at a higher girth class. The minimum number of trees prescribed for retention is 25 number and maximum 75 numbers per hectare.

There is no particular silviculture system for tending areas and only tending prescription have been given.

16.6.3 Rotation Period:

In case of Social Forestry village woodlots/Village Forests no rotation, period is prescribed.

The crop will be clear felled during the plan period except those trees left as standard to act as seed Bearing trees / mother trees. The standard

trees will be removed in the next plan period considering the number retained Girth class and effectiveness to act as plus trees. In case of low survival area, the Blank areas will be planted up during this plan period. No harvesting will be taken up in such areas and in very refractory sites.

Similarly, no rotation period is prescribed for tending areas.

16.6.4 Harvestable Diameters:

For village woodlots of erstwhile Social forestry plantation/Village Forests, as clear felling with standard practice will be followed no harvestable diameter is prescribed.

16.6.5 Reduced Factors and reduced areas:

The yield from plantations will be small quantum and irregular. It will be regulated "by area only". Hence no reduced factor is prescribed in this plan.

These factors do not apply to tending areas.

16.6.6 Planting Cycle:

The area assigned to each Planting series will be covered within the plan period i.e. in 10 years. Hence a planting cycle of ten years will be followed. The year wise assigned area for planting cycle has been detailed in **Table No 16.3**

Table No 16.3
Year wise assigned area of Planting Cycle

Year	Block	0th year (Area in Ha.)	1st year (Area in Ha.)	2nd year (Area in Ha.)	3rd year (Area in Ha.)	4th year (Area in Ha.)	Total Area in Ha.
2021 – 22	P.Jadunathpur VF	11.92					40.53
	Kapand VF	5					
	Khandbandh VF	6					
	Halpur VF	2					
	Ghosda VF	15.61					
2022 – 23	Narsandha VF		1.08				38.87
	Mahadevdeuli VF		5				
	Balisudura VF		4				
	Chheliaposi VF		7.84				
	Kusunpur VF		3.94				
	Bhramarposi – I VF		12				
	Mandua VF		5.01				
2023 – 24	Badposi VF			5			42.02
	Khandiadar VF			6.6			
	Khandbandh – II VF			9.37			
	Parbatipur VF			1.23			
	Nanduburu VF			1			
	Bamanposi VF			7.9			
	Ankura VF			3			
	Sanpalasa VF			5			
	Bhramarposi – II VF			2.92			
2024-25	Nuabeda VF				4.75		39.33
	Sarubil VF				5		
	KasiaVF				5		
	Chhemundia VF				10		
	Pandarsil VF				1.58		
	Baliposi VF				5		
	Reghasahi VF				8		
2025 – 26	Saradha VF					6	39.08
	Bangiriposi VF					6	
	Bhanda VF					10	
	Dhakata VF					6.08	

Table No 16.3
Year wise assigned area of Planting Cycle

Year	Block	0th year (Area in Ha.)	1st year (Area in Ha.)	2nd year (Area in Ha.)	3rd year (Area in Ha.)	4th year (Area in Ha.)	Total Area in Ha.
	B.Jadunathpur VF					6	
	Pokamunda VF					5	
2026 – 27	Hatibandha VF	10.52					
	Nuagaon VF	4.4					
	Rugudi – II VF	11.86					
	BalanposiVF	8					
	Sunamukhi VF	3.68					
	Badposi VF	1.59					40.05
2027 – 28	Rugudi-I VF		5				
	Purunapani – I VF		3.02				
	B. Badposi VF		0.02				
	Bakala VF		5				
	Bakartala VF		2.28				
	Bakartala – II VF		4.08				
	Bagdafa VF		2.38				
	Jharbeda VF		1.89				
	Purunapani – II VF		4.24				
	Majurasahi VF		1.49				
	Nodhagadhia VF		0.18				
	Patua VF		5.3				40.17
	Kenjharapanposi VF		1.34				
	Mata VF		3.95				

Year	Block	0th year (Area in Ha.)	1st year (Area in Ha.)	2nd year (Area in Ha.)	3rd year (Area in Ha.)	4th year (Area in Ha.)	Total Area in Ha.
2028 - 29	Ekghari VF			3.87			40.78
	Kenjhrapanposi – II VF			1.91			
	Badposi – III VF			4.18			
	Khadikudar VF			4.02			
	Nuagaon VF			2.8			
	Palsagadia VF			9			
	Tikarpada VF			10			
	Tilabadi VF			5			
2029-30	Udaisahi VF				3.2		40.23
	Jashipur – I VF				2.5		
	Dangapani VF				9		
	Kajala VF				1.04		
	Chainnebda VF				7		
	Godapalsa – II VF				10		
	Bisida VF				2.49		
	Balanposi VF				5		
2030 – 31	Balijodi VF					10	40.15
	Rangamatia VF					10	
	Jashipur – II VF					5	
	Jamukeswar VF					0.49	
	Niunti VF					10	
	Tingiria VF					0.66	
	Bhandaripsoi VF					4	
	Total plantable area of the Division: -						**401.21**

16.6.7 Calculation of the yield:

Table No 16.4
Year wise abstract of area proposed for planting.

Type of Forest Block	Year of assignment										Total
	21-22	**22-23**	**23-24**	**24-25**	**25-26**	**26-27**	**27-28**	**28-29**	**29-30**	**30-31**	
Area of Village Forests	40.53	38.87	42.02	39.33	39.08	40.05	40.17	40.78	40.23	40.15	**401.21**

In case of Village Forests, there is harvest provision. It is expected to obtain about 10 Tons of Fire wood and 7.5 cum of timber or poles. Hence the expected yield is calculated to be 4012.1 Tons of Fire wood and 3009.07 cum of timber within the plan period. The year wise yield is as follows.

Table No 16.5
Projected Yield from Village Woodlots of SFP.

Type of Forest Block	Year of assignment										Total
	21-22	**22-23**	**23-24**	**24-25**	**25-26**	**26-27**	**27-28**	**28-29**	**29-30**	**30-31**	
VF	13.92	12.86	16.82	49.34	49.69	26.19	52.37	52.64	58.23	69.15	401.21
Timber (cum)	104.4	96.45	126.15	370.05	372.67	196.42	392.77	394.8	436.72	518.62	3009.07
F. Wood (Ton)	139.2	128.6	168.2	493.4	496.9	261.9	523.7	526.4	582.3	691.5	4012.1

No yield calculation has been done for tending series areas as no systematic yield is expected.

16.6.8 Table of felling and Planting:

The year wise area assigned for Planting has been indicated in Table No 16.3. This table may be referred to.

16.6.9 Method of executing the felling & planting:

16.6.9.1 Method of Executing Harvesting (Felling):

a) Consultation with VSS / VFC:

Prior to taking of Operation like demarcation, marking etc. the VSS / VFC is required to be consulted, if the area is assigned to VSS/ VFC. The process of harvesting and restocking is to be explained. The mechanism of Usufruct Sharing is to be decided and resolution to be passed to that effect. Sharing of produce either in monetary term or in kind to be specifically discussed & decided. In case of Village Forest, the working cost is required to be adjusted against sale value / royalty of the produce so obtained. Voluntary contribution of labour by villagers for operations may also be examined to reduce the cost of operation. After harvesting, the planting modality is also to be discussed at length.

b) Demarcation of Area:

In case of RF / PRF, the area is to be demarcated on ground by putting RCC pillars, if the demarcating line coincides with the RF/ PRF Boundary. In other cases, putting of Stone Cairns at a visible distance will be sufficient.

In case of Village Forests, the area / boundary is not demarcated on ground. It is required to demarcate the Village Forest as notified with the help of Revenue personal in presence of VFC Members. RCC pillars of 20cm×20cm×120cm may be posted to keep the boundary line visible permanently. In all cases, the entire block is assigned for working in a single year; in that case only boundary line is of importance. This demarcation process is to start at least from April- May of previous year. For keeping the boundary line naturally demarcated, it is proposed to put Palm Seeds on the boundary at an interval of 5 meters which will grow to a tree within 5 years.

c) Selection of Standard Trees:

As the system to be followed is "**Clear Felling with Standard",** it is required to mark the standards initially. The criteria for selection of standards in general are furnished below.

- Timber species of greater importance,
- Fruit bearing trees like Mango, Jack Fruit, Barkoli (*Zizyphus*), Palm, Cashew.
- Any Plus tree suitable for seed collection for raising plantations.
- Any trees associated with sentiments of local villagers are to be retained as standard.

The number of Standard trees per hectare shall not be less than 25 and more than 75. A list of Standard Trees to be prepared and will

be a part of Compartment History File. The information may be recorded in a standard format.

Suggested format:

1. Name of Range:
2. Name of Forest Block / Coupe:
3. Area under marking in Ha:
4. Year of Marking:
5. Name of Marking Officer & Designation.

List of Standard Trees selected for retention					
Sl. No.	**Name of Species**	**GBH in cm**	**Latitude / Longitude**	**Crown width in meter**	**Remark**
				Signature of Marking Officer.	

d) Marking of trees for felling:

After selection of Standard trees, all remaining trees above 30cm GBH are marked for felling. However, marking on sensitive areas, the following marking rules are to be followed.

i) Trees near to perennial nala / river banks to a width of 40m measured from High Flood level are not to be marked.

ii) Tree on which bird's nests is observed is to be retained.

iii) Trees having cavity, suitable for nocturnal birds' habitation up to five numbers per hectares is to be retained.

iv) Trees on rocky surface / above 30°slope / high erosion prone area are not to be marked for felling.

Marking should be taken up by the section forester and to be checked by the Range Officer minimum up to 20% of marked trees. The marking list is to be prepared in quadruplicate in standard format with a standard estimate of timber and fire wood production. Marking is to be done in February / March of previous year to year of working.

e) Delivery of Coupes for Harvesting:

The Coupe are to be delivered to OFDC Ltd. for harvesting and marketing thereof. In case the VSS is willing to participate in harvesting operation, they may be engaged by OFDC Ltd. for felling / logging & conversion operation. The Coupe working may be allowed normally for nine months. Any extension of working period may be allowed as per administrative instruction / Odisha Forest Contract Rules, 1966.

The VSS may take up the harvesting operation as the yield expected will not be economical to OFDC Ltd. In that case, the removal of

trees and sharing will be under supervision of Range Officer / Forest Department.

f) Felling of trees & Removal thereof:

The marked trees may be felled, converted and removed as per modern logging practices and the Odisha Timber and Other forest produce transit Rules, 1980 and up to date amendments thereof. The trees felled by axe and saw do not produce coppice shoots. As most of the species are good coppicers, it is suggested to fell the trees with axe only. Subsequent logging may be taken up by saw or as convenient to OFDC Ltd. / VFC as per modern logging practices.

g) Sharing of Produce in case of VSS / VFC area:

Sharing of forest produce, in case of VSS area will be regulated as per **Para 11 of Joint Forest Management Resolution, 2011.** In case of village Forests, the sharing of forest produce will be regulated as per **Rule 9 of the Odisha Village Forest Rules, 1985.**

h) Surrender of Coupe Area:

After harvesting the marked trees and removal thereof, the Coup area shall be surrendered by OFDC Ltd. as soon as possible so as to take subsidiary silvicultural operation / planting activities on the same area. In case of harvesting

by VFC, preliminary operation for planting may be taken up simultaneously.

16.6.10 (a) Cleaning:

As the silvicultural system adopted is clear felling, the cleaning operation involves

- Removal of debris from the coupe and either buried under ground with a purpose to allow left over materials decompose and enrich soil organic content.
- Fell & Remove the marked trees, if not removed by the OFDC Ltd.
- Remove all weeds by cutting mechanically.
- Make the coupe area suitable for taking up plantation.

16.6.10 (b) Thinning:

In the coupe area, if any advance growth is left unmarked / not removed for any consideration and the advance growth is at pole stage, it is required to take up thinning. In this case no thinning will be required as the felling cycle is ten year and clear felling with standard system is adopted.

16.6.11 Regeneration:

The area assigned for fresh plantation is to be covered up through artificial Regeneration i.e. Block Planting. The standard procedure for planting is to be followed as per Approved Cost Norm. The standard procedure is described below for general reference.

The assigned area is to be restocked through Artificial Regeneration i.e. by planting of seedlings with adequate Soil & Moisture Conservation measures.

16.6.11.1 Survey, demarcation, site preparation, Alignment & stacking:

The assigned area has been well demarcated and pillars posted during coupe marking and described under **Para 16.6.10(b).** In case of fresh area, the assigned area is required to be demarcated and pillars posted. In case of Block plantation @1600 trees per hectare spacing of 2.5m×2.5m is to be adopted. The approved cost norm is to be followed.

16.6.11.2 Pitting:

The areas under consideration are mostly stony /alluvial soil. A pit size of 30cm×30cm×30cm is recommended.

Though pitting is generally carried out during January- March, there is possibility of refilling of pits during pre-monsoon due to rain water. It is

normally recommended to carryout pitting in March- May and allows weathering at least for one month before planting.

16.6.11.3 Choice of Species & Nursery:

It is recommended to plant species matching to the vegetation of the forest. Government has also suggested not planting Acacia, Eucalyptus, Sana Chakunda, Teak in natural forests. The species recommended are –

i) *Acacia catechu* (Khair)
ii) *Anogeissuslatifolia* (Dhaura)
iii) *Bahuniapurpuria* (Kanchan)
iv) *Bahuniavahilii* (Siali)
v) *Bombaxceiba* Simili)
vi) *Dalbergiasissoo* (Bali Sissoo)
vii) *Dalbergialatifolia* (PahadiSissoo)
viii) *Emblicaoccicinalis* (Anla)
ix) *Erithrinaindica / suberosa* (Paladhua),
x) *Gmelinaarborea* (Gamhar)
xi) *Meliaazadirachta* (Mahaneema)
xii) *Samaniasaman* (Badachakunda)
xiii) *Syzygiumcumini* (Jamu)
xiv) *Terminaliabelerica* (Bahada)
xv) *Terminaliachebula* (Harida)
xvi) *Terminaliatomentosa* (Asan)

Nursery for required species and number may be raised in permanent nursery or in a temporary nursery as convenient. The standard nursery technique found in any silviculture text or standard practices may be followed. The recommended height of seedling before planting is 60cm to 75cm in case of six-month-old seedlings and 100 cm in case of one-year old seedlings. For seed collection & use, plus trees available in the locality or brought from known source of origin may only be utilized. Unknown source should be strictly avoided to have a better plantation.

16.6.11.4 Planting:

Planting of seedlings shall be taken up during 1st week of July. During planting, application of Chemical fertilizer is recommended at sites away from water sources. Near water source application of FYM/Organic fertilizer is recommended. In no case chemical insecticides should be applied.

After planting following Post care is recommended.

a) Causality Replacement.

After planting, some planted seedlings may get damaged. These dead / defective seedlings are required to be replaced within 15 days of planting or as soon as possible with better seedlings.

b) Weeding & Soil Working:

After 30 days of planting, the planted seedlings start bearing new leaf. From 30 days to 45 days soil working around the plant along with application of fertilizer is recommended. Weeding around the plant i.e.

patch weeding is to be taken up. In case of area with heavy weeds or grasses strip weeding proves beneficial. Number of weeding in a year may be decided as per cost norm provisions. Two weeding in 1st year is always prescribed.

c) Mulching:

In sandy / refractory soil mulching by grasses from February to June helps in retaining soil moisture. Hence it is recommended in case of sand or refractory soil with complete open areas.

d) Fire Protection / watch & ward:

Fire protection measures and watch & ward against grazing are strictly to be implemented.

16.6.11.5 Soil & Moisture Conservation:

To improve the vegetation and ensure a good plantation role of Soil & Moisture Conservation is crucial. As the selected site is mostly of degraded soil, it is recommended to have contour bonding, percolation pits, contour trenches and half-moon trench in all plantations within cost norm provided. In case of eroded soil, gully plugging is also to be executed on priority.

16.6.12 Associated Regulations and Measures:

In case of plantations the plantation journal, Nursery journal is to be maintained. The details of operation, yield, year of working etc along with the photographs are to be recorded / placed in the Compartment history. Each

plantation site may be given an Identification number to be maintained at Division level for ease identification.

16.6.12.1 Grazing:

The area planted is to be closed to Grazing for at least for 3 years. The VFC / VSS may be allowed to cut and take grasses from plantations to encourage stall feeding.

16.6.12.2 Map on Top sheet:

The planted up area is required to be marked/depicted on Survey of India topo map either 1:50000 scale of 1:25000 scale for future management and next plan preparation.

16.6.12.3 Plantation Control Form:

After completion of planting, a plantation control form is required to be submitted by the Range Officer to regulate activities as per Working Plan prescription.

Table No 16.11
Plantation Control Form No-3

Name of Planting Series	Year of Working	Area assigned in ha	No of Standard Trees marked	Quantum of Timber / F.W obtained	Area actually planted up	Reason of Deviation if any.

16.7 Plantations raised during previous working Plan and Working scheme

Old plantations raised during previous working plan between 1996-97 to 2015-16 and plantations raised in working schemes period from 2016-17 to 2020-21 have been mentioned below. Owing to biotic pressure, the survival percentage is not as expected hence the thinning operations and other tending operations can be taken up very judiciously.

Sl. No.	Year of plantation	Name of the Range	Name of the site	Area in Ha.	Name of the species	No. of seedlings planted
1	**1996 – 97**	Karanjia	Panpatria RF	50.00	Teak, Sisoo, Gambhari, Bamboo	80,000
2	**1997 – 98**	Karanjia	Panpatria RF	50.00	Acacia, Eucalyptus	80,000
3	**2001 – 02**	Karanjia	Mahuliasol RF	50.00	Teak, Sisoo, Chakunda, Anla, Acacia, Gombhari, Sirish, Simarua, Neem, Bamboo, Karanja & Jackfruit	10,000
4	**2002 – 03**	Karanjia	Panpatria RF	25.00	Teak	40,000
5	**2003 – 04**	Karanjia	Panpatria RF	110.00	Teak	1,76,000
6	**2006 – 07**	Karanjia	Panideuli RF	50.00	Acacia, Eucalyptus & Chakunda	80,000
7	**2006 – 07**	Karanjia	Singda RF – II	44.00	Acacia, Eucalyptus & Chakunda	70,400
8	**2006 – 07**	Karanjia	Chhelianali RF – I	6.00	Acacia, Eucalyptus & Chakunda	9,600
9	**2008 – 09**	Karanjia	Kudarsahi RF	10.00	Acacia & Eucalyptus	2,000
10	**2009 – 10**	Karanjia	Jamuti RF	20.00	Bamboo	8,000
11	2010 – 11	Karanjia	Panpatria RF	15.00	Acacia & Eucalyptus	24,000
12	2010 – 11	Karanjia	Denua RF	10.00	Acacia & Eucalyptus	16,000
13	2010 - 11	Karanjia	Tulsipur RF	10.00	Bamboo	4,000

Sl. No.	Year of plantation	Name of the Range	Name of the site	Area in Ha.	Name of the species	No. of seedlings planted
14	2010 – 11	Karanjia	Jamuti RF	20.00	Teak	32,000
15	2011 – 12	Karanjia	Jamuti RF	20.00	Teak	32,000
16	2011 – 12	Karanjia	Mahuliasol RF	25.00	Bamboo	10,000
17	2012 – 13	Karanjia	Jamuti RF	75.00	Teak	1,20,000
18	2013 – 14	Karanjia	Panpatria RF	40.00	Teak, Acacia & Eucalyptus	64,000
19	2013 – 14	Karanjia	Adipur RF	39.2	Teak, Acacia, Eucalyptus, Chakunda & Simaruba	24,000
20	2013 – 14	Karanjia	Jhumkapala RF	15.00	Teak	24,000
21	2013 – 14	Karanjia	Galusahi RF	5.00	Teak, Acacia, Eucalyptus, Chakunda & Simaruba	8,000
22	2013 – 14	Karanjia	Naksara RF	8.00	Teak	11,200
23	2014 – 15	Karanjia	Panpatria RF	40.00	Teak & Bamboo	52,000
24	2014 – 15	Karanjia	Tulsipur RF	3.00	Teak, Acacia & Chakunda	4,800
25	2014 – 15	Karanjia	Naksara RF	12.40	Teak, Acacia, Chakunda & Simaruba	16,000
26	2015-16	Thakurmunda	Bharandia RF	20	Teak	0.32 Lakh
27	2015-16	Karanjia	Gharmabeda RF	30	Teak	0.48 Lakh
28	2015-16	Dudhiani	Panposi RF	10	Teak	0.16 Lakh
29	2015-16	Dudhiani	Srimanipur RF	10	Teak	0.16 Lakh
30	2015-16	Dudhiani	Kudarbisda-I RF	20	Teak	0.32 Lakh
31	2015-16	Dudhiani	Bhagabandhi RF	10	Jamu, Bija, Panasa & Kaitha	0.16 Lakh
32	2015-16	Karanjia	Jambani RF	4	Bamboo	0.0132 Lakh
			Total:-	**856.6**		

Plantation taken-up in Working Scheme from 2016-17 to 2020-21.

Sl. No.	Name of the Range	Name of the site	Year (2015-16 to 2019-20)	Name of the Species	seedlings planted in lakh	AR in Ha.
1	Dudhiani	Dumuria RF	2016-17	Teak	0.08	5
2	Karanjia	Gharmabeda RF	2016-17		0.352	22
3	Karanjia	Ghosda RF	2016-17		0.16	10
4	Karanjia	Pingu RF	2016-17		0.128	8
5	Thakurmunda	Khejuria RF	2019-20	Teak, Simaruba, Gambharia, Eucalyptus Mangium & Chakunda	0.16	**10**
6	Kendumundi	Gourigoda RF	2019-20		0.16	**10**
7	Karanjia	Hindola RF	2019-20		0.16	10
8	Karanjia	Buruhatu RF	2019-20		0.16	10
9	Karanjia	Naksara RF	2019-20		0.16	10
10	Karanjia	Hatisalbeda RF	2019-20		0.16	10
11	Karanjia	Paudia RF	2019-20		0.16	15
12	Karanjia	MahadevDeuli RF	2019-20		0.08	5
13	Dudhiani	Tato RF	2019-20	Babul, Gambhar, Acasia, Mahaneem, DhalaSirisa, Kala Sirisa, Chakunda, Ambada & Simaruba	0.18	7
14	Dudhiani	Begunia RF	2020-21	Karanja, Neem, Asana, Bel, Sisso, Sirisa, Badachakunda, Kanchan, Mahaneem, Mangium, Simaruba, Bahada, Amla, Teak & Arjuna	0.13	5
15	Dudhiani	Budhipat DPF	2020-21		0.13	5
16	Dudhiani	Begunia RF	2020-21		0.02	5
17	Dudhiani	KudarbisdaII RF	2020-21		0.02	5
18	Dudhiani	Budhipat DPF	2020-21		0.02	5
19	Dudhiani	Begunia RF	2020-21		0.11	**7**
20	Karanjia	Hindola RF	2020-21	Teak, Acasia, Simaruba, Sisoo& Mahogany	0.08	5
21	Karanjia	Jhumkapal RF	2020-21		0.08	5
				Total:-	2.69	174

16.8 Tending Series: -

In order improve of Old plantations raised during previous working plan i.e. 1996-1997- to 2016-2017 and to boost new plantations raised during the scheme from 2016-2017 detail prescription has been prescribed under a new tending series called Karanjia Tending Series.

Tending Series for Plantation raised during previous working plan i.e. 1996-1997- to 2016-2017 and working scheme i.e. 2016-2017 to 2020-2021.

Year of Operation	Year of Plantation	Annual Tending / Unit No.	Range	Name of the Plantation Site	Forest Block Name	Tending area in Ha.	Total Area in Ha.
2021-22	1996-97	I	Karanjia	Panpatria RF	Panpatria	50	100
	1997-98		Karanjia	Panpatria RF	Panpatria	50	
2022-23	2001-02		Karanjia	Mahuliasol RF	Mahuliasol	50	125
	2002-03	II	Karanjia	Panpatria RF	Panpatria	25	
	2006-07		Karanjia	Panideuli RF	Panideuli	50	
2023-24	2003-04	III	Karanjia	Panpatria RF	Panpatria	110	110
2024-25	2006-07	IV	Karanjia	Singda RF II	Singda	44	80
	2006-07		Karanjia	Chhelianali RF I	Chhelianali	06	
	2008-09		Karanjia	Kudarsahi RF	Kudarsahi	10	
	2009-2010		Karanjia	Jamuti RF	Jamuti	20	
2025-26	2010-11	V	Karanjia	Panpatria RF	Panpatria	15	75
	2010-11		Karanjia	Denua RF	Denua	10	
	2010-11		Karanjia	Tulasipur RF	Tulasipur	10	
	2010-11		Karanjia	Jamuti RF	Jamuti	20	
	2011-12		Karanjia	Jamuti RF	Jamuti	20	

Year of Operation	Year of Plantation	Annual Tending / Unit No.	Range	Name of the Plantation Site	Forest Block Name	Tending area in Ha.	Total Area in Ha.
2026-27	2011-12	VI	Karanjia	Mahuliasol RF	Mahuliasol	25	100
	2012-13		Karanjia	Jamuti RF	JamutiRF	75	
2027-28	2013-14	VII	Karanjia	Panpatria RF	Panpatria	40	79.2
	2013-14		Karanjia	Adipur RF	Adipur	39.2	
2028-29	2013-14	VIII	Karanjia	Jhumkapal RF	Jhumkapal	15	83.4
	2013-14		Karanjia	Galusahi RF	Galusahi	5	
	2013-14		Karanjia	Naksara RF	Naksara	8	
	2014-15		Karanjia	Panpatria RF	Panpatria	40	
	2014-15		Karanjia	Tulasipur RF	Tulasipur	3	
	2014-15		Karanjia	Naksara RF	Naksara	12.40	
2029-30	2015-16	IX	Karanjia	Gharmabeda RF	Gharmabeda	30	125
	2015-16		Thakurmunda	Bharandia RF	Bharandia	20	
	2016-17		Karanjia	Gharmabeda RF	Gharmabeda	22	
	2016-17		Dudhiani	Dumuria RF	Dumuria	5	
	2016-17		Karanjia	Ghosda RF	Ghosda	10	
	2016-17		Karanjia	Pingu	Pingu	8	
	2019-20		Thakurmunda	Khejuria RF	Khejuria	10	
	2019-20		Thakurmunda	Gourigoda RF	Gourigoda	10	
	2019-20		Karanjia	Hindola RF	Hindola RF	10	
2030-31	2015-16	X	Dudhiani	Panposi RF	Panposi	10	133
	2015-16		Karanjia	Jambani RF	Jambani	4	
	2015-16		Dudhiani	Siramanipur RF	Siramanipur	10	
	2015-16		Dudhiani	Kudarbisda I RF	Kudarbisda	20	
	2019-20		Karanjia	Buruhatu RF	Buruhatu	10	
	2019-20		Karanjia	Hatisalbeda RF	Hatisalbeda	10	
	2019-20		Karanjia	Paudia RF	Paudia	15	
	2019-20		Karanjia	MahadevDeuli RF	Mahadev Deuli	05	
	2019-20		Dudhiani	Tato RF	Tato	07	
	2020-21		Dudhiani	Begunia RF	Begunia	05	
	2020-21		Dudhiani	Budhipat DPF	Budhipat	05	
	2020-21		Dudhiani	Begunia RF	Begunia	05	
	2020-21		Dudhiani	Kudarbisda II RF	Kudarbisda	05	
	2020-21		Dudhiani	Budhipat DPF	Budhipat	05	
	2020-21		Dudhiani	Begunia RF	Begunia	07	
	2020-21		Karanjia	Hindola RF	Hindola	05	
	2020-21		Karanjia	Jhumkapal RF	Jhumkapal	05	
					Total:-	**1010.6**	

16.8.1 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.

16.8.2 Exploitable Diameters:

The exploitable girth of different species has been fixed basing on the size to which tree cannot develop unsoundness and give maximum financial return. The exploitable girth of the species in different planting area is given below.

Exploitable Diameters		
Name of the Blocks	**Name of the trees**	**Exploitable g.b.h in cm**
All blocks	Teak	120
	Gambhar	120
	Sisoo	105
	All other species	135

16.8.2.1 Plantation Treatment Cycle:

Plantation Treatment Cycle: -

It has been fixed basing on the period of the Working plan or the number of coupes in each plantation treatment series. As per Para 5 of the

working plan Code and for complete execution of work in each plantation treatment series, the plantation treatment cycle of 10 year has been fixed.

16.8.2.2 Yield Calculation: -

Felling of exploitable green trees are prohibited in Plantation Working Circle. Only uprooted and illicit felled trees are to be marked for extraction. No yield calculation has been prescribed as plantation is not matured.

16.8.3 Table of Plantation Treatments:

Coupe: - Basing on the period of the plan, each plantation treatment series has been divided into 10 coupes. All coupes in each planting series have been shown on the topo sheet 1~ 50000 scale.

16.8.4 Method of Executing the Plantation Treatment:

Prescriptions given in the Orissa Plantation Manual, 1977 and other executive instructions, in force, shall be followed meticulously in additional to the following guidelines. It is needless to emphasize that success of the plantation depends largely on good plantation treatments and timely operations in the field. However, a tentative work schedule with different operations is indicated below.

16.8.5 Demarcation: -

All annual coupes will be demarcated and inspected during cold weather previous to the year in which it falls due for treatment. As far as possible coupes line has been made to coincide with the plantation boundary. At the time of demarcation, single white paint ring shall be given or renewed on the trees standing at a visible distance along the coupe line. The coupe number and year of plantation treatment shall be shown in the displayed signboard.

16.8.6 Site Map: -

A site map on 1:50,000 scale topo sheet or in appropriately large scale showing the details of area, direction of slope, nature of erosion, biotic interference, site specific species, aspiration of the people and other factors shall be prepared.

16.8.7 Treatment Map: -

A treatment map shall be prepared along with a statement showing estimates of financial requirement and calendar of operations. This job shall be done by an Officer not below the rank of a Forest Ranger and checked by an Assistant Conservator of Forests. This work shall be completed by the end of the October of the year preceding to the year of plantation treatment.

16.8.8 Tending: -

The existing plantations in the managed area of this revision over an area of 1204.6 ha have been taken for tending operations. Growth of the existing planted trees is not uniform in some cases, plantation have been adversely affected by biotic interference, where as in other cases, the plantations have been protected. Moreover, the year of these plantations is made available from the outgoing Plan and Office record. Further, these plantations have yet not reached the harvesting stage. Hence uniform tending operation like cleaning, pruning and climber cutting for all the planted area is prescribed.

No systematic survey of these plantations was carried out; however, these areas are enumerated to ascertain the survival percentage of the plantation. The survival percentage gives a general idea of the condition of the existing plantations. However, on an average, about 100 hectares shall be taken up annually for the treatments so as to cover once the entire area of the Working Circle within the Plan period.

16.8.9 Tending in Teak Plantation: -

Since the take plantations are varying in age, these are in need of appropriate silvicultural operations to further boost the growth. They

require operations like pruning and climber cutting. However, the following shall be carried out in the annual coupes.

All dead and uprooted trees shall be removed departmentally.

All climbers shall be cut.

Pruning should be done in the plantations that are bushy and branchy.

Loranthus attacked branches shall be lopped.

Thinning shall be done only in the congested crop.

16.8.10 Tending in other Plantation: -

Growth in the miscellaneous plantations tends to become bushy and branchy for want of cleaning and pruning. This is more prevalent in case of miscellaneous plantations with species like Acacia, Chakunda, Sirisa, Gambhar, Amlaetc,which are in regular need of cleaning, pruning and climber cutting. These operations are beneficial in the early years of the formation of the plantations followed with thinning in the later years.

16.8.11 Items of Operation in Cleaning: -

(i) Cutting and extraction of the marked tress if left.

(ii) Extraction of balance logs and firewood if any.

(iii) Cutting of shoots of the trees damaged during extraction, if it hampers the growth of any promising shoots.

(iv) Cutting of climbers to be anticipated to climb in the principal species.

16.8.12 Thinning: -

Thinning is prescribed only to regulate the distribution of growing space for improving the growth and form of tress that are left in the annual worked our area. In this prescription permanent gaps are not created because regeneration is not the object of thinning. Only selection thinning in congested patches is prescribed with a thinning Cycle of 10 years.

16.8.13 Items of Operation in Thinning: -

Selection thinning will be carried out in all canopy classes, removing the tress of the following characteristics.

(i) Inferior tress which restrict the development of their neighbor principal species from all side.

(ii) All uprooted and elicit felled trees.

16.9 Other regulation:-

Grazing: -

The coupe shall be closed to grazing for a period of 05 years after the coupe working. Practically it is not easy to maintain this restriction

inside the forest over a period of 05 years, it is prescribed to issue notice to all the fringe villages nearer to the working coupe about such restriction. The concern Range officer will issue notice with a direction not to enter the heard into the working coupe.

Lopping: -

The local people are regularly lopping different species to use as leaf fodder for their domestic animals. Repeated lopping year after year wakens the tree and it becomes prone to many diseases. In course of time, such tress die leaving behind no regeneration to take their place. Lopping is discouraged. Any regulation for lopping in not prescribed.

Fire protection: -

All coupes shall be rigidly protected from forest fire for a minimum period of 10 years after treatments. As per previous record all the forest area were affected by fire in every year. Protection of fire in the working area can be practically possible by watching it from the month of February to June in every year. Provision of watcher has been prescribed and the annual allotment required for fire protection is given in a separate chapter.

Climber Cutting: -

Climbers are menace not only in the young regeneration area but also in the forest crops as they seriously affect the growth of young plants and trees. Thin climbers will be cut at one place on the ground level where as thick one shall be cut at two places (one near the base and other at a height of 1.5 mt). The amount required for climber cutting during the plan period is given in a separate chapter.

Singling out shoot: -

In the bushy area two healthy and good shoots of a stump will be selected to retain and others shall be cut. The local laborers will take the materials obtained by this operation as an incentive for their works those are engaged by the forest Department.

CHAPTER – 17

N.T.F.P. (Overlapping) Working Circle

17.1 Name of the working circle

Non-Timber Forest Produce (Overlapping) Working Circle

17.2 General constitution of working circle

Non Timber Forest Produce are organic materials other than timbers which are extracted from forests, other wooded land and trees outside forests that include products used as food & food additives fibers, resins, gums and plant and animal products used for medicinal cosmetic or cultural purpose of human use (Lanly, 1982) or traded as a community in local, regional, national and international markets for cash income (Dangi, 2008). NTFP have been the welfare, subsistence or livelihood commodity since long, these are traditional source of food, fiber and medicine. However, values of NTFPs have been recognized more since 1990s (Ojha 2000, Baujade and Pandei 2008) due to their role in improvement of rural livelihood economic returns and biodiversity conservation (Olsen 1998, Pandei, 2007).

N.T.F.P. yielding species have made its presence throughout Karanjia Forest Division. A separate overlapping Working Circle would serve the purpose of assessing the production, propagation,

collection and management. The Overlapping Working Circle comprises of an area of **43261.83 Ha** extending over 335 forest blocks.

The changing scenario of forest management envisages the enhancement of carbon sequestration and discourages the release of carbon to the atmosphere. This very concept forces the planner and the managers to decline the extraction of the trees from the forest, on the contrary there is increasing demand of herbal products in the market which shifted the focus to the propagation and extraction of the NTFP.

17.3 General characteristics of vegetation

This is already described in the chapter 3 of the part I of the Plan.

17.4 Felling Series, Cutting Sections and JFM areas

Not necessary to this Overlapping Working Circle

17.5 Blocks, Compartment and JFM areas

The area assigned to this Overlapping Working Circle are given in **Table No. 17.1**

Forest Block wise area allotted to NTFP (O) Working Circle.

Table No. 17.1

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
1	Karanjia	Adipur RF	39.20
2		Andharjhari RF	132.80
3		Ankura RF	75.70
4		Badbil RF	107.20
5		Badadeuli RF	227.60
6		Badsurei RF	44.80
7		Bhanjabeda RF	145.20
8		Bhanra RF	119.60
9		Bhramarposi RF	157.60
10		Budamara RF	8.80
11		Buruhatu RF	14.00
12		Gambharia – I RF	14.40
13		Gambharia – II RF	14.00
14		Gambharia – III RF	12.40
15		Chandiahil RF	26.40
16		Chaturisahi RF	113.20
17		Chhelianali – I RF	10.40
18		Chhelianali – II RF	34.40
19		Chauthia RF	44.80
20		Denua RF	28.40
21		Deodhipa RF	32.00
22		Diajodi RF	56.40
23		Dighiposi RF	82.40
24		Dumbisahi RF	42.00
25		Galusahi RF	26.40

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
26	Karanjia	Ghagi RF	227.20
27		Gharmabeda RF	188.80
28		Ghodaghaguri RF	141.20
29		Ghosda – I RF	19.20
30		Ghosda – II RF	140.00
31		Haldia RF	113.60
32		Halpur – I RF	47.20
33		Halpur – II RF	64.00
34		Halpur – III RF	11.60
35		Hatisalbeda RF	487.60
36		Hindola RF	23.60
37		Jambani RF	94.90
38		Jamunti RF	260.00
39		Jhaddumuria RF	56.80
40		Jhadghosda RF	36.40
41		Jhumkapal RF	28.00
42		Kalakad RF	99.99
43		Konika RF	24.80
44		Karanjia RF	109.20
45		Kasia RF	97.20
46		Kendua RF	152.00
47		Kenjhera RF	117.60
48		Khaparasahi RF	33.60
49		Kudarsahi RF	20.80
50		Kujiam RF	155.60
51		Kuliposi RF	24.00

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
52	Karanjia	Kusunpur – I RF	18.00
53		Kusunpur – II RF	43.20
54		Mahadevdeuli RF	37.20
55		Mahuliasole RF	153.60
56		Maricha RF	24.00
57		Miludihi RF	42.07
58		Naksara RF	20.40
59		Nuabeda RF	18.80
60		Nuagaon RF	142.00
61		Padheidura RF	456.11
62		Panpatria RF	1520.00
63		Panideuli RF	98.40
64		Paudia RF	627.40
65		Phulcomp RF	42.80
66		Phulguntha RF	103.60
67		Pingu RF	39.20
68		Pokamunda RF	190.00
69		Pokharia – I RF	145.60
70		Pokharia – II RF	73.60
71		Sandeuli RF	120.40
72		Sankesari – I RF	18.00
73		Sankesari – II RF	38.40
74		Saantabandh RF	17.60
75		Sanbadposi RF	201.20
76		Saranggarh RF	113.20
77		Sarasposi RF	115.20

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
78	Karanjia	Saragoda – I RF	18.00
79		Saragoda – II RF	36.80
80		Sarubali RF	81.14
81		Sarubil RF	99.60
82		Sarubhadi RF	52.10
83		Singda – I RF	23.20
84		Singda – II RF	54.00
85		Singda – III RF	104.76
86		Sunaposi RF	108.80
87		Tangia RF	30.00
88		Tikasil RF	92.80
89		Tulasipur RF	28.00
90		Balibhol PRF	8.64
91		Bhalughera PRF	2.08
92		Champarei-I PRF	22.26
93		Champarei-II PRF	3.01
94		Champarei-III PRF	2.63
95		Haldia-I PRF	5.34
96		Haldia-II PRF	7.49
97		Balisahi DPF	40.47
98		Mayursahi DPF	12.54
99		Singda DPF	7.28
100		Milu DPF	19.02
101		Halpur VF	2.00
102		Narsanda VF	1.08
103		Chheliaposi VF	7.84

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
104	Karanjia	Kusunpur VF	3.94
105		P.Jadunathpur VF	11.92
106		Badposi VF	5.00
107		Bamanposi VF	7.90
108		Nanduburu VF	1.00
109		Palsagadia VF	9.00
110		Kenjhera Panposi VF	1.34
111		Rugudi-II VF	11.86
112		Kasia VF	5.00
113		Badposi-III VF	4.18
114		Bhramarposi-I VF	12.00
115		Mandua VF	5.01
116		Ankura VF	3.00
117		Mata VF	3.95
118		Nuagan VF	2.80
119		Sarubil VF	5.00
120		Pandarsil VF	1.58
121		Baliposi VF	5.00
122		Saradha VF	6.00
123		Bangriposi VF	6.00
124		Mahadevdeuli VF	5.00
125		Ghosda VF	15.61
126		B.Jadunathpur VF	6.00
127		Dhakata VF	6.08
128		Pakamunda VF	5.00
129		Reghasahi VF	8.00
130		Bhramarposi-II VF	2.92
131		Khadiakudar VF	4.02
132		Nuabeda VF	4.75

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
133	Dudhiani	Badnai RF	23.20
134		Biunria RF	142.23
135		Chanchbani RF	55.66
136		Dari – I RF	19.60
137		Dari – II RF	51.20
138		Dumuria RF	174.80
139		Gudidiha RF	323.66
140		Hatimundi RF	147.60
141		Jharbeda RF	145.84
142		Kadambeda RF	75.44
143		Khandbandh RF	34.00
144		Kuita RF	164.80
145		Kunjia RF	125.20
146		Malharpada RF	27.20
147		Masinabila RF	77.60
148		Mota RF	281.20
149		Palasgodia – I RF	33.60
150		Palasgodia – II RF	16.00
151		Panposi RF	33.60
152		Pantho RF	176.00
153		Purunadeogaon RF	59.60
154		Ranipat RF	19.65
155		Rasamtala RF	155.81
156		Rugudi – I RF	19.20
157		Rugudi – II RF	36.00
158		Salarpada RF	87.14
159		Sannai RF	9.20
160		Siramanipur RF	110.00
161		Sialinai RF	84.00
162		Tato RF	104.00
163		Kadadiha RF	89.20

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
164	Dudhiani	Bala RF	25.20
165		Bakartala-I PRF	4.46
166		Bakartala-II PRF	2.19
167		Purunapani PRF	15.99
168		Raitalia A PRF	26.39
169		Raitalia A PRF	18.21
170		Kanthikana PRF	126.95
171		Dumuria DPF	4.41
172		Purunapani-I VF	3.02
173		Nuagaon VF	4.40
174		Khandbandh VF	6.00
175		Sunamukhi VF	3.68
176		Rugudi-I VF	5.00
177		Badposi VF	1.59
178		B.Badposi VF	0.02
179		Bakartala VF	2.28
180		Kenjhera Panposi-II VF	1.91
181		Bakartala-II VF	4.08
182		Khandbandha-II VF	9.37
183		Bagdafa VF	2.38
184		Jharbeda VF	1.89
185		Purunapani-II VF	4.24
186		Khandiadar VF	6.60
187		Parbatipur VF	1.23
188		Nodhagadia VF	0.18
189		Patua VF	5.30
190		Majurasahi VF	1.49
191		Akhaghari VF	3.87
192		Badampahar (P) RF	3253.84
193		Begunia-I RF	629.18
194		Begunia-II RF	107.20

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
195	Dudhiani	Kudarbisida-I RF	31.20
196		Kudarbisida-II RF	356.80
197		Budhipat DPF	1147.77
198		Ektali-II PRF	215.30
199		Tikarpada VF	10.00
200		Udaysahi VF	3.20
201		Balaniposi VF	8.00
202		Jashipur-I VF	2.50
203		Balaniposi VF	5.00
204		Dhangdiposi VF	9.00
205		Sanpalsa VF	5.00
206		Gadapalsa-II VF	10.00
207		Tingiria VF	0.66
208		Chain-Nebda VF	7.00
209		Jashipur-II VF	5.00
210		Bhanda VF	10.00
211		Balijodi VF	10.00
212		Jamukeshar VF	0.49
213		Kajala VF	1.04
214		Bakala VF	5.00
215		Bisida VF	2.49
216		Neuti VF	10.00
217		Bandiraposi VF	4.00
218		Chhamundia VF	10.00
219		Kapand VF	5.00
220		Tilabaddi VF	5.00
221		Balisudra VF	4.00
222		Rangamatia VF	10.00

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
223	Thakurmunda	Asankudar RF	11.86
224		Bisipur – I RF	421.20
225		Bisipur – II RF	74.00
226		Boring RF	275.20
227		Chheratangar RF	799.96
228		Dangapani RF	104.80
229		Gourigoda RF	66.40
230		Jadibil RF	187.60
231		Kadopani RF	145.20
232		Kaliajiani – I RF	378.79
233		Kaliajiani – II RF	147.58
234		Kendumundi – I RF	147.56
235		Kendumundi – II RF	648.00
236		Majuriposi RF	144.80
237		Padiabeda RF	51.02
238		Patbil RF	154.78
239		Purunapni RF	452.80
240		Rengalbeda – 1 RF	67.20
241		Rengalbeda – 2 RF	42.67
242		Saleibeda RF	125.60
243		Sanandharikhaman RF	120.00
244		Sanrugudibeda RF	212.80
245		Sarubil – I RF	162.00
246		Sarubil – II RF	83.36
247		Tikarpada RF	89.20
248		Majuraposi RF	13.98
249		Bhairanibeda PRF	12.46
250		Kalasira PRF	32.09
251		Keloposi PRF	23.09
252		Kendujiani PRF	17.56
253		Khandabandha PRF	19.83
254		Khuntakata PRF	7.96
255		Saleibeda PRF	34.40
256		Sunariposi PRF	14.37
257		Hatibandha VF	10.52

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
258	Thakurmunda	Akhapalan RF	57.52
259		Andharikhaman RF	48.48
260		Badabaliposi RF	27.57
261		Badbil RF	943.20
262		Banamunda RF	176.40
263		Baunsadiha RF	167.20
264		Basantpur RF	38.62
265		Bhadubeda RF	111.20
266		Bharandia RF	97.60
267		Chainbainsi RF	70.96
268		Chakulia RF	10.02
269		Chamakpur RF	182.72
270		Chirupada RF	23.49
271		Dakeipal RF	120.40
272		Dangadiha RF	97.20
273		Digdhar RF	45.10
274		Gahandia RF	14.15
275		Ghodabindha RF	168.40
276		Handiphuta RF	305.89
277		Handiphuta – A RF	61.32
278		Handiphuta – B RF	154.44
279		Hatigoda RF	108.80
280		Jamunalia RF	20.17
281		Jarak RF	48.00
282		Kaliaposi RF	78.25
283		Kathuanuagaon RF	68.00
284		Khejuria RF	15.28
285		Khejuri RF	641.60
286		Khudisila RF	83.60
287		Khuntaposi RF	3.66
288		Mandaljhari RF	32.98
289		Mankadbeda RF	208.40
290		Mulapal RF	90.00
291		Mituani – I RF	106.80
292		Mituani – II RF	184.40

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
293	Thakurmunda	Mituani – III RF	98.08
294		Nishchintpur RF	7.47
295		Panasdiha RF	8.81
296		Purunapani – II RF	54.98
297		Sunida RF	23.93
298		Talpada RF	145.60
299		Taramara RF	649.60
300		Thakurmunda RF	250.27
301		Vejidiha – I RF	160.00
302		Vejidiha – II RF	17.32
303		Rugudibeda RF	58.58
304		Ambabeda PRF	19.60
305		Andharikhaman PRF	28.45
306		Basantapur-II PRF	23.45
307		Bharandia PRF	29.26
308		Dangadiha-II PRF	44.52
309		Diliganj PRF	25.84
310		Gahandia PRF	19.02
311		Kaliaposi-II PRF	8.82
312		Kaliaposi-III PRF	15.68
313		Keshdiha PRF	42.03
314		Khadipal PRF	6.87
315		Kirkichipal PRF	34.09
316		Kucheikudar PRF	65.72
317		Mituani-III PRF	19.51
318		Mituani-IV PRF	97.41
319		Nunadiha PRF	82.72
320		Patrapada PRF	73.86
321		Purunapani PRF	26.87
322		Ghodabindha DPF	11.56
323		Majurposi DPF	111.48

Sl. No	Name of the Range	Name of the RF	Area in Ha. Allotted to NTFP (O) WC
324	Satkosia	Gaudiabahali RF	182.40
325		Khumthan RF	240.00
326		Noda RF	352.00
327		Satkosia RF	10276.00
328		Satkosia – I b RF	363.20
329		Satkosia – II RF	208.27
330		Satkosia – III RF	353.83
331		Bhaliadal-I PRF	10.63
332		Bhaliadal-III PRF	110.79
333		Bhaliadal-IV PRF	17.67
334		Mahuldiha-I PRF	23.67
335		Mahuldiha-II PRF	26.57
		Total:-	**43261.83**

17.6 Special Objectives of Management

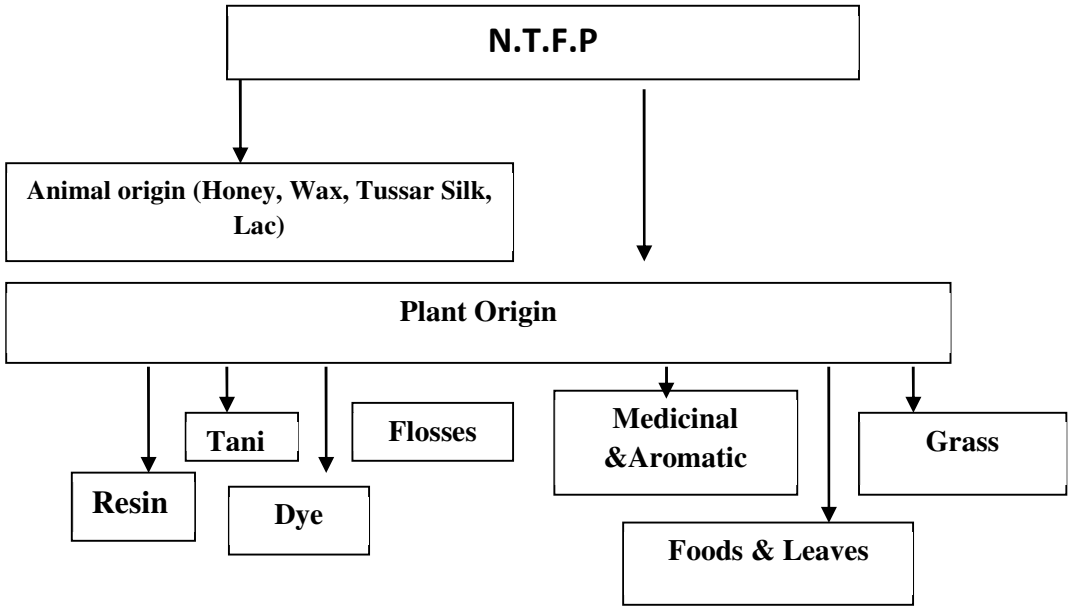
It is proposed to prescribe the following activities under this Working Circle.

- To build up the capacity of the VSS on enhancement of the production, sustainable harvesting of the NTFP from the forest and their processing technique, value addition, and storage.
- To encourage the VSS either to create and or to adopt the plantations of Medicinal and Aromatic Plants (MAPs) as an Income Generating Activity (IGA).

- To facilitate the marketing of the NTFP by creating conducive systems like opening the depots for the cluster of VSS.
- To establish linkages with the buyers to facilitate marketing.
- To plant site specific NTFP species for the benefit of the wild herbivores especially in the diffused wildlife habitat including the migratory paths identified.

17.6.1 Analysis of the Crop

Karanjia Forest Division is a treasure of wide numbers of NTFP species. Some of the prominent and commercially important NTFP found are described below: -



Honey

Honey the most prized gift of the nature is very commonly used as natural sweet. Nectar in its natural condition is transparent thin fluid but in course of transit and storage it passes through a process of chemical change and turns into honey. Nectar contains 70-80% sugar, proteins, minerals, salts and water. Honey is collected by Bees. The color and flavor of honey depend on the nature of nectar and fragrance of flowers which the bees visit. Honey Bee, the Apis species belongs to Order Hymenoptera of Phylum Arthropoda. There are three types of Bees

I. Rock Bee (*Apis dorsat*a)
II. Hive Bee (*Apis mellifera)*
III. Little Bee (*Apis florae)*

Rock Bee (*Apis dorsata*) is the greatest honey yielders but at the same time they are extremely vicious. They build the combs in the branches of big trees or in the buildings. They store honey in the upper part of the comb especially in the bigger cells.

When combs are full they are sealed with the wax. In unsealed cells the honey is not fully ripe. Their stings are quite painful. Honey hunters climb the trees at night when the bees are docile and light fire near the comb in such a way that it generates maximum smoke but no flame. Too much smoking kills the bees. The bees are thus driven away. Honey is separated in centrifuge machine or

sometimes it is heated over a bath of water. Heat should be just sufficient to help in melting the wax. Too much heat decomposes the honey. Honey comprises of minerals like Calcium, Iron, Silicon, Magnesium, Manganese, Chlorine, Sulphur, Aluminum and Phosphorous. Wax is skimmed off from the surface to separate honey. Honey is stored in cool and dry places.

Honey is used as sweetening the eatables, in medicines, as antiseptic, tonic and restorative. It is used in candies, cakes, breads and cold drinks, alcoholic drinks, livestock feeds and poison baits are also prepared from honey. Waxes used for manufacture of artificial hives, polishes, water proofing of leather goods cosmetics, lipsticks, face creams etc.

The traditional method of honey extraction has many follies which invite damage to the hive; kill the brood. The honey thus extracted becomes adulterated. Now a days, a variety of hives are used to rear the bee which includes a wooden box of a definite size kept on wooden frames and contains an outlet near the base. The outlet is made more scientifically from which drones and workers can come out but not the queen. Sometimes the bee hives are provided with two holes, one entrance and other exit. It contains a stand and a bottom wooden base and a brood chamber. Brood chamber is the largest and contains a network of wooden and wire mesh. The mesh hangs vertically with the help of two twigs and bees start making cell among the net mesh. Promotion of Apiculture boosts up the

economic condition of the forest fringe dwellers. The diverse forest of Karanjia Division with availability of flowers throughout the year has provided a nice ambience for Apiculture. VSS should be sensitized to take up such income generating alternate livelihood options. It requires little capitalization and making virtually no demands on natural resources. The melliferous (Honey Yielding) plants like, *Tilia spp, Eucalyptus, Azardirachta indica, Shorea robusta, Chloroxylon swetenia*are proposed to be raised and reared during the Assisted Natural Regeneration of the Rehabilitation Working Circle.

Resin: -

Natural resin is a solid/semisolid material usually a complex mixture of organic compounds called terpenes which is insoluble in water but soluble in certain organic solvents.

Resins are very widely distributed in the plant diversity of this division although a few families are notable in accounting for a large proportion of resins of commerce (e.g. Leguminosae, Burseraceae) can occur in almost any organ or tissue of the plant, a few (such as lac is produced from insects.Main resin found in this division is Sal resin.

Damar: - In *Shorea robusta* cut made into trunk have a triangular form bent become circular with age and are even vertical rows around the trunk. The first cuts are made when the tree is approximate 25 cm dia (about 20 years old). The cut is several cms

wide at first that becomes enlarged at every tapping and eventually becomes a hole of 15 – 20 cms in depth and width. The average number of holes for a tree about 30 m high and 60 – 80 cm dia is 9 – 11 in each of 4 – 5 vertical rows. The exuded resin is allowed to dry on the tree before it is collected, resin. Tapping can continue upto 30 years. The resin which exudes solidities and darkens on drying and is then removed from the tree. Tapping is repeated several times a year. When tapped once a month in the manner described above, a fully productive tree has been started to yield about 4 Kg of dammar at each tapping i.e. about 48 Kg/year. If the resin from a good – yielding tree is not collected for 06 months, if May completing fill the hole in the tree (10 – 50 cm wide and dead).

Tanins:-

Tannins are class of organic substances which often are used on the animal hides and skin to change and make them resistant to decomposition and at the same time, leave them flexible, very strong and greatly improved quality. Tannins are prevalent in dicot families like Combretaceae (Myrobalans), Myrtaceae (Eucalyptus) in this division. According to the point of genesis tannins are of the following types: -

i. Bark Tan yield from *Terminalia tomentosa, Acacia indica*,

ii. Fruit Tanin yield from *Terminalia bellirica* and *Terminalia chebula* and

iii. Leaf Tanin yield from *Anogeissus latifolia.*

Dye:-

A Dye can generally be described as a coloured substance that has an affinity to the substrate to which it is being applied. There is a growing demand for enlarging the list of various permitted food colours and additives.

This division has a long list of dye yielding plants, some of the commercially plants are as follows: -

a. *Bauhinia variegate*: (Family-Fabaceae) bark is used for dyeing and tanning.

b. *Butea monosperma:* (Family-Fabaceae) flowers yield a brilliant but very fugitive yellow colouring matter.



Figure: ***Butea monosperma***

c. *Cassia tora*: (Family-Fabaceae) seeds are used as a mordant in dyeing.

d. *Lannea coromandelica*: (Family-Anacardiaceae) bark extract Jhingan which is used for dyeing and textile printing.

e. *Mallotus philippensis:(*Family-Euphorbiaceae) glandular hair from fruits yield a dye called Kamala powder, giving a rich golden red colour on silk. Seeds yield fatty oil, which forms a good substitute for Tung oil in the formulation of rapid – drying paints and varnishes and hair fixers.



Figure: ***Mollotus philippensis***

f. *Morinda tinctoria*: (Family-Rubiaceae) root bark yields a dye known as A1 dye. The active principle is morindone, which is present in bark in the form of glucoside morindin. Morindone is used for the dyeing of cotton, silk and wool in shades of red, chocolate or purple.

g. *Pterocarpus marsupium*: (Family-Fabaceae) bark is used for dyeing. Wood also contains a colouring matter.

h. *Symplocos racemosa*:(Family-Symplocaceae) bark and leaves yield dye and are used as mordants.

i. *Wrightia tinctoria*: (Family-Apocynaceae) the leaves yield a blue indigo dye called Mysore Pala Indigo.

j. *Terminalia tomentosa:* (Family-Combretaceae) the bark is a good coagulating agent for cotton and silk cloths.

Flosses:-

Flosses are obtained from wild fruits of species like *Bombax ceiba* and *Ceiba pentendra*. *Bombax ceiba* is naturally available in this Division. The floss is obtained from the capsules and is called Indian Kapok. The floss is soft and strong and used in life saving devices, for boats stuffing, for cushions, pillows and mattresses, thermal insulation and sound proof covers and walls. Preferred as filling materials for padded surgical dressings. Capsules are collected green from the tree as the floss loses much of its resilience after the capsules are opened. Dried in Sun and split open with mallets. The floss mixed seeds are again dried in the sun and the seeds are separated by beating with sticks and then used commercially.

Medicinal and Aromatic Plants (MAPs): -

Medicinal and Aromatic Plants play an important role in the drugs industry. Some of the MAPs found in this forest division are described as follows:

Alma-*Phyllanthus emblica* (L.),
Family-Euphorbiaceae

A small / medium sized deciduous tree, Fruit fleshy, globose with vertical furrow, pale yellow seeds, this tree is available throughout the Division.

Parts Used: - Root bark, stem bark, Leaf, fruit and seed.



Figure: ***Amla***

Actions & Uses: - The root bark is astringent and is useful in ulcerative stomatitis, gastric ulcers. The bark is astringent and useful in gonorrhea, jaundice, diarrhea and myalgia. Flowers are cooling and aperients. Leaves are useful in conjunctivitis inflammation, dyspepsia, diarrhea and dysentery. The fruits are astringent, colling, anodyne, carminative, digestive, stomachic, laxative, alternant, olexeteric, diuretic, aphrodisiac, antipyretic, tonic and trichogenous. They are useful in diabetes, cough, asthma, bronchitis, headache, ophthalmic disorders, dyspepsia, colic, flatulence, inflammations, anemia, emaciation hepatitis disorders, jaundice, strangury, diarrhoea, dysentery, intrinsic hemorrhages, leucorrhoea, menorrhagia cardiac disorders, intermittent fever and greyness of hair, seeds are reported to be useful in asthma, bronchitis, biliousness. Fresh Amla is delivered at the

pharmaceutical industries for preparation of Chavanprash within 48 hours of collection. Immature and blackened fruits should be separated and the selected ones are boiled for 3 to 5 minutes only, that to be keeping the fruits in bamboo basket or an earthen pot. It is steam-boiled to facilitate depulping. The boiled fruits are then deseeded in a neat and clean place and sun dried on bamboo mats or fine cloth. In case of cloudy weather, drying should be done in well-ventilated places. Processed Amla (fruit rind) should be stored in gunny bags / woven sacks in dry place with a normal room temperature. But boiling destroys the germination capacity of the seeds and also reduces the nutritive richness for which steam boiling is preferable.

Fruits are depulped manually after they become soft during drying after two days.

Formulation and preparation: -

Brahmarasayana, Chyavanprasha, Dhatrpube, Dhatrirasayana, Triphala churna, Amlalyavaleha, Amlakyad kavotha, Brihachchhagaladya ghrita, Phalasishts, Dhatryarista.

Propagation and cultivation: -

Best in well-drained fertile loamy soil. Thrives well on light as well as heavy soil. Found even on moderately alkaline and acidic soil and moderate climate favour for the initiation of floral lands. Usually propagated by seeds, vegetatitively by lenddings,

cuttings and inarching. Nursery by sowing mature seeds directly on the polybags. Seed Collection – April to May, Germination % - 70 – 80% till 3 months of collection.

Pre-sowing treatment-500 PPM GA3 for 24 hours – 92.5% germination.

Planting is done without disturbing the root system in the month of June – July.

The soil is mixed with 5 to 10 Kg of Farm Yard Manure (FYM) + 5% Benzene Hexachloride (BHC). Pruning of the bearing plants should be done after the fruit bearing season. Young plant requires watering at fortnightly interval till they are established. During summer watering is needed in mature plant. Tree generally starts bearing fruits after 6 – 8 years.

Harida- *Terminalia chebula* (Retz.) Family – Combretaceae

A tree is of 15 – 24 mtr height. Drupes ellipsoidal ovoid or avoid. Yellow to orange brown sometimes tinged with red/black and hard when ripe. 3 – 5 cm long, 5 ribbed on drying, seeds hard, pale yellow.



Figure: ***Harida***

Action & Uses: -

Fruits astringent, sweet, acrid, bitter, sour, thermogenic, anodyne, anti-inflammatory, vulnerary, alternate stomachic, laxative, purgative, carminative digestive, anti-helmintic, cardiotopic aphrodisiac, antiseptic, diuretic, febrifuge depurative and tonic. Useful in wound, ulcers, inflammations, skin diseases, leprosy, stomatitis hyperacidity and associated gastric disorders, anorexia, indigestion flatulence, constipation, haemorrhoids, jaundice, hepato- splenomegaly, other abdominal diseases, helminthiasis, anaemia, deliricum, pharyngitrus hiccough, dyspnoea, cough, coryza asthma, scrotal enlargement, urinary disorders, vesicles, and renal calculi soft chancre, seminal defects, cephalagia narcosis, epilepsy, opthalmic disease, intermittent fevers, cardiac disorders, filarial, obesity, neuropathy rheumatoid arthritis whitlow, dandruff general debility.A cold infusion of fruit is used as gargle in

stomatitis and in chronic ulcers, cariousteeth in cough, asthma and urinary disease.

Formulation and preparation: -

Abhaya modak, Abhayarisha, Pathyadivati, Pathyadi krathe, Vyaghriharitsa, Haritaki leha, Chitrakaharitahi, Agasthi haritaki, Dantiharitaki, Haritaki Khanda, Pathyandi churpca, Abhayadi guggule, Abhayadi kalka, Amrita haritake. Abhaya malaliya rasayana.

Propagation and Cultivation: -

It grows in variety of soils but thrives best in clay and sandy soils. The fruits ripen from Nov – March depending upon the locality. Mostly fallen fruits are collected in first of January, they are dried and seeds can be stored for one year. Germination capacity of the seeds is low because of hard cover and seeds require pre-sowing treatment. Best germination is obtained when seeds are chipped at their broad end without damaging embryo and then soaked in water for 36 hours before they are sown in nursery beds. Germination starts after 15 days and continues for 3 – 4 weeks. These can be successfully raised by direct sowing the seeds or by transplanting the seedlings or by stem cuttings. Transplanting of one-year seedling grows better than cutting or directly sown plants. The young plants require watering during

first hot weather. Shelter is desirable in early stages in nursery and also after transplanting.

Bahada:- Belleric myrobalan (*Terminalia bellirica*, Gaertn.)

Family- Combretaceae

The fruit is belleric myrobalan, the single seeded fruit is ovoid or globix, fleshy about 1.8 cm. in diameter with a grey velvety covering. It ripens in December – February. Found throughout the forest of this Division. A ten-year-old tree yields 15 to 20 kg fruits annually. Bahada is one component of "Trifala" with a significant position in "Ayurveda". The half ripe fruit is used as an astringent. It is also given in piles, dropsy, diarrhoea, leprosy and headache. The fruit is also used in leather industry for tanning. The kernels are used for hair oil and Bahada powder for preparation of liquor. This is one of the staple foods of the deer and antelope. Best time for collection of the fruits is December-January. After collection it is sun dried for 7 to 10 days else it may decompose.

Processed Bahada should be stored in a dry place after packing in gunny bags.

Neem, *Azadirachta indica* (A. Juss.), Family: - Meliaceae

Neem tree have been used as medicine throughout the world for wide spectrum of properties. Neem is used in vitiated pitta conditions, hyperdipsia, leprosy, skin diseases, eczema,

leukoderma, pruritus, intermittent fever, wounds, and ulcers, burning sensation, tumours, lymph tuberculosis, anorexia, vomiting, dyspepsia, intestinal worms, liver, cough, bronchitis, inflammation and fatigue. Neem products have medicinal properties that have proven to be anti-diabetic, anti-fungal, antiviral, antibacterial, and sedatives and anti-fertility. Patients suffering from chickenpox are recommended to sleep on Neem leaves.

Neem products are known to neutralize more than 500 worldwide pests, including insects, mites, ticks and nematodes, affecting their behaviour and physiology. Neem tree gum is used as a bulking agent to prepare special food for diabetics. Its branches are used for cleaning teeth. Neem oil is used for the preparation of cosmetics such as creams, shampoo, soap, balms, etc. which are useful for treatment of acne, to maintain skin elasticity, and skin care.

Neem leaf extract is useful in the treatment of malaria and blood purification. A decoction can be prepared from the roots of the Neem tree and is taken to relieve fever. The paste of Neem leaves is applied on the skin to treat acne. Neem leaves are added to the bath to help the skin to maintain perfect condition, the leaf extract have an anti-bacterial properties and regular use can cure many types of skin diseases. Neem helps prevent haemorrhoids

by helping the body rid itself of waste and prevent constipation (which is probably one of the leading cause's particular of haemorrhoids). If applied topically to external haemorrhoids, which will soften and help to manage bleeding and itching. The crushed leaves of Neem are applied to lacerated wounds, because of its antiseptic properties, along with its power to promote healthy granulation tissue and scar healing.

As an ethnological use, Neem is tried in heat-related illnesses such as measles, smallpox modest, chickenpox, sweating, prickly heat disorder, and rash. Also neem leaves have antiseptic, antibacterial, and anti-fungal.

Satabari: - ***Asparagus recemosus***
(Family:- Liliaceae)

Satabari is a thorny bushy climber with perennial roots. In the early summer the roots develop into a full-blown climber. Instead of true leaves cladodes occur. Flower is white in colour and occurs during November. Fruits are rounded, red when ripe, one seeded and ripe in December.

The root has tuber. Both the root and tuber are used as medicine. Tuber is used in malnutrition, asthma etc. It promotes secretion and flow of milk. It is useful even in case of cow and buffalo. Satabari is used in dysentery.



Figure: - ***Satabari***

Satabari should only be harvested in area allotted to the VSS areas during February-March soon after the shedding of leaves begin. The roots and tubers are dugout of the earth. It is easier to harvest if floodwater is taken up before digging. 50% of the roots of one direction are dug in a year as a part of sustainable harvesting. 10% of the health plants should also be left intact to facilitate regeneration. After harvesting the thin bark of the root is removed with sharp knife because the barks are somewhat poisonous and woody portion of the root is also removed. After removal of the bark the roots are cut into small pieces and dried under the shade. As there is acute demand of Satabari in Ayurved, its marketing position is very much encouraging.

Arjuna, *Terminalia arjuna*
(Family: - Combretaceae)

A large evergreen tree, the bark of the tree trunk is used as medicine.

Action & Uses: –

Bark is astringent, cooling aphrodisiac, demulcent, cardio tonic, styptic anti-dysenteric, Urinary astringent, expectorant atexteric, lithontriptic and tonic. Useful in fracture, ulcers, urethrorrhea, spermatorrhoea, fatigue, asthma, bronchitis, cough, consmptic, intrinsic haemorrhages, tunner, otalgia, dysentery, inflammation, skin disease, like freckles, wound, haemorrhoid, and diarrhoea associated with blood cirrhosis of liver and hypertension.

Fruit: - Tonic and DE obstruent, juice of fresh leaves is used as earache.

Propagation & cultivation:-

Grows in variety of soils but prefers fertile alluvial loam and deep sandy, well-drained soil. Grows in saline and alkaline soil. Moderately drought hardy. Seedlings are susceptible to drought. Can be propagated by seeds or stumps. The seeds are dipped in water for 96 hours.

Soaked seeds are kept in heaps covered with moist gunny cloth in shade till germination (gives 85 to 90% with 20 days). This permits to raise a stable planting stock material as against erratic and poor germination spreading for nearby two months under conventional methods. Rooting media in container is

FYM soil and sand (3:2:1) and planting of three months old seedling leads to about 90% of the planting success.

Stump planting indicates that stumps of collar dia 1.3 cm to 2.5cm gave survival of 34 to 44% at the end of two seasons, best time in July end. Rooted layer of 30 days (Air layering shows better survival after transplanting). Young seedling suffers much from drip and frost.

Karanja: - *Pongamia pinnata* (L.) (Family: - Fabaceae)

A medium sized tree up to 18 mtrs high and sometimes even more leaves imparipinnate, leaf let 05–07 ovate or elliptic, Flower lilac or white tinged with pink, violet, fragrant, anti-axillary racemes pods woody compressed, yellowish grey when ripe, elliptic to oblique oblong 4.0 to 7.5 cm long with a short curved beak, seeds (10 – 20 cm long) 1 – 2. Elleptical or rein form, wrinkled.

Parts Used: -

Root, stem bark, leaf, flower, seed, seed oil, 4600 K Cal/Kg. The roots are good for cleaning teeth, strengthening gums and gonorrhea. Root paste is used for local applying in scrotal and scrofulous enlargement. The root juice is used in cleaning fistulous sores and also for clearing foul ulcers. Bark is anthelmintic, acrid,

and useful in internal bleeding piles, beriberi, ophthalmic disorders, vaginal infection skin disease and ulcers. Leaves are digestive, laxative, anthelmintic and are prescribed for flatulence, dyspepsia diarrhea, leprosy, maggot infected ulcers, wounds, gonorrhea, rheumatologic and cough. Flowers are useful to quench dyspepsia in diabetes.

Seeds are bitter, acrid, anthelmintic and carminative. Useful in inflammations leprous sores, earache lumbago, pectoral diseases, chronic fever, bronchitis, whopping cough, hydrocele, hemorrhoids and anemia. The oil (bitter) is anthelmintic, stomachic, chlagogue stypic and depurative and is recommended for leukoderma, herpes scabies, leprosy, hemorrhoids, dyspepsia with sluggish liver ulcers/fodder and fee lumbago and rheumatics.

Formulation and Preparation:-

Karanjin, Karanjadi churna, Karanjadi taila, Karanjadi ghrita, Brihanmarichyadi taila, Maharudra taila, Mahatrinaka taila,Vajraka taila,Jatyadi varti,Mahakhadiraka ghrita, Mahakhadiraka taila, Somaraji taila

Propagation and cultivation: -

Resists drought well. Moderately frost hardy and highly tolerant of salinity, natural reproduction through seeds and root suckers. Propagation is done by direct sowing or transplanting one-year seedling raised in the nursery. The tree starts bearing fruits at the age of 4-7 years.

Harvesting: - Harvesting normally starts from Nov- Dec to May June. The pods are collected and the shells are removed by hand yield range from 9 to 90 ka per tree. Vegetative reproduction is done by stem cutting, shoots are collected throughout the year from 15 years old trees. Leaves are excised and uniform cutting of 25 cm long and 1.0 to 1.5 cm dia are prepared. These cuttings are dipped in 0.1% Bavistine for few minutes and after washing treated with 800 PPM, IAA, ABA and NAA at the basal portion end of the cutting for 15 hours. Distilled water treated cutting were served as control. The top cut end of the treated cutting were sealed with paraffin wax to reduce transpiration loss, subsequently the cutting was planted in sand beds in the mist chambers at 30$\pm$2 degree and 70-80 % relative humidity.

Lodha, ***Symplocos racemosa*****,**
Family:- Symplocaceae

It is an evergreen medium size tree with height of 6-8.5m. Lodha is among the best Ayurveda herbs to alleviate all the health issues of females. It is recommended for gynecological problems. It is an important ingredient of Ayurveda Skin care packs. Bark of Lodha tree has been traditionally used as a uterine tonic.Lodha bark is also used an incense stick making.

Food & Leaves from Forest:-

***Aegle marmelos* (Bael) (Family: -Rutaceae)**

The ripe food is used as food preferably in summer.

***Annona squamosa* (Family: - Annonaceae)**

The ripe fruit is used as a food (Custard apple)

***Artocarpus heterophyllus* (Jack fruit) (Family: - Moraceae)**

The fruits in unripe state are used for curry, Seeds are eaten raw, grilled or boiled pulp eaten raw



Figure: Jack fruit

***Bauhinia vahlii* (Family: - Fabaceae)**

A gigantic climber. Seeds are eaten raw and boil.

***Bauhinia variegata* (Family: - Fabaceae)** Flower buds, leaf buds are eaten as vegetable.

Borassus flabellifer **(Family: - Palmae)** Fruit pulp roasted and eaten, seed is edible; Inflorescence is a source of sugar and toddy.

Diospyros melanoxylon- **(Family:Ebenaceae).**

The fruit of the tree is used as a food during the hot summer.



Figure: - ***Diospyros melanoxylon***

Careya arborea**– (Family: - Lecythidaceae)**

Seeds are edible**,**



Figure: - Kumbhi

***Phoenix sylvestris*- (Wild date, Sugar date, Palm) (Family: - Palmae)**

The sap is tapped by cutting a notch in the softwood at the base of the lowest living leaves is either fermented into liquor or toddy or boiled down into sugar. Almost 7–10 Kg of the sap yields 1 Kg of Gur**.**

***Semicarpus anacardium*- (Marking Nut) (Family: - Anacardiaceae)**

Ripe fruit collected; acrid and astringent when fresh, juice of which a strong shin irritant, kernels eaten roasted flavours of roasted apples, dried with taste like dates, roasted pedicle eaten sap of unripe fruit mixed with lime used for marking lime.

***Sterculia urens*- (Family: - Sterculiaceae)** Seeds are roasted and eaten, also used as an alternate for coffee.

***Syzygium cumini*-(Family: - Myrtaceae)**

Ripe fruits are very good source of food; fruit vinegar is a good commercial product.

***Ziziphus mauritiana*- (Family: - Rhamnaceae)**

Fruit is pleasant with food value close to that of banana are taken fresh / dried. After reducing to pulp or powder, it is used for cake making or confectionary. Foliage as cattle feed and raising Silk Worm.

***Grewia asiatica* (Family: - Tiliaceae)**

Fruit dark purple globular, 1 – 4 seeded drupe. The edible fleshy is sugary and acidulous. A perishable fruit. Pressed phalsa or phalsa syrup prepared from the juice is considered a delicacy in North India throughout the hot months of summer.

***Tamarindus indica* – (Family: - Fabaceae)**

The fruit is a long pod with 6 to 10 radish brown seeds and contain about 55% of its weight as pulp. Tamarind has a good distribution in this division besides being grown on private holdings. Fleshy fruits are used as food, the flower and tender leaves as chutney. The edible pods are used to make sweets, jams and pickles. Yellow colouring matte is also extracted from them. Fruit pulp is a home medicine as laxative cultivated as forage (high food value and relished by cattle) it is an excellent source of Vitamin 'B' (thiamine niacin) small carotene &Vitamin 'C'. Water 15 – 47%, protein 1.4 – 3.4%, Lipid 0.9 to 1.0%, Starch 62.5% cellulose 5.1%, Ash 1.5 – 4.2%, Ca – 0.074%, P =0.113%.

There is a craze of Tamarind in the present market and it will go on an ascending trend in the future. Value addition through deseeding by decorticator machine fetches about 40% hike in the price. The self-help groups to improve their economic condition can also use the seed kernel locally from production of Agarbatti.

Buchanania lanzan- (Anacardiaceae)

The black ovoid fruits are about 1.25 cm. long and ripen in April to May. Chironjee Kernel contains 51.8% oil, 12.1% protein, 21.6% starch, 5% sugar bank tannin (medicine for leprosy). Kernels are eaten raw or roasted and form a substitute for almonds. Sweet meats contain 51.8% of oil, 21.1% of starch, 21.6% of proteins and 5% sugar. The fruit of Char is considered as poor man's grape.



Figure: - ***Char***

Char seed is also used in sweets, biscuits, coke etc. The oil of Char seed is used as medicine for skin disease. One ten-year-old tree yields 20 to 25 kg. seeds annually. The ripe fruit is collected by plucking from the trees by using a long bamboo with hook or by collecting fallen fruits from the ground.

The fruit pulp is removed by rubbing with sand after they are kept in warm water over night. Then seeds are dried. The collected seeds are grinded to get the kernels by using Chaki. The seeds are sun dried to minimize the moisture contents and stored in a bamboo basket by covering it with leaves. In the traditional method of processing kernels are damaged very often. To overcome the problem, electric driven decorticators are used to get good result. Big sized kernels fetch good money.

Mango, ***Mangifera indic*****a (Family:-Anacardiaceae)**

The raw and ripe fruits are used as food. The chemical composition of the raw and ripe mango is given in **Table No. 17.2**

Table No. 17.2

Food Value	Green Fruit	Ripe fruit
Water	90.00 %	86.00 %
Protein	0.70 %	0.60%
Fat	0.10 %	0.10 %
Mineral Material	0.40%	0.30 %
Cellulose	--	1.10 %
Carbohydrates	8.80%	11.80 %

Mahua- ***Madhuca indica*** **– (Family: Sapotaceae)**

Fruit is fleshy and compressed. The kernels are used for culinary purposes in the hills. The flowers are ovoid about

2 cm. long, creamy white in colour and fleshy. They have an unpleasant odour and are sweet to taste. The fruit is an ovoid drupe, 0.8-1.2 cm. long with a green fleshy covering and a shiny brown ovoid seed about 2.5 cm. long. The flowers and seeds are the most important product of tree that are widely used as below: -

Mahua flowers are rich in sugar being widely used as a source of food by the forest dwellers. They are eaten fresh but are usually cooked with rice and eaten after they have been dried in the sun. But the most popular use of Mahua is in liquor making. On value addition high quality Jelly and Jams can be prepared and boost the economics of the product.

During March and April, the cream coloured corollas of Mahua fall on the ground by themselves after their moulting on the tree. Usually the showering of flowers take place between 4 O'clock to 10 O'clock in the morning. The primary collectors clean the ground under the tree and collect the flower free from debrises. But spreading mat on the ground can still improve quality of materials. Sugar content of corollas is maximum when flower is matured and ready to fall. So, the primary collectors do not apply any pressure on the tree for harvesting the flowers and wait for the showers. The flowers collected are sun dried preferably on

a clean surface decrease the moisture content. Once the flower turns reddish is stored in the well-ventilated room.



Figure: - Mahua flower



Figure:- Mahua Fruit

Either collected from the ground or plucked from the tree the fruits are dried in the sun and seeds are removed. The seeds cannot be stored for a long period.

But if moisture content is 5 to 6% and treated with application of aluminum phosphate it can be stored for a longer period. The seeds yield greenish yellow oil. Mahua oil is used mainly in the manufacture of laundry soap. It is also used for cooking purpose in some forest fringe villages, for candle manufacturing, as batching oil in jute industry and as raw materials for the production of stearic acid.

It has emollient properties and is used in skin diseases, rheumatism and headache.

Kusum- ***Schleichera oleosa*** (Family: - Sapindaceae)

Fruit of Kusum is eaten and kernels yield quality cooking oil. The oil is mainly used in soap industry. The seeds of Kusums are collected during June – July. The fruits fallen on the ground are collected or the fruits are plucked from the twigs by climbing the tree. The collected fruits are sun dried for 7 to 8 days and seeds are separated.



Figure:- ***Schleichera oleosa***

Sal, ***Shorea robusta*** **(Roxb. ex Gaertn.)**
(Family: - Dipterocarpaceae)

Extraction of oil from Sal seeds for domestic use has been in practice since long. But Sal seeds gained considerable importance when use of their oil for the manufacturing of commercial products like soaps and chocolates were discovered. This created a scope for the industrial use of Sal seed oil and as such its demand got increased significantly. The kernels produce oil which is a natural hard fat, non-greasy even without chemical refining. Hence it has the credit of revolutionising its use in the confectionary industry. About 10 Kg. kernels are required to produce 1 Kg. oil. Sal leaf plates are the main source of income generation for the local inhabitants in this division.

Grasses:-

Grasses are used for paper making, cattle fodder, matting, ropes, thatching and manufacturing furniture, baskets and screens. Grasses available in this division are mentioned below: -

1. **Fodder grasses: -**

   These includes *Andropogon, Cenchrus ciliaris, Cynodon species, Bothriochloa ischaemum, Bothriochloa persuta, Bromus spp., Hetropogon contortus.*

2. **Matting grasses: -**

   These includes culms of *Phragmites spp*. and *Arundo sp*p., these are split up and used for matting. The other species includes *Saccharum munja, Typha elephantina, and Cyperus corymbusus.*

3. **Rope grass: -**

   These includes *Desmostachya bipinnata*, Saccharum munja, *Saccharum spontaeum, Themeda arundinacea.*

4. **Thatching grass: -**

   These include *Imperata cylindaca, Saccharum munja, Saccharum spontaeum, and Hetropogon contortus.*

Grasses of miscellaneous use: -

Furniture's are made out of *Saccharum munja* stem, screen from stem and roots as coolant in summer of *Veteveria zizaniodes* are

of great craze. *Thysanolaena maxima* grass is valued for brooms and fodder.

Regeneration: -

Eulaliopsis binata, Saccharum munja, Cencrus ciliaris, Vetevriya zizaniodes, Thysanolaena maxima are some grasses are proposed to be raised using cuttings, slips or seedlings in the soil and moisture conservation works in Rehabilitation Working Circle.

Hill Broom or Phul Jhadu (*Thysanolaena maxim*a (Roxb) Kuntze)

This is also known as Bouquet grass or Tiger grass. It is a tall perennial grass of 1.5 to 3 meters long having large, flat and oblong-lanceolate leaves and usually occurs on shady forest slopes particularly near water streams. It grows well in soil having high moisture content. The panicles of this grass containing the inflorescence are the part used for preparing the broom. The size and weight of the panicle vary depending on soil quality and other locality factors.

The panicle is usually 1-meter-long having the inflorescence of about 45 cm. This broom is almost meant for sweeping the fine dust on polished surfaces because of its cleaning effectiveness and good look.

The common method of harvest is cutting of the broom grasses close to the ground with the help of a sickle. While cutting

care should be taken not to disturb the rootstock for regeneration. Sometimes it is observed that reckless cutting leads to the damage of rootstock, which affects regeneration adversely. Such destructive method of harvest shall be prevented through proper awareness and training to the primary collectors. After cutting, loose grass stalks are made into bundles and carried to the drying yard. The rural women folk mostly do this job. Since the inflorescence is the vital part of utility, the ideal period of collection is the time of its occurrence during January. At this stage it looks greenish and also fine textured which is considered as the best quality. With advent of time the inflorescence grows to become flower, thereby changing both colour and texture to brown and coarse as well as deteriorating the quality. The stalk with inflorescence so collected are dried in the sun for three days by spreading evenly on a dry surface or on thatch roofs of the hut with frequent turning for ensuring proper drying. The primary collectors at times sell off these dried materials.

These value additions involve very simple technique and the illiterate rural women can be groomed through short duration training at their locality. It is estimated that the cost of the broom is increased twice through value addition involving very small amount for the coloured plastic string and cover

with easy technique. This is a potential source of income generation to the illiterate rural women folk.

17.6.2 Silvicultural System

In order to accomplish the special objectives of management of this Overlapping Working Circle as well as promoting the prospects of non-timber forest produce in this Division the following prescriptions are made: -

Skill Up gradation

Massive skill up gradation of the local stakeholders for processing, storage and marketing in respect of major NTFP items are prescribed in individual sections of the chapter.

The primary collectors are very often deprived of fetching proper price due to lack of proper harvesting and processing technique to ensure desired quality. This is the main lacuna and ought to be sorted out by imparting necessary training. Value addition will enhance the sale price of the product significantly. People are adopting their age-old practice for such work. In the present day of sophistication, refinement of the work is necessary to compete in the market. So, the skill of the local people is required to be upgraded. The processing technique, value addition and storage have already been described for major NTFP items individually. The skill for marketing is also a crucial factor. Without proper marketing strategy it is also not possible to fetch the minimum support

price (MSP). So, information regarding the market trend with proper link up shall be updated. This aspect shall be a part of training curriculum for skill up gradation.

17.6.3 Rotation Period

Not required

17.6.4 Harvestable Diameter/Sustainable Harvesting

Most of the NTFP are produced annually for which it is considered as an alternate source of livelihood of the forest dwellers. In order to make this tapping source of livelihood sustainable the growth and regeneration of the source plant shall be ensured. Though prescriptions have been made in the main working circle to take care of this aspect, it needs reiteration in this Overlapping Working Circle. To make the prescription specific here, promotion of NTFP species particularly medicinal plants in Joint Forest Management areas shall be emphasised on priority basis. This will not only augment the income of the VSS but built up a potential and perpetual source of income for future generation. This shall be strictly adhered in preparation of Micro plan.

17.6.5 Reducing factors and reduced areas:

Not required to this Overlapping Working Circle.

17.6.6 Felling Cycle

Not required to this Overlapping Working Circle.

17.6.7 Division into periods and allotment to periodic blocks (PB):

Not required to this Overlapping Working Circle.

17.6.8 Calculation of yield

Already discussed in Para 7.7 of Chapter 7 of Part – I

17.6.9 Table of felling

Not required to this Overlapping Working Circle

17.6.10 Method of executing the felling

Not required to this Overlapping Working Circle

17.6.11 Subsidiary silvicultural operations cleaning and thinning

Not required to this Overlapping Working Circle

17.6.12 Regeneration

Not required to this Overlapping Working Circle

17.6.13 Associated regulations and measures

Besides the prescriptions provided in the foregoing paras, some other regulations are necessary to augment the former for effective results. These are the following.

17.6.13.1 Training to Panchayat-Raj Institutions

The control and management of trade for 69 NTFP items have been vested with Gram Panchayats till now since the year of transfer of management during 2000**. (Annexure-XIX**) During last two decades it is felt that improvement in capacity building of such institutions is highly essential to ensure flow of desired benefit to the forest fringe dwellers for which such deregulation has been intended. Training for PRI members shall be organised on skill up-gradation to equip them with modern technique to handle the matter for optimum benefit to the primary collectors.

17.6.13.2 Infrastructure for processing, storing and Marketing

Among in fracture the drying yards and depots need to be developed at the VSS level to have a minimisation of loss due to storage and processing.

17.6.13.3 Marketing

NTFP market is a fluctuating one, despite the Government of Odisha fixes the Minimum Support prices but, in many times, the clever traders never pay it to the primary collectors and an integrated approach is needed by the

Panchayat Raj department and the forest department to safeguard their interest.

It shall be the endeavour of the Divisional Forest Officer and staff to see that the gatherers of various NTFP items get the fair price for each item as fixed by the Government as the MSP for various NTFP items for any year should be given wide publicity and Executive Committee of the VSS should be mobilized in this task.

The formation of co-operatives of VSS / SHG in different NTFP rich areas and an apex cooperative at district level can help for marketing of NTFP. But the capacity building of the cooperatives is required at the initial stage. This would improve the economic condition of primary collectors. Participation of this cooperative in the district and state level exhibitions can facilitate market. Appropriate market linkage with these cooperatives and the consumers / pharmaceuticals need to be developed. Support from the State Medicinal Plant Board can also be extended to the cooperatives.

17.6.13.4 Maintenance of Records and Database

Steps should be taken to ensure proper maintenance of records at Gram Panchayat level with flow of information regularly.

A database shall be created through T.D.C.C. with the support from Gram Panchayat to provide market linkage. The Divisional Forest Officer shall coordinate the entire matter to formulate a procedure in consultation with Collector of the District to ensure this aspect. This is essential for marketing linkage as well as formulating different plan strategy for the promotion of NTFP. Also, this will give a correct on the production potential of different NTFP of the Division.

17.6.13.5 Participation and empowerment of VSS

It is necessary to involve the VSS to the optimum for effective implementation of the NTFP policy of the Government being managed by the Gram Panchayat. The traders can only be registered on recommendation of at least three VSS of the Panchayat. VSS being the grass root level people's institution for forest management must be given a leading role in this affair.

CHAPTER –18

J.F.M. (Overlapping) Working Circle

18.1 Name of the working circle

Joint Forest Management (Overlapping) Working Circle.

18.2 General constitution of working circle

It is proposed to retain J.F.M. Overlapping Working Circle in the revision of the plan. The JFM (Overlapping) Working Circle is constituted for portions of Reserved Forests, Proposed Reserved Forests, Village forests etc. assigned to Vana Surakshya Samiti (V.S.S.) spreading over 21057.5 Ha. An area of 21057.5 Ha has been allotted to this Working Circle. This working circle includes some of the RF, PRF, DPFs, VF covered under Selection Working Circle, Rehabilitation Working Circle, Plantation Working Circle of Karanjia Division. Some of the areas allotted to this circle are remotely located and also on hilly terrain. The chapter has been newly added in this Revised Working Plan due to its up-growing popularity for Joint Forest Management of Forest areas in Mayurbhanj District, more specifically in Karanjia Forest Division area as Mayurbhanj District has been the pioneer in Community Forest Management since 1980s through formation of village Forest protection committees (VFPC), Joint Forest Management

Committees (JFMC), which have been converted to Vana Surakshya Samiti (VSS) as per JFM resolution 2011 and 2015 of Govt. of Odisha Forest and Environment Dept. as attached in **Annexure No. XXI** and **XXI a.**

In this Division 272 nos. of VSSs have been formed covering an area of 21087.71 ha. out of which 21057.50 Ha has been considered under JFM (O) Working Circle. Balance area of 30.21 Ha. is under Revenue Forest and outside working plan area.

Table No.18.1

Range wise list of VSS in Karanjia Division

Name of the Range	No. of VSS	Type of Forest Land					Revenue forest land (Outside Plan Area)
		RF	PRF	DPF	VF	Total plan area under JFM (O) C	
Satkosia	24	3750.00	0	0	0	3750	0
Thakurmunda	74	5425.92	105	98.37	10.52	5639.81	0
Dudhiani	81	3693.8	1024.6	100	210.91	5029.31	30.21
Karanjia	93	6258.6	200	0	179.78	6638.38	0
Total: -	**272**	**19128.32**	**1329.6**	**198.37**	**401.21**	**21057.5**	**30.21**

The detail list of Vana Surakshya Samitis and assigned area is furnished in Annexure –XX.

The following initiatives are proposed to be taken under this working circle.

(a) Survey & demarcation of forest area assigned to VSS, preparation of digitized map.

(b) Preparation of Micro Plan for each VSS for forest protection and development.

(c) Institutionalization of VSSs through conducting regular meeting with the stakeholders.

(d) Capacity building of VSS members through imparting trainings on relevant themes.

(e) Construction of community hall for training / storage and provision of other amenities.

(d) Sustainable income generating activities for VSS & provision of revolving fund for SHG.

(f) Value addition of NTFP items through imparting trainings and providing different machines.

(g) To ensure record maintenance for different activities undertaken at each VSS level.

18.3 General characteristics of vegetation

The forests assigned to JFM (VSS) are mostly forest fringe area and categorized as Degraded Forests.

The village forests assigned to VFC (Village Forest Committee) are all manmade forests raised in between 1985 to 1993. The crop density varies from 30% to 70% and bears a good crop mostly of Eucalyptus, Acacia, and San Chakunda i.e. mostly Fuel wood & Fodder species etc.

18.4 Felling series, cutting sections and JFM areas

The JFM assigned area is an Overlapping Working Circle. The forests assigned to respective independent working Circle will be applicable. Mostly the forests are assigned to Selection Working circle, Rehabilitation Working Circle and Plantation Working Circle.

18.5 Special objectives of management

Within the limit of general objects of management as described earlier, the following special objectives have been set for this Overlapping Working Circle.

1. To jointly shoulder the responsibility of management of forest by the VSS with Forest Officials and discharge the required duties effectively on sustained basis through their capacity building and empowering this village level people's institution.

2. To foster the degraded forest for speedy resilience of the vegetation with active participation of the local people.
3. To motivate the local people for inculcating the attitude of both producer and consumer of the forest produce and becoming self-reliant through rational use of renewable natural community resources.

18.5.1 Silvicultural System

No specific system in general has been prescribed for this Overlapping Working Circle. The prescription for the exclusive Working Circle to which the assigned area is primarily allotted is applicable for the purpose. As per the provisions of Joint Forest Management Resolution 1993 the management is regulated through a Micro-plan which is specific to the area assigned. Such Micro-plan is also in conformity with the prescriptions of main working circle.

18.5.2 Rotation period

Not required.

18.5.3 Harvestable diameters

Not required.

18.5.4 Reducing factors and reduced areas

Not required.

18.5.5 Felling cycle

Not required.

18.5.6 Division into periods and allotment to periodic blocks (PB)

Not required.

18.5.7 Calculation of the yield

Not required.

18.5.8 Table of felling

Not required.

18.5.9 Method of executing the felling

Not required.

18.5.10 Subsidiary silvicultural operations

Cleaning and thinning

Not required.

18.5.11 Regeneration

Not required.

18.5.12 Associated regulations and measures

Methods of Execution: -

The resolution No.10F (Pron.) 20 / 93 – 16700 / F & E dt.03.07.1993 issued by Government of Odisha during 1993 contains the guideline as well as procedure for implementation of Joint Forest Management. The control and management are always subjected to the prevalent guideline and instruction of the Government. However, it is necessary to provide the following prescriptions in order to accomplish the special

objectives of management of this Working Circle as well as facilitating the effective working of Joint Forest Management.

18.5.13 Institutionalisation of V.S.S

VSS plays an important role in implementation of Joint Forest Management. It is highly essential to strengthen this base level people's institution. Prior to formation, the study of ethology of the stake holders is essential. A sense of motivation should be developed through massive sensitizations programme. This should be followed by empowering the VSS in decision making. Efforts should be made to make them fully aware of their duties and responsibilities to become an active partner with the forest officials for Joint Forest Management.

18.5.14 Capacity Building

Regular training and awareness campaign shall be organised to enhance the capacity of the people. Only through such process the VSS can be stabilised and built up necessary capacity to discharge their function effectively. The frontier staff like the Foresters and Forest Guards should concentrate on this matter. Once this foundation is consolidated, it can move ahead smoothly and steadily surpassing any type of obstacle coming in the way. Hence, it is reiterated that the field level functionaries shall adopt a dedicated approach in the beginning for formation of VSS.

Meetings shall be conducted regularly and sincerely. Instead of acting as an arbitrator, the forest officials should play the role of facilitator or moderator for the people who should be groomed to solve their own problem. Protection mechanism, benefit sharing, Conflict resolution, and participation of women actively are the focal points.

These are valuable ingredients of a strong VSS. Very often it is observed that VSS having dominated women and youth executive committee is successful one. So, efforts shall be made to encourage the participation of women and youth actively in VSS.

18.5.15 Preparation of Micro Plan

This is the guiding document of Joint Forest Management. 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 forests for resilience and improvement and (iii) The need for other supporting non-forest activities shall be assessed properly and considered as a guiding factor for preparation of the plan document. This is the micro treatment plan for that area within the ambit of the prescription of the main working circle to which the area is assigned.

The Forester being the ex-officio Member Secretary of the VSS shall prepare the micro plan with the villagers in a participatory

process. The micro plan so prepared by the Forester shall be examined by the Range Officer and forwarded to the Division Office. The Assistant Conservator of Forests shall ratify the aforesaid proposal recommended by the Range Officer. In case of any disagreement, the matter shall be referred the matter to the Divisional Forest Officer whose decision shall be the final.

18.5.16 Protection Mechanism

The first and foremost task in tackling the degraded forests is to curb the deterioration process, which is caused by mostly biotic interference. The details have been described in of Part-I. The protection is the prescribed treatment, which should be administered at the very beginning to cease the process of degradation. Various protection methods like watching on roster basis, social sanction and engagement of cowherd boys for domestic cattle, stall feeding mechanism contribution either in shape of kind or money for engagement of watcher etc. are in practice by the villagers. It is not prudent to prescribe any method in a general manner. The method suitable to the VSS shall be explored and adopted in due course of time. This is the crucial task which should be done with utmost care. Once this is accomplished properly, the success of Joint Forest Management is almost certain. The field functionaries particularly the Foresters and Forest Guards shall apply their mind seriously in this matter.

Site-specific strategy shall be devised to encounter the hazards inter alia uncontrolled grazing, illicit cutting and fire to contain them.

18.5.17 Rejuvenation & Development Process

After arresting the degradation through control of biotic interference by suitable protection mechanism, the vegetation starts rejuvenating in the areas having potential rootstock. Silvicultural treatment is necessary to boost up this process. The details of such treatment including gap/block planting wherever necessary have been described in Rehabilitation Working Circle and Plantation Working Circle. However, the operations as spelt out in the Micro Plan shall be carried out. Silvicultural Cleaning and Soil & Moisture Conservation measure must be executed scrupulously and meticulously. Care shall be taken to combat negative drivers. The Forester and Forest Guard shall visit the area frequently along with the VSS members to enable them for assessing the results from implementation of Micro Plan. This will boost the morale of the VSS and encourage their mindset for Joint Forest Management.

18.5.18 Benefit of Usufruct

This is the most vital component, which is intended to cater the bonafide need of the villagers in a legalised manner. Cent percentage of the intermediary harvest and half of the final/major

harvest are meant for the VSS as per the existing provisions of Joint Forest Management resolution 2011. It is observed that various products are collected without systematic documentation for which the tangible benefits from the assigned area are not properly appreciated. All sorts of collection shall be regulated quantified and documented. The VSS should be technically guided regarding the method, period and quantum of collection of usufructs. These activities shall be executed by them. The sharing of usufruct is a very delicate issue, which sometimes leads to internal conflicts and the collapse of the system. However, the Forester and Forest Guard shall be extra cautious to ensure that VSS should evolve a suitable and sustainable distribution mechanism for themselves. It is experienced that equitable distribution on household basis is the most accepted one. In this process the VSS shall be encouraged to play an active and major role for infusing the idea of both producer and consumer of forest produce. Further, the quantum of collection of produce shall be compared with that of pre JFM period for pronouncing the increase from the result of management. This will consolidate the mind-set of the VSS for Joint Forest Management as well as to become self-reliant.

18.5.19 Support Activities

Apart from enjoying the usufruct from the assigned area for catering the bonafide need, other Income Generating Activities (IGA) shall be explored. NTFP collection, processing, value addition and marketing should be given top priority as first choice if it is feasible for the VSS. MAPs plantation shall also be emphasised. Other non-forestry activities like Pisciculture, Mushroom production, cultivation of Banana, Pineapple, Papaya, Drumstick, Ginger and Onion processing of Pulses and Rice etc. shall be encouraged to augment their income and livelihood. The aforesaid items have a good demand in Karanjia Forest Division. However, this list is only indicative but not exhaustive. The Forester and Forest Guard shall assess the skill and adaptability of the VSS and provide them a galaxy of options with the cost benefit analysis for choice. The Range Officer and if necessary, the D.F.O. should make the marketing arrangement of the items produce by the VSS for ensuring appreciable income. This is essential to make the system sustainable.

18.5.20 Expansion of Joint Forest Management

At present 272 no. of VSS have been constituted in this Division assigning an area of 21087.71 ha belonging to different category of forests. Efforts should be made in the plan period to bring all uncovered forest fringe villages under the umbrella of Joint Forest

Management Similarly the village forests assigned to this Overlapping Working Circle shall be brought under the fold of Joint Forest Management after following due procedure. On the whole Joint Forest Management being unique panacea to address the current problems of forest conservation, it should be extended to cover maximum people and maximum area to the permissible extent as per the policy of the Government.

18.6 Other Regulations: -

Besides the prescriptions provided in the foregoing paras, some other regulations are necessary to augment the former for effective results. These are the following.

18.6.1 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 for providing the correct position. The evaluation shall be made in an objective manner for which the Divisional Forest Officer should prescribe a suitable format containing point wise scoring system. Reputed local NGO/Universities can be entrusted for such evaluation. Each year in the month of April, such evaluation shall be done for the performance of preceding financial year.

18.6.2 Review

The evaluation report shall be examined through a review by a committee comprising of all Range Officers under the Chairmanship of Assistant Conservator of Forests. This committee will finalise the list of best three VSS basing on the scores in the evaluation report and also shortlist the shortcomings along with remedial measures. This will be treated as a guiding factor for the next course of action on Joint Forest Management.

18.6.3 Rewards

Recognition of any meritorious work is always the best stimulant for any person or organisation to proceed further. VSS showing commendable performance shall be rewarded as a token of recognition to their work. It shall encourage a healthy competition among the VSS to propagate the Joint Forest Management. So, it is prescribed to reward Seven VSS each year covering all Ranges with a citation and cash. Such VSS shall be felicitated either on Independence Day or on Republic Day celebration.

18.6.4 Conflict Resolution

Sometimes conflict arises with the inhabitants of other villages for their unauthorised and forcibly collection of forest produces from the assigned area of the VSS. It is necessary to resolve the same from the very beginning. In such cases the Range Officer shall

visit the area at the earliest and try to settle the matter amicably. If the conflict does not subside, legal action shall be taken departmentally. It is observed that good VSS become disillusioned without adequate support from the department in this regard. Hence, all sorts of support shall be provided to the VSS in time. Similarly, any conflict within the VSS if arises shall be resolved forthwith. The Range Officer shall discuss the matter with the VSS and help them in sorting out the problem instead of acting as an adjudicator.

18.6.5 Convergence with other Rural Development Activities

Joint Forest Management cannot be fully successful in isolation. An integrated approach along with other developmental activities will make the process easier and quicker for achievement. The local Range Officer shall explore this aspect in consultation with his counter parts of other departments particularly B.D.O., Tahsildar, V.A.S., Agriculture Officer, Horticulturist etc. And ensure the needful coordination for converging various activities in the village.

18.6.6 Publicity

Wide publicity is of immense important for successful implementation of Joint Forest Management. Exposure visit to

the successful VSS area is needed. The success story shall be circulated. Frequent awareness programme shall be organised to attract the villagers towards the benefits of Joint Forest Management. The Range Officer shall take initiative for discussion on this issue in various Village / Gram Panchayat / Panchayat Samiti level forums through regular interactions with the concerned PRI members. The Forester and Forest Guard shall assist the Range Officer in ensuring due publicity of the programme.



CHAPTER – 19

Wildlife (Overlapping) Working Circle

19.1 Name of working circle

Wildlife (Overlapping) Working Circle.

19.2 General constitution of working circle

Wildlife is integral part of forests. Its management needs special emphasis on different aspects like conservation, protection, development and prevention of depredation and conflict. Constitution of a separate Working Circle will serve the management orientation for conservation and development of the wildlife habitat. The various activities of wildlife are felt in various pockets spreading all the forest blocks of this Division. Hence it is justified to constitute Wildlife Overlapping Working Circle. This Overlapping Working Circle extends whole the plan area for protection of wildlife and also for promotion and conservation of biodiversity. The area extends over the entire Plan Area of 335 Forest Blocks with 43261.83Ha.

19.3 General characteristics of vegetation

The details of the vegetation are described in chapter 3 of Part I of this plan.

19.4 Felling series, cutting sections and JFM areas

Not required

19.5 Blocks, compartments and JFM area

Forest blocks allotted to this Overlapping Working Circle are given in Table No. 19.1.

Forest Block wise area allotted to Wildlife (Overlapping) Working Circle.

Table No.19

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
1	Karanjia	Adipur RF	39.20
2	Karanjia	Andharjhari RF	132.80
3	Karanjia	Ankura RF	75.70
4	Karanjia	Badbil RF	107.20
5	Karanjia	Badadeuli RF	227.60
6	Karanjia	Badsurei RF	44.80
7	Karanjia	Bhanjabeda RF	145.20
8	Karanjia	Bhanra RF	119.60
9	Karanjia	Bhramarposi RF	157.60
10	Karanjia	Budamara RF	8.80
11	Karanjia	Buruhatu RF	14.00
12	Karanjia	Gambharia – I RF	14.40
13	Karanjia	Gambharia – II RF	14.00
14	Karanjia	Gambharia – III RF	12.40

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
15	Karanjia	Chandiahil RF	26.40
16	Karanjia	Chaturisahi RF	113.20
17	Karanjia	Chhelianali – I RF	10.40
18	Karanjia	Chhelianali – II RF	34.40
19	Karanjia	Chauthia RF	44.80
20	Karanjia	Denua RF	28.40
21	Karanjia	Deodhipa RF	32.00
22	Karanjia	Diajodi RF	56.40
23	Karanjia	Dighiposi RF	82.40
24	Karanjia	Dumbisahi RF	42.00
25	Karanjia	Galusahi RF	26.40
26	Karanjia	Ghagi RF	227.20
27	Karanjia	Gharmabeda RF	188.80
28	Karanjia	Ghodaghaguri RF	141.20
29	Karanjia	Ghosda – I RF	19.20
30	Karanjia	Ghosda – II RF	140.00
31	Karanjia	Haldia RF	113.60
32	Karanjia	Halpur – I RF	47.20
33	Karanjia	Halpur – II RF	64.00
34	Karanjia	Halpur – III RF	11.60
35	Karanjia	Hatisalbeda RF	487.60
36	Karanjia	Hindola RF	23.60
37	Karanjia	Jambani RF	94.90
38	Karanjia	Jamunti RF	260.00
39	Karanjia	Jhaddumuria RF	56.80
40	Karanjia	Jhadghosda RF	36.40
41	Karanjia	Jhumkapal RF	28.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
42	Karanjia	Kalakad RF	99.99
43	Karanjia	Konika RF	24.80
44	Karanjia	Karanjia RF	109.20
45	Karanjia	Kasia RF	97.20
46	Karanjia	Kendua RF	152.00
47	Karanjia	Kenjhera RF	117.60
48	Karanjia	Khaparasahi RF	33.60
49	Karanjia	Kudarsahi RF	20.80
50	Karanjia	Kujiam RF	155.60
51	Karanjia	Kuliposi RF	24.00
52	Karanjia	Kusunpur – I RF	18.00
53	Karanjia	Kusunpur – II RF	43.20
54	Karanjia	Mahadevdeuli RF	37.20
55	Karanjia	Mahuliasole RF	153.60
56	Karanjia	Maricha RF	24.00
57	Karanjia	Miludihi RF	42.07
58	Karanjia	Naksara RF	20.40
59	Karanjia	Nuabeda RF	18.80
60	Karanjia	Nuagaon RF	142.00
61	Karanjia	Padheidura RF	456.11
62	Karanjia	Panpatria RF	1520.00
63	Karanjia	Panideuli RF	98.40
64	Karanjia	Paudia RF	627.40
65	Karanjia	Phulcomp RF	42.80
66	Karanjia	Phulguntha RF	103.60
67	Karanjia	Pingu RF	39.20
68	Karanjia	Pokamunda RF	190.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
69	Karanjia	Pokharia – I RF	145.60
70	Karanjia	Pokharia – II RF	73.60
71	Karanjia	Sandeuli RF	120.40
72	Karanjia	Sankesari – I RF	18.00
73	Karanjia	Sankesari – II RF	38.40
74	Karanjia	Saantabandh RF	17.60
75	Karanjia	Sanbadposi RF	201.20
76	Karanjia	Saranggarh RF	113.20
77	Karanjia	Sarasposi RF	115.20
78	Karanjia	Saragoda – I RF	18.00
79	Karanjia	Saragoda – II RF	36.80
80	Karanjia	Sarubali RF	81.14
81	Karanjia	Sarubil RF	99.60
82	Karanjia	Sarubhadi RF	52.10
83	Karanjia	Singda – I RF	23.20
84	Karanjia	Singda – II RF	54.00
85	Karanjia	Singda – III RF	104.76
86	Karanjia	Sunaposi RF	108.80
87	Karanjia	Tangia RF	30.00
88	Karanjia	Tikasil RF	92.80
89	Karanjia	Tulasipur RF	28.00
90	Karanjia	Balibhol PRF	8.64
91	Karanjia	Bhalughera PRF	2.08
92	Karanjia	Champarei-I PRF	22.26
93	Karanjia	Champarei-II PRF	3.01
94	Karanjia	Champarei-III PRF	2.63
95	Karanjia	Haldia-I PRF	5.34

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
96	Karanjia	Haldia-II PRF	7.49
97	Karanjia	Balisahi DPF	40.47
98	Karanjia	Mayursahi DPF	12.54
99	Karanjia	Singda DPF	7.28
100	Karanjia	Milu DPF	19.02
101	Karanjia	Halpur VF	2.00
102	Karanjia	Narsanda VF	1.08
103	Karanjia	Chheliaposi VF	7.84
104	Karanjia	Kusunpur VF	3.94
105	Karanjia	P.Jadunathpur VF	11.92
106	Karanjia	Badposi VF	5.00
107	Karanjia	Bamanposi VF	7.90
108	Karanjia	Nanduburu VF	1.00
109	Karanjia	Palsagadia VF	9.00
110	Karanjia	Kenjhera Panposi VF	1.34
111	Karanjia	Rugudi-II VF	11.86
112	Karanjia	Kasia VF	5.00
113	Karanjia	Badposi-III VF	4.18
114	Karanjia	Bhramarposi-I VF	12.00
115	Karanjia	Mandua VF	5.01
116	Karanjia	Ankura VF	3.00
117	Karanjia	Mata VF	3.95
118	Karanjia	Nuagan VF	2.80
119	Karanjia	Sarubil VF	5.00
120	Karanjia	Pandarsil VF	1.58
121	Karanjia	Baliposi VF	5.00
122	Karanjia	Saradha VF	6.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
123	Karanjia	Bangriposi VF	6.00
124	Karanjia	Mahadevdeuli VF	5.00
125	Karanjia	Ghosda VF	15.61
126	Karanjia	B.Jadunathpur VF	6.00
127	Karanjia	Dhakata VF	6.08
128	Karanjia	Pakamunda VF	5.00
129	Karanjia	Reghasahi VF	8.00
130	Karanjia	Bhramarposi-II VF	2.92
131	Karanjia	Khadiakudar VF	4.02
132	Karanjia	Nuabeda VF	4.75
133	Dudhiani	Badnai RF	23.20
134	Dudhiani	Biunria RF	142.23
135	Dudhiani	Chanchbani RF	55.66
136	Dudhiani	Dari – I RF	19.60
137	Dudhiani	Dari – II RF	51.20
138	Dudhiani	Dumuria RF	174.80
139	Dudhiani	Gudidiha RF	323.66
140	Dudhiani	Hatimundi RF	147.60
141	Dudhiani	Jharbeda RF	145.84
142	Dudhiani	Kadambeda RF	75.44
143	Dudhiani	Khandbandh RF	34.00
144	Dudhiani	Kuita RF	164.80
145	Dudhiani	Kunjia RF	125.20
146	Dudhiani	Malharpada RF	27.20
147	Dudhiani	Masinabila RF	77.60
148	Dudhiani	Mota RF	281.20
149	Dudhiani	Palasgodia – I RF	33.60

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
150	Dudhiani	Palasgodia – II RF	16.00
151	Dudhiani	Panposi RF	33.60
152	Dudhiani	Pantho RF	176.00
153	Dudhiani	Purunadeogaon RF	59.60
154	Dudhiani	Ranipat RF	19.65
155	Dudhiani	Rasamtala RF	155.81
156	Dudhiani	Rugudi – I RF	19.20
157	Dudhiani	Rugudi – II RF	36.00
158	Dudhiani	Salarpada RF	87.14
159	Dudhiani	Sannai RF	9.20
160	Dudhiani	Siramanipur RF	110.00
161	Dudhiani	Sialinai RF	84.00
162	Dudhiani	Tato RF	104.00
163	Dudhiani	Kadadiha RF	89.20
164	Dudhiani	Bala RF	25.20
165	Dudhiani	Bakartala-I PRF	4.46
166	Dudhiani	Bakartala-II PRF	2.19
167	Dudhiani	Purunapani PRF	15.99
168	Dudhiani	Raitalia A PRF	26.39
169	Dudhiani	Raitalia A PRF	18.21
170	Dudhiani	Kanthikana PRF	126.95
171	Dudhiani	Dumuria DPF	4.41
172	Dudhiani	Purunapani-I VF	3.02
173	Dudhiani	Nuagaon VF	4.40
174	Dudhiani	Khandbandh VF	6.00
175	Dudhiani	Sunamukhi VF	3.68

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
176	Dudhiani	Rugudi-I VF	5.00
177	Dudhiani	Badposi VF	1.59
178	Dudhiani	B.Badposi VF	0.02
179	Dudhiani	Bakartala VF	2.28
180	Dudhiani	Kenjhera Panposi-II VF	1.91
181	Dudhiani	Bakartala-II VF	4.08
182	Dudhiani	Khandbandha-II VF	9.37
183	Dudhiani	Bagdafa VF	2.38
184	Dudhiani	Jharbeda VF	1.89
185	Dudhiani	Purunapani-II VF	4.24
186	Dudhiani	Khandiadar VF	6.60
187	Dudhiani	Parbatipur VF	1.23
188	Dudhiani	Nodhagadia VF	0.18
189	Dudhiani	Patua VF	5.30
190	Dudhiani	Majurasahi VF	1.49
191	Dudhiani	Akhaghari VF	3.87
192	Dudhiani	Badampahar (P) RF	3253.84
193	Dudhiani	Begunia-I RF	629.18
194	Dudhiani	Begunia-II RF	107.20
195	Dudhiani	Kudarbisida-I RF	31.20
196	Dudhiani	Kudarbisida-II RF	356.80
197	Dudhiani	Budhipat DPF	1147.77
198	Dudhiani	Ektali-II PRF	215.30
199	Dudhiani	Tikarpada VF	10.00
200	Dudhiani	Udaysahi VF	3.20
201	Dudhiani	Balaniposi VF	8.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
202	Dudhiani	Jashipur-I VF	2.50
203	Dudhiani	Balaniposi VF	5.00
204	Dudhiani	Dhangdiposi VF	9.00
205	Dudhiani	Sanpalsa VF	5.00
206	Dudhiani	Gadapalsa-II VF	10.00
207	Dudhiani	Tingiria VF	0.66
208	Dudhiani	Chain-Nebda VF	7.00
209	Dudhiani	Jashipur-II VF	5.00
210	Dudhiani	Bhanda VF	10.00
211	Dudhiani	Balijodi VF	10.00
212	Dudhiani	Jamukeshar VF	0.49
213	Dudhiani	Kajala VF	1.04
214	Dudhiani	Bakala VF	5.00
215	Dudhiani	Bisida VF	2.49
216	Dudhiani	Neuti VF	10.00
217	Dudhiani	Bandiraposi VF	4.00
218	Dudhiani	Chhamundia VF	10.00
219	Dudhiani	Kapand VF	5.00
220	Dudhiani	Tilabaddi VF	5.00
221	Dudhiani	Balisudra VF	4.00
222	Dudhiani	Rangamatia VF	10.00
223	Thakurmunda	Asankudar RF	11.86
224	Thakurmunda	Bisipur – I RF	421.20
225	Thakurmunda	Bisipur – II RF	74.00
226	Thakurmunda	Boring RF	275.20

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
227	Thakurmunda	Chheratangar RF	799.96
228	Thakurmunda	Dangapani RF	104.80
229	Thakurmunda	Gourigoda RF	66.40
230	Thakurmunda	Jadibil RF	187.60
231	Thakurmunda	Kadopani RF	145.20
232	Thakurmunda	Kaliajiani – I RF	378.79
233	Thakurmunda	Kaliajiani – II RF	147.58
234	Thakurmunda	Kendumundi – I RF	147.56
235	Thakurmunda	Kendumundi – II RF	648.00
236	Thakurmunda	Majuriposi RF	144.80
237	Thakurmunda	Padiabeda RF	51.02
238	Thakurmunda	Patbil RF	154.78
239	Thakurmunda	Purunapni RF	452.80
240	Thakurmunda	Rengalbeda – 1 RF	67.20
241	Thakurmunda	Rengalbeda – 2 RF	42.67
242	Thakurmunda	Saleibeda RF	125.60
243	Thakurmunda	Sanandharikhaman RF	120.00
244	Thakurmunda	Sanrugudibeda RF	212.80
245	Thakurmunda	Sarubil – I RF	162.00
246	Thakurmunda	Sarubil – II RF	83.36
247	Thakurmunda	Tikarpada RF	89.20
248	Thakurmunda	Majuraposi RF	13.98
249	Thakurmunda	Bhairanibeda PRF	12.46
250	Thakurmunda	Kalasira PRF	32.09
251	Thakurmunda	Keloposi PRF	23.09

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
252	Thakurmunda	Kendujiani PRF	17.56
253	Thakurmunda	Khandabandha PRF	19.83
254	Thakurmunda	Khuntakata PRF	7.96
255	Thakurmunda	Saleibeda PRF	34.40
256	Thakurmunda	Sunariposi PRF	14.37
257	Thakurmunda	Hatibandha VF	10.52
258	Thakurmunda	Akhapalan RF	57.52
259	Thakurmunda	Andharikhaman RF	48.48
260	Thakurmunda	Badabaliposi RF	27.57
261	Thakurmunda	Badbil RF	943.20
262	Thakurmunda	Banamunda RF	176.40
263	Thakurmunda	Baunsadiha RF	167.20
264	Thakurmunda	Basantpur RF	38.62
265	Thakurmunda	Bhadubeda RF	111.20
266	Thakurmunda	Bharandia RF	97.60
267	Thakurmunda	Chainbainsi RF	70.96
268	Thakurmunda	Chakulia RF	10.02
269	Thakurmunda	Chamakpur RF	182.72
270	Thakurmunda	Chirupada RF	23.49
271	Thakurmunda	Dakeipal RF	120.40
272	Thakurmunda	Dangadiha RF	97.20
273	Thakurmunda	Digdhar RF	45.10
274	Thakurmunda	Gahandia RF	14.15
275	Thakurmunda	Ghodabindha RF	168.40
276	Thakurmunda	Handiphuta RF	305.89

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
277	Thakurmunda	Handiphuta – A RF	61.32
278	Thakurmunda	Handiphuta – B RF	154.44
279	Thakurmunda	Hatigoda RF	108.80
280	Thakurmunda	Jamunalia RF	20.17
281	Thakurmunda	Jarak RF	48.00
282	Thakurmunda	Kaliaposi RF	78.25
283	Thakurmunda	Kathuanuagaon RF	68.00
284	Thakurmunda	Khejuria RF	15.28
285	Thakurmunda	Khejuri RF	641.60
286	Thakurmunda	Khudisila RF	83.60
287	Thakurmunda	Khuntaposi RF	3.66
288	Thakurmunda	Mandaljhari RF	32.98
289	Thakurmunda	Mankadbeda RF	208.40
290	Thakurmunda	Mulapal RF	90.00
291	Thakurmunda	Mituani – I RF	106.80
292	Thakurmunda	Mituani – II RF	184.40
293	Thakurmunda	Mituani – III RF	98.08
294	Thakurmunda	Nishchintpur RF	7.47
295	Thakurmunda	Panasdiha RF	8.81
296	Thakurmunda	Purunapani – II RF	54.98
297	Thakurmunda	Sunida RF	23.93
298	Thakurmunda	Talpada RF	145.60
299	Thakurmunda	Taramara RF	649.60
300	Thakurmunda	Thakurmunda RF	250.27
301	Thakurmunda	Vejidiha – I RF	160.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
302	Thakurmunda	Vejidiha – II RF	17.32
303	Thakurmunda	Rugudibeda RF	58.58
304	Thakurmunda	Ambabeda PRF	19.60
305	Thakurmunda	Andharikhaman PRF	28.45
306	Thakurmunda	Basantapur-II PRF	23.45
307	Thakurmunda	Bharandia PRF	29.26
308	Thakurmunda	Dangadiha-II PRF	44.52
309	Thakurmunda	Diliganj PRF	25.84
310	Thakurmunda	Gahandia PRF	19.02
311	Thakurmunda	Kaliaposi-II PRF	8.82
312	Thakurmunda	Kaliaposi-III PRF	15.68
313	Thakurmunda	Keshdiha PRF	42.03
314	Thakurmunda	Khadipal PRF	6.87
315	Thakurmunda	Kirkichipal PRF	34.09
316	Thakurmunda	Kucheikudar PRF	65.72
317	Thakurmunda	Mituani-III PRF	19.51
318	Thakurmunda	Mituani-IV PRF	97.41
319	Thakurmunda	Nunadiha PRF	82.72
320	Thakurmunda	Patrapada PRF	73.86
321	Thakurmunda	Purunapani PRF	26.87
322	Thakurmunda	Ghodabindha DPF	11.56
323	Thakurmunda	Majurposi DPF	111.48
324	Satkosia	Gaudiabahali RF	182.40
325	Satkosia	Khumthan RF	240.00
326	Satkosia	Noda RF	352.00

Sl. No.	Name of the Range	Name of the RF	Area in Ha. allotted to W.L. (O) WC
327	Satkosia	Satkosia RF	10276.00
328	Satkosia	Satkosia – I b RF	363.20
329	Satkosia	Satkosia – II RF	208.27
330	Satkosia	Satkosia – III RF	353.83
331	Satkosia	Bhaliadal-I PRF	10.63
332	Satkosia	Bhaliadal-III PRF	110.79
333	Satkosia	Bhaliadal-IV PRF	17.67
334	Satkosia	Mahuldiha-I PRF	23.67
335	Satkosia	Mahuldiha-II PRF	26.57
		Total:-	**43261.83**

19.6 General characteristics of Vegetation & Fauna:

19.6.1 Characteristics of Flora:

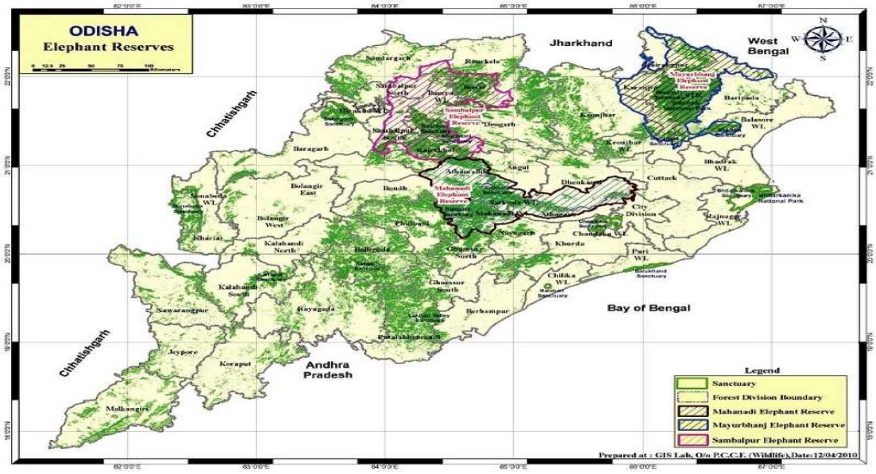
The vegetation of Karanjia Division has been broadly classified as Moist Deciduous Sal Forest. The associates of Sal are Piasal, Asan, Kuruma, Arjun, Kendu etc. The crop density is mostly around 40%. It is denser towards Similipal and becoming dryer and open towards Raruan / Ghagarbeda.

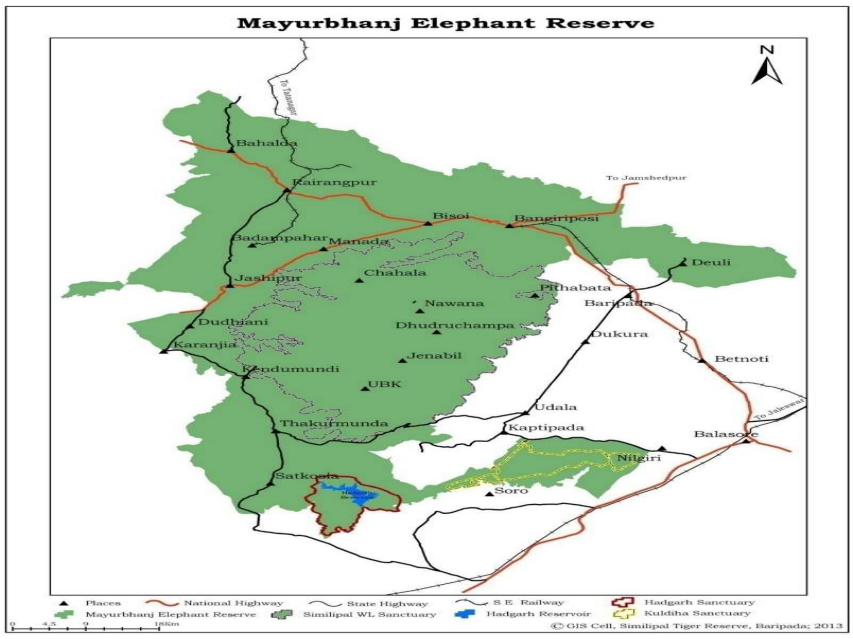
19.6.2 Characteristics of Fauna:

19.6.3 Mayurbhanj Elephant Reserve:

The Similipal-Kuldiha-Hadgarh Elephant Reserve popularly known as Mayurbhanj Elephant Reserve in the State of Orissa was notified vide Notification No. 15806 dt.29.09.2001 and revised vide No. 8639 dt.28.11.2001 of Forest and Environment Department, Government of Orissa comprising an area of 7043.04 km².

The area include protected areas i.e. Similipal Tiger Reserve (2750.00 km²), Hadgarh Wildlife Sanctuary (191.06 km²) and Kuldiha Wildlife Sanctuary (272.75 km²). Other Reserve Forests, Protected Forests, Private land and Revenue land including agricultural land lying adjacent to the protected areas measuring 3829.93 Sq. km are included in the Reserve to form a compact area of the landscape. The entire Karanjia Division except Ghagarbeda section and Badadeuli beat of Karanjia section and Ghosda & Haldia beat of Singda Section comes within Mayurbhanj Elephant Reserve.





19.6.4 Similipal Tiger Reserve:

The Similipal Tiger Reserve is a compact block of elevated plateau located in central portion of the Mayurbhanj district and lies between 20° 17' and 22° 34' North and 85^0 40' and 87° 10' East longitude. The stretch of forest including Similipal RF spread over an area of 2750 km^2 has been declared as 'Tiger Reserve' with effect from 04-12-1973 under 'Project Tiger' Scheme of Government of India. It has been conferred with legal status as per

provisions of Section 38V of Wildlife (Conservation) Act, 1972 vide notification no. 8F(T)-9/2007/20801/ F&E dt. 31st December, 2007 of Govt. of Orissa in Forest & Environment Department. The notification has clearly indicated with boundary description of Critical Tiger Habitat (Core) extending over 1194.75 km^2 and buffer area of 1555.25 km^2. There are 3 in-habitated villages inside the Critical Tiger Habitat and 65 villages in the buffer area.

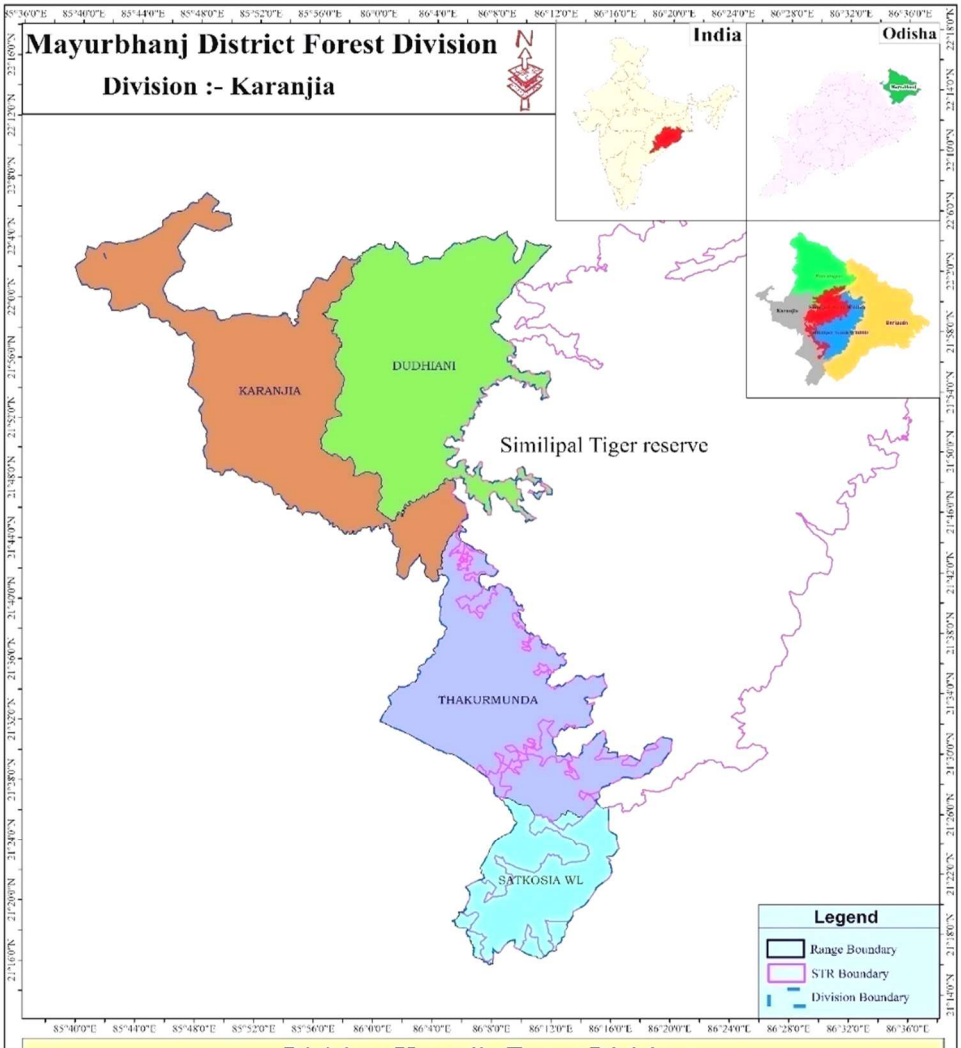
The area statement of Simlipal Tiger Reserve in Karanjia Forest division is enlisted below.

All the area comes under buffer zone of Simlipal Tiger Reserve.

Total area under Tiger reserve is 198.12 km^2.

List of forest blocks included in Simlipal Tiger Reserve

Name of the forest block	Name of the Range	Area(km^2)
Bhejdiha-I RF	Thakurmunda	1.60
Bhejdiha-II RF		0.18
Manikbeda RF		2.08
Dangdiha RF		0.97
Badbil RF		9.43
Bhadubeda RF		1.11
Handiphuta RF		3.06
Taramara RF		6.50
Ghorbindha RF		1.68
Dangapani RF		1.05
Salaibeda RF		1.26
Cheratangar RF		8.00
Kendumundi-I RF		1.48
Kendumundi-II RF		6.48
Bisipur-I RF		4.21
Bisipur-II RF		0.74
Noda RF	Satkosia	3.52
Satkosia-I RF		137.33
Satkosia-II RF		2.08
Satkosia-III RF		3.54
Gouriabahali RF		1.82



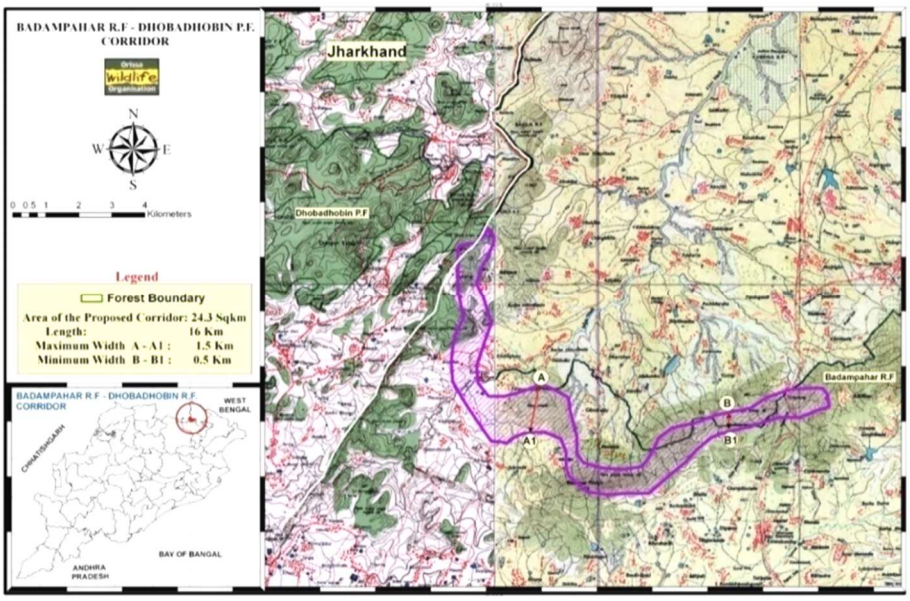
Division:-Karanjia Forest Division

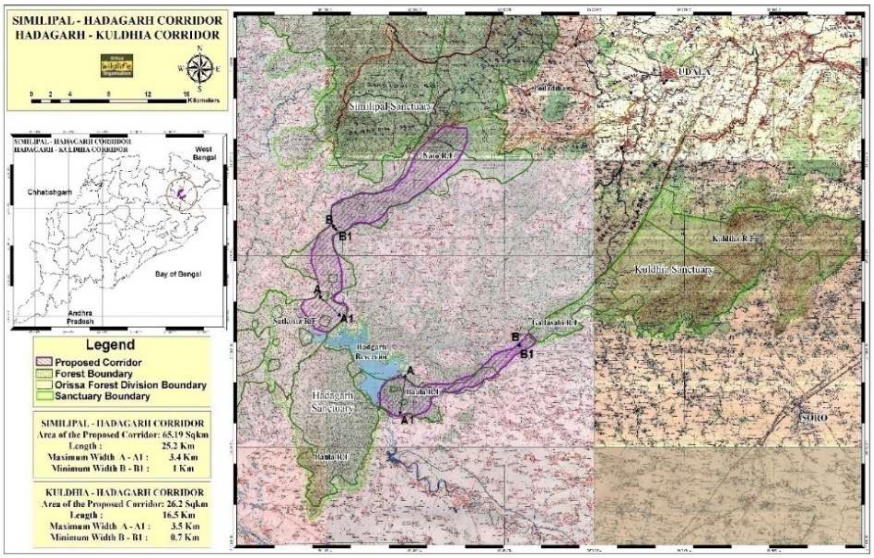
	Range	Section	Beat
Abstract	Satkosia WL	4	11
	Karanjia	5	14
	Dudhiani	7	16
	Thakurmunda	6	14
Total	4	22	55

19.6.5 Elephant Corridors:

Sl. No.	Name of the Corridor	Extends over Districts	Name of the Divisions	Length of corridor (km)	Width of corridor (km)	Total area (km^2)
1	Badampahar (Mayurbhanj)-Dhobadhobin (Jharkhand) INTERSTATE	Mayurbhanj	Karanjia, Rairangapur	16	0.5 - 1.5	24.3
2	Similipal-Hadagarh-Kuldiha	Balasore, Mayurbhanj, Keonjhar	Keonjhar WL, Karanjia, Baripada, Balasore WL	41.7	0.7-3.5	91.39

In the state there are 14 identified elephant corridors. Out of 14 corridors, two corridors are Out of these two corridors, one corridor that is Badampahar- Dhobadhobin is interstate linking Odisha and Jharkhand State. The other one Simlipal-Hadgarh-Kuldiha is inter district covering three districts namely Balasore, Keonjhar and Mayurbhanj. The total area coming under corridors is 115.69 Sq. Km. The major mammals include Tiger, Leopard, Asian Elephant, Sambar, Barking Deer, Jungle Cat, Wild Boar, Giant Squirrel and Common Langur. Red Jungle Fowl, Hill Myna, Peafowl, Alexandrin Parakeet Crested Serpent Eagle are the commonly found birds. The grey hornbill, Indian pied hornbill, Malabar pied hornbill and Malabar trogon are also found in the tract.


BADAMPAHAR R.F - DHOBADHOBIN P.F. CORRIDOR
Jharkhand
Dhobadhobin P.F
Badampahar R.F
A
A1
B
B1
Legend
Forest Boundary
Area of the Proposed Corridor: 24.3 Sqkm
Length: 16 Km
Maximum Width A - A1 : 1.5 Km
Minimum Width B - B1 : 0.5 Km
BADAMPAHAR R.F - DHOBADHOBIN R.F. CORRIDOR
WEST BENGAL
CHHATISHGARH
BAY OF BANGAL
ANDHRA PRADESH


SIMILIPAL - HADAGARH CORRIDOR
HADAGARH - KULDIHA CORRIDOR
Similipal Sanctuary
Kuldiha Sanctuary
Hadagarh Sanctuary
Legend
Proposed Corridor
Forest Boundary
Orissa Forest Division Boundary
Sanctuary Boundary
SIMILIPAL - HADAGARH CORRIDOR
Area of the Proposed Corridor: 65.19 Sqkm
Length : 25.2 Km
Maximum Width A - A1 : 3.4 Km
Minimum Width B - B1 : 1 Km
KULDIHA - HADAGARH CORRIDOR
Area of the Proposed Corridor: 26.2 Sqkm
Length : 16.5 Km
Maximum Width A - A1 : 3.5 Km
Minimum Width B - B1 : 0.7 Km
West Bengal
Chhatishgarh
Bay of Bengal
Andhra Pradesh

19.7 Special objectives of management

- To ensure the protection and improvement of the wildlife habitat and natural eco-system.
- To imperatively protect and promote the wildlife emphasising on endangered ones.
- To lessen elephant depredation and human-wild animal conflict to the maximum possible extent.
- To enrich habitat by planting fruit bearing trees, fodder and grasses and through creation of waterholes and artificial salt licks and protection against fire.
- To take up regular census to keep track of the trend of the population dynamics
- To minimize man and wild animal conflict. Compassionate amount towards damage of crops / human beings by wildlife should be paid immediately without any delay.
- To involve the local community in management of the wildlife and eco-tourism in the natural habitats.
- To become intolerant to wildlife poaching.

19.7.1 Analysis of the crop

Not required to this Overlapping Working Circle.

19.7.2 Silvicultural system

Not required to this Overlapping Working Circle.

19.7.3 Rotation Period

Not required to this Overlapping Working Circle.

19.7.4 Harvestable diameters

Not required to this Overlapping Working Circle.

19.7.5 Reducing factors and reduced area

Not required to this Overlapping Working Circle.

19.7.6 Felling cycle

Not required to this Overlapping Working Circle.

19.7.7 Division into periods and allotment to Period blocks

Not required to this Overlapping Working Circle.

19.7.8 Calculation of the yield

Not required to this Overlapping Working Circle.

19.7.9 Table of felling

Not required to this Overlapping Working Circle.

19.7.10 Method of executing felling

Not required to this Overlapping Working Circle.

19.7.11 Subsidiary Silvicultural Operations cleaning and thinning

Not required to this Overlapping Working Circle.

19.7.12 Regeneration

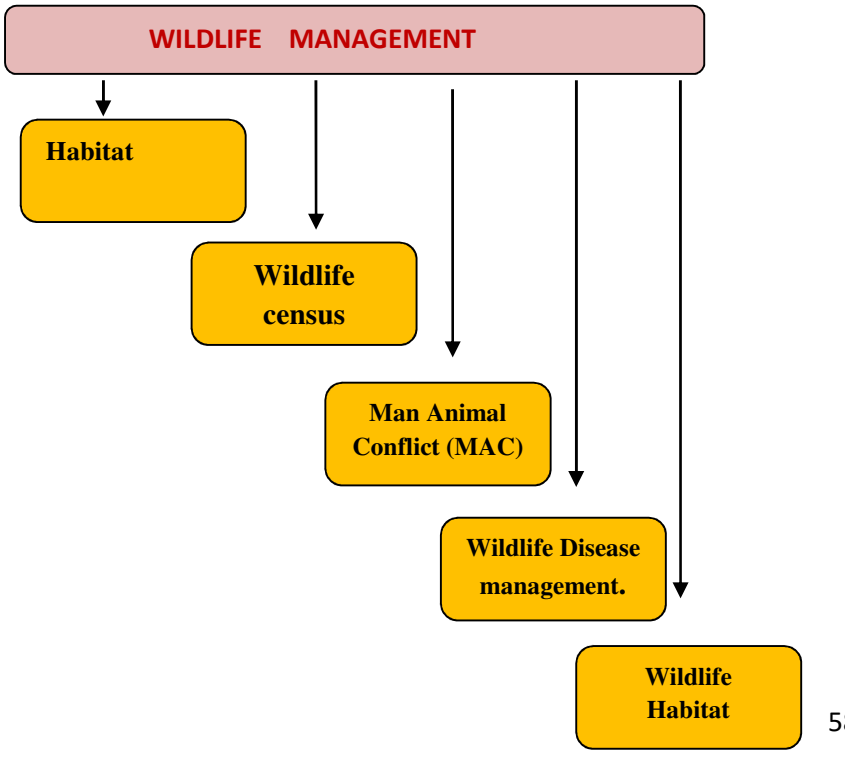
Not required to this Overlapping Working Circle.

19.7.13 Associated regulations and measures

Not required to this Overlapping Working Circle.

19.8 Activities of the Working Circle

This working circle revolves around the following activities.



19.8.1 Habitat Development

Wildlife habitat includes forest cover, pastures and water sources, some special habitats consists of burrows and crevices at the foothills, Cracks in rocky patches on steep slopes provide nice habitat for here for fauna like snakes, lizards. Special habitats like snags, snag recruits, down wood, isolated large old trees, trees with fluting boles, buttresses, lianas, some species of fruit bearing trees and shrubs provide habitat functions in the forests. Some geo-morphological structures like caves, overhangs, dens, cliffs, ledges etc. are unique habitats for some other wild life.

19.8.1.1 Objectives of habitat development

a. To maintain quality habitat existed in a natural ecosystem.
b. To develop habitat where it is deteriorated or where limiting factor/ factors have developed.

19.8.1.2 Principle of habitat management

a. It should be framed after thorough studies and justification in accordance with the needs of the wildlife.

b. The practice must be evaluated for their effect on other natural resources land uses etc. So, the proposed practices should not be against the benefits of the other species and natural resources along with the target species.

c. The improvement practices must simulate natural conditions/ ecosystem perpetuating native flora and fauna.

d. Manipulation should be engineered following topographical characteristics of the area.

Habitat development is a vital part of the wildlife management which include the Meadows development, creation and maintenance of Waterholes, Salt licks. Habitat is a simple part or a relatively complex entity regarded as a part of an area or type of environment in which an organism or biological population normally lives or occurs. For the sake of wildlife, it is not necessarily the plant communities and their succession stages, but includes the special and unique habitats which are other than the former. Though entire area of this division is

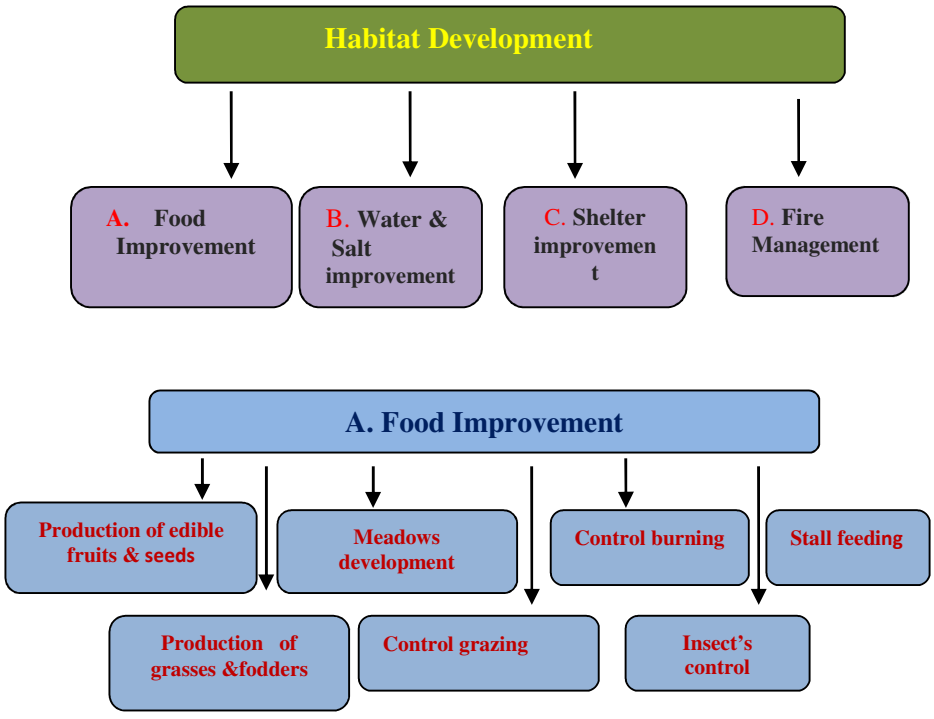
having some sorts of wildlife activities but there are some pockets which are rich in wildlife particularly the animals and birds. The pockets of such important localities are furnished in Table No. 19.2

Table No.19.2
Important localities of Wildlife in Karanjia Division

Name of the Range	Name of the Forest Block	Name of the Locality	Important fauna found
Karanjia	Baddeuli RF, Kendua RF, Bhanjabeda RF, Panpatria RF, Digposi RF	Kendua, Batisahi, Parabeda	Wolf, Hyena, Fox, Hare, Wild Pig, Spotted Deer, Barking Deer, Bear, Pangolin, Honey badger, Indian elephant etc.
Dudhiani	Jharbeda RF, Kadambeda RF, Kuita RF, Kunjia RF,Mota RF,Pantho RF, Dumuria RF, Gudidiha RF, Badampahar RF, Begunia RF,Kudarbisida RF	Tato, Biunria, Chhanchbani, Kudarbisida, Jamukeswar, Chhadban, Mahaldapalsa, Batisahi, Balanposi,	Wolf, Hyena, Fox, Hare, Wild Pig, Spotted Deer, Indian elephant, Leopard.
Satkosia	Satkosia RF Comptt. No.9 and Noda RF	Kardapal, Dhudibahali, Salachua, Balidiha, Noda	Sambar, Civet, Pangolin, Sloth bear, Wolf, Hyena, Fox, Hare, Wild Pig, SpottedDeer.

Thakurmunda	Bisipur-I RF, Kendumundi-II RF	Baghalata, Bisipur, Kadalibadi	Sambar, Pangolin,Sloth bear, Royal Bengal Tiger, Civet, Wolf, Hyena, Fox, Hare, Wild Pig, Spotted Deer.

Though improvement of the habitat shall be made in general through sound silvicultural practice, but the effort shall be focussed on the wildlife rich areas to provide adequate food, water and shelter to the wildlife. The measures prescribed are furnished as follows: -



A. Food improvement-

Production of edible fruits & seeds: -Herbivores live on foraging leaves, barks, twigs, flowers, fruits and seeds of species like *Mallotus philippinensis*, *Dendrocalamus strictus, Adina cordifolia, Albizzia lebbek, Aegle marmelos, Cassia fistula, Ficus bengalensis,Ficus religiosa, Ficus racemosa, Ougeinia ougenensis, Shorea robusta, Syzygium cumini, Terminalia alata, Terminalia belerica, Zizyphus mauritiana, Bombax ceiba* etc. Deer, Monkey, Langur, Rat and Hare are fond of the fruits of *Terminalia belercia, Buchanania lanzan, Aegle marmelos, Syzygium cumini, Emblica officinalis, Zizyphus mauritiana, Diospyros melanoxylon, Grewia hirtsuta, Ficus spp.*etc. Hence, the cutting offruit bearing trees is prohibited under Selection Working Circle.

Production of grasses & fodders: - Grasses constitute a major food item for the herbivores. It is highly preferred and palatable. The grassland in the plateau locally called "Malis" shall be developed along with other suitable localities. Malis can serve the purpose of meadow. The grasses like *Azonopus compresses*, *Eragrostis pilosa*, *Saccharum bengalensis, Stylanthus hemata* etc. shall be raised to meet the food requirement of herbivores.

Meadows development: -

Meadows shall be created wherever feasible in the available blank patches. But care should be taken not to create such meadows at the cost of natural vegetation if occurring or can be occurred through suitable silvicultural method. The extent of meadow should be limited and preferably inside dense vegetation by the side of natural stream. The existence of meadow and dense vegetation side by side can provide the edge effect, which is an important ingredient for development of wildlife.

Control grazing: -

This practice must be preferred area wise and period wise. Such periodical grazing will be helpful in proper growth of the vegetation and germination of the seeds and production of the sufficient food quality.

Control burning: -Herbivorous mostly preferred new delicate succulent parts of the vegetation, it is more nutritive as well as liked by the animals. Old and hard parts including bushes become unpalatable and hence lessen the carrying capacity of the habitat. In such conditions, control burning is essential to





regain new delicate plants. In such practice care should be taken to avoid burning of the wild animals and other valuable plants species. Burning should be preferably be done in winter when the temperature remains low and fire doesn't spread to the undesired areas. In certain areas even burning does not help in germination of delicate grass. Hence a full proof strategy is needed to be workout before execution.

Insect control: **-**

To maintain food chain of the ecosystem and its natural balance in the habitat, it is essential to keep the population of each species up to the optimum level. In this view the insect population is an important link in the food chain providing feeding to the insectivorous birds and animals. The race of insects is to be maintained, otherwise the existence of the

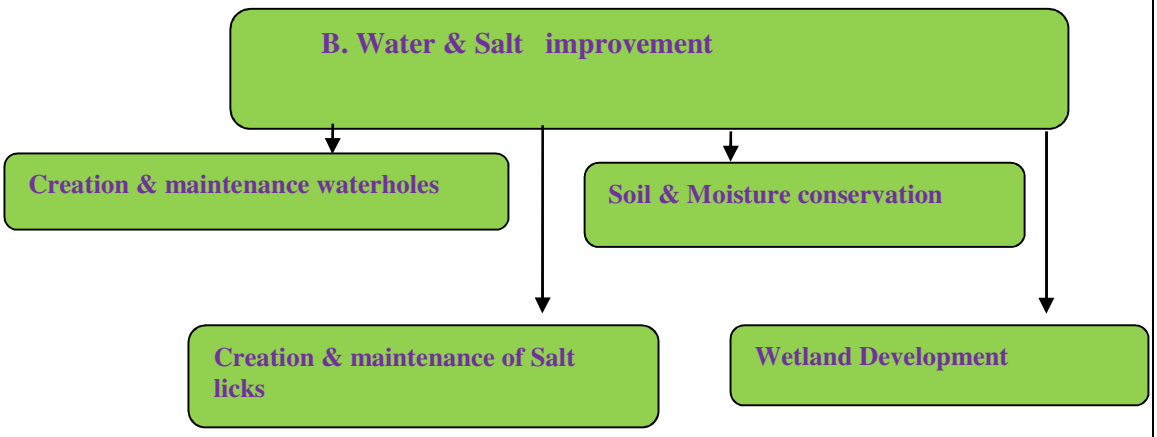
animals depending upon them comeinperil. For the purpose, all dead and dying trees should be removed. They should be retained as such in certain ratio so that the insects living on such trees may survive keeping ecological balance. If situation is adverse, the predators of insects will perish and the population of the insects will grow enormously and lead to epidemic, as the consequences insecticides are to be used to control them which is disastrous to the wild animals as well as causing environmental pollution and hencenot feasible everywhere and every time in the forest area. That is why "Integrated Pest Management IPM" technology is preferred. Overall as the preventive measure, at least 5 snag trees per ha should be left in all wildlife habitat at the time of silvicultural operation in the forest.

Snags:

As a thumb rule it is required to maintain at least the 5 tallest and largest diameter snags per hectare, in a well distributed design in all silvicultural treatments.

Retained snags need to appear in the compartment history. These are vital for a variety of primary hole-nesting birds like Woodpeckers and Barbets, which are colonized by secondary hole-nesters like Hill Mynas, Indian Rollers and Owlets etc during subsequent years.

B. Water & Salt improvement



Creation & maintenance of Waterholes:

It is an important ingredient of food material for the wild animals. The availability of water shall be ensured throughout the year particularly in the peak summer. The wild life very often strays outside the forests in search of water during hot season and become the prey of unnatural death. The existing nallas and streams shall be made perennial through construction of check dams on its course starting from uphill side. Such prescription has been provided under soil and moisture conservation measure in Rehabilitation and WorkingCircles. The existing water bodies and water holes shall be maintained through proper renovation as and when required in addition to creation of new such structures at appropriate locations. The Range Officer shall assess the necessity of such structure's location wise, which shall

be scrutinised and approved by the Assistant Conservator of Forests and Divisional Forest Officer respectively.

The creation of such new structures like water holes, water bodies, salt lick and meadows are to be done very meticulously so as to ensure the desired manipulation of the habitat to cater the need of the wild animals.

Creation & maintenance of Salt licks: -

Salt licks are very important for the survival and well beings of the wild animals. It is a place where salty or sulphurous earth, mud or water is found on the surface and wild animal habitually resort to eat, lick or drink the stuff. Natural saltlicks are available in the forests in the form of almost flat hilly rocks, made up of licking soil mixed with Sodium chloride (NaCl). But in some places, it is found in scanty and so artificial saltlicks are supplied to the wild animals to make up deficiency. Artificial salt licks are made by mixing the common salt (NaCl) with the licking soil in the form of balls or rectangular shapes and sun dried. It is supplied to the wild animals in the forest preferably near the waterholes.

Soil & Moisture conservation: -

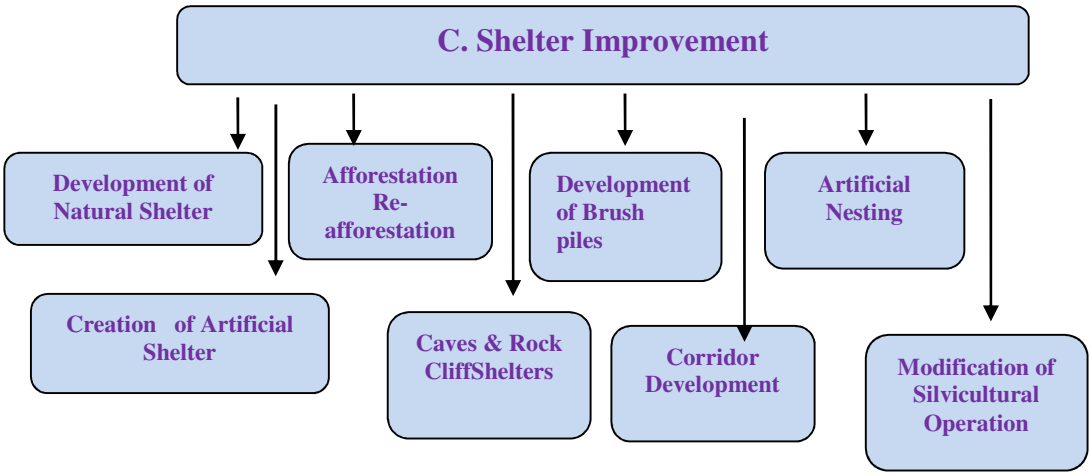
It is essential to maintain eco-balance of the wildlife habitat. Soil is the prime natural base for the development of vegetation. Soil is one of the factors determining the kinds and growth of the plant of a place as started earlier, for which water is also essential. Hence, their conservation and propagation of forests plants and all types of

vegetation and ultimately to the wild animals. By planting suitable tree, fodder, grass and other species in the habitat, soil and moisture should be conserved. This will play dual purposes like conservation of soil and water as well as solving water and food problems of the wildlife.

Wetland Development: -

Wetlands need to be improved for waterfowls. Wetlands and shallow water are required as their habitats. Deep water is required for the aquatic birds, marshy land and vegetation inside the reservoir are needed for their roosting and perching. Therefore, creation and development of wetland is very much essential. This is the reason that in vast water reservoir the number of birds in deep water area is very few; while on the bank and shallow water area they are found in plenty. Such areas should be free from effluents or by-products of the factory and siltation. The water level in the reservoir should not be even throughout the year so that the aquatic plant may grow on the moist banks or in shallow water very well. For the purpose check dams should be built in the deep reservoir and minimally there should be 15-45 cm water level area in the half of the total basin area.

C. Shelter Improvement



Development of Natural Shelter: **-**Adequate forest cover for different wild animal within their habitat is necessary for shelter and protection from weather, predators and enemies. Suitable prescriptions have already been made for enhancement and enrichment of forest in Selection, Plantation as well as Rehabilitation Working Circle. Retention of mature trees near water hole, along nalla bank, salt lick and also the trees whose removal may create permanent gap in the canopy are intended to provide adequate shelter and protection to the wildlife. These trees shall be maintained and improved for providing good canopy as well as other benefits. In the areas under Rehabilitation Working Circle, it has been prescribed to go for mixed plantation to create ground flora and middle storey to provide cover for different types of wild animals.

Creation of Artificial Shelter

This has a special function not provided by plant communities and successional stages. It includes riparian zones, snags, dead and down woody materials. Being biological in nature it can be created or altered by management. This is a sound technique for habitat manipulation. It is not proper to provide a general prescription for maintenance / creation of such habitat since the effective result can only be obtained from site-specific treatment. This aspect of management is left to the discretion of the Divisional Forest Officer for retaining number of snags, snag recruits, Den tree, large old trees, trees with fluting boles and buttresses and boles at the base, lianas and tangled climber, roosting / nesting trees in the pockets after assessing the necessity as well as considering silvicultural aspect for general hygiene of the forests.

Afforestation & Reforestation: -

Regular fruit and shade bearing species should be afforested and taken care up in the area allotted to this Working Circle to enrich the vegetation for upbringing of the wild animals and birds.

Caves & Rock Cliff Shelters: -

This is another wildlife habitats of special function not included within plant communities and successional stages or special

habitat. It is geomorphic in nature and includes cliffs, caves, dens, overhangs, shelves or ledges, talus, crevices etc. These rocky structures available in the forests, serves as ideal shelter for numerous wildlife and their various activities like hibernation, mating, laying of eggs etc. These are to be maintained and if necessary, such structures can be created after assessing its requirement in the locality. Like special habitat, the creation of these habitats is also left to the discretion of Divisional Forest Officer.

Development of Brush piles: -

Some small animals and birds require their shelter in bushes. They use them as their roosting and nesting covers. Therefore, such covers should be accessed in the habitats and if needed, must be developed artificially. For the purpose, the branches of fallen trees, cutting of bushes left during boundary clearance of the forest blocks, fire line etc and such other left out parts of the felling materials of the regular coupes in Selection Working Circle practices, should be used to form artificial brush to serve as shelter by the desired wild animals. Such unwanted materials should be collected and dumped at certain places at least 2 mts height having 6 mts dia. in the bottom, thick branches should be placed to serve as platform at least of 15 cm height. In the middle of the brush, a pole should be placed and covered around by leaves and twigs as

loose heap. Such brush-pilling serves as an ideal cover for certain animals as well as also helps to come out grasses and bushes inside it after sometimes. Such cover is used by certain birds especially for gallinaceous birds. The development of such bash piles is very much helpful in providing ideal shelter for certain wild animals enabling them to enhance their growth.

Corridor Development: -

Movement of wild animals take place for food, water and shelter. During such movement they need shelter cover. This corridor should be protected. Covers near water holes are mostly required to provide resting place for the migrating animals. Corridor means a long and narrow strip of land connecting two different habitats. These corridors are the connecting links between different habitats. So, it is imperative that the corridor shall be maintained and improved to render adequate safety to the wild animals for their movement / other activities. This is very much essential for the large animals particularly the elephant. The elephants usually adopt the same corridor for several years until and unless, there is some pressing need to change it. This Division only receives elephants from neighbouring Divisions mostly in the crop season. During the migration elephants from Similipal are joined by the jumbos from nearby Jharkhandstate to get their

number to more than 40. The water is available throughout the year in these localities surrounded by dense vegetation, for which the elephants have preferred to stay there. There are twoidentified corridors of the elephant in this division i.e. Dhobadhobin– Badampahar and Simlipal-Hadgarh-Kuldiha.

These forest blocks shall be protected and improved through suitable silvicultural methods prescribed under respective working circles to ensure both enhancement and enrichment of the vegetation for providing the food and shelter. It is seen that the corridors are originating from Satkosia Sanctuary, which is a suitable habitat for the elephants. Since these corridors are mostly within the forest area, these can be properly maintained and developed with least disturbance to human habitation. Tall sapling of family Moraceae, Fabaceae, Bamboos and other preferred forage species are prescribed along the sides of the said corridors.

Artificial nesting: -

Whenever required the artificial nesting in the form of baskets of variable shapes made up of wood should be hanged. Such nets are generally required for the game birds in the area which is devoid of vegetation.

Modification of Silvicultural Operation: -

To provide adequate food and shelter in the forest to the wild animals and birds following modification are needed while carrying out different silvicultural operations. Some of which are as follows:-

(i) Felling of shade and fruit bearing trees are prohibited in the entire plan area.

(ii) While raising plantations, mixed plantation shall be preferable over the monoculture.

(iii) All forestry operations shall be avoided during the dark to maintain the privacy of the wild animals.

D. Fire management

Forest fire is the most dangerous foe of the wild life. It makes irreparable damages to the wildlife in the forest. Hence,it is utmost important to take preventive measures like fire line creations and maintenance, provisions of adequate surveillance and combative measures like extinguishing the forest fire by the modern equipment's like blowers etc. The local people, the VSS members should be involved in managing the forest fire for sustainability of the operations.

19.9 Wildlife census

Although it is called wildlife census, in practice total count of wild animals in their natural habitat is not possible. Hence,

wildlife managers generally go for wild animal estimates with the help of some indices and through a calculation arrive at a figure as close as possible to the actual number of animals in a given area.

Objectives: -

a. To study the status of wild population.
b. Management and monitoring the various changes in animal numbers.
c. Study of population dynamics.

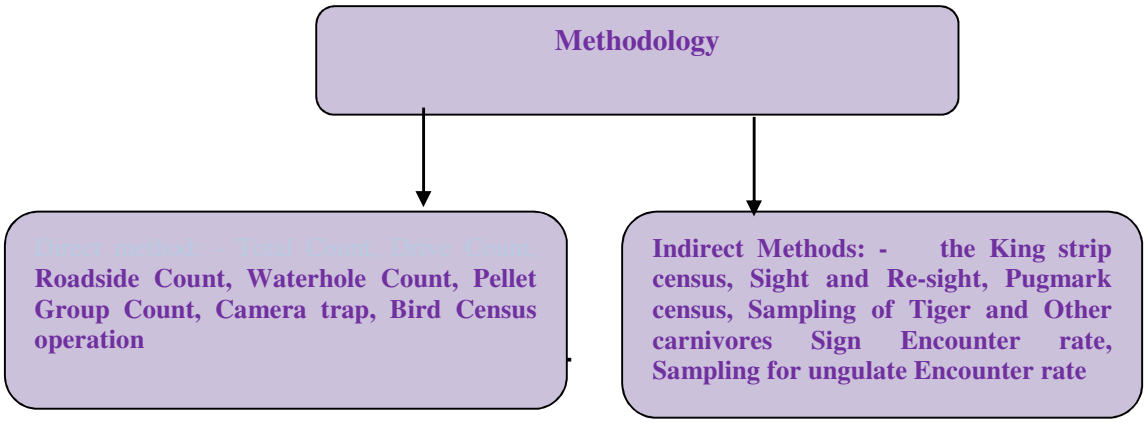
Selection of estimation method: -

An estimation method varies with a given situation. So, before deciding upon a particular method following factors are looked into: -

a. The management objectives
b. Nature of the habitat.
c. Special attributes of the animal.
d. Size of the area.
e. Availability of time, money and field personnel.

Methodology: -

All the practical method employed for census can be categorised into Direct and Indirect methods.



It involves counting of every animal available in the habitat. However, chances of double counting as well as missing some animals, during the process always exist and it's difficult to access the magnitude of the error. Therefore, to reduce the errors it is preferable to combine total count with some suitable sampling procedure.

Direct visual counts are preferable for larger mammals like Spotted Deer, Sambar, Gaur, Barking Deer, Mouse Deer, Wild Dog, Wild Pig, Jackal, Wolf, Hyena, Macaques, Langurs and Sloth Bear.

Usually the area to be counted is conveniently divided into counting sectors of 10 to 15 sq. Km, the sectors are serially numbered and indicated in the map. The size of the sectors is kept such that it can be covered by 4 to 5 enumerators spaced at a distance of 100 metres within three to four hours.

$$\text{Total distance covered in Km} = \frac{\text{Total number of steps covered}}{1000} \times \frac{\text{distance covered in 100 steps in mtrs}}{100}$$

Counting of animals is done on two successive days for four hours soon after the sun rise, during which the enumerator should count the animals seen by them.

Simultaneously counting is done by all the enumerators by starting from a base line and maintaining a distance of 100 mts between themselves taking into the notes of only those animals seen at their left. During the count, details regarding approximate age, sex, and other related evidences should be recorded; the figures are subsequently pooled and expressed for the area counted.

Drive Count: -

This is suitable for animals that are not found in the open area. Drive counts are easy if the terrain is not formidable. The field execution involves

- A set of persons for driving the animals.
- A set of enumerators counting the flushed animals.
- The enumerators are placed equidistantly on machans on one side of the area to prevent double counting.
- The distance between the machans (enumerators) is fixed in such a way that they can see each other. The counting is done on one either left or right side only

Roadside count: -

This is very common method for knowing the abundance of animals along a roadside. Here, the observer, travelling at a fixed speed, records the number of animals seen per kilometre of the road at a particular time of the day. Such counts of relative abundance are very cheap and involve less time, therefore, it is possible to undertake extensive surveys covering large areas.

Waterhole Technique: **-**

A census technique where large animals are counted from a hideout as they visit the waterholes. It is used where all dry season water sources are known, and animals are not too numerous and are distinct and not meandering streams of rivers. The method does have value as an index count, but the large number of untested assumptions means that there is no validity for its use to estimate actual population size.

Assumption: -That there is a linear relationship for each animal species between the number of the animal seen drinking per time period and the number of animals in the area. That field staff are able to record an unbiased estimate of animal numbers during drinking at a waterhole, i.e. staff remains awake, are literate and their presence in the hide does not deter animals from drinking.

Methods: -

The census should be carried out at the extreme hot season, with limited active waterholes. Strategically the arrangement of hides or machan should be prepared beforehand. Census period during full moon should be chosen. Staff should be well conversed with the objectives of the operation. Census should start in the evening of the day one, with staff having rested during the day. Data collection should start an hour after the arrival in the machan to eliminate the disturbance period. The census should continue for full 24 hours after the data collection begins. The crew members should be supplied with binoculars and digital cameras to accurately determine the sex and age classes. After completion of the census operation the data are collected and analysed in the office.

Pellet Group Count: -This methodology is applied for the Deers**.** Every deer defecates a number of times in every 24 hours as pellets deposited in groups. Each group belongs to one animal. The rate of defecation, on an average is constant for a given species. If the condition of terrain and climate permit, then one can estimate the population densities of some large ungulates by finding out their pellet densities and the rates at which they have been deposited. It is suited for animals that use the entire habitat, and are well distributed, throughout the area such as Spotted Deer, Sambar etc.

the term "pellet group" is used for the small pellets deposited during a single defecation at one place.

This is irrespective of quantum of defecation. This method consists of keeping the sample area clean of all the faecal matter and subsequently counting the same after a fixed period of time, which is statistically determined. Using this data, the total population of the species is calculated.

Camera trap Method: -

This methodology is meant for the census of big cats it involves the use of infrared cameras. These trap (Camera) are placed tied to trees at a height of two to three feet. When a tiger moves in front of the camera it intercepts the infrared rays that constantly get emitted from the camera. The moment it intercepts, the camera flashes light and takes a photograph automatically. Periodically, the cameras are removed to collect the photographs and finally these are analysed for identifying the number of tigers.

Bird census operation: -

Water fowl census is done in the forenoon hours of the mid-winter.

Methods: - Familiarity with the wetlands topography is important so that one can decide on the point of observation from where the entire wetland can be focused. When the size of the wetland is big, more such point of observation can be taken. Counting of fowl has to be done by scanning them in a particular direction (left to right

and vice versa). In one scan of the wetland or sector of the wetland as the case may be only one species must be counted. Repeated scans are required to exhaust all the species. The number so observed must be written down on the data sheets against the respective species. In case of water fowl which often occur in mixed flocks the identification may be restricted to male birds as it is difficult to tell apart females of different species. The numbers recorded must specify only males. For population estimation of the water fowl these may be doubled.

19.10 Human-Wildlife Conflict (HWC)

It's about Human-Wildlife Conflict. HWC describes any situation where wild animals cause problems for people. Wild animals may damage people's crops, they may destroy people's houses and property, and they may even endanger people's lives. There are different forms of conflict, but they are all similar in that they have a negative effect upon the people involved. Wild animals that cause conflict with people are often called 'problem animals'.

HWC happens across the world, from elephant, Wild pigs raiding the crops in the forest fringe villages to the Sloth killing and injuring the human of human and monkey conflict. Wherever people and wildlife come into contact there is potential for conflict. However, the people who are most likely to be affected are those living in forest fringe villages surrounded by woodland where

many animals live. In Karanjia Division, rural farmers suffer from conflict with wildlife because they share the landscape with wild animals.

Many of the big animals like Elephant need large areas of land to survive. Depleting forests do not always cover all the land which these large animals need and so they move outside. But people have settled on the land that wild animals once used and this is one reason why animals like elephants come into conflict with humans. In other cases, people have settled around sources of permanent water and in the dry season the animals are forced to enter the villages in order to drink.

Mostly migratory elephants, Sloth Bears and wild pigs cause problems for people in Karanjia. Elephants and wild pigs generally raid crops. Large and dangerous animals such as Sloth Bears and elephants may injure or kill people. They move around at night so that people living nearby are often too scared to travel after dark. Elephants and wild pigs may use the same water holes as people. When the animals are there, people may be too scared to use them. Leopards and Hyenasmay eat domestic cattle and goats, and may also attack people occasionally.

HWC makes it more difficult for a farmer to withstand. When animals damage crops or eat livestock, it become harder for a farmer to feed his or her family. The same applies when livestock

are killed by wild animals. But the most serious form of conflict is when human is killed by a wild animal.

The onus of the control of this problem animals lie always with the forest department. The most common way of dealing with problem animals is either to scare them away using crackers or to build fences to protect crops and livestock. In serious cases the problem animal may be tranquilized and trans located. However, these methods are not always very effective. Animals stop being scared of gun shots and may find ways to break through fences. Where some animals have been shot and killed, others often take their place.

Big cats such as leopards may occasionally kill goats and other livestock, and thus can be a problem to farmers. However, they also perform a vital role in controlling wildlife pests. Leopards and tiger kill deer and antelope for food and in doing so control the size of their population. If the carnivores were to disappear, the Deer and Antelopes herds would get bigger and bigger, and would cause more damage to people's crops as well as the natural regeneration. Therefore, it is important to conserve the top carnivores and recognize the pest control service they provide.

The best way to reduce conflict with wildlife is to use a combination of different methods. Conflict reduction methods are known as deterrents, because they aim to deter (stop) the animal

from causing the problem. For example, if elephants are damaging the crops then fences can be built and form co-operative guarding groups. One can try new methods such as chilli dung bricks and bangers. By using a variety of new and traditional methods one stands the best chance of protecting the crops and livestock against wildlife.

19.11 Wildlife Crime & Poaching:-

The wild animals commonly killed in the Division are - Barking Deer, Spotted Deer and Wild Pig. Shooting is common method for killing of mammals and birds. The Barking Deers are usually killed through trapping followed by use of a sharp instrument called "*Tenta*". The Wild Pig is killed through bursting of flesh bomb locally called "Gola" instantly soon after its intake. Different types of snaring with the help of rope, stick and glue are in use to kill animals.

An Elephant mobile App has been in vogue in Odisha which works 24×7 basic where the frontline staff uploads data of the herd in their area and their area thus the managers of the forest can monitor every movement of the herds and take swift action at the time of need.

19.12 Control of Man Wild Animal Conflicts:

It is observed that crop damage is of high magnitude during crop season in view of the movement of the migratory elephants from the neighbouring Divisions. House damage and human casualties have also been reported due to elephants. This is a matter of great concern. The villages are the focus of attention particularly during the harvest period. Precautionary measures like raising of elephant repellent crop in the forest fringe lands and preventing the movement of elephants to the crop field through raising of some barrier like elephant proof trench shall be emphasised. Awareness campaign shall be intensified in those villages along with imparting necessary training to drive the elephant safely into the forests. The leaflets containing suitable advice in local dialect shall be distributed in the localities. The VSS in those villages shall be activated and capacity-building measures should be taken up to tackle such situation. The first and foremost work is to manipulate the people during the time of depredation. The safety of human beings is the top most priority in such situation. The people should be motivated to refrain from combating the invading herds directly in order to avoid human casualty. The VSS showing exemplary actions shall be rewarded. Elephant trackers and anti-poaching squad shall be deployed keeping pace with movement of elephants during the ensuing period.

The Range Officer shall be entrusted with the deployment as well as movement of the squads in the area after assessing the day today situation. Advance planning is necessary at range level to control the situation. Adequate funds shall be placed with the Divisional Forest Officer for making instant payment to the affected persons in order to curb the resentment of the people. The rate of payment should be at par with the market value of the properties lost. Both preventive and curative methods shall be adopted to minimise the conflict and keep it under control.

19.12.1 Establishment of Anti-Poaching Squads

Each squad should consist of 6 (six) local youth headed by a Forester and assisted by 1 Forest Guards along with one vehicle. 3 (three) trackers per each herd of elephants should also be engaged. The Range Officer shall be entrusted for engagement of local youth after assessing their aptitude and ability as well as verifying their antecedent. The nos. of squads and elephant trackers to be engaged is left to the discretion of the Divisional Forest Officer.

19.12.2 Awareness among the local people

It is important to devise permanent solution to problems encountered with wildlife crime. The poor and innocent dwellers

of forest fringe villages become the toys in the hands of the criminals and smugglers who are actually the hand in glove for all such crimes. Both the urge for conserving the wildlife and also the penal provisions for its offences shall be explained to the local people through leaflets in local dialect. The endangered animals like Leopard (*Panthera pardus)*, Indian Wolf (Gadhia/ Ramsiala) (*Canis lupus pallipes*), Honey badger (*Mellivora capensis indica*), Indian Elephant (Hati) (*Elephas maximus indicus*), The Indian Pangolin or Scaly Anteater (*Manis crassicaudata*) available in the Division,shall be described with photographs in the leaflets to inculcate the inspiration for its conservation. Similarly, the penal provisions like the duration of imprisonment, quantum of fine and non-bailable nature of offence should be narrated in the leaflets. Periodical meetings along with celebration of Wildlife Week, Elephant Day and Habitat Day etc. shall be done. The eco-clubs established in various schools shall be mobilised to propagate the message of conservation of forests and wildlife. Reward / prize shall be instituted for the exemplary work done by the local people at Division level to motivate them.

19.13 Wildlife Disease: -

The new economic and cultural values attached to wild species have altered the conception of health problems as well as veterinary attitudes towards them. Several diseases are the important decimating

factor in case of wild animals. Heavy loss is caused by them. It's very difficult to diagnose and treat the disease in wild animals because they are free ranging animals. The diseased animal hides itself in very remote or core area of the woods.However preventive measure must be taken to check the epidemic condition and to save the population. After getting the sign of disease in the individual, proper action should be taken for its treatment, in this respect, modern technologies evolving day by day for identifying individuals and its health checking should be applied. The staff of the field should be trained in this regard. Some of the important diseases found in wild animals are**-**

19.13.1 Blackleg, black quarter, quarter evil, or quarter ill

(*Gangraena emphysematosa*) is an infectious bacterial disease most commonly caused by *Clostridium chauvoei*, a Gram-positive bacterial species. It is seen in livestock all over the world, usually affecting cattle, sheep, and goats. It has been seen occasionally in Deer. The critical nature of the disease makes successful treatment difficult, and the efficacy of the commonly used vaccine is disputed.

Blackleg is caused by infection with Clostridium bacteria. The most common causative agent is *C. chauvoei*, but the disease can also be caused by *C. septicum, C. sordelli,* and *C. Novyi. C. chauvoei* is Gram-positive, rod-shaped, anaerobic, and motile, and can produce

environmentally persistent spores when conditions are not ideal for growth. These spores can remain in the soil for years in an inactive state, and return to their infectious form when consumed by grazing livestock.

When infection begins, the animal may develop a fever, and the affected limb can feel hot to the touch. The limb usually swells significantly, and the animal can develop lameness on the affected leg. Crepitation (the sensation of air under the skin) can be noticed in many infections, as the area seems to crackle under pressure.

Once clinical signs develop, the animal may only live a short while, sometimes as few as 12 hours. Occasionally, cattle succumb to the disease without showing any symptoms, and only a necropsy reveals the cause. During a necropsy, a diagnosis is usually made very quickly, as the affected muscle is usually mottled with black patches, which are dead tissue, killed by the toxins the bacteria release when they infect live tissue.

If viewed under a microscope, small rod-like bacteria can be seen to confirm the diagnosis

Vaccination: -

The use of clostridial vaccination is the most common and cost effective preventative measure taken against blackleg, however, its efficacy is disputed. Burning the upper layer of soil to eradicate

left-over spores is the best way to stop the spread of blackleg from diseased cattle. Diseased cattle should be isolated. Treatment is generally unrewarding due to the rapid progression of the disease, but penicillin is the drug of choice for treatment. Treatment is only effective in the early stages and as a control measure.

19.13.2 Haemorrhagic Septicemia (HS) is a severe bacterial disease caused by certain strains of *Pasteurella multicoda*. It primarily affects cattle and water buffalo, but infrequently affects pigs, small ruminants, and other hoof-stock. It is rapidly fatal. **Haemorrhagic septicaemia** is one of the most economically important pasteurelloses. Haemorrhagic septicaemia in cattle and buffaloes was previously known to be associated with one of two serotypes of *P. multocida*: Asian B:2 and African E:2 according to the Carter-Heddleston system, or 6:B and 6:E using the Namioka-Carter system. The disease occurs mainly in cattle and water buffaloes, but has also been reported in goats (*Capra aegagrus hircus*), inpigs infected by serogroup B, and in wild elephants (*Elephas indicus*)Serotypes B:1 and B:3,4 have caused a septicaemic disease in antelope like Nilgai (*Boselaphustragocamelus*). The incubation periods (the time between exposure and observable disease) for buffalo calves 4–10 months of age varies according to the route of infection. The incubation period is 12–14 hours, approximately 30 hours and 46–80 hours for subcutaneous infection, oral infection and natural exposure,

respectively. There is variability in the duration of the clinical course of the disease. In the case of experimental subcutaneous infection, the clinical course lasted only a few hours, while it persisted for 2–5 days following oral infection and in buffaloes and cattle that had been exposed to naturally-infected animals.

Generally, progression of the disease in buffaloes and cattle is divided into three phases. Phase one is characterised by fever, with a rectal temperature of 40–41 °C (104–106 °F), loss of appetite and depression. Phase two is typified by increased respiration rate (40–50/minute), laboured breathing, clear nasal discharge (turns opaque and mucopurulent as the disease progresses), salivation and sub-mandibular oedema spreading to the pectoral (brisket) region and even to the forelegs. Finally, in phase three, there is typically recumbency, continued acute respiratory distress and terminal septicaemia. The three phases overlap when the disease course is short. In general, buffaloes have a more acute onset of disease than cattle, with a shorter duration. On post-mortem examination (necropsy), the most obvious gross lesion is subcutaneous oedema in the submandibular and pectoral (brisket) regions. Petechial haemorrhages are found subcutaneously and in the thoracic cavity. In addition, congestion and various degrees of consolidation of the lung may occur. Animals that die within 24–36 hours, have only few petechial haemorrhages on the heart and generalised congestion of the lung, while in animals that die after 72 hours, petechial

and ecchymotic haemorrhages were more evident and lung consolidation are more extensive.

19.13.3 Foot and Mouth Disease

Foot-and-mouth disease (FMD) is a highly contagious viral disease that primarily affects cloven-hooved livestock and wildlife. Although adult animals generally recover, the morbidity rate is very high in naive populations, and significant pain and distress occur in some species. Sequelae may include decreased milk yield, permanent hoof damage and chronic mastitis. High mortality rates can be seen in young animals.

The foot-and-mouth disease virus (FMDV) is a member of the genus *Aphthovirus* in the family Picornaviridae. There are seven immunologically distinct serotypes - O, A, C, SAT 1, SAT 2, SAT 3 and Asia 1 - and over 60 strains within these serotypes. New strains occasionally develop spontaneously.

Species Affected

FMDV can infect most or all members of the order Artiodactyla (cloven-hooved mammals), as well as a few species in other orders. Each species varies in its susceptibility to infection and clinical disease, as well as its ability to transmit the virus to other animals. Livestock susceptible to FMD include cattle, pigs, sheep, goats and

water buffalo. FMDV can also infect at least 70 species of wild animals including Spotted Deer and Sambar.

On most cases, cattle are usually the most important maintenance hosts for FMDV, but some virus strains are primarily found in pigs, sheep or goats. Cattle and Buffalo are the usual maintenance hosts for FMDV in India;

Transmission

FMDV can be found in all secretions and excretions from acutely infected animals, including expired air, saliva, milk, urine, faeces and semen. Pigs, in particular, produce large quantities of aerosolized virus. Animals can shed FMDV for up to four days before the onset of symptoms. This virus is also found in large quantities in vesicle fluid, and peak transmission usually occurs when vesicles rupture. Transmission can occur by direct or indirect contact with infected animals and contaminated fomites; routes of spread include inhalation of aerosolized virus, ingestion of contaminated feed, and entry of the virus through skin abrasions or mucous membranes. The importance of each of these routes varies with the species. For example, pigs are less susceptible to aerosolized virus than cattle or sheep.

Sheep may have less obvious symptoms than other species, and have been important in disseminating the virus in some outbreaks.

Some animals carry FMDV for prolonged periods after recovering from acute disease. Animals with natural or vaccine-induced immunity can also become carriers if they are later exposed to virus; these animals can remain asymptomatic. FMDV can persist for up to nine months in sheep and up to four months in goats. Most cattle carry this virus for six months or less, but some animals remain persistently infected for up to 3.5 years.

Incubation Period

In cattle, the incubation period varies from two to 14 days, depending on the dose of the virus and route of infection. In pigs, the incubation period is usually two days or more, but can be as short as 18-24 hours. The incubation period in sheep is usually 3 to 8 days. Incubation periods as short as 24 hours and as long as 12 days have been reported in this species after experimental infection.

Clinical Signs

Foot-and-mouth disease is characterized by fever and vesicles (blisters) on the feet, in and around the mouth, and on the mammary gland. Occasionally, vesicles may occur at other locations including the vulva, prepuce or pressure points on the legs. Vesicles often rupture rapidly, becoming erosions. Pain and discomfort from the lesions leads to a variety of symptoms including depression, anorexia, excessive salivation, lameness and reluctance to move or rise. Lesions on the coronary band may cause growth arrest lines

on the hoof. In severe cases, the hooves may be sloughed. Although FMDV does not cross the placenta, abortion may occur in pregnant animals. Most adults recover in two to three weeks, although secondary infections may extend the recovery time. Possible complications include temporary or permanent decreases in milk production, chronic lameness or mastitis, weight loss and loss of condition. Deaths usually occur only in young animals, as the result of multifocal myocarditis; vesicles are not always found. In some outbreaks, the mortality rate in young animals can be high. Severe disease may also cause sudden deaths among older animals, particularly some species of wildlife, but this is rare.

The symptoms and severity of FMD vary with the species of animal, and the serotype and strain of the virus. Cattle usually become febrile and develop lesions on the tongue, dental pad, gums, soft palate, nostrils or muzzle. The vesicles on the tongue often coalesce, rupture quickly, and are highly painful, and the animal becomes reluctant to eat. Profuse salivation and nasal discharge are common; the nasal discharge is mucoid at first, but becomes mucopurulent. Affected animals become lethargic, may lose condition rapidly, and have gradual or sudden, severe decreases in milk production. Hoof lesions occur in the area of the coronary band and inter digital space. Foot lesions cause reluctance to rise, or stamping or shaking of the feet. Pregnant animals may

abort. Young calves can die of heart failure without developing vesicles. In areas where cattle are intensively vaccinated, the entry of FMD into the herd can sometimes cause swelling of tongue and severe symptoms that resemble an allergic disease.

In pigs, the most severe lesions usually occur on the feet. The first symptoms may be lameness and blanching of the skin around the coronary bands. Vesicles develop on the coronary band and heel, and in the inter digital space. The lesions may become so painful that pigs crawl rather than walk. The horns of the digits are sometimes sloughed. Lesions at other sites are less common and less severe. Vesicles are sometimes found on the snout or udder, as well as on the hock or elbows if the pigs are housed on rough concrete floors. Mouth lesions are usually small and less apparent than in cattle, and drooling is rare. Affected pigs may also have a decreased appetite, become lethargic and huddle together. Fever may be seen, but the temperature elevation can be short or inconsistent. In some cases, the temperature may be near normal or even below normal. Young pigs up to 14 weeks may die suddenly due to heart failure; piglets less than eight weeks of age are particularly susceptible.

Foot-and-mouth disease tends to be mild in sheep and goats. Common symptoms include fever and mild to severe lameness of one or more legs. Vesicles may develop in the inter digital cleft and

on the heel bulbs and coronary band, but they may rupture and be hidden by foot lesions from other causes. Mouth lesions are often not noticeable or severe, and generally appear as shallow erosions.

Vesicles may also be noted on the teats, and rarely on the vulva or prepuce. Milk production may drop, and rams can be reluctant to mate. Ewes may abort. Up to 25% of infected sheep remain asymptomatic, and 20% have lesions only at one site.

Young lambs and kids may die due to heart failure, without vesicles. In some epidemics, large numbers of lambs may fall down dead when stressed.

The symptoms in wildlife resemble those seen in domesticated livestock. Vesicles and erosions may be found at various sites, particularly on the feet and in the mouth. More severe lesions occur where there is frequent mechanical trauma, e.g. on the feet and snout of suids or the carpal joints of warthogs. Loss of horns has also been seen. Some wildlife species typically experience subclinical infections or mild disease, while others develop severe, acute disease.

Young animals of any species can die suddenly of myocarditis.

Control

Vaccination as preventive measure, in cattle should be done. As remedial measure the case should be reported to the veterinary doctor for proper treatment. The appropriate measures should also be applied which can cure the disease. Regular vaccination against FMD is prescribed for the cattle exposed to forest for grazing.

19.13.4 Rinderpest: -

It is caused by Paeamyxo virus (Morbilli virus) as epidemic in ruminants such as cattle, Cheetal, Sambhar, Gaur, Wild buffalo etc. It is also infected in the wild animals through the cattle. The symptoms are excess fever up to 106^0 F, watering through eyes and nose, intestinal ulcer, diarrhoea, bleeding with faeces etc. The diseased animal should be separated by other individuals of the herd because it would generally, die within fifteen days. It is spread by the faces,pus of the wound, urine etc. The diseased animal should be watched and the dead animals should be buried immediately preferably mixed with Potassium Permanganate, lime and phenyl to avoid its spreading through scavengers. Vaccination, as preventive measure, in the cattle is very essential and veterinary doctor should be reported for proper treatment.

19.13.5 Anthrax: -

This disease is caused by *Bacillus anthrasis*. There is enlargement of spleen in this disease in the mammals. This is dangerous disease because its symptom is convulsive only, from few minutes to few hours. Bleeding occur through mouth, nose and anus and vulva in females. Swellings are on certain places of the body which rupture with oozing black blood. Affected animal may die within three days. It is very infectious disease and spread very rapidly. Men are also infected by this disease and so the treatment of such disease should be through knowledgeable and experienced doctors. Proper treatment should be done. The body of the animal should be buried to avoid its spreading through scavengers.

19.13.6 Tuberculosis

There are numerous instances of inadvertent infection with mycobacteria, particularly in species of wild animals kept in captivity in zoos, where they are exposed to human infection. These cases resulted from wild animals coming into contact with human beings or domestic animals.

19.14 Wildlife Habitat Relationship: -

Wild animals require four basic habitats components - food, water, cover and space. The amount and distribution of these will influence the types of wildlife that can survive in an area. Food

sources might include insects, plants, seeds, or even other animals. Water sources may be as small as drops of dew found on grass or as large as a lake or river. Some animals acquire most or all of the water they need through succulent foods like fruits.

Wildlife need cover for many life functions, including nesting, escaping from predators, seeking shelter from the elements on a cold winter day, and resting. An underground burrow, a cavity in a tree, or even plants along a road might provide cover for a den or nest site. A brush pile provides escape cover for rabbits and other small mammals, while evergreens provide nest sites for birds in spring and thermal cover for wildlife in winter. The amount and types of cover available in the forest determine the species of wildlife found there.

Animals also need space in which to perform necessary activities such as feeding or courtship. The space an animal needs is its home range. Large animals have larger home ranges than small animals, and large areas of undeveloped habitat are better for most wildlife.

As the quantity, type, and distribution of habitat components change, so do the types of wildlife species found within the habitat. Wildlife management often involves manipulating components of the habitat to favour a particular species or group of species. Because it is not always possible to alter the amount of space and water in a habitat, most habitat management involves

changing the vegetation in an area to provide food and cover for wildlife. Before one attempt to manage habitat for wildlife, one should understand how different types of habitat and features within the habitat determine which species of wildlife will be present.

19.14.1 Succession Stage

Succession is the predictable change in a plant community over time. For example, a field left untouched will become covered with shrubs and eventually with a forest. As the plant community changes, so do the habitat components available for wildlife and the wildlife species themselves.

Bare soil, if left alone, will become vegetated over time. Seeds are present in the soil and others arrive by wind, wildlife, and other means. As a result, untended bare soil eventually will become a grassy field, the seral stage of succession. Fields provide herbaceous food and cover as well as insects and seeds for small Hawks and fox, which feed on small mammals, often hunt in open fields.

Although these early successional-stage habitats provide a variety of important habitat components, they typically do not include some critical elements. Large seeds, such as acorns and hickory nuts, produced by over storey trees and used as food by many species of wildlife, are generally absent. Cavity trees, which

provide cover for birds and small animals, are also not present. Young habitats simply have not had time to develop some of the features present in more mature forest areas.

An unmanaged brush-stage forest will become a pole-stage forest in a couple of decades. This type of forest contains trees 4 to 10 inches in diameter at breast height (dbh). Pole-stage forests are generally considered the least productive forest habitats for wildlife. They are a transitional stage between brush-stage and mature forests, and generally lack the thick understory cover and browse so abundant in the brush-stage forest. They also lack the large over storey and cavity trees associated with mature forests. In most cases, wildlife will benefit if a pole-stage forest is managed to reverse succession (benefiting species associated with the brush stage) or allowed to mature (benefiting species associated with mature forestland).

As a pole-stage forest matures, cavity trees become more abundant; over storey trees produce more nuts, acorns, and fruit; and dead wood and leaf litter collect on the ground. Woodpeckers, squirrels, and other small animals' nest in cavity trees, and gray squirrels and wild turkey eat the acorns and hickory nuts produced by mature trees. Species as large as the sloth bear and as small as the masked shrew forage for insects in dead wood on the ground, and amphibians such as the newts and the salamander thrive in the moist environment created by the closed canopy overhead and

the deep leaf litter underfoot. The succession stage of a particular tract of forest often determines the type of wildlife community found there.

19.14.2 Vertical Structure

Along with the succession stage, a forest's vertical structure also affects the presence of certain species of wildlife.

Vertical structure describes the layers of vegetation present within a forest, from the shortest plants on the forest floor to the tallest trees.

Vertical structure is particularly important in determining which bird species might be present. Birds choose habitat vertically as well as horizontally, and individual species are associated with specific layers of vegetation. For example, wood thrushes generally nest from 5 to 15 feet above the ground and are rare if vegetation is not present in this layer. Many species require multiple layers of vegetation. Worm-eating warblers, for example, nest on the ground but forage for insects in foliage, on bark, and on the forest floor. A multiple-layered forest provides essential nesting and foraging sites for many types of birds.

By providing cover and travel routes, a forest with a well-developed vertical structure also benefits other types of forest wildlife, such as small mammals. Gray squirrels and white-footed

mice, for example, use the many branches present in a well-developed understory for travelling and escaping from predators.

19.14.3 Size of Area

Along with the succession stage and vertical structure of the habitat, its size influences which species will be found there. Many species are area sensitive, meaning that they are absent from or rare in small patches of habitat and more abundant within extensive areas of undeveloped land. Some have large home ranges, whereas others must travel a considerable distance to meet mates. The northern goshawk, for example, does not inhabit small woodlots because it has a large home range and requires large forested areas free from human disturbance.

19.14.4 Special Habitat Features

In addition to general wildlife-habitat relationships, some species also require special habitat features and will be absent if these features are not present. These features include snags, cavities, dead and downed wood, rocky outcrops, caves, evergreens, temporary pools, and spring seeps.

19.14.5 Snags and Cavity Trees

Snags are dead or partially dead standing trees. They provide a number of important benefits to wildlife. As a tree dies, its bark

begins to loosen and form bark cavities, which are used as roost sites by forest-dwelling bats and as nest sites by brown creepers. Insects, a valuable high-protein food source for certain species, are abundant in snags. A wide variety of birds, including raptors, kingfishers, flycatchers, and many songbirds, also use snags as hunting and singing perches.

Cavities are holes excavated in snags by woodpeckers. They are used for shelter and nesting cover by many species.

19.14.6 Dead Trees

Dead wood, including fallen branches and trees lying on the ground, is also important for wildlife habitat. As wood decays, it slowly returns nutrients to the ground and supports colonies of insects on which many animals feed. Amphibians rely on downed trees for cover, especially during droughts, when the undersides of fallen logs become a critical source of moisture. Small mammals also use logs on the ground as runways, and reptiles that prey on small mammals and insects use them as hunting areas.

To provide dead, downed wood for wildlife, no marking of the dead trees is allowed for exploitation in the wildlife populated area under the Selection Working Circle.

19.14.7 Rocky Outcrops and Caves

Rocky outcrops and caves are generally less common than some other habitat features. Certain species, however, such as the green salamander, require the unique habitat provided by rocky outcrops. Honey badgers use the caves as its den. Caves are especially important in the winter for hibernating bats, and some bats inhabit caves throughout the year. To protect these uncommon species, minimize disturbances around caves and rocky outcrops.

19.14.8 Evergreens

Evergreens, trees and shrubs that retain their leaves through the fall and winter, provide thermal cover for wildlife during cold months. Evergreens with branches that extend down to the bottom of the trunk provide the best thermal cover because these branches keep wind and snow out. Evergreens also provide nest sites and food.

19.14.9 Temporary Pools

Temporary, pools are unique wetland habitats that fill with water during a rainy season and then dry up later in the year. Although temporary, they provide a critical breeding ground for amphibians. Because temporary pools do not support fish

populations, amphibian eggs can develop there without high losses to fish predation.

In addition to providing breeding and hibernating habitat for amphibians, temporary pools also support a complex web of interactions among a variety of organisms, including aquatic insects, salamanders, frogs, turtles, snakes, small and large mammals, waterfowl, and songbirds.

List of vertebrate species of wildlife is prepared by using the attributes as listed below

a. Threatened, endemic and rare species
b. Species that are habitat specialists and obligate/ Species with geographically restricted distribution.
c. Species needing geographically separate seasonal habitats.
d. Species that are solitary, terrestrial or wide ranging.
e. Species using special or unique habitats.
f. Species that is migratory.
g. Flagship/ charismatic species
h. Species culturally respected
i. Species performing know ecological functions
j. Keystone species
k. Principal prey species of Leopard / tiger.

Each species profile is a narrative of its conservation and legal status, geographical distribution and ecosystem used habitat requirements and structural stages used by the species. Some of the important species of this division and their relations with the habitat are as follows.

THE TIGER (*Pantheratigris)*, Schedule I

ECOSYSTEM USED: **-**

Semiarid forest, dry and moist deciduous forest, semi evergreen and broadleaved, evergreen or the rain forest coniferous forests, coastal mangroves and Terai tall wet grassland plain and hills.

HABITAT REQUIREMENTS: -

1) **Rearing: -** Breeds around the year. Female seeks secluded place among large boulders preferably well concealed by vegetation, an enormous size hollow at the base of the tree, or a hollow of appropriate size in a large fallen tree or a log to drop, hide and rear the cubs. Complete protection of such sites at all times is critically important. One litter comprises of one to five cubs.

   The mother –cub association is strong and may last for about 16 to 18 months in case of a male cub and 20-22 months in case of female cubs. Dispersal is male biased and therefore it is expected that mortality among males would be higher.

2) **Food: -** The food of tiger includes small size mammals like the Porcupines, Pangolinand Muntjac to full grown bull Gaur, Elephant and Rhino calves, fish and crabs. Annual dietary

requirement of an adult tiger varies between 2500 to3500 Kg of prey on the hoof. A tiger is unable to crop more than 10 -15 % of the standing biomass of prey.

3) **COVER: -** well wooded and well-watered forest with patches of dense cover provided by scrub level thickets and bamboo under tree canopy or tall grass patches. Riparian forests are important.

THE LEOPARD (*Panthera pardus*), Schedule I

Ecosystem Used: **-** Semiarid forest types to evergreen conifers and broad leaved rainforest. Highest densities are attained in semiarid, dry and moist deciduous forest.

Habitat Requirement: **-**

Rearing: - Breeds throughout the year. Female attain sexual maturity around 2.5 to 3 years of age.

Gestation period: **-** The gestation period is 3 months, every litter comprises of 2-4 cubs, unlike tiger, leopard is more versatile in accepting small site offering concealment amidst otherwise disturbed tracts with limited cover. It may use spaces in a box culvert or a Hume pipe along the roads.

Food: - The food of Leopard food includes hare, porcupine and rodents, aves especially pea fowl, all deer except sambar stag, wild pig, primates (favourites) and gaur calves.

THE SLOTH BEAR (*Melursus ursinus ursinus*), Schedule I

Ecosystem Used: - Generally found in dry and moist deciduous forest, semi evergreen forest type sand broadleaf evergreen forests.

Habitat requirement: -

I. Rearing: -

The breeding season varies from winter and summer, Give birth to 2 to 3 cubs per litter. Thecubs are dropped in secluded places in depression surrounded by thick vegetation. When very small the cubs sit tight on mothers back as she goes about searching for food.

II. Feeding: -

Sloth Bear are omnivorous. They feed on variety of insects, tuber, rhizomes, roots and grubs, fruits, berries, ripe berries of lantana, figs,ficus species,wild mango, jamun, kendu, sunari, char, kasi, mahua, ber etc.

THE RATEL / HONEY BADGER (*Mellivora capensis*), schedule I

Ecosystem Used: - Generally found in semiarid tracts to the Dry moist deciduous forests, however they prefer the rolling broken and hilly country.

Habitat requirements: -

i) **Rearing**: **-**

The cubs are born in a system of below ground chambers dug by the animal and the cubs stay in this sett (burrow) till they are about 10 weeks old.

ii) **Food**: -

They are omnivorous and feed on wide variety of items. The Ratel has sweet tooth and sweet tasting pulping fruits and honey are favoured by them. They also eat birds, snakes, lizard, small tortoise, frogs and toads, hare, small porcupines and other rodents.

19.15 Mismanaged habitats

While habitat degradation is one aspect, wildlife biologists opine that inappropriate management of elephant landscape by way of "habitat improvement" could be one of the reasons for higher conflicts. Extensive construction of artificial water holes, water retention check dams and other water harvesting measures within elephant habitats could all reduce calf mortality and artificially augment elephant population beyond the carrying capacity of the area. "Spatial clustering of waterholes changes surface water availability, affecting seasonal movement patterns of elephants".

19.16 Other Regulations:-

Besides the prescriptions provided in the foregoing paras, some other regulations are necessary to augment the former for effective results. These are the following.

19.16.1 Infrastructure & Training

Without adequate infrastructure, it is not possible to obtain the desired result. Provision of adequate infrastructure is also not enough. The proper training of the field staff is necessary to handle the situation perfectly. Wildlife is a special subject, which needs better technique for smooth management. The field staff should undergo refresher training regularly to update their knowledge for coping with prevalent standard. Such refresher training shall be organised at frequent interval. Handling of arm and ammunitions and knowledge in photography particularly the use of digital / zoom cameras are essential. So, vehicle, arm and ammunition, camera, computer etc. are to be provided along with periodic training.

19.16.2 Establishment of an animal rescue-cum-rehabilitation Centre

Sometimes wild animals are rescued either from unlawful confinement or being wounded / injured. Such animals need some treatment to come over to normalcy before its release to the natural forest. The Forest Divisions are facing a lot of difficulty to ensure proper convalescing of the animals in absence of adequate infrastructure. So the injured animals are shifted to Nandankanan very often.

In order to mitigate this problem, the establishment of an animal rescue-cum-rehabilitation centre is essential at circle level at Baripada.

19.16.3 Information Network, Record Keeping & Database

To build up an intelligence network is of prime importance. In the present situation of inadequate staff and infrastructure, the collection of information is very vital to contain the wildlife crime. The Range Officer shall be entrusted to collect intelligence under the supervision of Assistant Conservator of Forests and the guidance of Divisional Forest Officer. All such information shall be documented secretly and correctly to develop a database at both Range and Division level. It includes the following items:

(i) Pictorial directory of all identified poachers.

(ii) Schedule species available in the range.

(iii) List of the license holder of gun.

(iv) List of traders in cattle and other animals as well as tanneries / slaughterhouse.

(v) List of Dhaba / Hotels suspected to serve meat of wild animal.

(vi) Timely and proper documentation of all incidence of poaching and man animal conflict.

19.16.4 Prosecution of Wildlife Crime

It is observed that the effort and sincerity shown during the detection of wildlife crime is gradually diminishing in subsequent stages i.e. investigation and trial. As a result, most of the wildlife cases are ended either with acquittal or mild punishment. Very often the accused are able to escape due to technical flaws, perfunctory prosecution report or shoddy investigation. Hence it is prescribed that whenever a wildlife crime is detected, an officer of and above the rank of Assistant Conservator of Forests shall visit the spot forthwith. The investigation shall be done by the Assistant Conservator of Forests duly assisted by the concerned Range Officer. Prior to submission of the prosecution report, it shall be examined by the Public Prosecutor / Assistant Public Prosecutor whose guidance shall be taken during the course of investigation and preparation of prosecution report. A case diary shall be maintained for each wildlife case to record the progress in trial. The Divisional Forest Officer shall review this matter at least once in a month.

19.16.5 Wildlife Depredation

It is the bone of contention between the human and wildlife. Public resentment leading to revengeful action by resorting to

killing of wild animals shall be contained with instant solace by the forest officials. On receipt of information regarding any wildlife depredation, an officer of and above the rank of Assistant Conservator of Forests shall visit the spot immediately. It would have been better to calm down the agitated people through instant payment of the compassionate amount. Since there is some paraphernalia to be maintained, the sanction of compassionate amount shall be done at earliest and such sanction order shall be handed over to the affected person. The affected family should be provided some additional benefit under other schemes of the department.

19.16.6 Control of Grazing & Fire Protection Measure

Though necessary prescription has been made for these works in respective working circles, the attention shall be focussed on wildlife rich pockets of the forest blocks as a special measure. Proactive steps should be taken to prevent fire in those localities.

19.16.7 Incentives & Rewards

As already stated earlier there shall be provision for rewards and incentives to the public whose laudable efforts have ensured the protection and promotion of wildlife. In addition to the public, the devoted and dedicated field staff should also be rewarded. Such persons should be felicitated in different ceremonial occasions like Wildlife Week.

CHAPTER – XX

TREE OUTSIDE FOREST AREA.

20.1 Introduction:-

Trees outside Forests (ToF) are located on the lands other than the forests(RF/ PRF/ PF/ VF/ Revenue Forest/ DLC Forest), including agricultural lands (e.g. agro-forestry systems, farm forestry, industrial plantations, hedgerows, woodlots, Cashew Plantations), Govt. Plantations on Non-Forest areas (FDA Plantations, CAMPA, Avenue Plantations, Parks, Urban Plantations), Jahiras and trees on private land, built-up areas such as settlements, Private Bamboo Plantations, private Acacia / Eucalyptus / Teak Plantations and bare lands available for tree plantations. As a matter of practice, private people take up tree planting in their own land which has proved profitable in comparison to agriculture. Species like Eucalyptus and Acacia which are more suitable and fast growing in the area are planted in the wasteland, water logged areas, back yards, fallow field. Orchards of Cashew nuts (*Anacardiumoccidentale*) have been planted through various schemes in private fields of Karanjia Forest Division and the coverage area by cashew plants is on increasing trend. It provides a good source of economic production for community as well as individuals who have raised cashew in their own land. So there is a need to describe and comprehend the dynamics of trees and shrubs on rural and urban land,

and their interaction with forest ecosystem. This will lead to a better understanding of off-forest tree management of forests as natural resources.

20.2 General Constitution of Working Circle

Commercial forest tree planting in private land is more profitable in comparison to agriculture. Species like Teak, Bamboo, Acacia, Eucalyptus, Jack Fruit, Jamun& Mango are mainly planted in back yards, field bunds, fallow uplands, wastelands. Based on plot description and enumeration for areas outside forests, assessment was done with respect to present scenario and their potential for tree outside forests as part of sustainable land use management at landscape level within Karanjia Forest Division. The focus of forestry outside forest area is on production forestry, revitalization of rural economy and expanding economic opportunities through innovations. Seedlings have been raised in different decentralized nurseries of the Division and distributed among the people for raising of forest trees on their own land. Total geographical area of Karanjia Forest Division **184578** ha out of which forest area under working plan are **43261.83** ha. Which is about 23.43% of the total Geographical area. DLC forest area in Karanjia Division is **25185.697** ha and Revenue Forest Area is **25839.58** ha out of which 19305.55 ha area is overlapping and 5880.1 ha is exclusive DLC area; so in remaining 106047.66 ha Non-forest area ToF area is distributed.

20.3 General Characteristics of Vegetation

The forest area under tree cover outside forest is in various stages of degradation. This area is under continuous pressure for removal of Timber, pole crops and firewood by the local inhabitants. Proper protection of the area against grazing and fire could not be ensured for which the existing crops and the site condition have deteriorated further and the rate of soil erosion has increased.

Composition

Tree outside forest area consists mostly of hardy species. The soil is highly eroded and susceptible to sheet and gully erosion. In some patches the top soil has been washed away and transformed into hard murram soil and rocky surface. The area is dominated by miscellaneous vegetation like Mango, Jackfruit, Amla, Jamun, Kurei, Dhaura, Sal, Teak, Neem, Bel etc.

Distribution

Common village woodlots in non-forest Govt. land like Gochar, Smasan, Anabadi, Hills, lands under lease, Mango groves, Canal bank plantations etc. are full of tree vegetation. In private lands also Bamboo plantations, Eucalyptus plantations, Acacia plantations, Mango plantations and trees in private lands are available. The uplands, where no crop can be cultivated are usually planted with long duration tree crops. All these constitute Tree Outside Forests.

Density

The crown density of the crops standing over the area varies from 0.1 to 0.4. The variation of density is due to felling of trees and various climatic & edaphic factors as well as the fertility of the area.

Growing Stock

The crop standing over the area is open and consists mostly of inferior hardy species. In habitation areas, luxuriant growth of teak, bamboo, acacia, eucalyptus, jack fruit, Jamun & mango are observed. Avenue plantations have been taken up along the high ways & other roads by Forest Department. Trees in agricultural lands (e.g. agro-forestry systems, farm forestry, industrial plantations, hedgerows, woodlots, Cashew Plantations), Govt. Plantations on Non-Forest areas (FDA Plantations, CAMPA Plantations, Avenue Plantations, Parks, Urban Plantations) and Private Bamboo Plantations, private Acacia / Eucalyptus / Teak Plantations constitute the growing stock of ToF.

Carbon Stock

No systematic study has been taken up to assess the Carbon stock of ToF. As per thumb Rule & taking Wood Empirical Formula $C_nH_{2n}O$, 30 gms of Wood contains 12 gms of carbon.

Considering the Ash content i.e. Metals and its oxides in plants 2.5 % reduction of Carbon may be safely considered.

Hence 30 Tons of Wood may contain (12T-0.3T) 11.70 Ton of Carbon. Hence 1 Ton of Wood (Dry mass) may contain 0.39 Tons of fixed Carbon. For Conversion of mass of Wood from Cum to Ton, the density factors for various species recorded in ToF are furnished below.

Density of Wood

Sl. No	Fruit Name	Scientific Name	Wood density (g/cc)
1	Mango	*Mangiferaindica*	0.59
2	Jack Fruit	*Artocarpousheterophyllus*	0.60
3	Amla	*Phyllanthusemblica*	0.80
4	Jamun	*Syzygiumcumini*	0.70
5	Kurei	*Hollarrhenapubiscens*	0.64
6	Dhaura	*Anogeissuslatifolia*	0.78, 0.79+
7	Sal	*Shorearobusta*	0.72
8	Teak	*Tectonagrandis*	0.50, 0.55+
9	Neem	*Azadirachtaindica*	0.69
10	Bael	*Aeglemarmelos*	0.75
11	Piasal	*Pterocarpusmarsupium*	0.67
12	Karanj	*Millettiapinnata*	0.61
13	Asan	*Terminaliaelliptica*	0.73, 0.76, 0.77 +
14	Sisoo	*Dalbergiasissoo*	0.69
15	Cashew	*Anacardiumoccidentale*	0.45
16	Harida	*Terminaliachebula*	0.96
17	Bahada	*Terminaliabellirica*	0.72
18	Gambhari	*Gmelinaarborea*	0.41, 0.45 +
19	Badachakunda	*Samaneasaman*	0.45, 0.46

Density of Wood			
Sl. No	**Fruit Name**	**Scientific Name**	**Wood density (g/cc)**
20	Semul	*Bombaxceiba*	0.33
21	Khair	*Acacia catechu*	0.88
22	Tamarind	*Tamarindusindica*	0.75
23	Mahua	*Madhucalongifolia*	0.74
24	Kochila	*Strychnosnux-vomica*	0.75,0.86
25	Sunari	*Casia fistula*	0.71
27	Eucalyptas	*Eucalyptus globulus*	0.78
28	Acacia	*Acacia auriculiformis*	0.58
29	Mahoganhi	*Swieteniamacrophylla*	0.49, 0.53 +
30	Kathabadam	*Terminaliacatappa*	0.52
31	Simaruba	*Simaroubaglauca*	0.37
32	Mahaneem	*Meliaazedarach*	0.46
33	Sanachakunda	*Cassia siamea*	0.68
34	Kadamb	*Neolamarckiacadamba*	0.48
35	Siris	*Albizialebbeck*	0.55,0.66+
36	Champa	*Micheliachampaka*	0.43
37	Radhachuda	*Peltophorumpterocarpum*	0.62
38	Patali	*Lagerstroemia speciosa*	0.63
39	Ou	*Dilenniaindica*	0.65
40	Krushnachuda	*Delonixregia*	0.80
41	Chhatian	*Alstoniascholaris*	0.36
42	Chukrasia	*Chukrasiatabularis*	0.57

20.4 Felling Series, Cutting Sections and JFM Areas

Tree outside Forest Area is the area outside forest blocks, revenue forests and DLC forests. So, there is no felling series/cutting section. This is the

area assigned for commercial forestry which will be felled as per species planted and rotation period.

20.5 Blocks, Compartments and JFM Areas

Tree outside Forest Area is the area outside forest blocks, revenue forests and DLC forests. So, there is no block allotted to this working circle. Tree outside Forest area includes planted vegetation/ natural forests outside legal forest area. Therefore, all vegetation outside RF, PRF, PF, VF, Revenue Forest and DLC Forest are called Tree outside Forest area.

20.6 Special Objectives of Management of ToF Area

- To educate people to regenerate the degraded forest by appropriate silvicultural operation(weeding, prevention of grazing and protection from fire) and protection measures for the principal species to achieve quick apical growth with active participation of the people.
- To restock the degraded forests through community participation.
- To educate people to restock the barren area by artificial regeneration.
- To educate people to extend soil and moisture conservation measure in a watershed approach to

enrich the micro-edaphic condition for making the forests more productive in the near future.

- To educate people to protect the area and minimize its further degradation.
- To educate people to supply available dry firewood, congested poles and timber from dead trees in a systematic manner for use by the local people and there by discouraging illicit felling.
- To educate people to remove the miscellaneous thorny bushes for the growth of principal and secondary species.
- To educate people to encourage natural regeneration through fire protection by involving local communities.
- To educate people to create favourable condition for the habitat and multiplication of the Wild Life.
- To educate people to remove exploitable trees in non-forest areas following approved procedure.
- To encourage formation of JFM / CFM / Forest Management Committees for scientific management of ToF in Govt. land.

20.6.1 Analysis of the Crop

The planted species available in this non-forest area have been classified basing on their timber, fire wood, fruit, oil and other yielding value. The classification of trees is given in the table below.

Table No. 20.1

Principal Species	Secondary Species	Commercial Species
Sal, Bija, Karanja, Asan, Sisoo and Jamu.	Cashew,Harida, Gambhari, Bahada, Badachakunda, Semul, Khair and Siris, Mango, Bela, Tamarind, Mahula, Kochila, Sunari and Neem	Eucalyptus, Acacia, Teak, Mahogany

Important commercial species can be planted when there is established market to utilize the timber/ leaves/ twigs in industries. The list of ToF plantations in Karanjia Division is given below.

Table No. 20.2

Plantation outside Forest areas in different Schemes

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
1	2		3	4	5	6	7
2010-11	CAMPA– Avenue	Singda – Sukruli				1.58	0.00316
2011-12	--	--	--	--	---	---	--
2012 – 13	S.P. Avenue Plantation	Kuita – Bala PMRY				15	0.0375
		Tato – Pichuli PMRY					
		Dumuria – Mota PMRY					
2012 – 13	MGNREGS (Avenue)	Dhangarbeda to Arjunbilla				40	0.08
		Karanjia – Ghodaghaguri PWD Road					
		Tato – Sialnai & Nakula – Ranipat PMRY Road					
		Matiagarh – Kaptira PMRY Road					
		Ghodabindha – Dhatikidiha					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
2013 – 14	SP-COL-Avenue Pltn.	Ghagarbeda-Mircha PMGSY Road				20	0.05
		Sukruli-Talanga PMGSY Road					
		NH-49 - Bhadubeda					
		Kankada-Purunapani PMGSY Road					
		Chaturisahi-Baliposi PMGSY Road					
2013 – 14	NBM-Non forest land	Damanigoda	10		10		0.04
		Bisipur					
		Chirupada					
		Kheliaposi					
		Kunjia					
		Laxmiposi					
2013 – 14	MGNREGS-Avenue Pltn.	Andharjhari-Bagdafa PMGSY Road				70	0.14

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Konica-Baunspur					
		Bhramarposi-Kujiam					
		Galusahi-Rautalipat					
		Budhisarei-Neduapal					
		Kuliposi-Kushpada					
		Boring-Bhimkund					
		Jamunanda-Bagdafa PMGSY Road					
		Salchua-Noda PMGSY Road					
		Akhapalan-Hatigoda PMGSY Road					
		Keshdiha-Purunapani					
		Tangabila-Karadia					
		Banamunda-Uski					
		Banamunda-Digposi					
		Jamukeswar-Bhanda					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Purunia-Sagarsahi					
		Ramasahi-Purunia					
		Itamundi-M.Jodi					
2014 – 15	MGNREGS Avenue	Chianbeda to Gohalmunda				90	0.18
		Goudiabahali to Bhaliadal					
		Mituani to Keshdiha					
		Bhadubeda to Ghantiadar					
		Jamunti to Baidyanath					
		Badpani to Hatibandha					
		Pingu to Chadeibhol					
		Fagu to Sagada					
		Gidhibas to Saradha					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Badgaon to Raikabasa					
		Dandrabeda to Uski					
		Baunsnali to Madrangajodi					
		Kudarsahi Chhak to Bandiraposi					
		Purunia Chhack to Godapalasa					
		Tingira Chhack to Panasi					
		Angarpada Chhack to Bakala					
2014 – 15	NBM Non – Forest Land	Chauthia	15		15		0.06
		Hatidandi					
		Kerkera					
		Manikduma					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
2014 – 15	SP – Avenue	Dudhibahali to Baunsopani				15	0.03
		Sunida to Mituani					
		Dhirol to Asankudar					
		Kendujiani to Edelbeda					
		Bhonra Chhack to Nuagaon					
		Podeidhora to Tikasil					
2015 – 16	MGNREGS – Avenue Plantation	Satkosia to Duarsuni				80	0.2
		Duarsuni to Salchua					
		Bhaliadal to Jambani					
		Akhapalan to Hatigoda					
		Talpada to Baliposi					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Mituani to Chirupada					
		Talpoda to Gohandia					
		Kasibeda to Saleibeda					
		Jamudiha to Badmahadi					
		Manikduma to Sanbadposi					
		Karadia to Simigaon					
		Gharmabeda to Mahuliasol					
		Nuabeda to Mukuna					
		Nimaipokhari to Sagada					
		Kudarsahi to Rudong					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Panposi to Kadadiha					
		Salarapada to Jhumkakudar					
		Matiagorh to Asanbani					
		Suampal to Kaliani					
2015 – 16	SP – Avenue Plantation	Handiphuta to Dakeipal				20	0.04
		Panasdiha to Baunsdiha					
		Mirginendi to Bharandia					
		Bhadubeda to Champajhar					
2015-16	Urban Plantation	Karanjia Town					0.20
		Tato					
		Jashipur					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
2016-17	MGNREGS–Avenue	Jhumkakudar to Jharbeda PMGSY Road				132	0.3375
		Rudong to Godgaon PMGSY Road					
		Dudhibari to Dhatikibeda PMGSY Road					
		Etamundi to Kudarsahi RD Road					
		Digdhar Nuasahi to Fire station Chack PMGSY Road					
		Kadupoda to Chakulia PMGSY Road					
		Matiagorh to Kaptira					
		Ganesh Matho to Kalikaprasad					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Moharajpur to Nuhamalia					
		Tentua Bridge to JanguluGhati					
		Gidhibas Chack to Kenjhara					
		Sunamuhin to Khandabandh					
		Jhumkakudar to Hatibari					
		Tato Chack to Pantho					
		Baidyanath to Mukuna					
		Kitisahi to Champarai					
		Kalakada to Balibhol					
		Kalakada to Chandaposi					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		NH - 49 to Pokharia					
		Ghosda to Jamuti					
		Ghormabeda to Mahuliasuli					
		Pokharia to Baria					
		Panpatria to Raikala					
		Padiabeda to Raipada					
		Talpoda to Chakulia					
		Badbaliposi to Chirupada					
		Ghantiadar to Panposi					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Bhaliadal to Jambani					
2016-17	MGNREGS - School Plantation	*List of Schools provided					0.142
2016-17	MGNREGS – Private land Plantation	Cheliaposi	55.5		55.5		1.3875
		Goudgaon					
		kadadiha					
		Arjunbilla					
		Badbil					
		Nuagaon					
		Kudarsahi					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Piurunapani					
		Nakuda					
		Dumuria					
		Pichuli					
		Karadia					
		Bankati					
		Dubapal					
		Jamchua					
		Gambharia					
		Goudiabahali					
		Karadapal					
		Satkosia					

Year (2010-11 to 2020 - 21)	Name of the scheme	Location	AR in Ha.	ANR with gap plantation. in Ha.	Total in Ha.	Avenue Plantation in RKM	seedlings planted in lakh
		Mahuldiha					
		Godbhanga					
2016-17	SP – Urban Pltn.	GadtalsahiMotha					0.15
		Tato					
		Karanjia NAC					
2016-17	OMBADC – Avenue	Banaphundugondi to Siltia				21	0.0525
		NH – 49 to Bakla					
2019-20	PE - Urban Plantation	Jashipur Motho					0.036
		Karanjia NAC					
		Total:-	**80.5**		**80.5**	**504.58**	**6.33**

School List

New Govt. High School Nuagaon	Monaharpur PUPS	Diajodi PS
Nodal Primary School Nuagaon	TalangaUGUPS	Barapanposi PS
BhanjakiaC.P. Collage Campus	Chaturanjali PS	TatoTOUPS
BhanjakiaG.P. Field	Chaturanjali HS	Biunria PS
Odisha AdarshaVidyalaya	Kadamadak PS	Kankada PS
Ghagarbeda M.E. School	Purunapani PS	Kunjia PS
Arjunasahi UP School	Batpalsa Nodal UPS	Hatidandi NPS
BaunsnaliSewasharm	Gudidiha PS	Badsorei NPS
Kudarbisda Ashram School	Jhumkakudar Nodal	Modiasahi NPS
Chhemundia Primary School	Khadikudar PS	Ramachandrapur PS
Nuabudani Primary School	Panaspal PS	Pingu PS
Thakurgoda Ashram School	Mirginendi PUPS	Sarangarh PS
Suanpal Ashram School	Purunapani PS	Pahadbhanga PS
Gudgudia UP School	Barakamunda PS	Halpur PS
Padampur UGUP School	Jalada PS	Birajadunathpur PS
Jashipur High School	Ramjodi PS	Chadeibhol PS
Jamukeswar Primary School	Budhigaon NPS	Murgapat PS
Angarpada Sebaasharm	Shyamchandrapur PUPS	Kathakaranjia PS
Dhatikia PUPS	Badadeuli PUPS	TintiaUGME
Tikarpada ME School	Bhanra Hudisahi NPS	Nuadeogaon PUPS
MatiagorhPrimary School	Bhanraposi NPS	Purunadeogaon PS
Singarpur Ashram School	Mandua PS	Dari Nodal UPS
Madarangajodi UGUP school	Mandua Nayak Sahi NPS	Thianali NPS
Mahulpoda Primary School	Kuduma PS	Badagaon NUPS
PanthoPrimary School	Pokamunda PS	Sanagan PPS
Kadadiha UP School	Kalikapur PS	MalharpadaNUPS
Sannoi High School	KudarSahi PS	Batagoudgaon PS
BadnnoiPrimary School	Tikasil PS	Batatainsira PS

Sannoi Girls High School	Padeidhuda NPS	Karadia PS
BaliposiPrimary School	Paudia NPS	Tulasiposi NPS
JamunaliaNUPS	Miludihi PS	Raitalia NPS
SingdaNUPS	Jarasahi PS	Nuagaon NPS
Singda High School	Hatisalbeda NPS	Khandiadar PS
KumbhirdaNUPS	Kendumundi PS	Thakurmunda Girls HS
Kumbhirda High School	Bisipur UGUPS	Thakurmunda New Govt. HS
Jambdapal PUPS	Khenjhara PS	Bharandia NUPS
Maa Kichakeswari HS	Kadalibadi NPS	Kaleijau PS
Sukruli Govt. High School	Dhatikibeda NPS	Nuapada NPS
Pandarsil NUPS	Rengalbeda NPS	
Teranty UGUPS	Jamunalia	
Hatigoda AS	Vejidiha PS	
Pahadpur NPS	Kirkichipal PS	
Padiabeda PS	Daunlikila PS	
Burudihi NPS	Khadipal PS	
Baliposi UPS	Chaibainsi PS	
Ghulghulia NPS	Kasibeda NPS	
Satkosia AS	Ladusahi NPS	
Kendujiani HS		
Sunariposi PS		
Nihangondi NPS		
Digdhor HS		
Taramara HS		
Jarak HS		
Khumthan PS		
Purunapani NPS		
BaunpaniUGUPS		
Akhapalan AC, HC		

Table No. 20.3

Farm Forestry details under OFSDP-II, Karanjia Division, 2020-21

Name of the DMU (Division)	Name of the FMU (Range)	Name of the VSS	Total		
			No of Beneficiary	Area	No of Seedling
Karanjia	Dudhiani	Tulasiposi	5	2.25	2250
		Tato	20	6.52	6520
		Purunapani	37	22.86	11837
		Nuagaon	11	6.22	6220
		Kuita	37	9.9	8820
		Kenjra	4	0.9	900
		Jharbeda	16	17.2	3493
		Jarali	5	1.09	713
		Kathakaranjia	80	23	11791
		Biunria	30	13.12	5311
		Kadamadak	13	8.12	3094
		Mota	19	5.84	4280
		Siramanipur	17	6.2	2480
		Dumuria	9	5.57	5570
		Chanchabani	10	12	7848
		Tainsira	40	21.95	14355
		Gudidiha	9	5.056	2022
		Total:-	**362**	**167.8**	**97505**

Table No. 20.4

Raising of Nursery 6 month old seedlings through VSS Under OMBADC Scheme.

Name of the Range	Location	Number
Dudhiani	GoudgaonVSS	8600
	PadampurVSS	8600
	ChhadbanVSS	8600
	ChhamundiaVSS	8600
	BadmarandaVSS	8600
	Total:-	**43000**

All the seedlings have been distributed among the beneficiaries for planting in their private land. Apart from this 1840300 nos. of seedlings have been distributed among beneficiaries in last 10 years under different schemes for planting in their private land.

20.6.2 Silvicultural System

The silvicultural system to be adopted is Rehabilitation and restocking through artificial regeneration.

20.6.3 Rotation Period

Rotation period depends upon trees planted.

20.6.4 Harvestable Diameters

Harvestable Diameters depends upon trees planted.

Species	Exploitable Diameter (in Cm.)	Remarks
Acacia auriculiformis	90	
Azadirachtaindica	180	
Gmelinaarborea	120	
Anacardiumoccidentale	After Fruit Bearing	Tree will not be felled as long as fruiting continues.
Fruit trees	After Fruit Bearing	

20.6.5 Reducing Factors and Reduced Areas

The objective is not harvesting of timber. Hence no reducing factor has been defined.

20.6.6 Treatment Cycle

A treatment cycle of 10 years is prescribed for this working circle.

20.6.7 Division into Periods and Allotment to Periodic Blocks (PB)

Periodic block is not prescribed in this working circle.

20.6.8 Calculation of Yield

No yield is calculated as no harvesting is prescribed.

Only in case of cyclone or illicit felling the trees are

Removed.

20.6.9 Table of Felling

Only in case of cyclone or illicit felling the trees are removed and table of felling is prepared.

20.6.10 Method of Executing Felling

The dead and up-rooted trees to be marked and felled.

20.6.11 Subsidiary Silvicultural Operations

Cleaning and Thinning

Cleaning after cyclone damage, thinning in congested areas and artificial regeneration is prescribed.

Climber Menace

At present approximately 1% of existing trees are affected by climber in areas away from habitation. Climber is not a major problem for Trees outside Forest.

Weed Growth

Unwanted plants are common in the ground flora. During rainy season vast numbers of weeds grow in the plantation floor of ToF. Weeds tend to interfere with the growth of trees of favoured species. Annual weeds die during the month of February. Dry weeds invite forest fire, which partly burns regenerations and saplings. Hence weeding at least once in a year in the month of October is advised before application of manure.

Grass Invasion

Different grasses are seen in patches on the forest floor. Grasses grow faster in small gap or in open space, which causes heavy grazing. Recruits are either suppressed by grasses or damaged by grazing.

20.6.12 Regeneration

Status of Regeneration

The tree outside forest area does not have sufficient regeneration. The renewal of forest crop purely depends on nature. The young shoots are affected due to frequent grazing. Therefore artificial regeneration is the Primary method adopted to regenerate the crop.

Artificial Regeneration

The renewal of ToF crop is done through planting of seedling / Twig / Rhizomes or through sowing of seeds. Gaps are noticed in almost all ToF areas. It is advised that the Forest Department /with the local people plant the permanent gaps through artificial regeneration.

Nursery

Seedlings can be distributed at a concessional cost through temporary/ permanent/ central nurseries.

Treatment Map

When the plantation is facilitated by Forest Department, a treatment map shall be prepared along with a statement showing estimates of financial requirement and calendar of operations.

This job shall be done by an officer not below the rank of a Forest Ranger and checked by an Assistant Conservator of Forests. This work shall be completed by the end of the October of the year proceeding to the year of plantation.

Planting

Planting shall be taken up immediately after onset of monsoon and completed by second week of July. The number of plants per hectare to be planted will be decided by the DFO. Required dosage of insecticides and fertilizers shall be applied after weeding during planting process.

Plantation Journal

When the plantation is facilitated by Forest Department, a separate plantation journal shall be maintained at Range level. The form prescribed in Orissa Forest Plantation Manual-1977 will be followed.

The observation of the Inspecting Officer will be written in form No. 4 prescribed in the Manual.

Research Needs

There is necessity of Research on cultivation of tree species in a row / in double row and compatibility of cultivating agricultural crops between two rows of tree crops.

Special Grant

Under exceptional circumstances, this Division may receive special grants for development of infrastructures, improvement of Jahira, plantation under diversion of forest land etc. beyond the financial forecast during the Plan period. In any circumstances, plantations generated through utilization of special fund will not be exploited for petty felling.

Deviation

All prescriptions prescribed in ToF shall be followed, so that any deviation with reference to harvesting of the forest produce will not arise. Due to unavoidable circumstances if it is necessary to harvest the forest produces out of the prescriptions then the Head of the Forest Division shall order for such harvest based on sufficient reasons.

Control Form

When the plantation is raised by Forest Department it is prescribed to maintain 03 numbers of control forms during each Working Plan year, which start from 1st July to 30th June.

Fuel wood

The fuel wood produced in ToF may be shared with the local people protecting the forest by constituting VSS/ CFM. In case there is no VSS/ CFM, OFDC Ltd. may be asked to take delivery of the fuel wood and the royalty can be deposited with department owning the land. At present OFDC Ltd. retail sale depot for fuel wood is located at Banasahi, Karanjia. It is proposed to have sale depot in each Range to meet the demand of local people. When the local people of this area will not be able to pay the rate fixed by OFDC Ltd. for firewood, the OFDC Ltd. should supply fuel wood at a concessional rate to the local people.

Matured Eucalyptus, Acacia and other fuel wood plantations in ToF, which have reached harvestable age and are fit for exploitation, may be worked as per approved procedure.

Bamboo

Natural bamboo is not available in forests of Karanjia Forest Division. Bamboo plantations have been raised by local people with assistance of Forest Department and OBDA at various locations in private land. Bamboo is cultivated in private holding in a large scale. *Bambusatulda, Bambusa vulgaris* and *Bambusanutans* have been declared as permit free species. Procedure for harvest of bamboo will be explained to the owners of bamboo plantations for scientific harvest.

20.6.13 Associated Regulations and Measure Method of Executing Usufructuary Benefits to Vana Surakhya Samiti:-

In Tree outside Forests, when the Vana Surakhya Samiti / Community Forest Rights holder are protecting the forest in non-forest Govt. land, they will enjoy usufructuary benefits provided they discharge their duties and responsibilities as laid down in the Scheme. The VSS members/ CFR holders will not get the benefits from ToF unless they actively protect the forest and wildlife. Further duties and responsibilities in the task of regeneration and protection of the forests should be intimated by DFO through Range Officer to the executive body of Samiti/ Committee/ CFR groups from time to time. The executive committee of VSS/ CFR group will be responsible for distribution of the usufructs equally among the members, each household being treated as one member. If a particular household has

not discharged the duties and responsibilities assigned to him, the executive committee may lessen or do away with its share through resolution.

Usufruct like leaves, fodder, grasses, thatch grasses, broom grasses, thorny fencing materials, brush-wood and fallen lops/ tops/ twigs used as fuel-wood shall be available to the members, free of cost. Other usufructs like kendu leaves can be collected by the members, but these will have to be delivered to the Departmental agency / lessee against payment of prescribed wages for the collection and delivery. All intermediate yields in shape of leaves, small wood, poles, fire wood etc. as may be obtained in silvicultural operations will be equitably distributed among the members by the executive committee.

Timber and poles as may be obtained from a major harvest or final felling shall be shared between the Forest Department and the Vana Surakhya Samiti in equal shares. The executive committee on behalf of the Samiti will have the option either to distribute the said 50 per cent of the total produce among the members of the Samiti in equal shares or to request the Forest Department to dispose of the same and make the net sale-proceeds available for distribution among the members.



CHAPTER-21

APPLICATION OF MODERN TECHNOLOGY TO FOREST MANAGEMENT

21.0 Introduction:-

A number of popular technologies are currently being used in the field, but Geographic Information Systems (GIS) and Global Positioning System (GPS) rank at the top. Pick up a modern smart phone and you'll see how far this technology has come in just a short period of time. For modern foresters and loggers, an array of similar handheld receivers can be used to download data gathered from GPS, which can then be input into databases that combine it with other GIS information. This data can then be added directly into spreadsheets, modeling programs, visualization applications and mapping projects. Such technology helps foresters and loggers monitor and analyze timberland health, improve transportation routing, track forest growth and maintain a database of timberland changes.

LIDAR technology (Light Detection and Ranging) is also beneficial for modern foresters, which collects tree measurements and detailed imaging.

While traditional prisms are still valuable tools, LIDAR helps to measure canopy heights and volume, basal areas and habitat mapping.

Drones are also proving to be increasingly valuable to foresters. While drones are still considered to be a hobbyist toy by many, forestry professionals use them to help with forest management planning, detecting disease and managing forest fires. For large properties, drones are a great device for assessing volume and the overall condition of tree plantations.

Most of these tools have practical applications on the ground and in the field, which result in real-world information that cannot be replaced. However, combining this information with the detailed, customizable datasets that are available in SilvaStat360 allows foresters to apply context to the information they gather in the field so they are better equipped to make more informed decisions.

All of these technologies provide incredible benefits to the forestry industry and the pace of exciting, new technological developments continues to quicken. Members of the modern forest supply chain who embrace and utilize these technologies will be well-positioned to succeed in the modern global forest economy.

21.1 Modern Technology being adopted:-

At present the Forest Officials are quite conversant with the following technology and frequently using for forest management. These are

- Use of Global Positing System (GPS) in survey, Demarcation & locating the specified spot.
- Use of Differential Global Positing System (DGPS) for survey of Forest blocks / area with an exact accuracy of 95% level.
- GIS applications for map study / Map preparation etc.
- Study and use of Satellite Imagery for detecting vegetation change, degradation of land / vegetation.
- Use of Satellite imagery for detection of Fire and faster communication of location of incidents.

- Clonally Propagation with mist chamber facilities for better genetically improved seedlings for plantation purpose.

Root trainer nursery for mass seedling production.

- Use of Sprinkler for watering in Nursery.
- Use of blowers, Chemical fire extinguisher to combat Forest fire.
- Various mobile applications, Satellite telemetry, Infrared radio collars to monitor animal movement & reporting.
- Use of Bioacoustics machine, Trip alarm system, scare away multiboring guns etc. are being used as elephant human conflict mitigation measures.

The available technology at the hands of Forester, as stated above are not used / applied in an extensive manner that is required & desirable. During this plan period it is expected that each forester in field should have access to all these facilities and use them for day to day management.

21.2 Modern Technology to be introduced in Forest Management:-

With advancement of technology it is proposed to have the following facilities available with Karanjia Forest Division for better management.

a. Identified Plus trees within the Division and maintaining a Clonal Orchard.

b. To have improved Mega Hi-tech Nursery with clonal propagation facilities with mist chamber, Sprinkler System.

c. Root trainer facilities and capacity to meet requirement of Quality Planting Materials (QPM) for the division instead of depending upon temporary nursery.

d. All forest blocks / plantations to be surveyed with DGPS and mapping thereof.

e. Establishment of GIS Cell with available Satellite imagery for monitoring purpose at Divisional and Range level.

f. Modern logging tools to meet emergency in **Post Cyclone Management**.

g. Drone camera facilities to watch forest fire, wildlife movement and winter bird's congregation & problems.

h. Use of Tranquilizing guns and drug and other rescue equipment's for dealing with problematic Wild animals.

i. Use of Red Dot Sight and Laser Range Finder.

j. Night vision Binocular.

k. Trap- Cameras, Mega phone with Siren, Public Portable Address Sound system.

l. Use of VHF fixed set and Hand held set for communication.

CHAPTER -22

REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION (REDD+)

22.1. Introduction:-

REDD+ stands for countries' efforts for "Reducing Emissions from Deforestation and Forest Degradation", and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks. Deforestation and forest degradation are the second leading cause of global warming, responsible for about 15% of global greenhouse gas emissions, which makes the loss and depletion of forests a major issue for climate change. In some countries, such as Brazil and Indonesia, deforestation and forest degradation together are by far the main source of national greenhouse gas emissions.

Eighty percent of the Earth's above-ground terrestrial carbon and forty percent of below-ground terrestrial carbon is in forests. In addition to the large contribution of deforestation and forest degradation to global emissions, combating both has been identified

as one of the most cost-effective ways to lower emissions.

Deforestation and forest degradation are responsible for about 15% of global greenhouse gas emissions.

Currently, there appears to be a consensus that the issue of deforestation and forest degradation must be effectively tackled as it would otherwise limit the options available to reduce greenhouse gas emissions, greenhouse gas concentrations and increases in temperature to acceptable levels. Any reduction in the rate of deforestation and forest degradation has the benefit of avoiding a significant source of carbon emissions and reducing other environmental and social problems associated with deforestation.

Unlike afforestation and reforestation activities, which generally cause small annual changes in carbon stocks over long periods of time, stemming deforestation causes large changes in carbon stocks over a short period of time. Most emissions from deforestation take place rapidly, whereas carbon

removal from the atmosphere through afforestation and reforestation activities is a slow process.

In addition to mitigating climate change, stopping deforestation and forest degradation and supporting sustainable forest management conserves water resources and prevents flooding, reduces run-off, controls soil erosion, reduces river siltation, protects fisheries and investments in hydropower facilities, preserves biodiversity and preserves cultures and traditions. With all that at stake it is clear what has to happen. With all the services that forests provide both to humanity and the natural world, there is now widespread understanding of a simple yet profound fact that forests are more important left standing, than cut. Out of that understanding, the Forest Carbon Partnership Facility have come up.

Country commitments to mitigate and adapt to climate change are an integral part of the 2030 Agenda for Sustainable Development with its 17 global goals that countries have adopted to guide development efforts. The REDD+ mechanism contributes directly to achieving Sustainable Development Goals (SDGs) 13 and 15. Those address climate change, reducing deforestation and

sustainable use of ecosystems. REDD+ can also contribute to achieving other SDGs – including those which address poverty reduction, health and well-being, hunger alleviation, and improving institutions.

22.2 FAO's support to countries' Nationally Determined Contributions (NDCs):-

With FAO's technical support, countries can use REDD+ actions as catalysts to deliver on their Nationally Determined Contributions (NDCs) towards climate change mitigation and adaptation. Agriculture, Forestry and Other Land Use (AFOLU) are among the climate actions that most countries have included their NDCs, which underscores the important role these sectors play in climate change mitigation and adaption. Many NDCs have also made specific reference to REDD+ plans, offering an opportunity to mainstream REDD+ and climate efforts into countries' national planning processes and ultimately, actions on the ground.

22.3 REDD+ Implementation:-

FAO's support to countries is based on technical expertise in assessing the drivers of deforestation and forest degradation and finding opportunities for

forest carbon conservation, management and enhancement. FAO also helps countries design and implement REDD+ mitigation actions, which offer both carbon and non-carbon benefits, taking advantage of cross-sectoral expertise and building on existing experience. FAO works to strengthen collaboration with other initiatives and helps to promote public-private partnerships to scale up investments on REDD+ implementation.

22.3.1 Country highlights:-

Equatorial Guinea highlights the transformational role of women in climate action. Aiming to address gender inequalities and strengthen women's contributions to the planning of national climate action, Equatorial Guinea organized a national workshop with the participation of 53 women representing various sectors and social groups. The workshop complemented an ongoing participatory process to develop the country program for the Green Climate Fund (GCF), which defines the national priorities to contribute to the global fight against climate change, and ways to translate these priorities into projects to be submitted to the GCF.

The 21st session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) was held in Paris in November and December 2015.

All together 195 participating countries negotiated and adopted the Paris Agreement, which includes objectives to peak greenhouse gas emissions as soon as possible, to limit the global average temperature increase above pre-industrial levels to well below 2°C, and to pursue efforts to limit the increase to 1.5°C.

The Paris Agreement, which entered into force on 4 November 2016, requires Parties to put forward their best efforts through "Nationally Determined Contributions" (NDCs). These NDCs represent targets and actions for the post-2020 period. India ratified its' contribution the 2 of October 2016.

22.3.2 India's first NDC includes commitments:-

Our country's commitment for **"Nationally Determined Contributions" (NDCs) are**

- To reduce the emissions intensity of its GDP by 33-35% from 2005 levels by 2030.
- To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based

energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).

- To create an additional carbon sink of 2.5 to 3 billion tons of CO_2 equivalent through additional forest and tree cover by 2030.
- To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.

India announces its INDC, pledges to cut emission intensity of its GDP by 33-35 per cent by 2030. All countries are required to submit voluntary climate action plans as contribution. These will form part of the outcome of Paris climate summit. India's INDC is fair, and its renewable energy and forestry targets are ambitious, says CSE Ahead of the UN Conference of Parties on Climate Change, scheduled in December 2015 in Paris, India on Sunday submitted its Intended Nationally Determined Contribution (INDC) to the secretariat of the United Nations Framework Convention on. Climate Change (UNFCCC). Delhi-based non-

profit Centre for Science and Environment (CSE) has called the Indian INDC "fair" and its renewable and forestry targets "ambitious".

In its INDC, India has pledged to improve the emissions intensity of its GDP by 33 to 35 per cent by 2030 below 2005 levels. It has also pledged to increase the share of non-fossil fuels-based electricity to 40 per cent by 2030. It has agreed **to enhance its forest cover which will absorb 2.5 to 3 billion tons of carbon dioxide (CO2, the main gas responsible for global warming) by 2030.**

India has accepted the huge impact that climate change is exerting and will exert on different sectors of its economy and has agreed to enhance investments to adapt in vulnerable sectors like agriculture, water resources, coastal regions, health and disaster management.

India has also reiterated its need for international finance and technology support to meet its climate goals. In this regard, it has said it would require at least US $ 2.5 trillion (at 2014-15 prices) to meet its climate change actions between now and 2030.

India's forestry target is also very ambitious. It intends to create an additional carbon sink of 2.5 to

3 billion tons of CO_2 through additional forests by 2030.

Talking about the efforts already in the pipeline, the government highlights.

- India's National Solar Mission,
- Green Energy Corridor projects,
- Swatchh Bharat,
- National Air Quality Index,
- Smart Cities,
- Paramparagat Krishi Vikas Yojana,
- Soil Health Card Scheme,
- Pradhan Mantri Krishi Sinchayee Yojana,
- National Mission for Clean Ganga etc. among others.

22.3.3 Indicative Work plan to combat Climate Change:-

- Government harps on sustainable lifestyle to fight climate change.
- Promising raising requisite funds and adopting new technology.
- More focus on agriculture, water resources, coastal regions, and health and disaster management.
- To tackle climate change by adopting healthy and sustainable lifestyle, which were "inherent in traditions and values of conservation & moderation.

- To reduce consumerism in our lifestyle & reduce to reduce per capita consumption by not wasting food and limiting the number of durables / cars per household.
- To have ambitious focus on energy efficiency and dramatic increase in renewable energy.
- To enhance dependency on non-fossil fuel-based energy.

22.3.4 Suggestive measures on Forestry Sector.

In forestry sector to combat climate change the following activities are suggested.

a) To reduce felling of trees in all sphere and enhance creation of renewable energy.
b) To reduce dependency on fossil fuel including that of firewood.
c) To enhance use of solar energy / wind energy where ever possible.
d) To motivate people to reduce consumerism & reduce generation of solid waste.
e) Conserve water body and enhance efficient use of water.

CHAPTER-23

GENERAL

23.1 General financial forecast and financial plan of Operation;

Considering the prescriptions in various working circles, the activities involve & its quantum of operation with financial forecast at the present price level is furnished at **Table no 23.1**

Table No 23.1

Financial forecast of Karanjia Division.

Sl. No.	Name of Working Circle	Suggested area of operation. In Ha	Per unit Cost norm in Lakh Rs	Total amount in Lakh Rs
1.	**Selection Working Circle**			
a	Demarcation of area	28995.78	@0.3 lakh /- per ha as per ANR without gap prescription.	8698.734
b	SMC			
c	Closing to Grazing & Fire Protection			
2.	**Rehabilitation WC**			
a	RDF activities	12854.23	@Rs61000/- per ha	7841.074
b	Treatment to natural seed origin seedlings	12854.23	@Rs1000/- per ha	128.542
3.	**Plantation WC**			
a	Replanting of VF	401.21	@Rs2.00 Lakh	802.42

Table No 23.1

Financial forecast of Karanjia Division.

Sl. No.	Name of Working Circle	Suggested area of operation. In Ha	Per unit Cost norm in Lakh Rs	Total amount in Lakh Rs
b	Old Plantations	1030.6	@0.3 lakh /- per ha as per ANR without gap prescription.	309.18
4.	**NTFP(O) WC**			
a	In situ conservation		LS	50.00
b	Ex- situ conservation	100.00	@2.00 lakh per ha	200.00
c	Demonstration Plot		LS	40.00
5.	**Wildlife (O) WC**			
a	Creation of Water body	100 no	@6.00 Lakh	600.00
b	Wetland Management	2	@15.00 Lakh	30.00
c	Grass Land Development.	100 ha	@50,000/-	50.00
d	Public Awareness	50 Nos.	@35000/-	17.50
6.	**JFM (O) WC**			
a	Training of VSS members		LS	50.00
b	Audit of VSS Account & Documentation.		LS	50.00

7.	**REDD+**			
a	Reduce dependency on fossil fuel including that of firewood		LS	100.00
b	Use of solar Energy		LS	100.00
c	Public awareness		LS	50.00
8.	**Application of Modern Technology**			
a	Plus Tree / Clone Orchard		LS	100.00
b	High tech Nursery		LS	150.00
c	GIS Cell & Drone camera		LS	40.00
			Total:-	**19886.83**

(NB: The financial requirement to implement the plan prescription is* 19886.83 *lakhs at the present price level on a holistic approach. Basing on Wage escalation, the cost of implementation will be hiked by minimum 20% of the estimated cost.)

23.2 Source of Funding:-

The division receives funds from State Plan, Central Plan, CAMPA Fund, OMBADC, GIM, National Afforestation Program (NAP), MGNREGA etc. The level of present resource allocation is to a tune of 8.00 Crore to 10.00 Crore. Govt. is putting more thrust in plantations and rehabilitation of degraded forests. Resources to a tune of Rs19.00 crores to 20.00 crores annually will not be a constrain. Hence it is expected to implement the plan prescription in totality will not be a problem.

23.3 Petty felling and Extraction:-

Petty Felling and extraction for research and training needs may be allowed by Divisional Forest Officer on academic interest. It is necessary to emphasize the fact that experimental, preservation and sample plot, seed stand and their demarcated surrounds, etc. are excluded from all operations prescribed in the working plan. Special grants in exceptional circumstances for maintenance of these may be allowed, which do not cause much deviation.

23.4 Rights and Concessions:-

At present Rights & Concessions those are allowed are

i) Right of Way on Forest Blocks,

ii) Collection of Non Timber Forest Produce as admissible in JFM Resolution-2011

iii) Rights on Forest land either individual or Community to be allowed as per provisions of Forest Rights Act,2005 / Rules,2006

No other rights & concessions are allowed at this stage.

23.5 Other research and Bio Diversity study:-

It is proposed to have a detail Biodiversity Study for Forest blocks coming within buffer zone of Similipal Tiger Reserve, Development plan for Elephant Corridors and assessment of NTFP in Karanjia Division.

Some suggested Research proposals:-

1. Regional Changes in Species richness and diversity.
2. Study of Prey base density with respect of tiger habitat.
3. Study on ethnobotany and Traditional knowledge of indigenous people.
4. Monitoring population of flag ship species and other endangered species.
5. Identification of Wildlife corridors and management strategies.
6. Floral diversity of Karanjia Division.
7. Bird diversity of Karanjia Division.
8. Survey of roosting sites of bats in Karanjia Division.
9. Status and extent of Human- Elephant conflict in Karanjia Division.

CHAPTER-24

MISCELLANEOUS REGULATIONS

24.1 Besides the Working Plan Prescription various miscellaneous regulation in form Acts/ Rules / administrative directives are framed and being implemented by the Forest Department for better management of Forest & Environment.

1) Forest (Conservation) Act, 1980;
2) Environment Protection Act, 1986.
3) Biodiversity Act, 2002.
4) Forest Rights Act, 2006
5) Wildlife (Protection) Act-1972 amended.
6) Odisha Forest Act- 1972 amended.

CHAPTER-25

WATER RESOURCE MANAGEMENT

25.1 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.

25.2 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.

25.3 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 0.85^0 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.

25.4 MANAGEMENT OF WATER

The main source of water regime of this Division comprises of the drainage system of river, nallas and some perennial streams. Khairi, Bhandan, West Deo, Salandi, Goharjhora, Tel and Sim flow ultimately into the Baitarani. The rivers are known by different names in different regions through which it passes and are perennial in nature due to their origin from Similipal hills. Many Nallas and Streams enrich the above river system.

Mayurbhanj district have nine major perennial rivers namely

Budhabalanga, Deo, Sunei, Gangahar, Jambhira, Kharjhai, Khairibhadan, Bankabal, Katara and their tributaries, which originate mainly from Similipal Hills. These provide a good perennial water resource throughout the district. The Budhabalanga is the main river which rises from the Similipal Hills and flows about 90.00 Km through the district. Katra, Palpala and Chipat hill streams are its important tributaries. The river Baitarini divides the districts of Mayurbhanj and Keonjhar. The river Subarnrekha meanders through the States of Bihar, West Bengal and Odisha. However, only 23.4% of the net sown area is irrigated and the farmers mostly depend on the monsoons for a normal harvest. The need for expansion of irrigation facility is highly essential for the socio-economic development of the people. There is a great scope for exploitation of irrigation potential for the all-round benefit of the farmers. Besides, there is a tremendous scope for fresh water fishery through scientific pisciculture and exploitation of captive fishery. Judicious management of water resources will not only help us to regenerate our forests resources but also it will help in raising water table of that region and supplement in watershed management and its better functioning for agriculture, horticulture etc. All the forestry activities and land use plan should be made on micro watershed basic, so as to get good results. In Karanjia NAC area drinking water facilities have been made.

25.4.1 Temperature and Precipitation: -

The maximum temperature during hot weather rises up to 48.9^0 C (120^0F), while the minimum temperature during cold weather comes near about 4.4^0C (40^0F). The relative humidity varies from 25.0% to 82.5%. The mean temperature is found to vary from 21^0 C to 29^0 C. Due to proximity to the sea the humidity is higher on the Southern side. Portions of Panchipir Sub-Division and Similipal hills are cool in summer than other Sub-Divisions of the district. There is occurrence of heavy dew in the central highlands and in the forest clad areas in the southwest.

The district Mayurbhanj comes under "North Central Plateau agro-climatic region with an average rainfall of 1648.20 mm per annum. Being away from the coastal belt, the district experiences a sub-tropical climate with a hot summer, chilling winter with good precipitation.

25.4.2 Ground Water Level:-

The water table in most of the areas goes down as low as 9.5 meter from the ground level. Scarcity of water is acutely felt all over the division during summer season.

As per Ground water booklet of Mayurbhanj district, the depth to water level map for pre and post monsoon periods 2011 are prepared based on the ground water monitoring data of 77 Nos. of National Hydrograph Stations of C.G.W.B. monitored during the month of April and November 2006 are presented in Plate 2 Plate 3 respectively. The pre and post monsoon depth to water levels in the district range from 3.54 to 14.50 m below ground level and 1.39 to 8.20 m below ground level respectively. It is observed that during pre-monsoon about 75% of the total areas show the water level varying between 5 to 10 m below ground level. During post monsoon nearly 60% of the area has water levels within 2 to 5 m, while the 10 rest part has between 0 to 2 and 4 to 6 m below ground levels.

As per the ground water resources assessed during 2009, the net ground water resources availability in the district are 148194 ham. The block wise ground water resources are given in Table 3. 6365 ham of the total ground water is used in domestic and industrial water supply. The existing gross ground water draft for irrigation in net terms is 33963 ham. The Net ground water availability for future irrigation development 106150 ham. Over all the present level of

ground water development is only 27.21 percent in the district with the maximum in Badasahi block viz. 64.65% and minimum in Bijatala block (9.79%). Hence the district as well as all the blocks come under the white category.

Sl. No.	Block	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic & Industrial Supply	Existing Gross Ground Water Draft for all uses	Provision for domestic & industrial requirement supply for next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development
		(ham)	(ham)	(ham)	(ham)	(ham)	(ham)	(%)
1	2	3	4	5	6	7	8	9
1	Badasahi	7739.00	4675.07	327.99	5003.00	472.00	2592.00	64.65
2	Bahalda	5809.00	1227.00	385.51	1612.00	273.00	4309.00	27.75
3	Bangiriposi	4185.00	1095.00	283.61	1379.00	334.00	2755.00	32.95
4	Baripada	5546.00	898.00	457.65	1356.00	562.00	4086.00	24.45
5	Betnoti	8837.00	3780.00	319.42	4099.00	468.00	4589.00	46.38
6	Bijatala	8388.00	640.00	180.18	821.00	223.00	7524.00	9.79
7	Bisoi	4049.00	398.00	174.05	572.00	240.00	3411.00	14.13
8	Gopabandhu Nagar	3477.00	981.00	188.00	1169.00	240.00	2256.00	33.62
9	Jamda	2054.00	251.00	163.34	414.00	202.00	1601.00	20.16
10	Jashipur	6154.00	1329.00	228.12	1557.00	320.00	4505.00	25.30
11	Kaptipada	8477.00	1285.00	411.05	1695.00	478.00	6714.00	20.00
12	Karanjia	5227.00	847.00	295.03	1142.00	375.00	4005.00	21.85
13	Khunta	6673.00	1211.00	238.30	1449.00	246.00	5216.00	21.71
14	Kuliana	6169.00	1227.00	223.65	1451.00	319.00	4623.00	23.52
15	Kusumi	9054.00	853.00	208.46	1061.00	298.00	7903.00	11.72

Sl. No.	Block	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic & Industrial Supply	Existing Gross Ground Water Draft for all uses	Provision for domestic & industrial requirement supply for next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development
		(ham)	(ham)	(ham)	(ham)	(ham)	(ham)	(%)
16	Moroda	6778.00	1829.00	252.30	2082.00	338.00	4611.00	30.72
17	Rairangpur	6881.00	784.00	213.48	997.00	280.00	5817.00	14.49
18	Raruan	2699.00	684.00	155.00	839.00	213.00	1802.00	31.09
19	Rasgovindpur	7191.00	2763.00	223.00	2986.00	303.00	4125.00	41.52
20	Saraskana	4821.00	1221.00	244.00	1465.00	323.00	3277.00	30.39
21	Shamakhunta	7625.00	710.00	197.86	908.00	256.00	6659.00	11.91
22	Sukruli	2049.00	687.00	149.00	836.00	189.00	1173.00	40.80
23	Suliapada	5017.00	1911.00	253.79	2165.00	336.00	2770.00	43.15
24	Thakurmunda	7284.00	983.00	249.11	1233.00	332.00	5970.00	16.93
25	Tiring	1266.00	330.00	134.00	464.00	177.00	759.00	36.65
26	Udala	4745.00	1364.00	210.00	1574.00	283.00	3098.00	33.17
	District Total:-	**148194.00**	**33963.07**	**6365.90**	**40329.00**	**8080.00**	**106150.00**	**27.21**

25.4.3 Management Intervention: -

1) Intensive groundwater exploration should be taken up to delineate deeper potential water saturated fracture zones and to compute aquifer parameter.

2) Large scale planning for ground water development should be preceded by intensive hydrogeological and geophysical surveys aided by remote sensing studies.

3) Effective measures may be taken to conserve the surface run off by contour bunding at suitable sites. Also, proper maintenance of reservoir, tanks and spring channels by periodical desilting should be carried out.

4) Existing dug wells should be deepened to tap the maximum saturated thickness of the weathered mantle or vertical bores may be drilled through the bottom to enhance the well yield.

5) Energization of wells already constructed should be stepped up to ensure optimal utilization of the irrigation potential already created.

6) The farmers should be educated through agricultural extension services for adopting suitable cropping pattern for optimal utilization of available groundwater resources.

7) Programmes for artificial recharge may also be taken up for augmentation of groundwater through construction

of percolation tanks, subsurface dykes, and check dams and through contour bunding etc.

8) An intensive network of groundwater monitoring stations is required to be established in the command areas of irrigation projects to monitor the changes in groundwater regime consequent on application of surface water irrigation.

CHAPTER -26

SUMMARY OF PRESCRIPTION

Plan is an elaborate document in which facts, figures and features of operation have been described in detail. Very often the necessity is felt to find out a concise version of any particular operation just through glimpse of the plan. So, a synopsis of the prescription is required to cater this need. It is not only intended for senior officers but also quite useful to the field functionaries for quick reference.

Chapter	Heading		Prescription	Para
Basic of Proposal	Objective of Management	**1**	(A) The general objects to be followed for managing the forests in this revision are in conformity to the National Forest Policy and priorities laid down in this regard. (B) Within the last couple of decades' numbers of conferences on Environment conservation, combating greenhouse gas (GHG) emission and REDD+ have guided the planners around the world to look into the role of forest in combating global warming and climate change and management is oriented accordingly. Keeping in view the above-mentioned aspects the objectives of the plan are as follows - ***Dynamics of Forests and Stands:***	**13.1**

Chapter	Heading		Prescription	Para
			To maintain tree species diversification, to maintain perpetual closed canopy on the hill slopes and catchments etc. ***Forests and Soil*:** To maintain the soil structure and texture by arresting erosion, to boosts up soil vitality by facilitating the growth of microorganism, like earthworm and termites to piles up humus in the forest floor etc. ***Forests and Water*:** To protect the existing riparian areas by guiding the rainwater to percolate inside the earth by adopting suitable means and recharging the groundwater in perpetuity and to protect road/stream interfaces. ***Forest Biodiversity*:** To protect and manage wildlife with view to conserve biodiversity, to maintain the amounts of all habitats at all times, to maintain critical habitats for key species, to maintain reserve areas, Old forest reserves etc. ***Climate and Forests*:** To maintain low wind and fire risk, to maintain the carbon budget by adopting integrated effort to sink more and release less carbon etc.	

Chapter	Heading		Prescription	Para
			***Socioeconomic considerations and generation of forest-based employment opportunities and livelihood options*:** To ensure people's participation in forestry activities, to educate children and the wider public about the forest etc. ***Tool for integrated development*:** To enhance the forest cover and productivity of the forests through application of scientific and technical inputs, to meet the growing needs for essential goods and services which the forests provide etc.	

Chapter	Heading		Prescription	Para
	Method of treatment to be adopted	**2**	Specific treatment has been prescribed on the basis of forests, water shed, composition of crop, crown density, types of soil, configuration of ground, nature of degradation, ecological succession, biodiversity of the area, climate, biotic interference and other facts operating in the area. Following assumptions are further made: - Population of man and cattle has to be regulated, sufficient budgetary allocation is provided to implement the prescriptions of the plan staffing and legal support is given etc.	**13.2**
	Constitution of Working Circles	**1**	Selection Working Circle	**13.3**
		2	Rehabilitation Working Circle	
		3	Plantation Working Circle	
		4	N.T.F.P. Overlapping Working Circle	
		5	Wildlife Overlapping Working Circle	
		6	J.F.M. Overlapping Working Circle	
	Name of the working circle	1	Selection Working Circle	**14.1**

Chapter	Heading		Prescription	Para
Selection Working Circle	General constitution of working circle	2	In this Circle the felling and regeneration are not confined to certain parts of the area but are distributed all over it**.** The felling consisting of the removal of single tree or small group of trees scattered throughout the forest	**14.2**
	General characteristics of vegetation	3	High forests having more crown density, perfect natural regeneration and crop of different age classes are the constituents of Selection Working Circle. The details of the characteristics of the forests have been discussed in Part I.	**14.3**
	Felling series, cutting sections and JFM areas	4	The entire area assigned to this working circle has been categorized into eight felling series.	**14.4**
	Blocks, compartments and JFM area (marked on GIS based maps)	5	Not required for this Working Circle.	**14.5**
	Special objectives of management	6	Details of objective has been prescribed	**14.6**
	Name of the working circle	1	Rehabilitation Working Circle.	**15.1**

Chapter	Heading		Prescription	Para
Rehabilitation Working Circle	General constitution of working circle	2	In this revision area assigned to the Rehabilitation Working Circle is 12854.23 Ha of area covering parts and full of 138 nos. of forest blocks. This includes 103 nos. RF, 33 nos. PRF, and 07 nos. of DPFs.	**15.2**
	General characteristics of vegetation	3	Details has been prescribed	**15.3**
	Felling series, cutting sections and JFM areas	4	Not relevant to this Working Circle.	**15.4**
	Blocks, compartments and JFM area (marked on GIS based maps)	5	Not relevant to this Working Circle.	**15.5**
	Special objectives of management	6	Details has been prescribed	**15.6**
Plantation Working Circle	Plantation working circle	1	Plantation is an important component in enriching vegetation and a tool in hands of foresters to increase basal area of the crop in a forest and increase biomass production per annum per hectare.	**16.1**
	General Constitution	2	This working Circle comprises erstwhile Social Forestry Village Woodlots declared as Village Forest under provisions of Odisha Forest Act, 1972 and blank areas identified in RF / PRF/ DPF for planting within next 10 years.	**16.2**

Chapter	Heading		Prescription	Para
	General characteristics of Vegetation	3	In Village Woodlots of Social Forestry Project, the main crop is Eucalyptus, Acacia, Simaruba and San Chakunda.	**16.3**
	Treatment Series and JFM Area	4	The area from Reserved Forests, PRF, DPF and VF are assigned to one planting series i.e. Karanjia Planting Series.	**16.4**
	Blocks, Compartments and JFM Area	5	All the areas under this Working Circle have been assigned to JFM (VSS or VFC).	**16.5**
	Special Objectives of Management	6	Details has been prescribed	**16.6**
	Plantations raised during previous working planed working scheme	7	The total plantation area raised during previous working plan i.e. 1996-97 to 2015-16 is 856.6 ha. and the total plantation area raised during working scheme i.e. 2016-17 to 2020-21 is 174 ha. The grand total of the abovementioned plantation is 1030.6 ha. and the tending series was prescribed in this working plan from 2021-22 to 2030-31.	**16.7**
	Tending Series	8	In this working plan tending series was prescribed from 2021-22 to 2030-31 for 1030.6 ha area of plantation. Old plantations were prescribed in early year of operation i.e. from 2021-22 to 2025-26 and placed in annual tending/ unit No. I – V and the new plantations were prescribed in later year of operation i.e. from 2027-28 to 2030-31 and	**16.8**

Chapter	Heading		Prescription	Para
			placed in the annual tending/ unit No. VI – X. Very new plantation raised during 2019-21 to 2020-21 were placed in annual rending series unit No. IX-X. The details of operation in tending series like Exploitable Diameters of species, Plantation Treatment Cycle, Yield Calculation, Table of Plantation Treatments, Method of Executing the Plantation Treatment, Demarcation, Site Map, Treatment Map etc.	
	Other Regulation	9	Grazing, Lopping, Fire Protection, Climber Cutting, Singling out shoot are prescribed in this regulation.	**16.9**
	Name of the working circle	1	Non-Timber Forest Produce (Overlapping) Working Circle	**17.1**
N.T.F.P. (Overlapping) Working Circle	General constitution of working circle	2	N.T.F.P. yielding species have made its presence throughout Karanjia Forest Division. A separate overlapping Working Circle would serve the purpose of assessing the production, propagation, collection and management. The Overlapping Working Circle comprises of an area of 43261.83 Ha extending over 335 forest blocks.	**17.2**
	General characteristics of vegetation	3	This is already described in the chapter 3 of the part I of the Plan.	**17.3**

Chapter	Heading		Prescription	Para
	Felling Series, Cutting Sections and JFM areas	4	Not necessary to this Overlapping Working Circle	**17.4**
	Blocks, Compartment and JFM areas	5	The area assigned to this overlapping working Circle are given in Table No. 17.1.	**17.5**
	Special Objectives of Management	6	Details has been prescribed	**17.6**
J.F.M. (Overlapping) Working Circle	Name of the working circle	1	Joint Forest Management (Overlapping) Working Circle.	**18.1**
	General constitution of working circle	2	This Working Circle is constituted for portions of Reserved Forests, Proposed Reserved Forests, Village forests, Revenue Forests etc. assigned to VanaSurakshyaSamiti (V.S.S.) spreading over 20686.50 Ha. An area of 1057.5 Ha as per notification has been allotted to this Working Circle.	**18.2**
	General characteristics of vegetation	3	The forests assigned to JFM (VSS) are mostly forest fringe area and categorized as Degraded Forests.	**18.3**
	Felling series, cutting sections and JFM areas	4	The JFM assigned area is an Overlapping Working Circle. The forests assigned to respective independent working Circle will be applicable. Mostly the forests are assigned to Selection Working circle, Rehabilitation Working Circle and Plantation Working Circle.	**18.4**

Chapter	Heading		Prescription	Para
	Special objectives of management	5	Details has been prescribed	**18.5**
	Other Regulations	6	The following other regulation are prescribed – Monitoring & Evaluation, Review, Rewards, Conflict Resolution, Convergence with other Rural Development Activities, Publicity,	**18.6**
	Name of the working circle	1	Wildlife (Overlapping) Working Circle.	**19.1**
	General constitution of working circle	2	This Overlapping Working Circle extends whole the plan area for protection of wildlife and also for promotion and conservation of biodiversity. The area extends over the entire Plan Area of 335 Forest Blocks with 43261.83 Ha.	**19.2**
	General characteristics of vegetation	3	The details of the vegetation are described in chapter 3 of Part I of this plan.	**19.3**
	Felling series, cutting sections and JFM areas	4	Not required	**19.4**
	Blocks, compartments and JFM area	5	Forest blocks allotted to this Overlapping Working Circle are given in Table No. 19.1.	**19.5**
	General characteristics of Vegetation& Fauna:	6	The vegetation of Karanjia Division has been broadly classified as Moist Deciduous Sal Forest. Under fauna - Mayurbhanj Elephant Reserve,	**19.6**

Chapter	Heading		Prescription	Para
Wildlife (Overlapping) Working Circle			Similipal Tiger Reserve, 2 No. of Elephant Corridors.	
	Special objectives of management	7	Details has been prescribed	**19.7**
	Activities of the Working Circle	8	This working circle revolves around – Human Development, Wildlife Census, Human-Animal Conflict, Wildlife Disease Management & Wildlife Habitat Relationship.	**19.8**
	Wildlife census	9	Drive Count, Roadside count, Waterhole Technique, Pellet Group Count, Camera trap Method and Bird census operation,	**19.9**
	Human-Wildlife Conflict (HWC)	10	In Karanjia Division, rural farmers suffer from conflict with wildlife because they share the landscape with wild animals. Mostly migratory elephants, Sloth Bears and wild pigs cause problems for people in Karanjia. Elephants and wild pigs generally raid crops.	**19.10**
	Wildlife Crime & Poaching	11	The wild animals commonly killed in the Division are - Barking Deer, Spotted Deer and Wild Pig.	**19.11**
	Control of Man Wild Animal Conflicts	12	Precautionary measures like raising of elephant repellent crop in the forest fringe lands and preventing the movement of elephants to the crop field through raising of some barrier like elephant proof trench shall be emphasized. Awareness campaign	**19.12**

Chapter	Heading		Prescription	Para
			shall be intensified in those villages along with imparting necessary training to drive the elephant safely into the forests. The leaflets containing suitable advice in local dialect shall be distributed in the localities. The VSS in those villages shall be activated and capacity-building measures should be taken up to tackle such situation.	
	Wildlife Disease	13	Some of the important diseases found in wild animals are – (i) Blackleg, black quarter, quarter evil, or quarter ill, (ii) Haemorrhagic Septicemia (HS), (iii) Foot and Mouth Disease, (iv) Rinderpest, (v) Anthrax and (vi) Tuberculosis.	**19.13**
	Wildlife Habitat Relationship	14	Wild animals require four basic habitats components - food, water, cover and space. The amount and distribution of these will influence the types of wildlife that can survive in an area	**19.14**
	Mismanaged habitats	15	Extensive construction of artificial water holes, water retention check dams and other water harvesting measures within elephant habitats could all reduce calf mortality and artificially augment elephant population beyond the carrying capacity of the area. "Spatial clustering of waterholes changes surface water availability, affecting	**19.15**

Chapter	Heading		Prescription	Para
			seasonal movement patterns of elephants".	
	Other Regulations	16	It includes - Infrastructure & Training, Establishment of an animal rescue-cum-rehabilitation Centre, Information Network, Record Keeping & Database, Prosecution of Wildlife Crime, Wildlife Depredation, Control of Grazing & Fire Protection Measures and Incentives & Rewards.	**19.16**
Tree Outside Forest Area	Introduction	1	Orchards of Cashewnuts have been planted through various schemes in private fields of Karanjia Forest Division and the coverage area by cashew plants is on increasing trend	**20.1**
	General Constitution of Working Circle	2	Total geographical area of Karanjia Forest Division 184578 ha out of which, 106047.66 ha Non-forest area ToF area is distributed.	**20.2**
	General Characteristics of Vegetation	3	Composition - Mango, Jackfruit, Amla, Jamun, Kurei, Dhaura, Sal, Teak, Neem, Bel etc. Distribution - Common village woodlots in non-forest Govt. land like Gochar, Smasan, Anabadi, Hills, lands under lease, Mango groves, Canal bank plantations etc. In private lands also Bamboo plantations, Eucalyptus plantations, Acacia plantations, Mango plantations and trees in private lands are available.	**20.3**

Chapter	Heading		Prescription	Para
			Density - 0.1 to 0.4 Growing Stock - open and consists mostly of inferior hardy species. Carbon Stock – details have been furnished.	
	Felling Series, Cutting Sections and JFM Areas	4	There is no felling series/cutting section & felled as per species planted and rotation period.	**20.4**
	Blocks, Compartments and JFM Areas	5	There is no block allotted to this working circle, all vegetation outside RF, PRF, PF, VF, Revenue Forest and DLC Forest are called ToF area.	**20.5**
	Special Objectives of Management of ToF Area	6	To restock the degraded forests through community participation. To educate people to restock the barren area by artificial regeneration. To educate people to protect the area and minimize its further degradation.	**20.6**
Application of Modern Technology to Forest Management	Introduction	1	Detail number of popular technologies i.e. GIS & GPS, Modern Smart Phone, LIDAR technology (Light Detection and Ranging),Drones, Differential Global Positing System (DGPS), Use of Satellite imagery for detection of Fire and faster communication of location of incidents, Clonally Propagation with mist chamber facilities for better genetically improved seedlings for plantation purpose etc.	**21**

Chapter	Heading		Prescription	Para
Reducing Emissions from Deforestation and Forest Degradation (REDD+)	Introduction	1	Reducing Emissions from Deforestation and Forest Degradation (REDD+)	**22.1**
	FAO's support to countries' NDCs	2	With FAO's technical support, countries can use REDD+ actions as catalysts to deliver on their Nationally Determined Contributions towards climate change mitigation and adaptation. Agriculture, Forestry and Other Land Use (AFOLU) are among the climate actions that most countries have included their NDCs, which underscores the important role these sectors play in climate change mitigation and adaption.	**22.2**
	REDD+ Implementation	3	FAO helps countries design and implement REDD+ mitigation actions, which offer both carbon and non-carbon benefits, taking advantage of cross-sectoral expertise and building on existing experience.	**22.3**
	General financial forecast and financial plan of operation	1	Detail of General financial forecast and financial plan of operation shown in Table No 23.1.	**23.1**
	Source of Funding	2	State Plan, Central Plan, CAMPA Fund, OMBADC, GIM, National Afforestation Program (NAP), MGNREGA.	**23.2**
	Petty felling and Extraction	3	May be allowed by Divisional Forest Officer on academic interest.	**23.3**

Chapter	Heading		Prescription	Para
Financial Forecast and Financial Plan of Operation	Rights and Concessions	4	Right of Way on Forest Blocks, Collection of Non Timber Forest Produce as admissible in JFM Resolution-2011, Rights on Forest land either individual or Community to be allowed as per provisions of Forest Rights Act, 2005 / Rules, 2006	**23.4**
	Other research and Bio Diversity study	5	It is proposed to have a detail Biodiversity Study for Forest blocks coming within buffer zone of Similipal Tiger Reserve, Development plan for Elephant Corridors and assessment of NTFP in Karanjia Division.	**23.5**
Miscellaneous Regulations	Miscellaneous Regulations		Besides the Working Plan Prescription various miscellaneous regulation in form Acts/ Rules / administrative directives are framed and being implemented by the Forest Department for better management of Forest & Environment.	**24.1**
Water Resource Management	**Water Resource Management**		The details of Water Resource Management has been described in this chapter.	**25.1 - 25.4**

ANNEXURE-I

Dy.No-28926
12-8-03

GOVERNMENT OF ORISSA
FOREST & ENVIRONMENT DEPARTMENT
***

RESOLUTION

Dated, Bhubaneswar, the 8th August, 2003.

No.FF(A)-100/2003/13228/F&E., Government, after careful consideration, have decided to reorganise the field establishments of the Forest & Environment Department under the 'Foresty and Wildlife' wing by abolishing the Afforestation and Social Forestry Divisions and Circles and creating a number of Territorial and Wildlife Divisions and Circles. It has also been decided to abolish some other establishments which have outlived their utility or have ceased to be efficacious in their present form. Government have further decided to redeploy the staff of the existing establishments carried under different Schemes among the Establishments which will exist after the reorganisation in a rational manner. It is accordingly ordered as follows.

2. Establishments:

2.1. The Forest & Environment Department has 105 Establishments under 'Forestry and Wildlife', out of which 23 establishments are under the 'Kenduleaf Organisation'. The remaining 82 establishments are controlled by the three Controlling Officers, namely; the PCCF (54 establishments), the Addl. PCCF, Wildlife (10 establishments), and Director, Social Forestry Project (18 establishments). The detailed list of Establishments existing presently under the control of Principal Chief Conservator of Forests [illegible] Principal Chief Conservator of Forests, Wildlife and the [illegible], Social Forestry Project are as follows:-

A. Establishments under the Administrative control of PCCF, Orissa

1	O/o Principal Chief Conservator of Forests, Orissa, Bhubaneswar
2	O/o Project Director, World Food Programme, Bhubaneswar
3	O/o Conservator of Forests, Angul Circle, Angul.
4	O/o Conservator of Forests, Berhampur circle, Berhampur.
5	O/o Conservator of Forests, Sambalpur Circle, Sambalpur.
6	O/o Conservator of Forests, Koraput Circle, Koraput.
7	O/o Conservator of Forests, Afforestation Circle, Sambalpur
8	O/o Conservator of Forests, Development Circle, Cuttack.
9	O/o Conservator of Forests, Working Plan Circle, Cuttack.
10	O/o Divisional Forest Officer, Angul Division, Angul.
11	O/o Divisional Forest Officer, Athagarh Division, Athagarh.
12	O/o Divisional Forest Officer, Dhenkanal Division, Dhenkanal.
13	O/o Divisional Forest Officer, Athamallik Division, Athamallik.
14	O/o Divisional Forest Officer, Keonjahr Division, Keonjhar.
15	O/o Divisional Forest Officer, Baripada Division, Baripada.
16	O/o Divisional Forest Officer, Karanjia Division, Karanjia.
17	O/o Divisional Forest Officer, Sambalpur Division, Sambalpur.
18	O/o Divisional Forest Officer, Rairakhol Division, Rairakhol.
19	O/o Divisional Forest Officer, Sundargarh Division, Sundargarh.
20	O/o Divisional Forest Officer, Bamra Division, Bamra.
21	O/o Divisional Forest Officer, Deogarh Division, Deogarh.
22	O/o Divisional Forest Officer, Bonai Division, Bonai.
23	O/o Divisional Forest Officer, Ghumsar South Division, Bhanjanagar.
24	O/o Divisional Forest Officer, Ghumsar North Division, Bhanjanagar.
25	O/o Divisional Forest Officer, Paralakhemundi Division, Parlakhemundi.
26	O/o Divisional Forest Officer, Phulbani Division, Phulbani
27	O/o Divisional Forest Officer, Balliguda Division, Balliguda
28	O/o Divisional Forest Officer, Puri Division, Khurda.
29	O/o Divisional Forest Officer, Nayagarh Division, Nayagarh
30	O/o Divisional Forest Officer, Jeypore Division, Jeypore.
31	O/o Divisional Forest Officer, Boudh Division, Boudh.
32	O/o Divisional Forest Officer, Rayagada Division, Rayagada.
33	O/o Divisional Forest Officer, Kalahandi Division, Bhawanipatna.
34	O/o Divisional Forest Officer, Khariar Division, Khariar.
35	O/o Divisional Forest Officer, Bolangir Division, Bolangir.
36	O/o Divisional Forest Officer, Nowrangpur Division, Nowrangpur.
37	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation Division, Puri
38	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation Division, Cuttack
39	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation Division, Balasore
40	O/o Divisional Forest Officer, Afforestation Division, Rourkela
41	O/o Divisional Forest Officer, Afforestation Division, Bhawanipatna.
42	O/o Divisional Forest Officer, Afforestation Division, Koraput.
43	O/o Divisional Forest Officer, Afforestation Division, Bolangir.
44	O/o Divisional Forest Officer, Afforestation Division, Rayagada.
45	O/o Working Plan Officer, Sambalpur Working Plan Division, Sambalpur
46	O/o Working Plan Officer, Keonjhar Working Plan Division, Keonjhar
47	O/o Working Plan Officer, Bhanjanagar Working Plan Division, Bhanjanagar.
48	O/o Working Plan Officer, Angul Working Plan Division, Angul.
49	O/o Working Plan Officer, Bhawanipatna Working Plan Division, Bhawanipatna.
50	O/o Working Plan Officer, Koraput Working Plan Division, Koraput.
51	O/o Divisional Forest Officer, Forest Resources Survey Division, Cuttack
52	O/o Siviculturist, Bhubaneswar.
53	O/o Forest Utilisation Officer, Cuttack.
54	O/o Principal, Forest Rangers College, Angul.

B. Establishments under the control of Addl. PCCF, Wildlife

1.	O/o Addl. Principal Chief Conservator of Forests, Wildlife, Orissa.
2.	O/o Director, Nandankanan Zoological Park, Bhubaneswar.
3.	O/o Field Director, Simlipal Tiger Reserve, Baripada.
4.	O/o Divisional Forest Officer, Chandaka Wildlife Division, Bhubaneswar
5.	O/o Divisional Forest Officer, Mangrove Wildlife Division, Rajnagar.
6.	O/o Divisional Forest Officer, Satkosia Wildlife Division, Angul.
7.	O/o Divisional Forest Officer, Sunabeda Wildlife Division, Nuapada.
8.	O/o Divisional Forest Officer, Chilika Wildlife Division, Balugaon.
9.	O/o Divisional Forest Officer, Badarama Wildlife Division, Sambalpur.
10.	O/o Divisional Forest Officer, Mahanadi Wildlife Division, Phulbani.

C. Establishments under the control of Director, Social Forestry Project

1.	O/o Director, Social Forestry Project, Orissa, Bhubaneswar.
2.	O/o Regional Joint Director, Social Forestry Project, Bhubaneswar.
3.	O/o Regional Joint Director, Social Forestry Project, Sambalpur.
4.	O/o Regional Joint Director, Social Forestry Project, Berhampur.
5.	O/o Deputy Director, Cuttack Social Forestry Project Division, Cuttack.
6.	O/o Deputy Director, Puri Social Forestry Project Division, Bhubaneswar.
7.	O/o Deputy Director, Balasore Social Forestry Project Division, Balasore.
8.	O/o Deputy Director, Keoniar Social Forestry Project Division, Keonihar.
9.	O/o Deputy Director, Rairangpur Social Forestry Project Division, Rairangpur.
10.	O/o Deputy Director, Sundargarh Social Forestry Project Division, Sundargarh
11.	O/o Deputy Director, Sambalpur Social Forestry Project Division, Sambalpur
12.	O/o Deputy Director, Bargarh Social Forestry Project Division, Bargarh
13.	O/o Deputy Director, Bolangir Social Forestry Project Division, Bolangir
14.	O/o Deputy Director, Kalahandi Social Forestry Project Division, Bhawanipatna
15.	O/o Deputy Director, Koraput Social Forestry Project Division, Koraput
16.	O/o Deputy Director, Rayagada Social Forestry Project Division, Rayagada
17.	O/o Deputy Director, Ganjam Social Forestry Project Division, Berhampur
18.	O/o Deputy Director, Dhenkanal Social Forestry Project Division, Angul

2.2 Government, after careful consideration have decided to abolish the 18 establishments now under the control of Director, Social Forestry Project and another 11 establishments now under the control of PCCF which are as follows:

A. Under the control of Director, Social Forestry Project:

1.	O/o Director, Social Forestry Project, Orissa, Bhubaneswar.
2.	O/o Regional Joint Director, Social Forestry Project, Bhubaneswar.
3.	O/o Regional Joint Director, Social Forestry Project, Sambalpur.
4.	O/o Regional Joint Director, Social Forestry Project, Berhampur.
5.	O/o Deputy Director, Cuttack Social Forestry Project Division, Cuttack.
6.	O/o Deputy Director, Puri Social Forestry Project Division, Bhubaneswar.
7.	O/o Deputy Director, Balasore Social Forestry Project Division, Balasore.
8.	O/o Deputy Director, Keonjar Social Forestry Project Division, Keonjhar.
9.	O/o Deputy Director, Rairangpur Social Forestry Project Division, Rairangpur.
10.	O/o Deputy Director, Sundargarh Social Forestry Project Division, Sundargarh
11.	O/o Deputy Director, Sambalpur Social Forestry Project Division, Sambalpur
12.	O/o Deputy Director, Bargarh Social Forestry Project Division, Bargarh
13.	O/o Deputy Director, Bolangir Social Forestry Project Division, Bolangir
14.	O/o Deputy Director, Kalahandi Social Forestry Project Division, Bhawanipatna
15.	O/o Deputy Director, Koraput Social Forestry Project Division, Koraput
16.	O/o Deputy Director, Ravagada Social Forestry Project Division, Ravagada
17.	O/o Deputy Director, Ganjam Social Forestry Project Division, Berhampur
18.	O/o Deputy Director, Dhenkanal Social Forestry Project Division, Angul

B. Under the control of the PCCF, Orissa.

1.	O/o Conservator of Forests, Afforestation Circle, Sambalpur
2.	O/o Conservator of Forests, Working Plan Circle, Cuttack
3.	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation Division, Puri
4.	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation Division,Cuttack
5.	O/o Divisional Forest Officer, Coastal Shelter Belt Afforestation , Balasore
6.	O/o Divisional Forest Officer, Afforestation Division, Rourkela.
7.	O/o Divisional Forest Officer, Afforestation Division, Bhawanipatna.
8.	O/o Divisional Forest Officer, Afforestation Division, Koraput.
9.	O/o Divisional Forest Officer, Afforestation Division, Bolangir.
10.	O/o Divisional Forest Officer, Afforestation Division, Ravagada.
11.	O/o Forest Utilisation Officer, Cuttack

2.3 Government have further decided to create 21 Establishments for the new Circles and Division as named below:

1.	O/o Conservator of Forests, Bhubaneswar Circle, Bhubaneswar
2.	O/o Conservator of Forests, Bhawanipatna Circle, Bhawanipatna
3.	O/o Conservator of Forests, Rourkela Circle, Rourkela
4.	O/o Divisional Forest Officer, Rourkela Division, Rourkela
5.	O/o Divisional Forest Officer, Sambalpur (North) Division, Sambalpur
6.	O/o Divisional Forest Officer, Bolangir (East) Division, Bolangir.
7.	O/o Divisional Forest Officer, Kalahandi (South) Division, Bhawanipatna.
8.	O/o Divisional Forest Officer, Koraput Division, Koraput.
9.	O/o Divisional Forest Officer, Malkangiri Division, Koraput
10.	O/o Divisional Forest Officer, Rairangpur Division, Rairangpur
11.	O/o Divisional Forest Officer, Cuttack Division, Cuttack
12.	O/o Divisional Forest Officer, Bargarh Division, Bargarh

13.	O/o Divisional Forest Officer, Berhampur Division, Berhampur.
14.	O/o Divisional Forest Officer, City Forest Division, Bhubaneswar.
15.	O/o Divisional Forest Officer, Keonihar (WL) Division, Anandapur
16.	O/o Divisional Forest Officer, Balasore (WL) Division, Balasore
17.	O/o Divisional Forest Officer, Bhadrakh (WL) Division, Bhadrakh
18.	O/o Divisional Forest Officer, Puri (WL) Division, Bhubaneswar.
19.	O/o Silviculturist, Rayagada.
20.	O/o Working Plan Officer, Bhubaneswar Working Plan Division, Bhubaneswar
21.	O/o Working Plan Officer, Balasore Working Plan Division, Balasore

2.4. Government have also decided to convert the Bamra Territorial Division to a Wildlife Division and place the same, like the other Wildlife Divisions, under the control of Addl. Principal CCF (WL). Besides, the Offices of the Divisional Forest Officers, Puri, Sambalpur, Kalahandi and Bolangir will now be renamed as the Offices of the Divisional Forest Officers of Khurda, Sambalpur (South), Kalahandi (North) and Bolangir (West) respectively; and the Office of the Divisional Forest Officer, Badarama (WL) Division will be renamed as the Office of the Divisional Forest Officer, Hirakud (WL) Division.

2.5. After this reorganisation, the following 74 Establishments will exist under the Forest & Environment Department on the Forestry and Wildlfe side (exclusive of the Kenduleaf Organisation) and will remain under the administrative control of the PCCF (59 establishments) and the Addl. PCCF Wildlife (15 establishments) as indicated below:

A. Establishments under the Administrative control of PCCF, Orissa

1	O/o Principal Chief Conservator of Forests, Orissa, Bhubaneswar
2	O/o Project Director, World Food Programme, Bhubaneswar
3	O/o Conservator of Forests, Angul Circle, Angul.
4	O/o Conservator of Forests, Berhampur circle, Berhampur.
5	O/o Conservator of Forests, Sambalpur Circle, Sambalpur.
6	O/o Conservator of Forests, Koraput Circle, Koraput.
7.	O/o Conservator of Forests, Bhubaneswar Circle, Bhubaneswar
8.	O/o Conservator of Forests, Bhawanipatna Circle, Bhawanipatna
9.	O/o Conservator of Forests, Rourkela Circle, Rourkela
10.	O/o Conservator of Forests, Development Circle, Cuttack.
11	O/o Divisional Forest Officer, Baripada Division, Baripada.

12	O/o Divisional Forest Officer, Karanjia Division, Karanjia.
13.	O/o Divisional Forest Officer, Rairangpur Division, Rairangpur
14	O/o Divisional Forest Officer, Keonihar Division, Keonihar.
15	O/o Divisional Forest Officer, Deogarh Division, Deogarh.
16	O/o Divisional Forest Officer, Rourkela Division, Rourkela
17	O/o Divisional Forest Officer, Bonai Division, Bonai
18	O/o Divisional Forest Officer, Sundargarh Division, Sundargarh
19	O/o Divisional Forest Officer, Sambalpur (North) Division, Sambalpur
20	O/o Divisional Forest Officer, Sambalpur (South) Division, Sambalpur
21	O/o Divisional Forest Officer, Rairakhol Division, Rairakhol
22	O/o Divisional Forest Officer, Bargarh Division, Bargarh
23	O/o Divisional Forest Officer, Kalahandi (North) Division, Bhawanipatna
24	O/o Divisional Forest Officer, Kalahandi (South) Division, Bhawanipatna
25	O/o Divisional Forest Officer, Khariar Division, Khariar
26	O/o Divisional Forest Officer, Bolangir (East) Division, Bolangir.
27	O/o Divisional Forest Officer, Bolangir (West) Division, Bolangir.
28	O/o Divisional Forest Officer, Nowrangpur Division, Nowrangpur.
29	O/o Divisional Forest Officer, Jeypore Division, Jeypore.
30	O/o Divisional Forest Officer, Koraput Division, Koraput.
31	O/o Divisional Forest Officer, Malkangiri Division, Malkangiri
32	O/o Divisional Forest Officer, Rayagada Division, Rayagada.
33	O/o Divisional Forest Officer, Ghumsar South Division, Bhanjanagar.
34	O/o Divisional Forest Officer, Ghumsar North Division, Bhanjanagar.
35	O/o Divisional Forest Officer, Berhampur Division, Berhampur.
36	O/o Divisional Forest Officer, Phulbani Division, Phulbani
37	O/o Divisional Forest Officer, Balliguda Division, Balliguda
38	O/o Divisional Forest Officer, Boudh Division, Boudh
39	O/o Divisional Forest Officer, Paralakhemundi Division, Parlakhemundi
40	O/o Divisional Forest Officer, Khurda Division, Khurda
41	O/o Divisional Forest Officer, Nayagarh Division, Nayagarh
42	O/o Divisional Forest Officer, City Forest Division, Bhubaneswar
43	O/o Divisional Forest Officer, Angul Division, Angul
44	O/o Divisional Forest Officer, Athamallik Division, Athamallik
45	O/o Divisional Forest Officer, Dhenkanal Division, Dhenkanal
46	O/o Divisional Forest Officer, Athagarh Division, Athagarh.
47	O/o Divisional Forest Officer, Cuttack Division, Cuttack
48	O/o Siviculturist, Bhubaneswar.
49	O/o Siviculturist, Rayagada.
50	O/o Divisional Forest Officer, Forest Resources and Survey Division, Cuttack
51	O/o Working Plan Officer, Sambalpur Working Plan Division, Sambalpur
52	O/o Working Plan Officer Keonihar Working Plan Division, Keonihar
53	O/o Working Plan Officer, Bhanjanagar Working Plan Division, Bhanjanagar.
54	O/o Working Plan Officer, Angul Working Plan Division, Angul.
55	O/o Working Plan Officer, Bhawanipatna, Working Plan Division, Bhawanipatna.
56	O/o Working Plan Officer, Koraput Working Plan Division, Koraput.
57	O/o Working Plan Officer, Bhubaneswar Working Plan Division, Bhubaneswar
58	O/o Working Plan Officer, Balasore Working Plan Division, Balasore
59	O/o Principal, Forest Rangers College, Angul

B. Establishments under Administrative control of Addl PCCF (WL)

1.	O/o Addl. Principal Chief Conservator of Forests, Wildlife, Orissa.
2.	O/o Director, Nandankanan Zoological Park, Bhubaneswar.
3.	O/o Field Director, Simlipal Tiger Reserve, Baripada.
4.	O/o Divisional Forest Officer, Mangrove Wildlife Division, Rainagar
5.	O/o Divisional Forest Officer, Satkosia Wildlife Division, Angul
6.	O/o Divisional Forest Officer, Sunabeda Wildlife Division, Nuapada
7.	O/o Divisional Forest Officer, Chilika Wildlife Division, Balugaon
8.	O/o Divisional Forest Officer, Bhadrakh (WL) Division, Bhadrakh
9.	O/o Divisional Forest Officer, Balasore (WL) Division, Balasore
10.	O/o Divisional Forest Officer, Keonjhar (WL) Division, Anandapur
11.	O/o Divisional Forest Officer, Hirakud (WL) Division, Sambalpur
12.	O/o Divisional Forest Officer, Puri (WL) Division, Bhubaneswar.
13.	O/o Divisional Forest Officer, Mahanadi Wildlife Division, Kuanria
14.	O/o Divisional Forest Officer, Chandaka Wildlife Division, Bhubaneswar
15.	O/o Divisional Forest Officer, Bamra Wildlife Division, Bamra

3. Redeployment of Posts:

3.1 With the abolition of 18 establishments of Social Forestry project and 11 of the PCCF, Orissa, the staff of the 29 establishments will be redeployed in the Divisions/Circles/State Forest headquarters as per the following plan

A. Deployment plan of ministerial and other office staff of the abolished Divisions/ Circles in reorganised Divisions/ Circles/ Headquarters

Sl. No	Name of the Existing field Divisions/Circles.	Name of the Divisions/Circles in reorganized set up in which present staff are to be deployed.
1	FUO, Cuttack	City Forest Division
2	DFO, CSB Afforestation, Cuttack Cuttack	Cuttack Forest Division
3	DFO, CSB Afforestation, Bhubaneswar	Puri WL Division
4	DFO, CSB Afforestation, Balasore	WPO, Balasore
5	DFO, Affn, Koraput	Koraput Forest Division
6	DFO, Affn, Rayagada	Silviculture Divn, Rayagada
7	DFO, Affn, Rourkela	Rourkela Forest Division
8	DFO, Affn, Bhawanipatna	Kalahandi (South) Forest Division
9	DFO, Affn, Bolangir	Bolangir (East) Forest Division
10	DD, Cuttack SFP, Cuttack	Cuttack Forest Division
11	DD, Puri SFP, Bhubaneswar	WPO, Bhubaneswar
12	DD, Balasore SFP, Balasore	Balasore WL Division
13	DD, Keonjhar SFP, Keonjhar	Keonjhar WL (Hq. Anandapur)
14	DD, Rairangpur SFP, Rairangpur	Rairangpur Forest Division
15	DD, Sundargarh SFP, Sundargarh	Sundargarh & Sambalpur (N) Forest Dvn
16	DD, Sambalpur SFP, Sambalpur	Sambalpur (North) Forest Division
17	DD, Bargarh SFP, Bargarh	Bargarh Forest Division
18	DD, Bolangir SFP, Bolangir	Bolangir (East) Forest Division
19	DD, Kalahandi SFP, Bhawanipatna	Kalahandi (South) Forest Division
20	DD, Rayagada SFP, Rayagada	Koraput Forest Division
21	DD, Koraput SFP, Koraput	Malkangiri Forest Division
22	DD, Ganjam SFP, Berhampur	Berhampur Forest Division
23	DD, Dhenkanal SFP, Angul	Bhadrakh WL Division
24	CF, Affn, Sambalpur	CF, Rourkela Circle

25	RJD, Bhubaneswar	CF, Bhubaneswar Circle
26	RJD, Berhampur	CF, Bhawanipatna Circle
27	RJD, Sambalpur	CF, Rourkela Circle
28	CF, W.P.	CF, Angul Circle & CF, Bhubaneswar Circle
29	Director, SFP	Office of PCCF, Orissa

B. Redeployment of Officers

Sl. No.	Name of Existing Post	Name of the post in the reorganised setup to which the officer is redeployed
1	Director, SFP, Orissa	CCF., SF & Aff, O/o – PCCF, Orissa
2	JD (Hq), O/o Director, SFP	CF (Admn.), O/o - PCCF, Orissa
3	DD (M & E) O/o Director, SFP	Dy. CF (Nodal) O/o - PCCF, Orissa
4	DD (Admn) O/o Director, SFP	Dy CF (SF & Aff) O/o - PCCF, Orissa
5	RJD SFP, Bhubaneswar Zone	CF, Bhubaneswar Circle
6	RJD,SFP, Sambalpur Zone	CF, Rourkela Circle
7	RJD SFP, Berharapur Zone	CF, Bhawanipatna Circle
8	DD Cuttuck SFP, Cuttuck	DFO, Cuttuck Forest Division
9	DD Puri SFP, Bhubaneswar	Working Plan Officer, Bhubaneswar
10	DD Balasore SFP, Balasore	DFO, Balasore (WI) Division
11	DD Keonjhar SFP, Keonjhar	DFO, Keonjhar (WL) Division
12	DD Rairangpur SFP, Rairangpur	DFO, Rairangpur Forest Division
13	DD Sundergarh SFP, Sundergarh	WLCO, O/o -- Chief WL Warden, Orissa
14	DD Sambalpur SFP, Sambalpur	DFO, Sambalpur (North) Forest Division
15	DD Bargarh SFP, Bargarh	DFO, Bargarh Forest Division
16	DD Bolangir SFP, Bolangir	DFO, Bolangir (East) Forest Division
17	DD Kalahandi SFP, Bhawanipatna	DFO, Kalahandi (South) Forest Division
18	DD Koraput SFP, Koraput	DFO, Malkangiri Forest Division
19	DD Rayagada SFP, Rayagada	ACCF (Admn), O/o – PCCF, Orissa
20	DD Ganjam SFP, Berhampur	DFO, Berhampur Forest Division
21	DD Dhenkenal SFP, Dhenkenal	DFO, Bhadrakh (WL) Division
22	CF, Aff.Circle, Sambalpur	CF, (Aff. & SF), O/o – PCCF, Orissa
23	DFO, CSB Aff Division., Puri	DFO, Puri (WL) Dvision
24	DFO, CSB Aff. Division, Cuttuck	DFO, City Forest Division
25	DFO, CSB Aff. Division, Balasore	Working Plan Officer, Balasore
26	DFO, Aff. Division, Rourkela	DFO, Rourkela Forest Division
27	DFO, Aff. Division, Bhawanipatna	Dy.CF, (Enforcement) O/o – PCCF, Orissa
28	DFO, Aff Division., Koraput	DFO Koraput Forest Division
29	DFO, Aff. Division, Bolangir	Dy. Director, Simlipal Tiger Reserve, o/o FD. STR, Baripada
30	DFO, Aff. Division, Rayagada	Silviculturist, Rayagada
31	CF, Working Plans, Cuttuck	CF, Working Plans, O/o -- PCCF, Orissa
32	FUO, Cuttuck	FUO, O/o – PCCF, Orissa
33	Geneticist, Bhubaneswar	Dy. CF, (R & T), O/o – PCCF, Orissa
34	ACCF, O/o – PCCF, Orissa	ACCF (Hq), O/o – PCCF, Orissa
35	WLCO, Nandankanan	Dy. Director, Nandankanan Zoological Park
36	DFO, Puri Forest Division	DFO, Khurda Forest Division
37	DFO, Sambalpur Forest Division	DFO, Sambalpur (South) Division
38	DFO, Kalahandi Forest Division	DFO, Kalahandi (North) Division
39	DFO, Bolangir Forest Division	DFO, Bolangir (West) Division
40	DFO, Badrama (WL) Division	DFO, Hirakud (WL) Division
41	DFO, Bamra Forest Division	DFO, Bamra (WL) Division

3.2 This resolution comes into force with immediate effect and the reorganisation exercise will be completed by 30th September 2003.

3.3 The PCCF, Orissa will issue necessary follow up orders.

By order of the Governor

(G.B. Mukherji)
PRINCIPAL SECRETARY TO GOVERNMENT

Memo No.13229/F&E., Dated 8th August,2003

Copy forwarded to Secretary to Hon'ble Chief Minister/ Private Secretary to Minister(S), Forest for kind information of Chief Minister/ Minister(S) Forest.

Deputy Secretary to Government.

Memo No.13230/F&E., Dated 8th August,2003

Copy forwarded to Private Secretary to Chief Secretary/ Agriculture Production Commissioner/ Development Commissioner for kind information of Chief Secretary/A.P.C./Development Commissioner

Deputy Secretary to Government.

Memo No.13231/F&E., Dated 8th August,2003

Copy forwarded to Finance Department for information & necessary action.

They are requested to issue instructions not to hold back pay and other work related expenditure of officers / staff who have been disturbed in the process of this re-organisation and their offices till 30.9.2003.

Deputy Secretary to Government.

Memo No.13232/F&E. Dated 8th August,2003

Copy forwarded to Principal Chief Conservator of Forests, Orissa / Chairmancum-Managing Director, O.F.D.C. / Addl. Pr. Chief Conservator of Forests (KL),Orissa/ Addl. Pr. Chief Conservator of Forests (WL), Orissa/ Director, Social Forestry Project, Orissa/ All Revenue Divisional Commissioners for information and necessary action.

Deputy Secretary to Government.

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS:ORISSA.

Memo No.14985(95) / 3F.(Misc)69/03.
Dated,Bhubaneswar,the 21st.Aug'03.

Copy forwarded to all Conservators of Forests(T), (N.T) &(W.L) /All Regional Joint Directors (S.F.P)/ All Divisional Forest Officers,(T),(N.T) & (W.L)/ Deputy Director,S.F.P.Orissa for information and necessary action.

Copy forwarded to all Branch Officers,Office of the Pr.CCF(O) for information and necessary action.

Chief Conservator of Forests(E&M).

Annexure-II

GOVERNMENT OF ODISHA
FOREST & ENVIRONMENT DEPARTMENT

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NOTIFICATION

Bhubaneswar, Dated the 21/02/19

No.1F-(A)-71/2018-3913 /F&E, In supersession to this Department Notification No.25673/F&E, dt.29.11.18 & pursuant to the proposal of the Principal Chief Conservator of Forests & HoFF, Odisha vide Letter No.2304, dated 07.02.19, Government have been pleased to reorganize the Similipal sanctuary covering 2306.61 Sq. Km of Similipal Tiger Reserve (2750 Sq. Km) into two Wildlife Divisions namely Similipal South Wildlife Division covering 1247.58 Sq. Km with headquarters at Baripada and Similipal North Wildlife Division covering 1059.03 Sq. Km with headquarters at Jashipur in the larger interest of Wildlife Management. In addition, as per codal provision it does not involve increase or decrease in the sanctioned strength of staff or any recurring or non-recurring expenditure.

The Forest Administration of Mayurbhanj District as per this Department Notification No.25673/F&E, dt.29.11.18 spread over five Divisions i.e. Similipal (South) Division, Similipal (North) Division, Baripada Forest Division, Rairangpur Forest Division & Jashipur Wildlife Division with area as follows:

Forest DIVISION	AREA (SQ. KM)	RANGES
1	2	3
BARIPADA	4186.8	7
RAIRANGPUR	3481.2	6
SIMILIPAL NORTH	845	6
SIMILIPAL SOUTH	1408	9
JASHIPUR (WL)	497	4
TOTAL	**10418**	**32**

After reorganization, the Similipal South Wildlife Division (headquarters at Baripada), Similipal North Wildlife Division (headquarters at Jashipur), Rairangpur Forest Division, Baripada Forest Division & Karanjia Forest Division shall have the following administrative setup as shown below:-

SIMILIPAL SOUTH WILDLIFE DIVISION			
SL. NO.	RANGE	SECTION	BEATS
1	PITHABATA NORTH (WL)	05	11
2	PITHABATA SOUTH (WL)	06	15
3	NAWANA SOUTH (WL)	04	09
4	DUKURA (WL)	04	10
5	JENABIL (WL)	05	15
6	NATIONAL PARK (WL)	04	09
7	UBK (WL)	07	17
8	BHANJABASA (WL)	04	12
9	PODADIHA (WL)	02	05
TOTAL	**09**	**41**	**103**

SIMILIPAL NORTH WILDLIFE DIVISION			
SL. NO.	RANGE	SECTION	BEATS
1	TALABANDHA (WL)	03	08
2	CHAHALA (WL)	05	12
3	NAWANA NORTH (WL)	04	11
4	BAREHIPANI (WL)	06	13
5	GURGURIA (WL)	04	08
6	KENDUMUNDI (WL)	06	12
7	THAKURMUNDA (WL)	03	06
8	JASHIPUR (ECO-TOURISM) (WL)	03 (Units)	04 (Sub-Units)
TOTAL	**08**	**34**	**74**

Continue... (P/02)

RAIRANGPUR FOREST DIVISION			
SL. NO.	RANGE	SECTION	BEATS
1	RAIRANGPUR	04	13
2	BAHALDA	03	06
3	BADAMPAHAR	03	07
4	MANADA	02	05
5	BISOI (WL)	05	12
TOTAL	05	17	43

BARIPADA FOREST DIVISION			
SL. NO.	RANGE	SECTION	BEATS
1	BARIPADA	06	16
2	UDALA	04	12
3	KAPTIPADA	05	14
4	BANGRIPOSI	03	09
5	BETNOTI	04	13
6	DEULI	04	11
7	RASGOBINDPUR	03	09
TOTAL	07	29	84

KARANJIA DIVISION			
SL. NO.	RANGE	SECTION	BEATS
1	SATKOSIA (WL)	04	11
2	KARANJIA	05	13
3	DUDHIANI	07	17
4	THAKURMUNDA	06	14
TOTAL	04	22	55

After reorganization the sanctioned strength of staffs, Division wise are as follows:-

DIVISIONS	AREA SQ. KM	FOREST AREA	ACF	RANGES	RO	DY. R.O.	SECTION	FORESTER	BEAT	F.G.
SIMILIPAL SOUTH (WL) DIVISION	1247.58	1211	3* + 1@	9	10	5	41	48	103	109
SIMILIPAL NORTH (WL) DIVISION	1059.03	1002	3#	8	9	4	34	40	74	81
RAIRANGPUR FOREST DIVISION	2002.48	503	2	5	6	4	17	21	43	49
BARIPADA FOREST DIVISION	4263.13	871	3	7	9	7	29	36	84	92
KARANJIA DIVISION	1845.78	493	2	4	4	5	22	26	55	60
TOTAL	10418	4080	14	33	38	25	143	171	359	391

*1 ACF to be stationed in Udala, @1 ACF to be stationed in FD, STR, #1 ACF to be stationed in Thakurmunda.

Continue... (P/03)

The cadre strength and posts of Office Staff to be transferred to Jashipur (WL) Division are detailed below:

SL. NO.	NAME OF POST	CADRE STRENGTH	POST TRANSFERRED FROM
1	JUNIOR ACCOUNTANT	3	RAIRANGPUR DIVISION – 2 WPO BALASORE – 1
2	JUNIOR CLERK	5	RAIRANGPUR DIVISION – 3 KARANJIA DIVISION – 1 WPO BALASORE – 1
3	GUIDE	1	STR BARIPADA – 1
4	DRIVER (LV)	1	RAIRANGPUR DIVISION – 1
5	CHOUKIDAR	1	BARIPADA DIVISION – 1
6	WATCHER	1	KARANJIA DIVISION – 1
7	MUGGER WATCHER	1	STR BARIPADA – 1

Order: Ordered that this notification be published in an extra ordinary issue of the Odisha Gazette and the copy forwarded to all Departments of the Govt./ All Heads of Department/ All Collectors / Advocate General, Odisha, Cuttack/ Registrar Odisha High Court, Odisha, Cuttack.

By order of the Governor

21/2/2019

Addl. Chief Secretary to Government

Memo No. 3914 /F&E, Date. 21/02/19

Copy forwarded to the Director, Printing, Stationary & Publication, Odisha, Cuttack with a request to publish the said notification in the next issue of Odisha Gazette.

21/2/19

Additional Secretary to Government

Memo No. 3915 /F&E, Date. 21/02/19

Copy forwarded to the P.S. to Hon'ble Chief Minister, Odisha for favour of kind information of Hon'ble Chief Minister / P.S. to the Hon'ble Minister, Forest & Environment, for favour of kind information of Hon'ble Minister, F&E.

21/2/19

Additional Secretary to Government

Memo No. 3916 /F&E, Date. 21/02/19

Copy forwarded to P.S. to Chief Secretary, Odisha for kind information of Chief Secretary (O) /P.S. to Addl. Chief Secretary to Govt., F&E for kind information of Addl. Chief Secretary / Special Secretaries to Govt., F&E Deptt. / Director, Environment-cum-Special Secretary to Govt., F&E/ Addl. Secretaries to Govt., Forest & Environment Deptt. for information and necessary action.

21/2/19

Additional Secretary to Government

Continue.... (P/04)

Memo No. 3917 /F&E, Date. 21/02/19

Copy forwarded to the PCCF, Odisha/ PCCF (KL), Odisha / PCCF (WL) & CWLW, Odisha/ Addl. PCCF-cum-Field Director, STR, Baripada/ PD, OFSDP, BBSR/ MD, OFDC, BBSR/ All RCCFs/ All DFOs for information and necessary action.

21/2/19

Additional Secretary to Government

Memo No. 3918 /F&E, Date. 21/02/19

Copy forwarded to OIC, State Portal, NIC, IT Department, Odisha Secretariat/ Guard File (2 Copies) for information and necessary action.

The OIC, State Portal, NIC, IT Department, Odisha Secretariat is requested for publication of this Notification in the Website of Forest & Environment Department.

21/2/19

Additional Secretary to Government

ANNEXURE – III

DETAILS OF RANGE, SECTION & BEAT

Sl. No	Name of the Range	Sl. No.	Section	Sl. No.	Beat
1	Satkosia (WL)	1	Godbhanga	1	Dhatikidiha-I
				2	Dhatikidiha-II
				3	Godbhanga
		2	Mahuldiha	4	Jharjhari
				5	Bhaliadal
				6	Mahuldiha
		3	Noda	7	Balidiha
				8	Noda
		4	Satkosia	9	Salchua
				10	Satkosia-I
				11	Satkosia-II
2	Thakurmunda	5	Baliposi	12	Baliposi
				13	Bouring
		6	Kendumundi	14	Kendumundi
				15	Bisipur
		7	Kendujiani	16	Kendujiani
				17	Khapkhai
		8	Champajhar	18	Champajhar
				19	Vejidiha
				20	Ghantiadar
		9	Keshdiha	21	Mituani
				22	Purunapani
		10	Thakurmunda	23	Thakurmunda-I
				24	Thakurmunda-II
				25	Talpada
3	Karanjia	11	Ghagarbeda	26	Ghagarbeda
				27	Naksara
				28	Panpatria
		12	Karanjia	29	Badadeuli
				30	Karanjia-I
				31	Karanjia-II
				32	Manikduma
		13	Raruan	33	Bhramarposi
				34	Raruan
		14	Singda	35	Ghosda
				36	Haldia
				37	Singda
		15	Kadadiha	38	Tikasil
				39	Sunaposi

Sl. No	Name of the Range	Sl. No.	Section	Sl. No.	Beat
4	Dudhiani	16	Bhanda	40	Ramsahi
				41	Jamukeswar
				42	Godapalsa
				43	Siltia
		17	Ektali	44	Ektali
		18	Jashipur	45	Jashipur-I
				46	Jashipur-II
				47	Kudarbisida
				48	Sanjambila
		19	Barakamunda	49	Hatibari
				50	Budhigaon
		20	Dari	51	Dari
		21	Tangabilla	52	Tainsira
				53	Tangabilla
		22	Tato	54	Tato
				55	Purunapani

ANNEXURE-IV
List of Residential Buildings of Karanjia Division.

Sl.No	Name of the Range	Location	Residential buildings
01	Karanjia Range	Karanjia	Ministerial Staff Qtr
02	Karanjia Range	Karanjia	Class – IV Qtr
03	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
04	Karanjia Range	Karanjia	Old Range Officer residence
05	Karanjia Range	Karanjia	New Range Officer residence
06	Karanjia Range	Karanjia	Ministerial Staff Qtr
07	Karanjia Range	Karanjia	Ministerial Staff Qtr
08	Karanjia Range	Karanjia	Ministerial Staff Qtr
09	Karanjia Range	Karanjia	Ministerial Staff Qtr
10	Karanjia Range	Karanjia	Ministerial Staff Qtr
11	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
12	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
13	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
14	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
15	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
16	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
17	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
18	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
19	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
20	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
21	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
22	Karanjia Range	Karanjia	Old Ministerial Staff Qtr
23	Karanjia Range	Karanjia	Old Ministerial Staff building
24	Satkosia Range	Satkosia	Section Office Cum- Residence
25	Satkosia Range	Satkosia	Beat Office Cum- Residence
26	Satkosia Range	Satkosia	Beat Office Cum- Residence
27	Satkosia Range	Salchua	Beat Office Cum- Residence
28	Satkosia Range	Mahuldiha	Section Office Cum- Residence
29	Satkosia Range	Mahuldiha	Beat Office Cum- Residence
30	Satkosia Range	Bhaliadal	Beat Office Cum- Residence

Sl.No	Name of the Range	Location	Residential buildings
31	Satkosia Range	Bhaliadal	Beat Office Cum- Residence
32	Satkosia Range	Godbhanga	Beat Office Cum- Residence
33	Satkosia Range	Dhatikidiha	Beat Office Cum- Residence
34	Satkosia Range	Noda	Section Office Cum- Residence
35	Satkosia Range	Noda	Beat Office Cum- Residence
36	Satkosia Range	Kundei	Beat Office Cum- Residence
37	Dudhiani Range	Tato	Old Forester Quarter
38	Dudhiani Range	Tato	Old Forest Guard Quarter
39	Dudhiani Range	Tato	Forest Guard Quarter
40	Dudhiani Range	Tato	Old Range Office
41	Dudhiani Range	Tato	Old Range officer Quarter
42	Dudhiani Range	Tangabilla	Forester Quarter
43	Dudhiani Range	Tangabilla	Forest Guard Quarter
44	Dudhiani Range	Tainsira	Forest Guard Quarter
45	Dudhiani Range	Mota	Forest Guard Quarter
46	Dudhiani Range	Barakamuda	Forest Guard Quarter
47	Dudhiani Range	Mota	Forest Guard Quarter
48	Dudhiani Range	Jamukeswar	Forest Guard Quarter
49	Dudhiani Range	Jamukeswar	Forester Quarter
50	Dudhiani Range	Jamukeswar	Forest Guard Quarter
51	Dudhiani Range	Pahadpur	Forest Guard Quarter
52	Dudhiani Range	Kudarbisda.	Forest Guard Quarter
53	Dudhiani Range	Jashipur	Forest Guard Quarter
54	Dudhiani Range	Jashipur	Old Forester Quarter
55	Dudhiani Range	Jashipur	Forester Quarter (Check Gate)
56	Dudhiani Range	Jashipur	Old Forest Guard Quarter (Check Gate)
57	Dudhiani Range	Ektali	Forest Guard Quarter
58	Thakurmunda Range	Thakurmunda	R.O. Residence
59	Thakurmunda Range	Thakurmunda	Forester Quarter
60	Thakurmunda Range	Thakurmunda	Residential
61	Thakurmunda Range	Thakurmunda	Residential
62	Thakurmunda Range	Talpada	Residence-cum-Office

Sl.No	Name of the Range	Location	Residential buildings
63	Thakurmunda Range	Mituani	Residence-cum-Office
64	Thakurmunda Range	Mituani	Residence-cum-Office
65	Thakurmunda Range	Mituani	Residence-cum-Office
66	Thakurmunda Range	Champajhar	Residence-cum-Office
67	Thakurmunda Range	Champajhar	Residence-cum-Office
68	Thakurmunda Range	Champajhar	Residence-cum-Office
69	Thakurmunda Range	Ghantiadar	Residence-cum-Office
70	Thakurmunda Range	Kendumundi	Residence-cum-Office
71	Thakurmunda Range	Kendumundi	Residence-cum-Office
72	Thakurmunda Range	Bisipur	Residence-cum-Office
73	Thakurmunda Range	Kendujiani	Residence-cum-Office
74	Thakurmunda Range	Kendujiani	Residence-cum-Office
75	Thakurmunda Range	Khaparkhai	Residence-cum-Office
76	Thakurmunda Range	Baliposi	Residence-cum-Office
77	Thakurmunda Range	Boring	Residence-cum-Office

ANNEXURE-V
List of Non-Residential Buildings of Karanjia Division

Sl. No.	Name of the Range	Name of the section	Location	Non-Residential buildings
01	Karanjia Range	Ghagarbeda	Ghagarbeda	Old Section Office with asbestos roof
02	Karanjia Range	Raruan	Raruan	Old Section Office with asbestos roof
03	Karanjia Range	Raruan	Jhumkapal	Nursery Shed at Jhumkapal Permanent Nursery
04	Karanjia Range	Raruan	Godhimara	Nursery Shed at Godhimara Permanent Nursery
05	Karanjia Range	Singda	Singda	Section Office
06	Karanjia Range	Singda	Ghosda	Beat Office
07	Karanjia Range	Kadadiha	Kadadiha	Community Center
08	Karanjia Range	Kadadiha	Milu	Antipoaching Camp
09	Karanjia Range	Karanjia	Karanjia	FMU Office Building
10	Karanjia Range	Karanjia	Karanjia	Malkhana
11	Karanjia Range	Karanjia	Karanjia	Barrack Building
12	Karanjia Range	Karanjia	Karanjia	Old Hazat building
13	Karanjia Range	Karanjia	Karanjia	Labour rest house
14	Karanjia Range	Karanjia	Karanjia	Rasamtola Check Beat house
15	Karanjia Range	Karanjia	Karanjia	Seed Godown
16	Karanjia Range	Karanjia	Karanjia	Seed Godown
17	Karanjia Range	Karanjia	Karanjia	Office building
18	Karanjia Range	Karanjia	Karanjia	Labour rest house
19	Karanjia Range	Karanjia	Karanjia	Non residential
20	Satkosia Range	Mahuldiha	Bhaliadal	Anti-poaching Camp
21	Satkosia Range	Godbhanga	Dhatikidiha	Anti-poaching Camp
22	Dudhiani Range	Tato	Tato	Old store Room
23	Dudhiani Range	Tato	Tato	Field protection camp
24	Dudhiani Range	Tato	Tato	Range Office
25	Dudhiani Range	Tato	Tato	OFSDP Office
26	Dudhiani Range	Tato	Tato	Seizure yard
27	Dudhiani Range	Tangabilla	Tangabilla	Old Forester Quarter

Sl. No.	Name of the Range	Name of the section	Location	Non-Residential buildings
28	Dudhiani Range	Tangabilla	Tangabilla	Godown
29	Dudhiani Range	Tangabilla	Tangabilla	Store Room
30	Dudhiani Range	Bhanda	Jamukeswer	Old Beat Office
31	Dudhiani Range	Bhanda	Batisahi	Permanent Field Protection Camp
32	Dudhiani Range	Bhanda	Dayaposi	Permanent Field Protection Camp
33	Dudhiani Range	Jashipur	Jashipur	Check Gate Office
34	Dudhiani Range	Jashipur	Jashipur	Beat Office
35	Dudhiani Range	Ektali	Ektali	Old Forest Guard Quarter
36	Thakurmunda Range	Thakurmunda	Thakurmunda	Range Office
37	Thakurmunda Range	Thakurmunda	Thakurmunda	FMU Building
38	Thakurmunda Range	Thakurmunda	Thakurmunda	Old Range Office
39	Thakurmunda Range	Thakurmunda	Thakurmunda	Anti-poaching Barrack
40	Thakurmunda Range	Thakurmunda	Thakurmunda	Anti-poaching Rest shed
41	Thakurmunda Range	Champajhar	Champajhar	Old Beat house
42	Thakurmunda Range	Kendumundi	Kendumundi	Seizure Yard

ANNEXURE-VI: LIST OF FOREST ROADS OF KARANJIA FOREST DIVISION

Name of the Division	Name of the District.	Name of the C.D Block	Name of the Forest road.	From	To	Total length in kms.
Karanjia	Mayurbhanj	Thakurmunda	Tinadiha to Thakurmunda	Ranibhol	Thakurmunda	8.2
		Thakurmunda	Ghadabindha to Malabasa	Ghadabindha	Ranibhol	2
		Thakurmunda	Kendumundi to Kandadhenu	Kendumundi	Ranibhol	4
		Thakurmunda	Satkosia to Noda	Satkosia	Noda	11.6
		Thakurmunda	Bhaliadal to Satbedi	Bhaliadal	Satbedi	3
		Karanjia	Dudhiani to Uperbarakamuda	Dudhiani	Rangamatia Gate	2
		Karanjia	Dudhiani to Rangamatia	Dudhiani	Rangamatia Chhaka	2.8
		Karanjia	Mahuldiha to Kiajhari	Mahuldiha	Khandiadara	2
		Jashipur	Tangabila to Dudhiani	Tangabila	Dudhiani	12
		Jashipur	Jashipur to Gurguria	Jashipur (Bhai Bhai Chhak)	Kalikaprasad gate	14
			Total:-			**61.6**

ANNEXURE VII LIST OF RESERVED FORESTS IN KARANJIA FOREST DIVISION				
Sl no	**Name of Range**	**Name of RF**	**Area in Hac.**	**Notification number**
1	Karanjia	Adipur	39.20	F/G/9/2823 dt.21.06.45
2	Karanjia	Andharjhari	132.80	F/G/5/11717/A dt.20.03.45
3	Karanjia	Ankura	77.60	F/G/5/11717/A dt.20.03.45
4	Karanjia	Badbil	107.20	F/G/9/2823 dt.21.06.45
5	Karanjia	Badadeuli	227.60	F/G/15/11717/A dt.20.03.45
6	Karanjia	Badsurei	44.80	F/G/9/2823 dt.21.06.45
7	Karanjia	Bhanjabeda	145.20	F/G/15/11717/A dt.20.03.45
8	Karanjia	Bhanra	119.60	F/G/5/11717/A dt.20.03.45
9	Karanjia	Bhramarposi	157.60	F/G/9/2823 dt.21.06.45
10	Karanjia	Budamara	8.80	F/G/9/2823 dt.21.06.46
11	Karanjia	Buruhatu	14.00	F/G/9/2823 dt.21.06.47
12	Karanjia	Gambharia-I	14.40	F/G/9/2823 dt.21.06.48
13	Karanjia	Gambharia-II	14.00	F/G/9/2823 dt.21.06.49
14	Karanjia	Gambharia-III	12.40	F/G/9/2823 dt.21.06.50
15	Karanjia	Chandiahil	26.40	F/G/9/2823 dt.21.06.51
16	Karanjia	Chaturisahi	113.20	F/G/5/11717/A dt.20.03.45
17	Karanjia	Chhelianali-I	10.40	F/G/9/2823 dt.21.06.45
18	Karanjia	Chhelianali-Ii	34.40	F/G/9/2823 dt.21.06.46
19	Karanjia	Chauthia	44.80	F/G/15/11717/A dt.20.03.45
20	Karanjia	Denua	28.40	F/G/15/11717/A dt.20.03.46
21	Karanjia	Deodhipa	32.00	F/G/15/11717/A dt.20.03.47
22	Karanjia	Diajodi	56.40	F/G/15/11717/A dt.20.03.48
23	Karanjia	Dighiposi	82.40	F/G/9/2823 dt.21.06.45
24	Karanjia	Dumbisahi	42.00	F/G/9/2823 dt.21.06.46
25	Karanjia	Galusahi	26.40	F/G/15/11717/A dt.20.03.45
26	Karanjia	Ghagi	227.20	F/G/9/2823 dt.21.06.45
27	Karanjia	Gharmabeda	188.80	F/G/9/2823 dt.21.06.46
28	Karanjia	Ghodaghaguri	141.20	F/G/5/11717/A dt.20.03.45
29	Karanjia	Ghosda-I	19.20	F/G/9/2823 dt.21.06.45
30	Karanjia	Ghosda-II	140.00	F/G/9/2823 dt.21.06.46
31	Karanjia	Haldia	113.60	F/G/9/2823 dt.21.06.47
32	Karanjia	Halpur-I	47.20	F/G/9/2823 dt.21.06.48
33	Karanjia	Halpur-II	64.00	F/G/9/2823 dt.21.06.49
34	Karanjia	Halpur-III	11.60	F/G/9/2823 dt.21.06.50
35	Karanjia	Hatisalbeda	487.60	F/G/5/11717/A dt.20.03.45
36	Karanjia	Hindola	23.60	F/G/9/2823 dt.21.06.45
37	Karanjia	Jambani	107.20	F/G/9/2823 dt.21.06.46
38	Karanjia	Jamunti	260.00	F/G/15/11717/A dt.20.03.45
39	Karanjia	Jhaddumuria	56.80	F/G/5/11717/A dt.20.03.45
40	Karanjia	Jhadghosda	36.40	F/G/9/2823 dt.21.06.45
41	Karanjia	Jhumkapal	28.00	F/G/15/11717/A dt.20.03.45
42	Karanjia	Kalkad	100.00	F/G/5/11717/A dt.20.03.45

ANNEXURE VII LIST OF RESERVED FORESTS IN KARANJIA FOREST DIVISION				
Sl no	**Name of Range**	**Name of RF**	**Area in Hac.**	**Notification number**
43	Karanjia	Konika	24.80	F/G/15/11717/A dt.20.03.45
44	Karanjia	Karanjia	109.20	F/G/5/11717/A dt.20.03.45
45	Karanjia	Kasia	97.20	F/G/9/2823 dt.21.06.45
46	Karanjia	Kendua	152.00	F/G/15/11717/A dt.20.03.45
47	Karanjia	Kenjhera	117.60	F/G/5/11717/A dt.20.03.45
48	Karanjia	Khaparasahi	33.60	F/G/9/2823 dt.21.06.45
49	Karanjia	Kudarasahi	20.80	F/G/9/2823 dt.21.06.46
50	Karanjia	Kujiam	155.60	F/G/9/2823 dt.21.06.47
51	Karanjia	Kuliposi	24.00	F/G/5/11717/A dt.20.03.45
52	Karanjia	Kusunpur-I	18.00	F/G/9/2823 dt.21.06.45
53	Karanjia	Kusunpur-II	43.20	F/G/9/2823 dt.21.06.46
54	Karanjia	Mahadevdeuli	37.20	F/G/9/2823 dt.21.06.47
55	Karanjia	Mahuliasole	153.60	F/G/9/2823 dt.21.06.48
56	Karanjia	Maricha	24.00	F/G/9/2823 dt.21.06.49
57	Karanjia	Miludihi	42.07	
58	Karanjia	Naksara	20.40	F/G/9/2823 dt.21.06.45
59	Karanjia	Nuabeda	18.80	F/G/15/11717/A dt.20.03.45
60	Karanjia	Nuagaon	142.00	F/G/5/11717/A dt.20.03.45
61	Karanjia	Padheidura	457.60	F/G/5/11717/A dt.20.03.45
62	Karanjia	Panpatria	1520.00	F/G/9/2823 dt.21.06.45
63	Karanjia	Panideuli	98.40	F/G/9/2823 dt.21.06.46
64	Karanjia	Paudia	639.20	F/G/5/11717/A dt.20.03.45
65	Karanjia	Phulcomp	42.80	F/G/9/2823 dt.21.06.45
66	Karanjia	Phulguntha	103.60	F/G/9/2823 dt.21.06.46
67	Karanjia	Pingu	39.20	F/G/9/2823 dt.21.06.47
68	Karanjia	Pokamunda	190.00	F/G/5/11717/A dt.20.03.45
69	Karanjia	Pokharia-I	145.60	F/G/9/2823 dt.21.06.45
70	Karanjia	Pokharia-II	73.60	F/G/9/2823 dt.21.06.46
71	Karanjia	Sandeuli	120.40	F/G/5/11717/A dt.20.03.45
72	Karanjia	Sankesari-I	18.00	F/G/9/2823 dt.21.06.45
73	Karanjia	Sankesari-II	38.40	F/G/9/2823 dt.21.06.45
74	Karanjia	Saantabandh	17.60	F/G/15/11717/A dt.20.03.45
75	Karanjia	Saranggarh	113.20	F/G/15/11717/A dt.20.03.46
76	Karanjia	Sarasposi	115.20	F/G/15/11717/A dt.20.03.47
77	Karanjia	Saragoda-I	18.00	F/G/15/11717/A dt.20.03.48
78	Karanjia	Saragoda-II	36.80	F/G/15/11717/A dt.20.03.49
79	Karanjia	Sarubali	83.20	F/G/5/11717/A dt.20.03.45
80	Karanjia	Sarubil	99.60	F/G/9/2823 dt.21.06.45
81	Karanjia	Sarubhadi	55.20	F/G/5/11717/A dt.20.03.45
82	Karanjia	Sanabadaposi	201.20	F/G/9/2823 dt.21.06.45
83	Karanjia	Singda-I	23.20	F/G/9/2823 dt.21.06.45
84	Karanjia	Singda-II	54.00	F/G/9/2823 dt.21.06.46
85	Karanjia	Singda-III	112.40	F/G/5/11717/A dt.20.03.45
86	Karanjia	Sunaposi	108.80	F/G/9/2823 dt.21.06.45

ANNEXURE VII LIST OF RESERVED FORESTS IN KARANJIA FOREST DIVISION				
Sl no	**Name of Range**	**Name of RF**	**Area in Hac.**	**Notification number**
87	Karanjia	Tangia	30.00	F/G/9/2823 dt.21.06.46
88	Karanjia	Tikasil	92.80	F/G/5/11717/A dt.20.03.45
89	Karanjia	Tulasipur	28.00	F/G/15/11717/A dt.20.03.45
		Total		
90	Satkosia	Gaudiabahali	182.40	F/G/4/4/4696 dt.14.08.43
91	Satkosia	Khumthan	240.00	F/G/4/4/4696 dt.14.08.44
92	Satkosia	Noda	352.00	F/G/4/4/4696 dt.14.08.45
93	Satkosia	Satkosia	13732.80	F/G/4/4/4696 dt.14.08.46
94	Satkosia	Satkosia-Ib	363.20	F/G/4/4/4696 dt.14.08.47
95	Satkosia	Satkosia-II	208.27	FS-112/71-7344/12 dt.04.01.72
96	Satkosia	Satkosia-III	353.83	SRO/202/75 dt.29.03.75
97	Thakurmunda	Akhapalan	57.52	35510/R dt.26.05.73
98	Thakurmunda	Andharikhaman	48.48	FS/78/70-22049 dt.24.4.70
99	Thakurmunda	Badabaliposi	27.57	FS/13/71-72008/R dt.31.12.71
100	Thakurmunda	Badbil	943.20	F/G/4/4696 dt.14.08.43
101	Thakurmunda	Banamunda	176.40	F/G/4/4696 dt.14.08.44
102	Thakurmunda	Baunsadiha	167.20	F/F/5/117/7A dt.20.03.45
103	Thakurmunda	Basantpur	38.62	FS/10/71-67446/R dt.09.12.71
104	Thakurmunda	Bhadubeda	111.20	
105	Thakurmunda	Bharandia	97.60	F/F/5/117/7A dt.20.03.45
106	Thakurmunda	Chainbainsi	70.96	FS/25/71-71909/R dt.31.12.71
107	Thakurmunda	Chakulia	10.02	FS/2G/71-6745/R dt.31.12.71
108	Thakurmunda	Chamakpur	182.80	F/F/5/117/7A dt.20.03.45
109	Thakurmunda	Chirupada	23.49	58625 dt.10.9.73
110	Thakurmunda	Dakeipal	120.40	F/G/4/4696 dt.14.08.43
111	Thakurmunda	Dangadiha	97.20	F/G/4/4696 dt.14.08.44
112	Thakurmunda	Digdhar	45.10	FS-30/71-5445/R dt.25.9.71
113	Thakurmunda	Gahanndia	14.15	FS/49/70-20464 dt.18.04.70
114	Thakurmunda	Ghodabindha	168.40	FG/4/4696 dt.14.08.43
115	Thakurmunda	Handiphuta	306.00	F/F/5/117/7A dt.20.03.45
116	Thakurmunda	Handiphuta_A	61.32	FG/4/4695 dt.14.06.43
117	Thakurmunda	Handiphuta_B	154.44	FG/4/4695 dt.14.06.43
118	Thakurmunda	Hatigoda	108.80	FG/4/4696 dt.14.08.43
119	Thakurmunda	Jamunalia	20.17	FS/14/71-7662/R dt.04.01.72
120	Thakurmunda	Jarak	48.00	FG/4/4696 dt.14.08.43
121	Thakurmunda	Kaliaposi	78.25	FS/55/71-66719 dt.06.12.71
122	Thakurmunda	Kathuanuagaon	68.00	FG/4/4696 dt.14.08.43
123	Thakurmunda	Khejuria	15.28	F/F/5/117/7A dt.20.03.45
124	Thakurmunda	Khejuri	641.60	FS/23/76-47059/R dt.19.6.76
125	Thakurmunda	Khudisila	83.60	FG/4/4696 dt.14.08.43
126	Thakurmunda	Khuntaposi	3.66	FS/85/70-20959/R dt.22.4.70
127	Thakurmunda	Mandalijhari	32.98	FS/80/71-67046/R dt.7.10.71
128	Thakurmunda	Mankadbeda	208.40	FG/4/4696 dt.14.08.43
129	Thakurmunda	Mulapal	90.00	FG/4/4696 dt.14.08.43

ANNEXURE VII LIST OF RESERVED FORESTS IN KARANJIA FOREST DIVISION				
Sl no	**Name of Range**	**Name of RF**	**Area in Hac.**	**Notification number**
130	Thakurmunda	Mituani_I	106.80	FG/4/4696 dt.14.08.43
131	Thakurmunda	Mituani_II	184.40	FG/4/4696 dt.14.08.43
132	Thakurmunda	Mituani_III	98.08	FS/79/71-6898/R dt.2.01.72
133	Thakurmunda	Nishchintpur	7.47	FC/91/71-66728 dt.06.12.71
134	Thakurmunda	Panasdiha	8.81	FS/96/71-67348/R dt.8.12.71
135	Thakurmunda	Purunapani_II	55.77	FS/28/71-77040/R dt.4.02.72
136	Thakurmunda	Sunida	23.93	SRO/154/74 dt.7.03.74
137	Thakurmunda	Talpada	145.60	FG/5/117/7A dt.20.03.45
138	Thakurmunda	Taramara	649.60	FG/4/4696 dt.14.06.43
139	Thakurmunda	Thakurmunda	250.80	FG/4/4696 dt.14.06.43
140	Thakurmunda	Vejidiha_I	160.00	FG/4/4696 dt.14.08.43
141	Thakurmunda	Vejidiha_II	17.88	SRO/247/70 Dt.10.04.70
142	Thakurmunda	Rugudibeda	58.58	FS/02/71-67046/R dt.31.1271
143	Thakurmunda	Asankudar	11.86	11F/B/48/70/20659R dt.21.04.70
144	Thakurmunda	Bisipur_1	421.20	132/G/5/11717 dt.21.3.45
145	Thakurmunda	Bisipur_2	74.00	132/G/5/11717 dt.21.3.45
146	Thakurmunda	Boring	275.20	24F/G/5/11717-A dt.20.03.45
147	Thakurmunda	Chheratangar	800.00	89F/G/4/4697 dt.14.08.63
148	Thakurmunda	Dangapani	104.80	26F/G/4/9696 dt.14.08.63
149	Thakurmunda	gourigoda	66.40	1F/G/5/117/7A dt.20.3.45
150	Thakurmunda	Jadbil	187.60	28/F/G/5/117/7A dt.20.3.45
151	Thakurmunda	Kadopani	145.20	19F/G/4/9696 dt.14.08.63
152	Thakurmunda	kalijhiani_1	378.80	39F/G/4/4697 dt.14.08.43
153	Thakurmunda	kalijhiani_2	147.60	18F/G/4/4697 dt.14.08.43
154	Thakurmunda	kendumuni_1	147.60	A11F/G/11717 dt.20.03.45
155	Thakurmunda	kendumundi_2	648.00	A11F/G/11717 dt.20.03.46
156	Thakurmunda	Majuriposi II	144.80	F/G/4/4695 dt.14.06.43
157	Thakurmunda	Padiabeda	51.02	BO-FS/50/70-20963 dt.22.4.70
158	Thakurmunda	Patbil	154.80	48/G/11717 dt.20.03.45
159	Thakurmunda	Purunapani	452.80	F/G/4/4695 dt.14.06.43
160	Thakurmunda	Rengalbeda_1	67.20	A5/G/5/11717 dt.20.03.45
161	Thakurmunda	Rengalbeda_2	42.67	B/5/SRO-301/70 dt.25.04.70
162	Thakurmunda	Saleibeda	125.60	24F/G/4/9696 dt.14.08.45
163	Thakurmunda	Sanandharikhaman	120.00	37/F/G/5/117/7A dt.20.03.45
164	Thakurmunda	Sanarugudibeda	212.80	F/G/4/9696 dt.14.08.45
165	Thakurmunda	Sarubil_1	162.00	126/G/5/117/7A dt.20.03.45
166	Thakurmunda	Sarubil_2	83.36	B-2/Fs/54/70-22057 dt.24.4.70
167	Thakurmunda	Tikarpada	89.20	16/F/G/5/117/7A dt.20.03.45
168	Thakurmunda	Majurposi I	13.98	
169	Dudhiani	Badnai	23.20	53F/G/9/2823 dt.21.06.45
170	Dudhiani	Biunria	146.00	F/G/9/2823 dt.21.06.45
171	Dudhiani	Chanchbani	63.20	F/G/9/2823 dt.21.06.46
172	Dudhiani	Dari_1	19.60	F/G/9/2823 dt.21.06.47
173	Dudhiani	Dari_2	51.20	F/G/9/2823 dt.21.06.48

ANNEXURE VII LIST OF RESERVED FORESTS IN KARANJIA FOREST DIVISION				
Sl no	**Name of Range**	**Name of RF**	**Area in Hac.**	**Notification number**
174	Dudhiani	Dumuria	174.80	F/G/9/2823 dt.21.06.49
175	Dudhiani	Gudidiha	329.20	F/G/9/2823 dt.21.06.50
176	Dudhiani	Hatimundi	147.60	F/G/9/2823 dt.21.06.51
177	Dudhiani	Jharbeda	152.80	F/G/5/11717 dt.20.03.45
178	Dudhiani	Kadambeda	79.20	F/G/5/11717 dt.20.03.46
179	Dudhiani	Khandbandh	34.00	F/G/9/2823/ dt.21.06.45
180	Dudhiani	Kuita	164.80	F/G/9/2823/ dt.21.06.46
181	Dudhiani	Kunjia	125.20	F/G/9/2823/ dt.21.06.47
182	Dudhiani	Malharpada	27.20	39F/G/9/2823 dt.21.06.45
183	Dudhiani	Masinabila	77.60	49F/G/9/2823 dt.21.06.45
184	Dudhiani	Mota	281.20	49F/G/9/2823 dt.21.06.46
185	Dudhiani	Palasgodia_1	33.60	60F/G/9/2823 dt.21.06.45
186	Dudhiani	Palasgodia_2	16.00	60F/G/9/2823 dt.21.06.46
187	Dudhiani	Panposi	33.60	F/G/9/2823 dt.21.06.45
188	Dudhiani	Pantho	176.00	77F/G/9/2823 dt.21.06.45
189	Dudhiani	Purunadeogaon	59.60	F/G/9/2823 dt.21.06.45
190	Dudhiani	Ranipat	20.00	F/G/5/2039 dt.03.07.44
191	Dudhiani	Rasamtala	162.80	F/G/5/11717/A dt.20.03.45
192	Dudhiani	Rugudi_1	19.20	63F/G/9/2823/A dt.21.06.45
193	Dudhiani	Rugudi_2	36.00	63F/G/9/2823/A dt.21.06.46
194	Dudhiani	Salarpada	89.20	63F/G/9/2823/A dt.21.06.47
195	Dudhiani	Sananai	9.20	137F/G/9/2823 dt.21.06.45
196	Dudhiani	Siramanipur	110.00	137F/G/9/2823 dt.21.06.46
197	Dudhiani	Sialinai	84.00	137F/G/9/2823 dt.21.06.47
198	Dudhiani	Tato	104.00	137F/G/9/2823 dt.21.06.48
199	Dudhiani	Kadadiha	89.20	60F/G/9/2823 dt.21.06.45
200	Dudhiani	Bala	25.20	F/G/9/2823 dt.21.06.45
201	Dudhiani	Badampahar (P)	3253.84	F/G/9/2823 dt.21.03.44
202	Dudhiani	Begunia-I	629.60	F/G/9/2823 dt.21.03.45
203	Dudhiani	Begunia-II	107.20	F/G/9/2823 dt.21.03.46
204	Dudhiani	Kudarbisida-I	31.20	F/G/9/2823 dt.21.03.47
205	Dudhiani	Kudarbisida-II	356.80	F/G/9/2823 dt.21.03.48
	Total		**43567.03**	

ANNEXURE-VIII

Regd. No. P-388

MAYURBHANJ STATE GAZETTE

PUBLISHED BY AUTHORITY

VOL. X. | BARIPADA, APRIL 22, 1945 | No. 8

CONTENTS

Part I-A.—Rules, notifications, etc., issued under the authority of the Maharaja or the Dewan 53

Part I-B.—Legislative measures, rules & notifications thereunder 55

Part I-C.—Notifications re: appointments, leave, promotions, etc., of officers issued under the authority of the Maharaja or the Dewan 56

Part I-D.—Notifications reproduced from the Gazette of India & Press Notes or Notices issued by the State 56

Part II.—Departmental Orders, Circulars, Notifications, rules, etc. 57

Part III.—Miscellaneous Notices & Advt. .. 57

Part IV.—War Supplement 15

Part V.—Oriya Section 37

Part VI.—Oriya Supplement 21

Part VII.—Information Bulletin 19

PART I—A.

Rules, Notifications, etc. issued under the authority of the Maharaja or the Dewan.

The 20th March, 1945.

No. F|G|5|11717 A.—Under the provisions of Section 9 of the Mayurbhanj Forest Act, the Government of the Maharaja of Mayurbhanj are hereby pleased to declare that the areas specified below which in Notification Nos. mentioned against each were proposed to be reserve forests, shall be reserved forest with effect from the date of this Notification.

I Thakurmunda Pergana, Panchpir Sub-division (Notification No. F|G|4|4695, dated 14. 6. 43).

1. Taramara—A 1824, 2. Handiphuta—A 765, 3. Thakurmunda—A 6274, 4. Chamakpur—A 457, 5. Khejuria—A 1604, 6. Talpada—A 364, 7. Bansadiha—A 418, 8. Bharandia—A 244, 9. Manjurposi—A 362, 10. Tikarpada—A 223, 11. Gaurigardia A—166, 12. Purunapani—A 1132, 13. Jadibil—A 469, 14. San Rugdibeda—A 532, 15. Buring—A 685, 16. San Andharikhaman—A 300.

Total—A 10,175.

II. Ratanpur Pergana, Panchpir Sub-division Notification No. F|G|4|4696, dated 14. 8. 43).

1. Kadapani—A 363, 2. Dangapani—A 262, 3. Kaliajjani No. 1—A 947, 4. Kaliajiani No. 2—A 369, 5. Ghodabindha—A 421, 6. Hatigoda—A 272, 7. Mituani No. 1—A 267, 8. Mituani No. 2—A 461, 9. Badbil—A 2358, 10. Mankadbeda—A 521, 11. Dangadiha—A 242, 12. Vejidiha—A 400, 13. Mulapal—A 225, 14. [illegible]pal—A 301, 15. Jarak—A 120, 16. Kathuanuagaon—A 170, 17. Banmunda—A 441, 18. Gaudiabahali—A 456, 19. Khumthan—A 600, 20. Nada—A 880, 21. Satkoshia Hill block—A 35240.

Total—A 45,272.

III. Barpada Pergana, Panchpir Sub-division (Notification No. F|G|4|4697, dated 14. 8. 43).

1. Salaibeda—A 314, 2. Chheratanagar—A 2000, 3. Kendumundi No. 2—A 1620, 4. Sarubali—A 405, 5. Rengalbeda—A 168, 6. Kendumundi No. 1—A 369, 7. Bispur No. 2—A 185, 8. Bispur No. 1—A 1053, 9. Patbil—A 387, 10. Kalakad—A 250, 11. Kenjhar—A 294, 12. Tikasil—A 232, 13. Podeidhada—A 1144, 14. Chaturisahi—A 283, 15. Singda—A 281, 16. Kuliposi—A 60, 17. Hatisalbeda—A 1219, 18. Paudia—A 1598.

Total—A 11,861.

IV. Kanika Pir, Panchpir Sub-division (Notification No. F|G|4|6457, dated 4. 10. 1943).

1. Jhumukapal—A 70, 2. Bhanjabeda—A 363, 3. Kanika—A 62, 4. Tulsipur—A 70, 5. Gulusahi—A 66.

Total—A 631.

V. Karanjia Pergana, Panchpir Sub-division (Notification No. F|G|4|6458, dated 4. 10. 43).

1. Bhaura—A 99, 2. Chauthia—A 112, 3. Bad Deoli—A 569, 4. Nuagaon—A 355, 5. Andharjhori—A 332, 6. San Deoli—A 301, 7. Ankura—A 194, 8. Karanjia—A 288, 9. Ghodaghagari—A 353, 10. Sarubali—A 208, 11. Rasuntala—A 407, 12. Kadambeda A 198, 13. Jharbeda—A 382, 14. Pukamunda—A 475, 15. Sarbhadi—A 138, 16. Dianjudi—A 141, 17. Jhardumuria A 142.

Total—A 4,694.

VI. Baidyanath Pergana, Panchpir Sub-division (Notification No. F|G|4|6459, dated 4. 10. 43).

1. Jaunti—A 650, 2. Santbandh—A 44, 3. Deodhipa—A 80, 4. Nuabeda—A 47, 5. Kendua—A 380, 6. Denua—A 71.

Total—A 1,272.

The 20th March, 1945.

As a special concession without any prejudice to the State the raiyats of the neighbouring villages are permitted to use the following paths provided they do not violate any forest rules and regulations.

I. Thakurmunda Pergana.

Name of Block.	*Pillar No.*
Taramara	6 to 47
Handiphuta	2 to 24
Do.	27 to 57
Khejuria	18 to 57
Do.	24 to 40
Talpada	14 to 15
San Rugdibeda	10 to 22
Do.	7 to 29
Purunapani	10 to 30
Do.	20 to 26
Do.	38 to 47
Jadibil	10 to 24

II. Ratanpur Pergana.

Nil.

III. Barpada Pergana.

Name of Block.	*Pillar No.*
Chheratangar	18 to 78
Kendumundi	4 to 59
Bispur No. 1	31 to 101
Hatisalbeda	23 to 82
Podeidhada,	61 to 123
Paudia	19 to 73
Do.	34 to 67

IV. Kanika Pir.

Nil.

V. Karanjia Pergana.

Name of Block.	*Pillar No.*
Guridiha	48 to 102

VI. Baidyanath Pergana.

Nil.

The 4th April, 1945.

No. WM|7-2|28.—In pursuance of clause (a) of the provision to sub-rule (1) of rule 87 of the Defence of Mayurbhanj Rules the Government of the Maharaja of Mayurbhanj is pleased to direct that the following further amendment shall be made in the notification No. WM|7-2|10364, dated 6. 2. 45, namely :—

In the said notification after the word 'through', the following words shall be inserted, namely :—

"letters not exceeding 1 oz. by weight of each of".

The 16th April, 1945.

No. 338-35.—Amendments to the rules for the conduct of the State Examinations published in the State Gazette, dated 7. 8. 44 :—(1) Read 'Director of Education and Rural Reconstruction' for 'Superintendent of Education' wherever it occurs in the Rules.

(2) Para 1 of the Rules—Insert 'Domestic Science Examination' as item (E).

(3) Para 3—Add 'Domestic Science Class' after the words 'Elementary Training Schools' in the 3rd and 6th line.

(4) Para 5—Insert 'Domestic Science Examination Centre, L. F. Girls' School, Baripada' as a new item (v) in this paragraph.

(5) Para 7—Add 'Domestic Science Class' after the words 'E. T. School' in the 2nd line.

(6) Para 8—Examination Fees—Insert 'Domestic Science—Rs. 2|-' as a new item below 'E. T.—Rs. 2|8.'

(7) Para 9—Descriptive Roll—Omit 'And' before 'E. T.' and put 'and Domestic Science' after it on the 17th line of sub-paragraph 2.

(8) Para 11—Papers set and Pass marks—Insert the following as Section V :—

DOMESTIC SCIENCE EXAMINATION.

	Theoretical		Total mark		
	Name of subject	Paper	Assigned	Time	Pass mark
1	Mother Craft 50 ...	I	100	2 hours	33
2	Child study 50 ...				
3	Hygiene 40 ...	I	100	2 hours	33
4	Food study 60 ...				
5	Home management 60	I	100	2 hours	33
6	Laundry 40 ...				
7	First Aid 50 ...	I	100	2 hours	33
8	Home nursing 50 ...				
	(ii) Practical :—				
1	Needle work 20 ...				
2	Drawing 10 ...				
3	Home Nursing 20 ...	...	100	...	33
4	Laundry 10 ...				
5	Cooking 20 ...				
6	First Aid 20 ...				
	TOTAL	...	500		3

(9) Para 14—Certificates—Add 'or Domestic Science' in and between the words 'E. T. & U.' in the 6th line.

(10) Para 15—Rates of Remuneration—Insert 'Domestic Science—Re. -|4|-' as item (d) after in this paragraph.

The 17th April, 1945.

No. LE|G|1|482.—Mr. B. K. Sarbadhikary, of Mr. J. N. Sarbadhikary of Chaibassa, has been granted a license under rule 3 of the Rules for Recruitment of Emigrant Labour from Mayurbhanj State to act as a Local Forwarding Agent for the State on behalf of Messrs. Tea District Labour Association for the Chaibassa Agency.

This license shall be valid till the 30th September, 1945.

By Order,
B. C. DAS,
for Secretary

ANNEXURE-VIII

MAYURBHANJ STATE GAZETTE

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Vol. X | BARIPADA, APRIL 22, 1945 | No. 8

PART I – A.

Rules, Notifications, etc. issued under the authority of the Maharaja or the Dewan.

The 20th March, 1945.

No. F/G/5/ 11717 A – Under the provisions of Section 9 of the Mayurbhanj Forest Act, the Government of the Maharaja of Mayurbhanj are hereby pleased to declare that the areas specified below which in Notification Nos. mentioned against each were proposed to bereserve forests, shall be reserved forest with effect from the date of this Notification.

I. Thakurmunda Pergana, Panchpir Sub-Division (Notification No. F/G/4/4695, dated 14. 6. 43).

1. Taramara-A.	1824	9. Manjurposi-A	362
2. Handiphuta-A.	765	10. Tikarpada-A	223
3 Thakurmunda A	6274	11. Gaurigardia-A	166
4. Chamakpur-A	457	12. Purunapani-A	1132
5. Khejuri-A	1604	13. Jadibil-A	469
6. Talpada-A	364	14. San Ruggudibeda-A	532
7. Bansadiha-A	418	15. Buring-A	688
8. Bharaudia-A	244	16. San Andharikhaman-A	300
		Total— A	10,175

II. Ratanpur Pergana, Panchpir Sub-Division (Notification No. F/G/4/4696 Dated 14.8.43.).

1. Kadapani-A	363	11. Dangadiha-A	243
2. Dangapani-A	262	12. Vejidiha-A	400
3. Kalijhaari No-1-A	947	13. Mulapal-A	225
4. Kalijhari No-2 A	369	14. Dakeipal-A	301
5. Gudgumdha A	421	15. Jarak-A	129
6. Hatigoda-A	272	16. Kathuanuagaon-A	170
7. Mituani No. 1 A	268	17. Banmunda-A	441
8 Mituani No.-2-A	461	18. Gaudiababali-A	456
9. Badbil A	2358	19. Khumthan–A	600
10 Mankadbeda-A	521	20. Nada-A	880
		21. Satkoshia Hill block-A	35240
		Total. A	45,272

III Barpada, Pergana Panchpir Sub-division (Notification No-F/G/4/4697 Dated 14.8.43)

1, Salaibeda-A	314	10. Kalakad-A	250
2, Chberarangar-A	2060	11. Kenjhar A	294
3, Kendumundi No. 2-A	1620	12 Tikasil-A	232
4 Sarubali-A	405	13 Podeidhada-A	1144
5. Rengalbeda-A	168	14. Chaturisahi-A	283
6 Kendumundi No. 1. A	369	15. Singa-A	281
7 Bispur No. 2-A	185	16. Kuliposi-A	60
8. Bispur No 1A-	1053	17. Hatisalbeda-A	1219
9. Patbil-A	387	18. Paudia-A	1598
		Total :– A	11,861

IV. Kanika pir Panchpir Sub-division (Notifie ation No. F/G/4 6457 Dated 4,10,1943).

1	Jhumukapal-A	70	4.	Tulsipur-A	70
2	Bhanjabeda-A	363	5.	Gulusah-A	66
3.	Kanka-A	62			Total-A 631

V Karanjia Pergana, Panchpir Sub-division (Notification No. F/G/4/6458 Dated 4. 10, 43).

1.	Bhanra-A	99	10.	Sarubali-A	208
2	Chanthia-A	312	11.	Rasamatala-A	407
3	Bad Deoli A	169	12.	Kadambeda-A	198
4	Nuagaon-A	355	13.	Jharbeda-A	382
5	Andharjhori-A	352	14	Pasimunda-A	475
6.	San Deoli-A	301	15.	Sarbhadi-A	138
7.	Ankura-A	194	16.	Gajudi-A	141
8	Karanjia-A	228	17.	Jhardumuria-A	142
9.	Ghodaghagari-A	357			Total-A 4,624

VI Bandyanath Pergana, Panchpir Sub-division (Notification No. F/G/4/6459 dated 4. 10. 43).

1.	Jaunti-A	650	4.	Nuabeda-A	47
2.	Sautbandh-A	44	5.	Kendua-A	380
3.	Deodhipa-A	90	6.	Demua-A	71
					Total-A 1272

The 20th March, 1944.

As a Special concession without any prejudice to the State the raiyats of the neighbouring villages are permitted to use the following paths provided they do not violate any forest rules and regulations.

I. Thakurmunda Pergana.

Name of the Block	Pillar No.
Taramara	6 to 47
Handiphuta	2 to 24
-Ditto-	27 to 57
Khejuria	24 to 50
-Ditto-	14 to 15
Talpeda	14 to 15
San Rajdibeda	1 to 22
-Ditto-	7 to 20
Purunapani	10 to 30
-Do-	20 to 26
-Do-	33 to 17
Jodibil	10 to 24

II Ratanpur Pergana
Nil

III. Barpada Pergana

Name of Block.	Pillar No.
Chhatangar	18 to 78
Kendumundi	4 to 59
Bispur No. 1	31 to 101
Hatisalbeda	23 to 82
Podelghada	61 to 123
Puaudia	19 to 73
-Do-	34 to 67

IV. Kanika Pir- Nil.
Karanjia Pergana.

Guridiha	4 to 102

VI Bandyanath Pergana Nil.

Collector

ANNEXURE-IX

Sl. No.	Name of Range	Name of PRF	Area in Ha.	Notification number
1	Karanjia	Balibhol	8.64	FS 310/79-73669 dt. 18-10-79
2	Karanjia	Bhalughera	2.08	FS 359/79-71018dt. 11-10-79
3	Karanjia	Champarei-I	22.26	FS 117/80-21752/R dt. 22-03-80
4	Karanjia	Champarei-II	3.01	FS 333/79-74315/R dt. 22-10-80
5	Karanjia	Champarei-III	2.63	FS 334/79-75048/R dt. 23-10-80
6	Karanjia	Haldia-I	5.34	FS 307/79-73556/R dt. 18-10-79
7	Karanjia	Haldia-II	7.49	FS 337/79-74335/R dt. 22-10-79
8	Satkosia	Bhaliadal-I	10.63	FS 164/80-24727dt. 02-04-80
9	Satkosia	Bhaliadal-III	110.79	FS 165/80-24718dt. 02-04-80
10	Satkosia	Bhaliadal-IV	17.67	FS 370/79-86573dt. 06-12-79
11	Satkosia	Mahuldiha-I	23.67	FS 282/78-80447dt. 30-03-77
12	Satkosia	Mahuldiha-II	26.57	FS 134/78-34658dt. 18-12-78
13	Thakurmunda	Ambabeda	19.60	FS 193/78-15559 dt. 22-02-79
14	Thakurmunda	Andharikhaman	28.45	FS 308/78-73561 dt. 18-10-79
15	Thakurmunda	Basantapur-II	23.45	FS 488/78-30455 dt. 05-12-78
16	Thakurmunda	Bharandia	29.26	FS 163/80-24731dt. 02-04-80
17	Thakurmunda	Dangadiha-II	44.52	FS 314/79-73570 dt. 18-10-79
18	Thakurmunda	Diligang	25.84	FS 316/79-74381 dt. 22-10-79
19	Thakurmunda	Gahandia	19.02	FS 125/80-21682 dt. 22-03-80
20	Thakurmunda	Kaliaposi-II	8.82	FS 218/78-88676 dt. 30-12-78
21	Thakurmunda	Kaliaposi-III	15.68	FS 218/78-88676 dt. 30-12-78
22	Thakurmunda	Keshdiha	42.03	FS 163/80-24721 dt. 02-04-80
23	Thakurmunda	Khadipal	6.87	FS 116/80-21706 dt. 22-03-80
24	Thakurmunda	Kirkichipal	34.09	FS 330/79-74737 dt. 30-10-79
25	Thakurmunda	Kucheikudar	65.72	FS 353/79-71880dt. 11-10-79
26	Thakurmunda	Mituani-III	19.51	FS 234/79-43182dt. 07-06-79
27	Thakurmunda	Mituani-IV	97.41	FS 113/79-42111 dt. 02-06-79
28	Thakurmunda	Nunadiha	82.72	FS 266/78-84650 dt. 18-12-78
29	Thakurmunda	Patrapada	73.86	FS 119/80-21686 dt 22-03-80
30	Thakurmunda	Purunapani	26.87	FS 183/78-84654 dt. 08-12-78
31	Thakurmunda	Bhairanibeda	12.46	FS 315/79-73575dt. 18-10-79
32	Thakurmunda	Kalasira	32.09	FS 368/79-86577dt. 06-12-79
33	Thakurmunda	Keloposi	23.09	FS 3/84-51144dt. 21-07-84
34	Thakurmunda	Kendujiani	17.56	FS 118/80-21726dt. 22-03-80
35	Thakurmunda	Khandabandha	19.83	FS 124/80-21714dt. 22-03-80
36	Thakurmunda	Khuntakata	7.96	FS 113/80-21690dt. 22-03-80
37	Thakurmunda	Saleibeda	34.40	FS 352/79-74733dt. 23-10-79
38	Thakurmunda	Sunariposi	14.37	FS 322/79-74327dt. 22-10-79
39	Dudhiani	Bakartala - I	4.46	FS/320/79-13590/R dt 18.10.79
40	Dudhiani	Bakartala - II	2.19	FS/319/79-73585/R dt 18.10.79
41	Dudhiani	Barakmunda	12.14	FS/123/80-21738 dt 22-03-80
42	Dudhiani	purunapani	15.99	FS/114/80-21734 dt 22.03.80
43	Dudhiani	Raitalia	26.39	FS 111/80-21698 dt 22-03-80
44	Dudhiani	Raitalia A	18.21	FS 111/80-21698 dt 22-03-80
45	Dudhiani	Kanthikana	126.95	FS 317/79-74723 dt 23-10-79
46	Dudhiani	Ektali-II	215.30	FS 373/79-85530 dt. 03-12-79
	Total		**1487.89**	
* Badakasira, Chandraposi and Gurguria PRF listed In PWPR were transferred to Similipal and Kusumi was transferred to Rairangpur Division. So, These 4 PRFs have not been considered in the plan.				

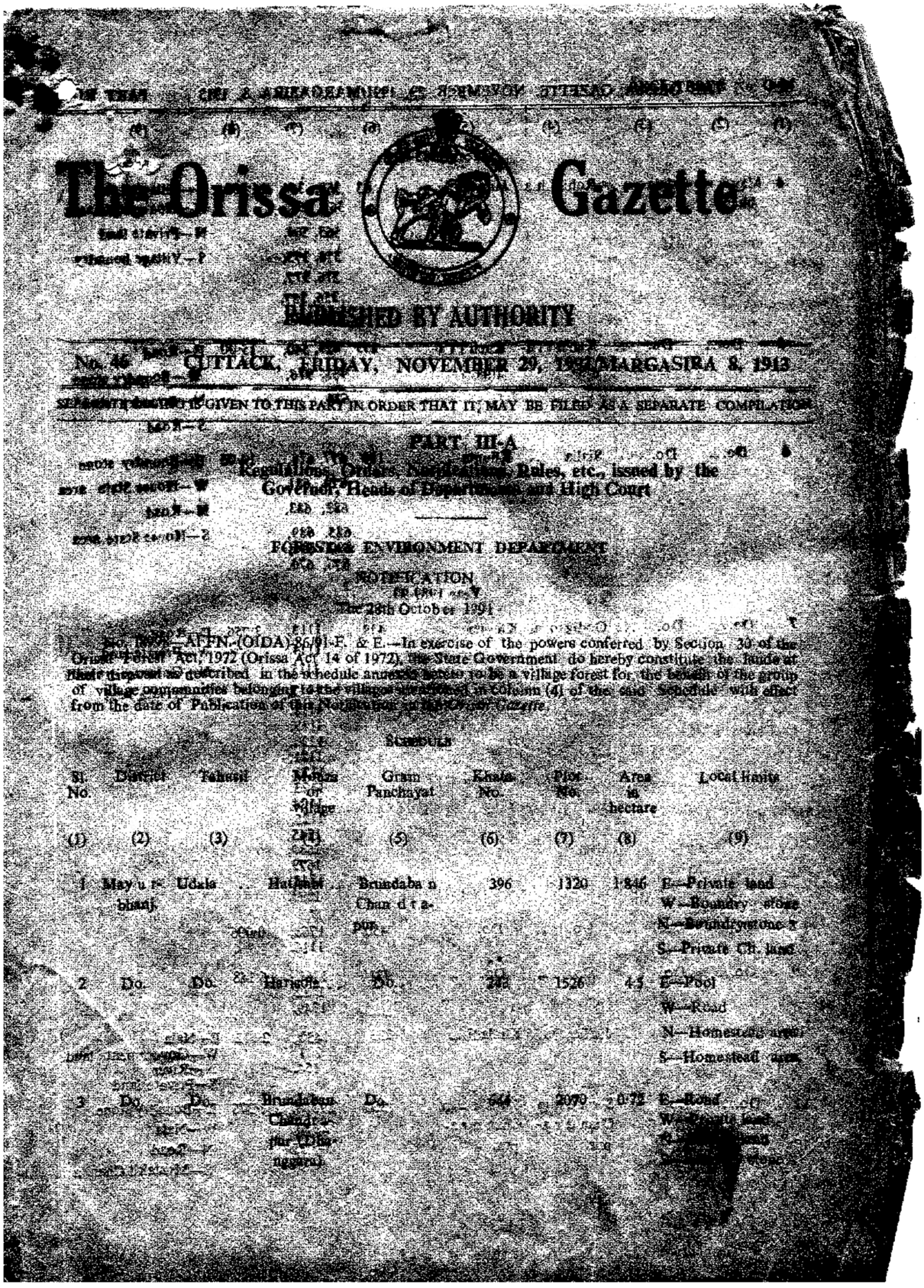
ANNEXURE X

LIST OF DEMARCATED PROTECTED FORESTS OF KARANJIA DIVISION				
Name of Range	**Sl no**	**Name of DPF**	**Area in Ha.**	**Remarks**
Karanjia	1	Mayursahi	12.54	
Karanjia	2	Singda	7.28	
Karanjia	3	Milu	19.02	Notified Area- 61.09 Ha, 42.07Ha area has been notified as RF
Karanjia	4	Balisahi	40.47	
Thakurmunda	5	Ghodabindha	11.56	
Thakurmunda	6	Majuraposi	111.48	Notified Area- 125.46 Ha, 13.98 Ha area has been notified as RF
Dudhiani	7	Dumuria	4.41	
Dudhiani	8	Budhipat	1147.77	
Total			**1354.53**	

* Khejuri DPF listed in PWPR after reorganisation belongs to Similipal North Wildlife Division and Bhatgoda DPF has been transferred to Rairangpur Division.

ANNEXURE XI: LIST OF VILLAGE FORESTS IN KARANJIA FOREST DIVISION			
Sl. No.	**Name of Range**	**Name of VF**	**Area in Ha.**
42	Dudhiani	Balisudra	4
43	Dudhiani	Rangamatia	10
44	Dudhiani	Purunapani-I	3.02
45	Karanjia	Halpur	2
46	Karanjia	Narsanda	1.08
47	Karanjia	Chheliaposi	7.84
48	Karanjia	Kusunpur	3.94
49	Karanjia	P.Jadunathpur	11.92
50	Karanjia	Badposi	5
51	Karanjia	Bamanposi	7.9
52	Karanjia	Nanduburu	1
53	Karanjia	Palsagadia	9
54	Karanjia	Kenjhera Panposi	1.34
55	Karanjia	Rugudi-II	11.86
56	Karanjia	Kasia	5
57	Karanjia	Badposi-III	4.18
58	Karanjia	Bhramarposi-I	12
59	Karanjia	Mandua	5.01
60	Karanjia	Ankura	3
61	Karanjia	Mata	3.95
62	Karanjia	Nuagan	2.8
63	Karanjia	Sarubil	5
64	Karanjia	Pandarsil	1.58
65	Karanjia	Baliposi	5
66	Karanjia	Saradha	6
67	Karanjia	Bangriposi	6
68	Karanjia	Mahadevdeuli	5
69	Karanjia	Ghosda	15.61
70	Karanjia	B.Jadunathpur	6
71	Karanjia	Dhakata	6.08
72	Karanjia	Pakamunda	5
73	Karanjia	Reghasahi	8
74	Karanjia	Bhramarposi-II	2.92
75	Karanjia	Khadiakudar	4.02
76	Karanjia	Nuabeda	4.75
77	Thakurmunda	Hatibandha	10.52
		Division Total:-	**401.21**

ANNEXURE-XII



The Orissa Gazette

PUBLISHED BY AUTHORITY

No. 46 CUTTACK, FRIDAY, NOVEMBER 29, 1991/AGRAHAYANA 8, 1913

SEPARATE PAGE NUMBERS ARE GIVEN TO THIS PART IN ORDER THAT IT MAY BE FILED AS A SEPARATE COMPILATION

PART III-A

Regulations, Orders, Notifications, Rules, etc., issued by the Governor, Heads of Departments and High Court

FOREST & ENVIRONMENT DEPARTMENT

NOTIFICATION

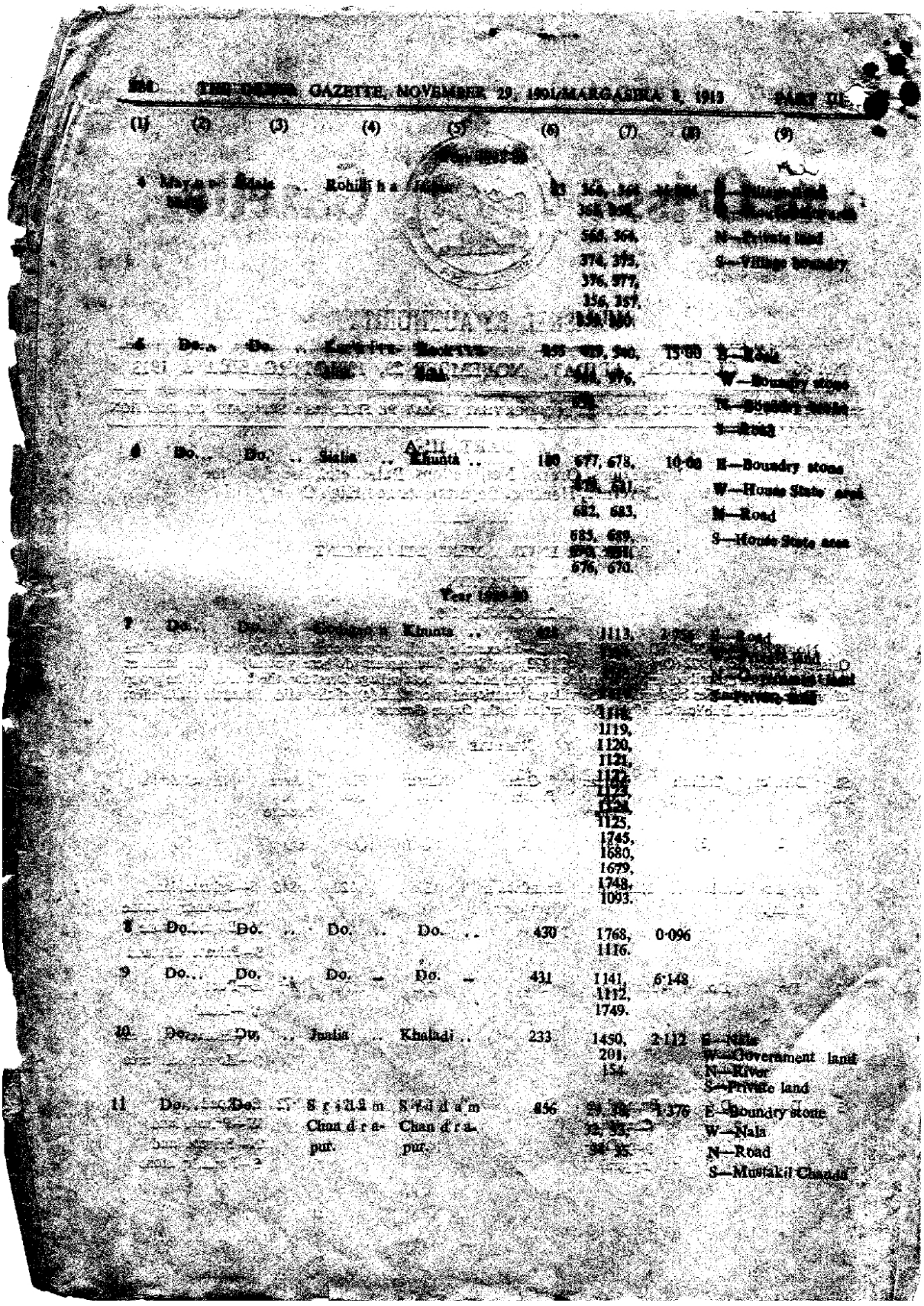
The 28th October 1991

No. 19974 AFFN.-(OIDA)-86/91-F. & E.—In exercise of the powers conferred by Section 30 of the Orissa Forest Act, 1972 (Orissa Act 14 of 1972), the State Government do hereby constitute the lands of their interest as described in the schedule annexed hereto to be a village forest for the benefit of the group of village communities belonging to the villages specified in Column (4) of the said Schedule with effect from the date of Publication of this Notification in the Orissa Gazette.

SCHEDULE

Sl. No.	District	Tahasil	Mouza or Village	Gram Panchayat	Khata No.	Plot No.	Area in hectare	Local limits
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Mayurbhanj	Udala	Hatibari	Boundaba Chandrapur	396	1320	1.846	E—Private land W—Boundary stone N—Boundary stone S—Private Ch. land
2	Do.	Do.	Harisole	Do.	248	1526	4.5	E—Pool W—Road N—Homestead area S—Homestead area
3	Do.	Do.	Brundaban Chandrapur (Dhangoal)	Do.	644	2070	0.72	E—Road W—Private land S—Homestead area

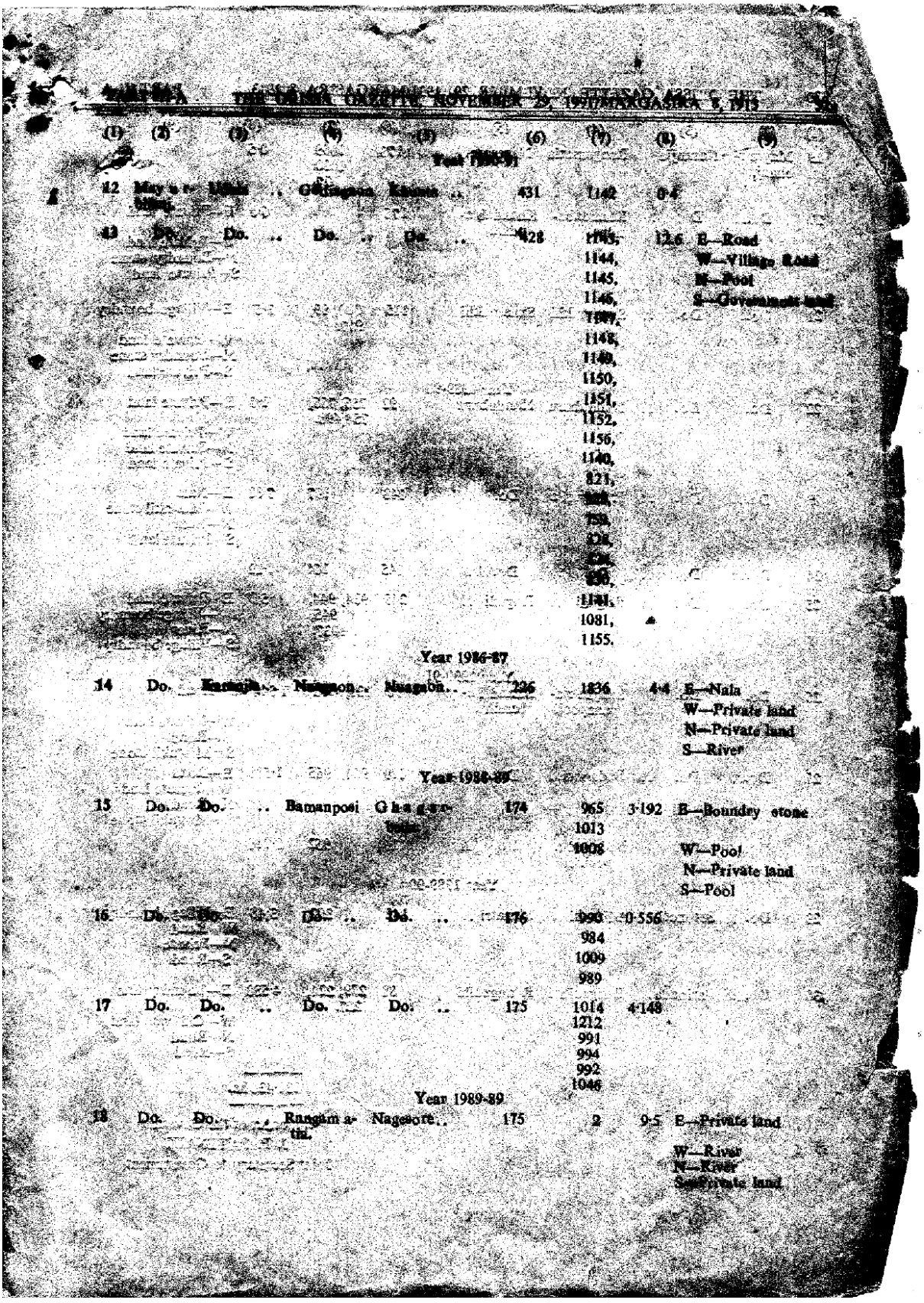
ANNEXURE-XII



THE ORISSA GAZETTE, NOVEMBER 29, 1991/MARGASIRA 8, 1913 PART II

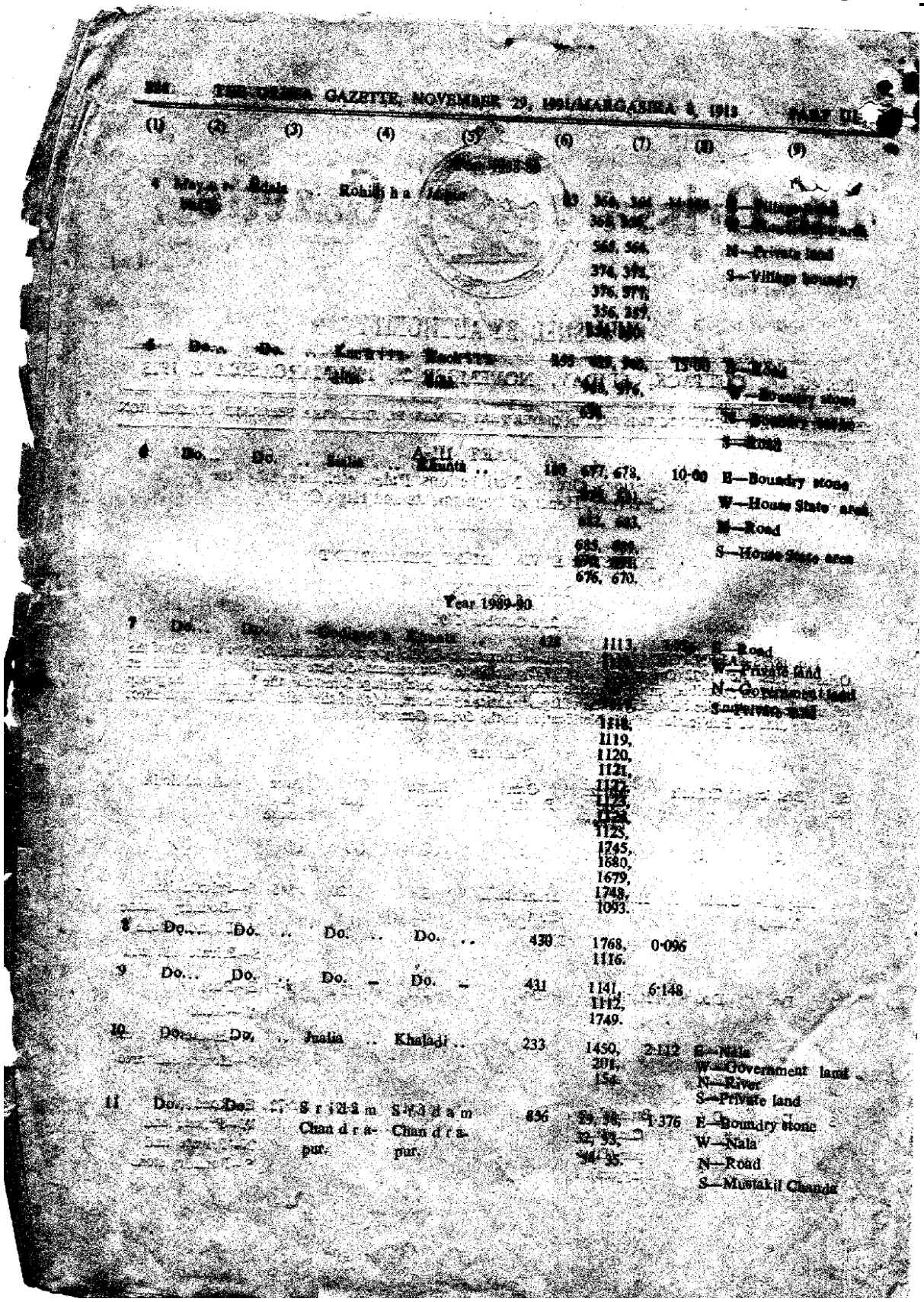
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4	[illegible]	[illegible]	.. Rohidi h a	[illegible]	83	364, 365, 366, 368, 369, 558, 564, 374, 375, 376, 377, 156, 157, 159, 160	[illegible]	E—[illegible] W—[illegible] N—Existing Road S—Village boundry
5	Do..	Do.	.. [illegible]	[illegible]	835	339, 340, 341, 342, 343,	15·00	E—Nala W—Boundry stone N—Boundry [illegible] S—Road
6	Do..	Do.	.. Sialia	.. Khunta ..	180	677, 678, 681, 682, 683, 685, 689, 675, 676, 670.	10·00	E—Boundry stone W—House Site area N—Road S—House Site area
				Year [illegible]				
7	Do..	Do.	.. [illegible]	Khunta ..	428	1113, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1745, 1680, 1679, 1748, 1093.	2·752	E—Road W—[illegible] N—[illegible] S—Private land
8	Do..	Do.	.. Do.	.. Do. ..	430	1768, 1116.	0·096	
9	Do..	Do.	.. Do.	.. Do. ..	431	1141, 1112, 1749.	6·148	
10	Do..	Do.	.. Jualia	.. Khaladi ..	233	1450, 201, 154.	2·112	E—Nala W—Goverament land N—River S—Private land
11	Do..	Do.	.. Sridam Chandra-pur.	Sridam Chandra-pur.	856	29, 30, 32, 33, 34, 35.	1·376	E—Boundry stone W—Nala N—Road S—Mustakil Chanda

ANNEXURE-XII



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Year 1988-89				
12	Mayang Khullen	Do.	Gelingsam	Khoum	431	1142	0·4	
13	Do.	Do.	Do.	Do.	428	1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1156, 1140, 821, 822, 759, 824, 825, 826, 1141, 1081, 1155.	12.6	E—Road W—Village Road N—Pool S—Government land
				Year 1986-87				
14	Do.	Kamajin	Nungpon	Nungpon	236	1836	4·4	E—Nala W—Private land N—Private land S—River
				Year 1988-89				
15	Do.	Do.	Bamanpooi	Ghagra-bung	174	965 1013 1008	3·192	E—Boundey stone W—Pool N—Private land S—Pool
16	Do.	Do.	Do.	Do.	176	990 984 1009 989	0·556	
17	Do.	Do.	Do.	Do.	175	1014 1212 991 994 992 1046	4·148	
				Year 1989-89				
18	Do.	Do.	Rangkimathi.	Nageore	175	2	9·5	E—Private land W—River N—River S—Private land

ANNEXURE-XII



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4	Do.	Do.	Kurariya	Kurariya	433	368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367,

ANNEXURE-XII

Government of Orissa
Forest and Environment Department

NOTIFICATION

Dated Bhubaneswar the 28th Dec.'92

No.AFFN(VIDA)-86/91.30836/F&E, In exercise of the powers conferred by section 30 of the Orissa Forest Act, 1972 (Orissa Act 14 of 1972), the State Government do hereby constitute the lands at their disposal as described in the Schedule hereto annexed to be a village forest for the benefit of the group of village communities belonging to the villages mentioned in column(4) of the said Schedule with effect from the date of publication of this notification in the Orissa Gazette.

SCHEDULE

Sl. No.	District	Tahasil	Name of village	Gram Panchayat.	Khata No.	Plot No.	Area in ha.	Boundary	
1	2	3	4	5	6	7	8	9	
1.	Mayurbhanj	Karanjia.	Bakartala	Pantha	108	985 1084 1079 949	4.080	N-Pool S-Cultivated land E-Sal forest W-Sal forest	87-88
2.	Mayurbhanj	Baripada	Jhinai	Kuabuda	246 243	744 745 1504 1506 1517 1546 1547 1908	12 ha	N-Jangle S-P.land E-Cultivated land W-PFRP 88-89	88-89
3.	Mayurbhanj	Baripada	Jhinai	Kuabuda	243	460 400 318	6 ha.	N-Cultivated land S-Plot No.1969 E-Plot 462 W-Plot 444	89-90
4.	Mayurbhanj	Baripada	Raghunathpur	Kuabuda	15	23	8 ha.	N-Vill. boundary S-Boundary Vill. Marangtandi. E-P. Land W-Govt. land.	89-90

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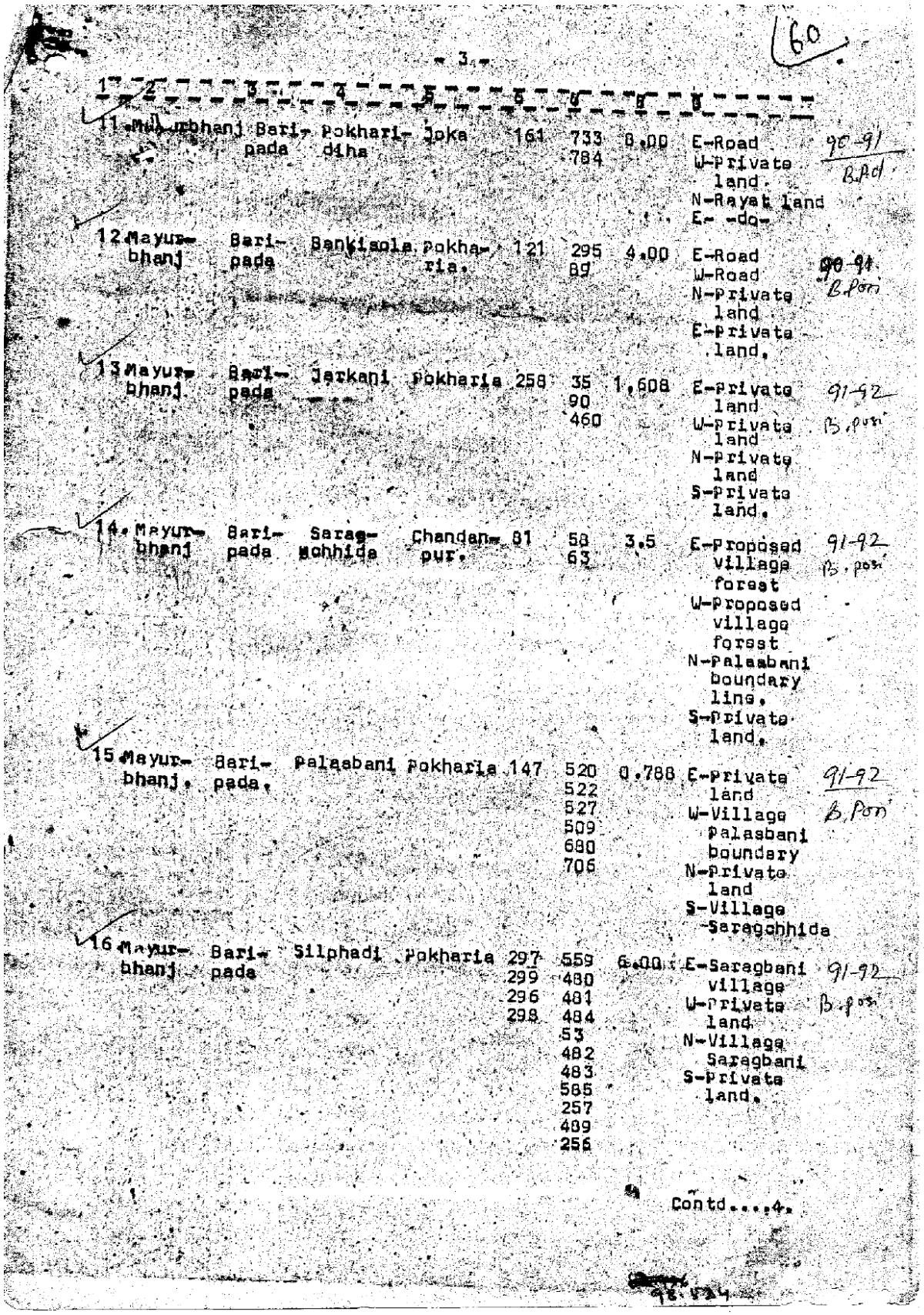
ANNEXURE-XII

1	2	3	4	5	6	7	8	9	
5.	Mayur-bhanj	Baripada	Jhangar-pal	Kuabuda	90 94 92	205 206 207 357 379 380	10.608	N-Vill. boundary S-P. land E-Govt.land W-P. land,	89-90 B.Pal
6.	Mayur-bhanj	Baripada	Jhinai	Kuabuda	243	143	5 ha	N-P. land S-Plot 1936 E-Govt.land W-Road,	91-92 B.Pal
7.	Mayur-bhanj	Karanjia	Khand-bandh	Khand-bandh	176	204 248 402 405 249 269 270 271 354 348 349 350 351 345 344 324 327 328 342 352 353 403 411 323	9.732	N-P. land S-Vill. boundary E-Plot 281 W-Plot 406	91-92 J.Sil
8.	Mayur-bhanj	Baripada	Kasiabada	Pokha-ria	190	660	4.00	E-Rayat zami W-Bankikhol N-Rayat zami S-Kasiabada boundary	88-89 B.Pan
9.	Mayur-bhanj	Baripada	Kanadiha	Pokha-ria.	123	426 1028 652 1006 1002	10.00	E-Jungle W-Cultivated land N-Chasa Jami S-land	89-90 B.Pan
10.	Mayur-bhanj	Baripada	Pokharia	Pokha-ria.	513 516	1831 1808 1761 1755	6.208	E-Basti N-Kapasia boundary line W-cultivated land S- Road	89-90 B.Pan

Contd...3.

74-628

ANNEXURE-XII



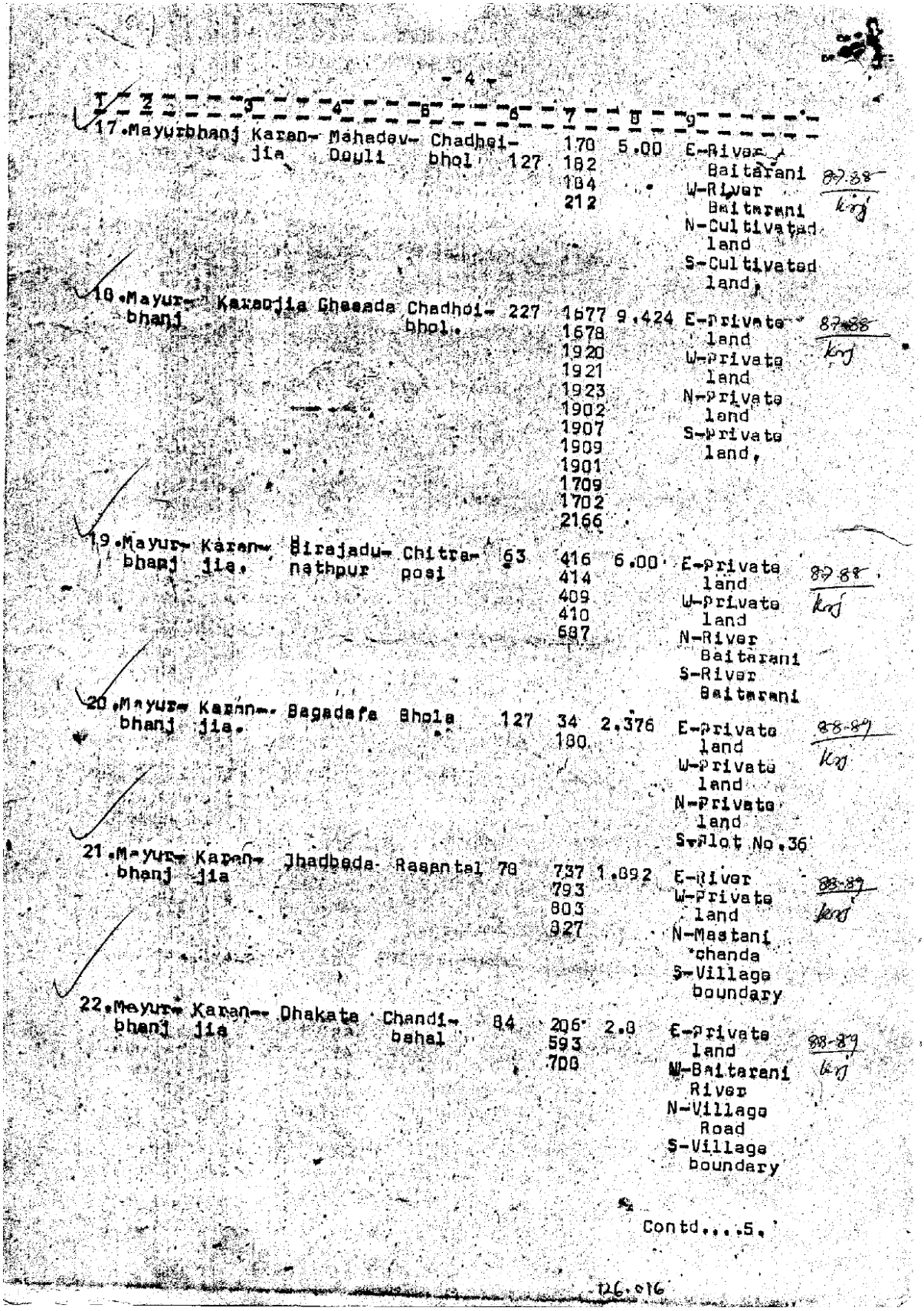
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160

1	2	3	4	5	6	7	8	9	
11	Mayur-bhanj	Bari-pada	Pokhari-diha	Joka	161	733 784	8.00	E-Road W-Private land. N-Rayat land E- -do-	90-91 B.Pol
12	Mayur-bhanj	Bari-pada	Bankisola	Pokha-ria.	121	295 89	4.00	E-Road W-Road N-Private land. E-Private land.	90-91 B.Pon
13	Mayur-bhanj	Bari-pada	Jarkani	Pokharia	258	35 90 460	1.608	E-Private land W-Private land N-Private land S-Private land.	91-92 B.Pon
14	Mayur-bhanj	Bari-pada	Sarag-achhida	Chandan-pur.	81	58 63	3.5	E-Proposed village forest W-Proposed village forest N-Palasbani boundary line. S-Private land.	91-92 B.Pon
15	Mayur-bhanj.	Bari-pada.	Palasbani	Pokharia	147	520 522 527 509 690 706	0.788	E-Private land W-Village Palasbani boundary N-Private land S-Village -Saragchhida	91-92 B.Pon
16	Mayur-bhanj	Bari-pada	Silphadi	Pokharia	297 299 296 298	559 480 481 484 53 482 483 585 257 489 256	6.00	E-Saragbani village W-Private land. N-Village Saragbani S-Private land.	91-92 B.Pon

Contd....4.

ANNEXURE-XII



1	2	3	4	5	6	7	8	9	
17.	Mayurbhanj	Karan-jia	Mahadev-Dauli	Chadhoi-bhol	127	170 182 184 212	5.00	E-River Baitarani W-River Baitarani N-Cultivated land S-Cultivated land,	87-88 Kej
18.	Mayur-bhanj	Karanjia	Ghasada	Chadhoi-bhol.	227	1677 1678 1920 1921 1923 1902 1907 1909 1901 1709 1702 2166	9.424	E-Private land W-Private land N-Private land S-Private land,	87-88 Kej
19.	Mayur-bhanj	Karan-jia.	Birajadu-nathpur	Chitra-posi	63	416 414 409 410 687	6.00	E-Private land W-Private land N-River Baitarani S-River Baitarani	87-88 Kej
20.	Mayur-bhanj	Karan-jia.	Bagadafe	Bhola	127	34 180	2.376	E-Private land W-Private land N-Private land S-Plot No.36	88-89 Kej
21.	Mayur-bhanj	Karan-jia	Jhadbeda	Rasantal	79	737 793 803 827	1.892	E-River W-Private land N-Mastani chanda S-Village boundary	88-89 Kej
22.	Mayur-bhanj	Karan-jia	Dhakata	Chandi-bahal	84	206 593 708	2.8	E-Private land W-Baitarani River N-Village Road S-Village boundary	88-89 Kej

Contd....5.

126.016

ANNEXURE-XII

1	2	3	4	5	6	7	8	9	
23.	Mayurbhanj	Karan-jia	Poka-munda	Karanjia	79 66	102 98	5.00	E-Private land W-Boundary line N-Pool S-Private land.	90-91 kmj
24.	Mayur-bhanj	Karan-jia	Dhakata	Chandi-bahal	81	639 661 641 663 665 684 681 636	3.20	E-Private land W-River N-N.H.-5 S-F.F.R.P. 88-89	90-91 kmj
25.	Mayur-bhanj	Karan-jia	Ghogada	Chandi-bahal	277	1036 1037 1038 1043 2265 2277 2278 2280 2282 2240 2249 2250	6.100	E-Jungle W-Basti N-Kasapur Boundary S-Road.	90-91 kmj
26.	Mayur-bhanj	Udala	Kudiakhunte	Rani-bandha	39	107	3.44	E- Road W-Village Jungle N-Road S-Govt.land	86-86 Udala
27.	Mayur-bhanj	Baknati	Nuagaon Sahil Chotaripur	Purunia	263	140 142 137	10.00	E-Private land W-Private land N-Road S-Field	91-92 Bet
28.	Mayur-bhanj	Baknati	Nuagaon	Purunia	263	137	10.00	E-Road W-Private land N-Road S-Cultivated land	91-92 Bet.
29.	Mayur-bhanj	Baknati	Balaka	Balaka	246	1165	2.00	E-Road W-Adi N-V.W.L.87-88 S-V.W.L.87-88	91-92 Bet.
30.	Mayur-bhanj	Baripada	Godidiha Samil Kamala	Khanua	459	3016 2077 2081 3196, 2083, 2075, 2076, 3215, 2087, 2086, 3213, 2074, 2082, 2085, 3214, 3198, 3197, 2073, 2084	6.00	E-privt.land W-privt.land N- Land S-Road.	91-92 Bnf.

ANNEXURE-XII

1	2	3	4	5	6	7	8	9	
31	Mayur-bhanj.	Karan-jia	Puruna-pani,	Ghagar-bodha	152	361 691	4.24 he.	N-Village road S-Private land No.692 E-Private land No.363 W-Private land No.357,Mx.359	88-89 Jathija
32	Mayur-bhanj	Karanjia	Kogha-sahi	Ghagar-bodha	32	42 45	8 ha.	N-Pool S-Private land E-Private land W-Village boundary.	88-89 JSM
33	Mayur-bhanj	Karanjia	Bhramar-pani,	Teranti	169	1 34	2.580	N-Village boundary	88-89
					171	3 11	0.276	S-Private land E-Road	JSM
					168	6	0.06	W- Hudi	
							2.924		
34	Mayur-bhanj	Karanjia	Khadi-kudar	Bata-pelasa	124	19 19 044	3.540	N- Nali S-Vill.boundary E-Privt.land	99-90 Kuj
					121	4 5 16 25 24	0.476	W- Nali	
							4.016		
35	Mayur-bhanj	Karan-jia	Khandia-dag,	Badagan	93 96	43 17	6.50	N-Nali S-Private land E-Road W- Nali	89-90 Kuj
36	Mayur-bhanj	Karan-jia	Parbati-pur,	Sukruli	76 73	215 170 106 191 189	1.232	N-River S-Boundary stone E-Road W-Vill.boundary	90-91 Kuj
37	Mayur-bhanj	Karan-jia.	Nodha-gadia	Badagan	79	1	0.104	N-Boundary Stone S-Road E- Patit W-Casua field	90-91 Kuj
38	Mayur-bhanj	Karan-jia	Patua	Teranti	72	369 370 371 372 373 356 300 381 303 384 390 391 425 379	5.300	N-Vill.boundary S-Basti E-Private land W-Road	90-91 Kuj

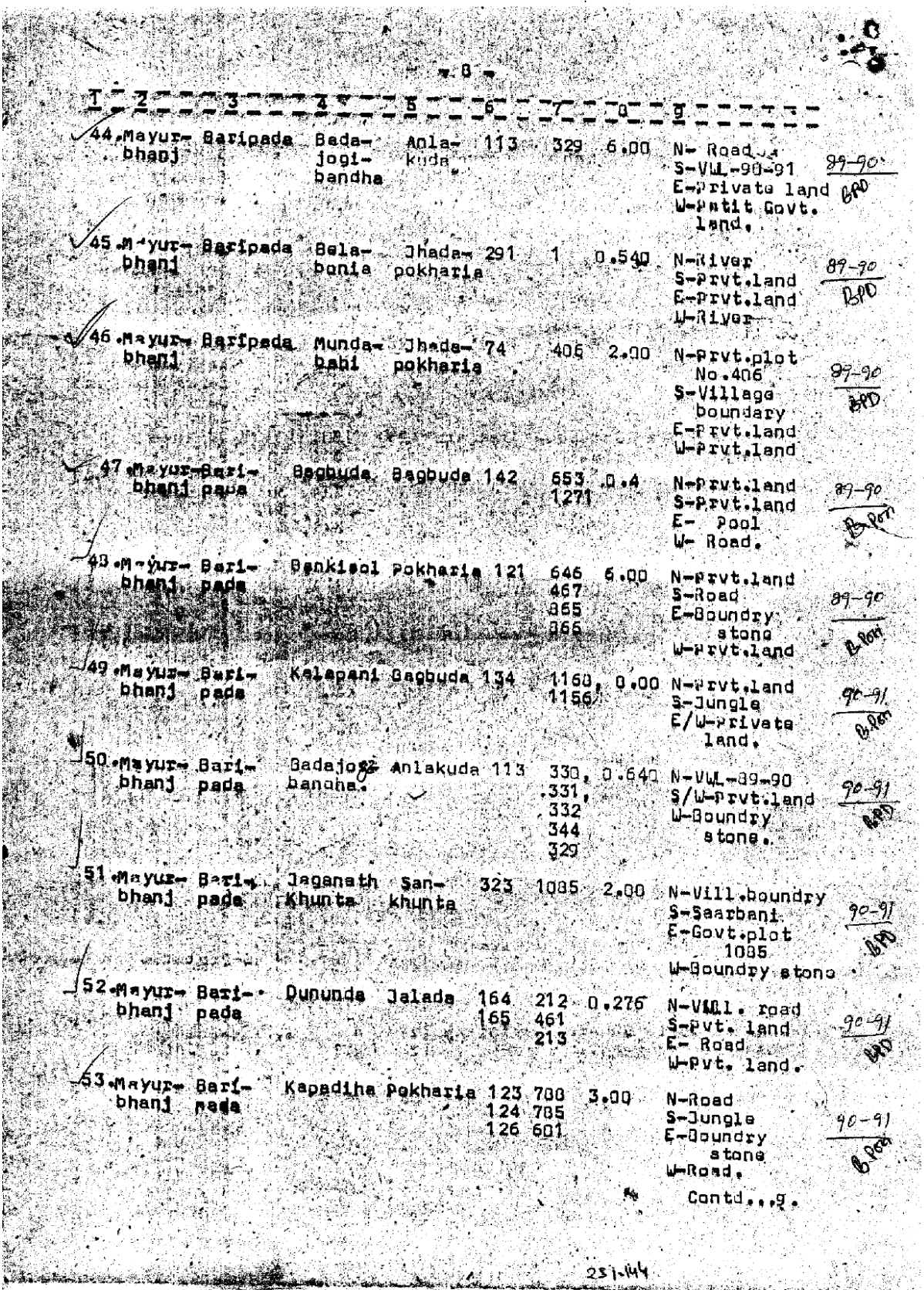
ANNEXURE-XII

1	2	3	4	5	6	7	8	9	
39	Mayur-bhanj	Karanjia	Mazara-sahi,	Chatu-ranjali	59 56	10 19	1.492	N-Vill.boundary S-Privt.land E-Basti W-Jungle	90-91
40	Mayur-bhanj	Karanjia	Nuabadha	Turanti	193	1493, 1497 1499, 1536 1539, 480 485, 486.	4.796	N-Privt.land S-River E-Privt.land W-River	90-91
41	Mayur-bhanj	Udala	Kamali	Basipitha	259	347, 345 345 629	2.060	N- Road S-River E-Private land W- Road	88-89 Udala
42	Mayur-bhanj	Udala	Satapau-tia.	Bangara	239	1301, 1302 1303, 1304, 1305 1306, 1307 1308, 1309 1310, 1311 1312, 1313 1314, 1315 1316, 1317 1318, 1277 1272, 1271 1266, 1265 1298, 1299 1300, 996, 997, 965, 964, 963, 962, 960, 961, 959, 958, 954, 953, 952, 951, 950, 949, 948, 947, 946, 945, 944, 943, 942, 941, 981, 982, 985 1281, 1282, 1283, 1284, 1285, 1280, 1278, 1279, 1275, 1276.	10.00	N- Road S-Private land E-Private land W- Basti	89-90 Udala
43	Mayur-bhanj	Udala	Sahada-Qadi.	Basipitha	127 126	4 271	0.12	N-Boundary stone S-Private land E-River W-Boundary	90-91 Udala

Contd....3.

221-288

ANNEXURE-XII



1	2	3	4	5	6	7	8	9	
44	Mayur-bhanj	Baripada	Bada-jogi-bandha	Anla-kuda	113	329	6.00	N- Road S-VWL-90-91 E-Private land W-Patit Govt. land.	89-90 BPD
45	Mayur-bhanj	Baripada	Bela-bonia	Jhada-pokharia	291	1	0.540	N-River S-Prvt.land E-Prvt.land W-River	89-90 BPD
46	Mayur-bhanj	Baripada	Munda-babi	Jhada-pokharia	74	406	2.00	N-Prvt.plot No.406 S-Village boundary E-Prvt.land W-Prvt.land	89-90 BPD
47	Mayur-bhanj	Bari-pada	Bagbuda	Bagbuda	142	653 1271	0.4	N-Prvt.land S-Prvt.land E- Pool W- Road.	89-90 B.Pari
48	Mayur-bhanj	Bari-pada	Bankisol	Pokharia	121	646 467 865 866	6.00	N-Prvt.land S-Road E-Boundry stone W-Prvt.land	89-90 B.Pari
49	Mayur-bhanj	Bari-pada	Kalapani	Bagbuda	134	1160, 1156	0.00	N-Prvt.land S-Jungle E/W-Private land.	90-91 B.Pari
50	Mayur-bhanj	Bari-pada	Badajoga banaha.	Anlakuda	113	330, 331, 332 344 329	0.640	N-VWL-89-90 S/W-Prvt.land W-Boundry stone.	90-91 B.P.D
51	Mayur-bhanj	Bari-pada	Jagannath Khunta	San-khunta	323	1085	2.00	N-Vill.boundry S-Saarbani E-Govt.plot 1085 W-Boundry stone	90-91 BPD
52	Mayur-bhanj	Bari-pada	Dununde	Jalada	164 165	212 461 213	0.276	N-Vill. road S-Pvt. land E- Road W-Pvt. land.	90-91 BPD
53	Mayur-bhanj	Bari-pada	Kapadiha	Pokharia	123 124 126	788 785 601	3.00	N-Road S-Jungle E-Boundry stone W-Road.	90-91 B.Pari

Contd...9.

251-144

57

1	2	3	4	5	6	7	8	9	
54.	Mayur-bhanj.	Baripada	Kharibani	Pokharia	60 70	267 202 201 292	2.108	N-Road S-Boundry stone E-Prvt.land W-Basti	90-91 B.Pani
55.	Mayur-bhanj	Baripada	Jhikei-pahadi	Bana-kati.	196 195	81 59 250	3.000	N-River S-Prvt.land E-Vill.stone W-pvt. land.	90-91 B.Pani
56.	Mayur-bhanj	Baripada	Jhiki-pahadi	Bana-kati.	196	212	2.00	N- Road S- Road E- Road W-Pvt. land.	90-91 B.Pani
57.	Mayur-bhanj	Baripada	Janade-pal.	Banakati	70	514	0.5	N-Prvt.land S-River E-Road W-Vill.stone	90-91 B.Pani
58.	Mayur-bhanj	Betnoti	Bianu-pur.	Raghu-pur	147	523 519	10.00	N-Govt.land S-Pvt. land E/W-Govt.land	86-87 Bet
59.	Mayur-bhanj	Betnoti	Tika-yatpur	Raghupur	203	2	7.00	N-Govt.land. S-Prvt.land E/W-Govt.land	86-87 Betnoti
60.	Mayur-bhanj	Betnoti	Sunda-joda.	Gadigan	132	394 426 427 428 429,432 433,434	9.644	N-Prvt.land S-Vill.boundary E/W-Pvt.land	86-87 Betnoti
61.	Mayur-bhanj	Betnoti	Puruna-pani Samil Lakhary Khunta	Raghupur	174	170 93 46	9.6	N-Pvt.land S-Boundry stone E-Road W-Boundry.	87-88 Betnoti
62.	Mayur-bhanj	Betnoti	Bianupur	Raghupur	147	470	3.00	N-Road S-Plot 471 E-Plot 569 W-Plot 434	88-89 Betnoti
63.	Mayur-bhanj	Betnoti	Amba-gadia (Angar-gadia)	Raghupur	772 770	3677 3678 3679 3681 3680,3682 3684,3683 3690,3688 3694,3695 4225,3645 3651,3652 3692,3647 3640,3655 3656	5.684	N-Prvt.land S-PWD Road E/W-Pvt.land	88-89 Betnoti

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Contd...10.

ANNEXURE-XII

1	2	3	4	5	6	7	8	9	
64	Mayur-bhanj.	Butnoti	Gadadeulia (Lakhabindha)	Gadadeulia	516	332	0.840	N-Road S-Govt.land E-Central Nursery W-Pvt.land	88-89 Betnoti
65	Mayur-bhanj	Betnoti	Ambagadia (Tikarasahi)	Raghupur.	772 770	3327 3366 3273 3303,3302 3300,3301 3304,3305 4256,3299 2972,2973 3203,3204 3285,3284 3206,3326 3262,3263 3265,3267 3218,3219 3216,3217 3220,3274 3275,3276 3277,3278 3196,3192 3191,3271 3272	11.232	N/S- Road E- Busti W-Private land.	89-90 Betnoti
66	Mayur-bhanj	Betnoti	Mahisasol	Purunia.	105	233	3.000	N-Govt.land S-Boundry stone E-Road W-Pool.	89-90 Betnoti
67	Mayur-bhanj	Betnoti	Tikayatpur.	Purunia.	203	2 26	6.56	N-Patit S- Road E-Pvt.land W-Boundry stone.	89-90 Betnoti
68	Mayur-bhanj	Betnoti	Purunapani Samil Kakharukhunta.	Raghupur.	174	4, 10, 12, 13,26, 27,28, 14,15	7.00	N-Pvt.land S- Road E-Pvt.land W-Boundary stone.	88-89 Betnoti
69	Mayur-bhanj	Baripada	Gadadeulia Gurudihi	Gadadeulia Sahagh.	166	620 624	7.296	N-Road S-Boundry stone E-PWD Road W-Vill.road	89-90 Bet

Contd...11.

340.496

156

1	2	3	4	5	6	7	8	9	
70.	Mayur-bhanj.	Batnoti	Nuagan	Nuagan	40	311 161 324 330 332	3.200	N-Pvt. land S-Village Boundary E/W-Private land.	90-91 Not
71.	Mayur-bhanj	Garipada	Kala-pani.	Duguhuda	134	667	2.00	N-Prvt.land S-Vill. boundary of Kalapani E-Kalapani Rivor W-Private land.	90-91 B Pori

345.962

Total:- 344.762 ha.

BY ORDER OF THE GOVERNOR

C. S. SATPATHY

DEPUTY SECRETARY TO GOVERNMENT

Memo No. 30837 F&E, dated BBSR the 28-11 Dec.'92

Copy forwarded to the Director, Printing, Stationary and Publications, Orissa, Cuttack with a request to publish the above notification in the next issue of Orissa Gazette and supply with 100 copies of the same each to the Director, Social Forestry Project, Orissa, Deputy Director, S.F.Division, Mayurbhanj and 50 copies to this Department at an early date.

Deputy Secretary to Government

Memo No. 30838 F&E, dated the 28-11 Dec.'92

Copy forwarded to Revenue Department/ Panchayati Raj Deptt./ Secretary, Board of Revenue, Orissa, Cuttack/ Revenue Divisional Commissioner, Cuttack/ Director, Land Records and Settlement, Orissa/ Principal Chief Conservator of Forests, Orissa/ Director, Social Forestry Project, Orissa/ Collector, Mayurbhanj/ Conservator of Forests, Working Plan Circle/ Conservator of Forests, Angul/ Regional Joint Director, Social Forestry Project, Bhubaneswar/ D.F.O., Rairangpur/ Baripada/ Karanjia/ Deputy Director, S.F.P. Division, Mayurbhanj for information.

Deputy Secretary to Government

Memo No. 30839 F&E, dated the 28-11 Dec.'92

Copy forwarded to the Forest Settlement Section/ Guard File (10 copies) for information.

Ojha 26/1/93

Deputy Secretary to Government.

ANNEXURE-XIII

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Karanjia	Adipur RF	39.2				39.2		39.2	**0.0**	**39.2**	**39.2**	30
Karanjia	Andharjhari RF	132.8				132.8		0	**132.8**	**132.8**	**132.8**	**50**
Karanjia	Ankura RF	77.6	--	1.9		75.7	75.70	0	**0.0**	**75.7**	**75.7**	**50**
Karanjia	Badbil RF	107.2				107.2	107.20	0	**0.0**	**107.2**	**107.2**	**50**
Karanjia	Badadeuli RF	227.6				227.6		0	**227.6**	**227.6**	**227.6**	**200**
Karanjia	Badsurei RF	44.8				44.8	44.80	0	**0.0**	**44.8**	**44.8**	**20**
Karanjia	Bhanjabeda RF	145.2				145.2		0	**145.2**	**145.2**	**145.2**	**93**
Karanjia	Bhanra RF	119.6				119.6	119.60	0	**0.0**	**119.6**	**119.6**	**119.6**
Karanjia	Bhramarposi RF	157.6				157.6		0	**157.6**	**157.6**	**157.6**	**150.6**
Karanjia	Budamara RF	8.8				8.8		0	**8.8**	**8.8**	**8.8**	**0.8**
Karanjia	Buruhatu RF	14				14	0.00	10	**4.0**	**14**	**14**	14
Karanjia	Gambharia – I RF	14.4				14.4		0	**14.4**	**14.4**	**14.4**	**14.4**
Karanjia	Gambharia – II RF	14				14		0	**14.0**	**14**	**14**	**14**
Karanjia	Gambharia – III RF	12.4				12.4		0	**12.4**	**12.4**	**12.4**	12.4
Karanjia	Chandiahil RF	26.4				26.4	26.40	0	**0.0**	**26.4**	**26.4**	**26.4**
Karanjia	Chaturisahi RF	113.2				113.2	113.20	0	**0.0**	**113.2**	**113.2**	**113.2**
Karanjia	Chhelianali – I RF	10.4				10.4		6	**4.4**	**10.4**	**10.4**	**30**
Karanjia	Chhelianali – II RF	34.4				34.4		0	**34.4**	**34.4**	**34.4**	**34.4**
Karanjia	Chauthia RF	44.8				44.8	44.80	0	**0.0**	**44.8**	**44.8**	**40**
Karanjia	Denua RF	28.4				28.4		10	**18.4**	**28.4**	**28.4**	**20**
Karanjia	Deodhipa RF	32				32		0	**32.0**	**32**	**32**	**32**
Karanjia	Diajodi RF	56.4				56.4	56.40	0	**0.0**	**56.4**	**56.4**	**50**

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Karanjia	Dighiposi RF	82.4				82.4		0	**82.4**	**82.4**	**82.4**	**82.4**
Karanjia	Dumbisahi RF	42				42		0	**42.0**	**42**	**42**	**42**
Karanjia	Galusahi RF	26.4				26.4		5	**21.4**	**26.4**	**26.4**	20
Karanjia	Ghagi RF	227.2				227.2		0	**227.2**	**227.2**	**227.2**	50
Karanjia	Gharmabeda RF	188.8				188.8		52	**136.8**	**188.8**	**188.8**	150
Karanjia	Ghadaghaguri RF	141.2				141.2		0	**141.2**	**141.2**	**141.2**	100
Karanjia	Ghosda – I RF	19.2				19.2		10	**9.2**	**19.2**	**19.2**	140
Karanjia	Ghosda – II RF	140				140	140.00	0	**0.0**	**140**	**140**	140
Karanjia	Haldia RF	113.6				113.6		0	**113.6**	**113.6**	**113.6**	113.6
Karanjia	Halpur – I RF	47.2				47.2		0	**47.2**	**47.2**	**47.2**	47.2
Karanjia	Halpur – II RF	64				64		0	**64.0**	**64**	**64**	64
Karanjia	Halpur – III RF	11.6				11.6		0	**11.6**	**11.6**	**11.6**	11.6
Karanjia	Hatisalbeda RF	487.6				487.6	477.60	10	**0.0**	**487.6**	**487.6**	162
Karanjia	Hindola RF	23.6				23.6		15	**8.6**	**23.6**	**23.6**	23.6
Karanjia	Jambani RF	107.2	9.56	2.74		94.9		4	**90.9**	**94.9**	**94.9**	94.9
Karanjia	Jamunti RF	260				260		135	**125.0**	**260**	**260**	260
Karanjia	Jhaddumuria RF	56.8				56.8		0	**56.8**	**56.8**	**56.8**	50
Karanjia	Jhadghosda RF	36.4				36.4	36.40	0	**0.0**	**36.4**	**36.4**	30
Karanjia	Jhumkapal RF	28				28		20	**8.0**	**28**	**28**	20
Karanjia	Kalakad RF	100	0.01	--		99.99	99.99	0	**0.0**	**99.99**	**99.99**	**50**
Karanjia	Konika RF	24.8				24.8		0	**24.8**	**24.8**	**24.8**	**20**
Karanjia	Karanjia RF	109.2				109.2		0	**109.2**	**109.2**	**109.2**	**50**
Karanjia	Kasia RF	97.2				97.2	97.20	0	**0.0**	**97.2**	**97.2**	**50**
Karanjia	Kendua RF	152				152		0	**152.0**	**152**	**152**	**50**

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Karanjia	Kenjhera RF	117.6				117.6	117.60	0	0.0	117.6	117.6	100
Karanjia	Khaparasahi RF	33.6				33.6	33.60	0	0.0	33.6	33.6	33.6
Karanjia	Kudarsahi RF	20.8				20.8		10	10.8	20.8	20.8	20
Karanjia	Kujiam RF	155.6				155.6	155.60	0	0.0	155.6	155.6	80
Karanjia	Kuliposi RF	24				24	24.00	0	0.0	24	24	24
Karanjia	Kusunpur – I RF	18				18		0	18.0	18	18	18
Karanjia	Kusunpur – II RF	43.2				43.2		0	43.2	43.2	43.2	43.2
Karanjia	Mahadevdeuli RF	37.2				37.2		5	32.2	37.2	37.2	37.2
Karanjia	Mahuliasole RF	153.6				153.6		75	78.6	153.6	153.6	153.6
Karanjia	Maricha RF	24				24		0	24.0	24	24	24
Karanjia	Miludihi RF	42.07				42.07	42.07	0	0.0	42.07	42.07	42.2
Karanjia	Naksara RF	20.4				20.4		20.4	0.0	20.4	20.4	20.4
Karanjia	Nuabeda RF	18.8				18.8		0	18.8	18.8	18.8	15
Karanjia	Nuagaon RF	142				142		0	142.0	142	142	142
Karanjia	Padheidura RF	457.6	--	1.49		456.11	456.11	0	0.0	456.11	456.11	159.11
Karanjia	Panpatria RF	1520				1520		330	1190.0	1520	1520	730
Karanjia	Panideuli RF	98.4				98.4		50	48.4	98.4	98.4	98.4
Karanjia	Paudia RF	639.2	1.4	10.4		627.4	612.40	15	0.0	627.4	627.4	159
Karanjia	Phulcomp RF	42.8				42.8		0	42.8	42.8	42.8	40
Karanjia	Phulguntha RF	103.6				103.6		0	103.6	103.6	103.6	103.6
Karanjia	Pingu RF	39.2				39.2		8	31.2	39.2	39.2	39.2
Karanjia	Pokamunda RF	190				190		0	190.0	190	190	100
Karanjia	Pokharia – I RF	145.6				145.6	145.60	0	0.0	145.6	145.6	145.6
Karanjia	Pokharia – II RF	73.6				73.6	73.60	0	0.0	73.6	73.6	73.6

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Karanjia	Sandeuli RF	120.4				120.4	120.40	0	0.0	120.4	120.4	120.4
Karanjia	Sankesari – I RF	18				18		0	18.0	18	18	18
Karanjia	Sankesari – II RF	38.4				38.4		0	38.4	38.4	38.4	38.4
Karanjia	Saantabandh RF	17.6				17.6		0	17.6	17.6	17.6	15
Karanjia	Sanbadposi RF	201.2				201.2	201.20	0	0.0	201.2	201.2	150
Karanjia	Saranggarh RF	113.2				113.2	113.20	0	0.0	113.2	113.2	113
Karanjia	Sarasposi RF	115.2				115.2		0	115.2	115.2	115.2	115.2
Karanjia	Saragoda – I RF	18				18		0	18.0	18	18	18
Karanjia	Saragoda – II RF	36.8				36.8		0	36.8	36.8	36.8	36.8
Karanjia	Sarubali RF	83.2	--	2.06		81.14		0	81.1	81.14	81.14	81.4
Karanjia	Sarubil RF	99.6				99.6	61.00	0	38.6	99.6	99.6	60
Karanjia	Sarubhadi RF	55.2	--	3.1		52.1	52.10	0	0.0	52.1	52.1	50
Karanjia	Singda – I RF	23.2				23.2		0	23.2	23.2	23.2	100
Karanjia	Singda – II RF	54				54		44	10.0	54	54	54
Karanjia	Singda – III RF	112.4	0.22	7.42		104.76	104.76	0	0.0	104.76	104.76	104.76
Karanjia	Sunaposi RF	108.8				108.8		0	108.8	108.8	108.8	108.8
Karanjia	Tangia RF	30				30		0	30.0	30	30	30
Karanjia	Tikasil RF	92.8				92.8	92.80	0	0.0	92.8	92.8	92.8
Karanjia	Tulasipur RF	28				28		13	15.0	28	28	28
	Karanjia Range Total	**9574.47**	**11.2**	**29.1**	**0**	**9534.17**	**3845.33**	**886.60**	**4802.24**	**9534.17**	**9534.17**	**6722.37**
Dudhiani	Badnai RF	23.2				23.2		0	23.2	23.2	23.2	20
Dudhiani	Biunria RF	146	--	3.77		142.23		0	142.2	142.23	142.23	100
Dudhiani	Chanchbani RF	63.2	7.54	--		55.66	55.66	0	0.0	55.66	55.66	50
Dudhiani	Dari – I RF	19.6				19.6		0	19.6	19.6	19.6	25

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			FRA	FCA								
Dudhiani	Dari – II RF	51.2				51.2		0	**51.2**	**51.2**	**51.2**	**25**
Dudhiani	Dumuria RF	174.8				174.8	169.80	5	**0.0**	**174.8**	**174.8**	100
Dudhiani	Gudidiha RF	329.2	--	5.54		323.66		0	**323.7**	**323.66**	**323.66**	**210**
Dudhiani	Hatimundi RF	147.6				147.6		0	**147.6**	**147.6**	**147.6**	**100**
Dudhiani	Jharbeda RF	152.8	--	6.96		145.84		0	**145.8**	**145.84**	**145.84**	**100**
Dudhiani	Kadambeda RF	79.2	--	3.76		75.44	75.44	0	**0.0**	**75.44**	**75.44**	**60**
Dudhiani	Khandbandh RF	34				34		0	**34.0**	**34**	**34**	**30**
Dudhiani	Kuita RF	164.8				164.8		0	**164.8**	**164.8**	**164.8**	**100**
Dudhiani	Kunjia RF	125.2				125.2		0	**125.2**	**125.2**	**125.2**	**70**
Dudhiani	Malharpada RF	27.2				27.2	27.20	0	**0.0**	**27.2**	**27.2**	**10**
Dudhiani	Masinabila RF	77.6				77.6		0	**77.6**	**77.6**	**77.6**	**60**
Dudhiani	Mota RF	281.2				281.2	281.20	0	**0.0**	**281.2**	**281.2**	**200**
Dudhiani	Palasgodia – I RF	33.6				33.6	33.60	0	**0.0**	**33.6**	**33.6**	**15**
Dudhiani	Palasgodia – II RF	16				16	16.00	0	**0.0**	**16**	**16**	**15**
Dudhiani	Panposi RF	33.6				33.6	23.60	10	**0.0**	**33.6**	**33.6**	15
Dudhiani	Pantho RF	176				176		0	**176.0**	**176**	**176**	**100**
Dudhiani	Purunadeogaon RF	59.6				59.6		0	**59.6**	**59.6**	**59.6**	**50**
Dudhiani	Ranipat RF	20	0.35	--		19.65		0	**19.7**	**19.65**	**19.65**	**20**
Dudhiani	Rasamtala RF	162.8	--	6.99		155.81		0	**155.8**	**155.81**	**155.81**	**100**
Dudhiani	P – I RF	19.2				19.2		0	**19.2**	**19.2**	**19.2**	**19.2**
Dudhiani	Rugudi – II RF	36				36		0	**36.0**	**36**	**36**	**15**
Dudhiani	Salarpada RF	89.2	2.06	--		87.14		0	**87.1**	**87.14**	**87.14**	**70**
Dudhiani	Sannai RF	9.2				9.2		0	**9.2**	**9.2**	**9.2**	**50**
Dudhiani	Siramanipur RF	110				110		10	**100.0**	**110**	**110**	10

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			FRA	FCA								
Dudhiani	Sialinai RF	84				84		0	**84.0**	**84**	**84**	**30**
Dudhiani	Tato RF	104				104		7	**97.0**	**104**	**104**	100
Dudhiani	Kadadiha RF	89.2				89.2	89.20	0	**0.0**	**89.2**	**89.2**	**60**
Dudhiani	Bala RF	25.2				25.2		0	**25.2**	**25.2**	**25.2**	**50**
Dudhiani	Badampahar (P) RF	3253.84				3253.84	2012.16	0	**1241.7**	**3253.84**	**3253.84**	**1020**
Dudhiani	Begunia-I RF	629.6	0.42	--		629.18		17	**612.2**	**629.18**	**629.18**	**80**
Dudhiani	Begunia-II RF	107.2		--		107.2		0	**107.2**	**107.2**	**107.2**	**85**
Dudhiani	Kudarbisida-I RF	31.2				31.2		20	**11.2**	**31.2**	**31.2**	100
Dudhiani	Kudarbisida-II RF	356.8				356.8		5	**351.8**	**356.8**	**356.8**	100
	Dudhiiani Range Total	**7343.04**	**10.4**	**27**		**7305.65**	2783.86	74	**4447.8**	**7305.65**	**7305.65**	**3364.2**
Thakurmunda	Asankudar RF	11.86				11.86	11.86	0	**0.0**	**11.86**	**11.86**	**0.22**
Thakurmunda	Bisipur – I RF	421.2				421.2	421.20	0	**0.0**	**421.2**	**421.2**	**25**
Thakurmunda	Bisipur – II RF	74				74	74.00	0	**0.0**	**74**	**74**	**25**
Thakurmunda	Boring RF	275.2				275.2	275.20	0	**0.0**	**275.2**	**275.2**	**200**
Thakurmunda	Chheratangar RF	800	0.04	--		799.96	799.96	0	**0.0**	**799.96**	**799.96**	**50**
Thakurmunda	Dangapani RF	104.8				104.8	104.80	0	**0.0**	**104.8**	**104.8**	**50**
Thakurmunda	Gourigoda RF	66.4				66.4	56.40	10	**0.0**	**66.4**	**66.4**	66
Thakurmunda	Jadibil RF	187.6				187.6	187.60	0	**0.0**	**187.6**	**187.6**	**100**
Thakurmunda	Kadopani RF	145.2				145.2	145.20	0	**0.0**	**145.2**	**145.2**	**50**
Thakurmunda	Kaliajiani – I RF	378.8	0.01	--		378.79	378.79	0	**0.0**	**378.79**	**378.79**	**25**
Thakurmunda	Kaliajiani – II RF	147.6	0.02	--		147.58	147.58	0	**0.0**	**147.58**	**147.58**	**25**
Thakurmunda	Kendumundi – I RF	147.6	0.04	--		147.56	147.56	0	**0.0**	**147.56**	**147.56**	**100**

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			FRA	FCA								
Thakurmunda	Kendumundi – II RF	648				648	648.00	0	0.0	648	648	100
Thakurmunda	Majuriposi RF	144.8				144.8	144.80	0	0.0	144.8	144.8	100
Thakurmunda	Padiabeda RF	51.02				51.02	51.02	0	0.0	51.02	51.02	30
Thakurmunda	Patbil RF	154.8	0.02	--		154.78	154.78	0	0.0	154.78	154.78	100
Thakurmunda	Purunapni RF	452.8				452.8	452.80	0	0.0	452.8	452.8	30
Thakurmunda	Rengalbeda – 1 RF	67.2				67.2	67.20	0	0.0	67.2	67.2	25
Thakurmunda	Rengalbeda – 2 RF	42.67				42.67	42.67	0	0.0	42.67	42.67	25
Thakurmunda	Saleibeda RF	125.6				125.6	125.60	0	0.0	125.6	125.6	50
Thakurmunda	Sanandharikhaman RF	120				120		0	120.0	120	120	35
Thakurmunda	Sanrugudibeda RF	212.8				212.8	212.80	0	0.0	212.8	212.8	100
Thakurmunda	Sarubil – I RF	162				162		0	162.0	162	162	50
Thakurmunda	Sarubil – II RF	83.36				83.36		0	83.4	83.36	83.36	50
Thakurmunda	Tikarpada RF	89.2				89.2	89.20	0	0.0	89.2	89.2	32
Thakurmunda	Majuraposi RF	13.98				13.98		0	14.0	13.98	13.98	5
Thakurmunda	Akhapalan RF	57.52				57.52	57.52	0	0.0	57.52	57.52	57.52
Thakurmunda	Andharikhaman RF	48.48				48.48	48.48	0	0.0	48.48	48.48	25
Thakurmunda	Badabaliposi RF	27.57				27.57	27.57	0	0.0	27.57	27.57	15
Thakurmunda	Badbil RF	943.2				943.2	943.20	0	0.0	943.2	943.2	150
Thakurmunda	Banamunda RF	176.4				176.4	176.40	0	0.0	176.4	176.4	150
Thakurmunda	Baunsadiha RF	167.2				167.2	167.20	0	0.0	167.2	167.2	167
Thakurmunda	Basantpur RF	38.62				38.62	38.62	0	0.0	38.62	38.62	50
Thakurmunda	Bhadubeda RF	111.2				111.2	111.20	0	0.0	111.2	111.2	111.2
Thakurmunda	Bharandia RF	97.6				97.6		20	77.6	97.6	97.6	75

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			FRA	FCA								
Thakurmunda	Chainbainsi RF	70.96				70.96	70.96	0	0.0	70.96	70.96	70
Thakurmunda	Chakulia RF	10.02				10.02	10.02	0	0.0	10.02	10.02	10
Thakurmunda	Chamakpur RF	182.8	0.08	--		182.72	182.72	0	0.0	182.72	182.72	100
Thakurmunda	Chirupada RF	23.49				23.49	23.49	0	0.0	23.49	23.49	15
Thakurmunda	Dakeipal RF	120.4				120.4	120.40	0	0.0	120.4	120.4	120
Thakurmunda	Dangadiha RF	97.2				97.2	97.20	0	0.0	97.2	97.2	50
Thakurmunda	Digdhar RF	45.1				45.1	45.10	0	0.0	45.1	45.1	30
Thakurmunda	Gahandia RF	14.15				14.15	14.15	0	0.0	14.15	14.15	5
Thakurmunda	Ghodabindha RF	168.4				168.4	168.40	0	0.0	168.4	168.4	100
Thakurmunda	Handiphuta RF	306	0.11	--		305.89	305.89	0	0.0	305.89	305.89	100
Thakurmunda	Handiphuta – A RF	61.32				61.32		0	61.3	61.32	61.32	30
Thakurmunda	Handiphuta – B RF	154.44				154.44		0	154.4	154.44	154.44	10
Thakurmunda	Hatigoda RF	108.8				108.8	108.80	0	0.0	108.8	108.8	40
Thakurmunda	Jamunalia RF	20.17				20.17	20.17	0	0.0	20.17	20.17	10
Thakurmunda	Jarak RF	48				48	48.00	0	0.0	48	48	50
Thakurmunda	Kaliaposi RF	78.25				78.25	78.25	0	0.0	78.25	78.25	40
Thakurmunda	Kathuanuagaon RF	68				68	68.00	0	0.0	68	68	50
Thakurmunda	Khejuria RF	15.28				15.28	5.28	10	0.0	15.28	15.28	20
Thakurmunda	Khejuri RF	641.6				641.6	641.60	0	0.0	641.6	641.6	20
Thakurmunda	Khudisila RF	83.6				83.6	83.60	0	0.0	83.6	83.6	25
Thakurmunda	Khuntaposi RF	3.66				3.66		0	3.7	3.66	3.66	0
Thakurmunda	Mandaljhari RF	32.98				32.98	32.98	0	0.0	32.98	32.98	15
Thakurmunda	Mankadbeda RF	208.4				208.4	208.40	0	0.0	208.4	208.4	58.4
Thakurmunda	Mulapal RF	90				90	90.00	0	0.0	90	90	60

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			FRA	FCA								
Thakurmunda	Mituani – I RF	106.8				106.8	106.80	0	0.0	106.8	106.8	100
Thakurmunda	Mituani – II RF	184.4				184.4	184.40	0	0.0	184.4	184.4	100
Thakurmunda	Mituani – III RF	98.08				98.08	98.08	0	0.0	98.08	98.08	40
Thakurmunda	Nishchintpur RF	7.47				7.47	7.47	0	0.0	7.47	7.47	7
Thakurmunda	Panasdiha RF	8.81				8.81		0	8.8	8.81	8.81	0
Thakurmunda	Purunapani – II RF	55.77	0.79	--		54.98	54.98	0	0.0	54.98	54.98	100
Thakurmunda	Sunida RF	23.93				23.93	23.93	0	0.0	23.93	23.93	20
Thakurmunda	Talpada RF	145.6				145.6	145.60	0	0.0	145.6	145.6	100
Thakurmunda	Taramara RF	649.6				649.6	649.60	0	0.0	649.6	649.6	200
Thakurmunda	Thakurmunda RF	250.8	0.53	--		250.27	250.27	0	0.0	250.27	250.27	100
Thakurmunda	Vejidiha – I RF	160				160	160.00	0	0.0	160	160	70
Thakurmunda	Vejidiha – II RF	17.88	0.56			17.32		0	17.3	17.32	17.32	10
Thakurmunda	Rugudibeda RF	58.58				58.58	58.58	0	0.0	58.58	58.58	100
	Thakurmunda RF Total	**11217.02**	**2.2**	**0**		**11214.82**	10472.33	40.0	**702.5**	**11214.82**	**11214.82**	**4224.34**
Satkosia	Gaudiabahali RF	182.4				182.4		0	**182.4**	**182.4**	**182.4**	**182.4**
Satkosia	Khumthan RF	240				240		0	**240.0**	**240**	**240**	**240**
Satkosia	Noda RF	352				352		0	**352.0**	**352**	**352**	**352**
Satkosia	Satkosia RF	13732.8	57.78	--	3399.02	10276	10276.00	0	**0.0**	**10276**	**10276**	**2050.3**
Satkosia	Satkosia – I RF	363.2				363.2		0	**363.2**	**363.2**	**363.2**	**363.2**
Satkosia	Satkosia – II RF	208.27				208.27		0	**208.3**	**208.27**	**208.27**	**208.27**
Satkosia	Satkosia – III RF	353.83				353.83		0	**353.8**	**353.83**	**353.83**	**353.83**
	Satkosia RF Total	**15432.5**	**57.8**		**3399.02**	**11975.7**	10276.00	0	**1699.7**	**11975.7**	**11975.70**	**3750**
	Division RF Total	**43567.03**	**81.5**	**56.1**	**3399.02**	**40030.34**	27377.52	1000.60	**11652.22**	**40030.34**	**40030.34**	**18060.91**

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			FRA	FCA								
Karanjia	Balibhol PRF	8.64				8.64	8.64	0	0.0	8.64	8.64	8.64
Karanjia	Bhalughera PRF	2.08				2.08		0	2.1	2.08	2.08	2.08
Karanjia	Champarei-I PRF	22.26				22.26	22.26	0	0.0	22.26	22.26	22.26
Karanjia	Champarei-II PRF	3.01				3.01	3.01	0	0.0	3.01	3.01	3.01
Karanjia	Champarei-III PRF	2.63				2.63		0	2.6	2.63	2.63	2.63
Karanjia	Haldia-I PRF	5.34				5.34		0	5.3	5.34	5.34	5.34
Karanjia	Haldia-II PRF	7.49				7.49		0	7.5	7.49	7.49	7.49
	Karanjia PRF Total	**51.45**	**0**	**0**	**0**	**51.45**	33.91	0	17.5	**51.45**	**51.45**	**51.45**
Dudhiani	Bakartala-I PRF	4.46				4.46		0	4.5	4.46	4.46	4.46
Dudhiani	Bakartala-II PRF	2.19				2.19		0	2.2	2.19	2.19	2.19
Dudhiani	Barakmunda PRF	12.14		12.14								
Dudhiani	Ektali II PRF	215.3				215.3			215.3	215.3	215.3	
Dudhiani	Purunapani PRF	15.99				15.99		0	16.0	15.99	15.99	15.99
Dudhiani	Raitalia PRF	26.39				26.39	26.39	0	0.0	26.39	26.39	26.39
Dudhiani	Raitalia A PRF	18.21				18.21	18.21	0	0.0	18.21	18.21	18.21
Dudhiani	Kanthikana PRF	126.95				126.95	126.95	0	0.0	126.95	126.95	126.95
	Dudhiani PRF Total	**421.63**	**0**	**12.1**	**0**	**409.49**	171.55	0	237.9	**409.49**	**409.49**	**194.19**
Thakurmunda	Ambabeda	19.6				19.6			19.6	19.6	19.6	
Thakurmunda	Bhairanibeda PRF	12.46				12.46	0.00	0	12.5	12.46	12.46	12.46
Thakurmunda	Kalasira PRF	32.09				32.09		0	32.1	32.09	32.09	32.09
Thakurmunda	Keloposi PRF	23.09				23.09		0	23.1	23.09	23.09	23.09
Thakurmunda	Kendujiani PRF	17.56				17.56	17.56	0	0.0	17.56	17.56	17.56

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			FRA	FCA								
Thakurmunda	Khandabandha PRF	19.83				19.83		0	**19.8**	**19.83**	**19.83**	19.83
Thakurmunda	Khuntakata PRF	7.96				7.96		0	**8.0**	**7.96**	**7.96**	7.96
Thakurmunda	Saleibeda PRF	34.4				34.4		0	**34.4**	**34.4**	**34.4**	34.4
Thakurmunda	Sunariposi PRF	14.37				14.37		0	**14.4**	**14.37**	**14.37**	14.37
Thakurmunda	Andharikhaman PRF	28.45				28.45		0	**28.5**	**28.45**	**28.45**	28.45
Thakurmunda	Basantapur-II PRF	23.45				23.45		0	**23.5**	**23.45**	**23.45**	23.45
Thakurmunda	Bharandia PRF	29.26				29.26		0	**29.3**	**29.26**	**29.26**	29.26
Thakurmunda	Dangadiha-II PRF	44.52				44.52	44.52	0	**0.0**	**44.52**	**44.52**	44.52
Thakurmunda	Diliganj PRF	25.84				25.84		0	**25.8**	**25.84**	**25.84**	25.84
Thakurmunda	Gahandia PRF	19.02				19.02		0	**19.0**	**19.02**	**19.02**	19.02
Thakurmunda	Kaliaposi-II PRF	8.82				8.82		0	**8.8**	**8.82**	**8.82**	8.82
Thakurmunda	Kaliaposi-III PRF	15.68				15.68		0	**15.7**	**15.68**	**15.68**	15.68
Thakurmunda	Keshdiha PRF	42.03				42.03		0	**42.0**	**42.03**	**42.03**	42.03
Thakurmunda	Khadipal PRF	6.87				6.87		0	**6.9**	**6.87**	**6.87**	6.87
Thakurmunda	Kirkichipal PRF	34.09				34.09		0	**34.1**	**34.09**	**34.09**	34.09
Thakurmunda	Kucheikudar PRF	65.72				65.72		0	**65.7**	**65.72**	**65.72**	65.72
Thakurmunda	Mituani-III PRF	19.51				19.51		0	**19.5**	**19.51**	**19.51**	19.51
Thakurmunda	Mituani-IV PRF	97.41				97.41		0	**97.4**	**97.41**	**97.41**	97.41
Thakurmunda	Nunadiha PRF	82.72				82.72		0	**82.7**	**82.72**	**82.72**	82.72
Thakurmunda	Patrapada PRF	73.86				73.86	73.86	0	**0.0**	**73.86**	**73.86**	73.86
Thakurmunda	Purunapani PRF	26.87				26.87		0	**26.9**	**26.87**	**26.87**	26.87

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
	Thakurumunda PRF Total	**825.48**	**0**	**0**	**0**	**825.48**	**135.94**	**0**	**689.5**	**825.48**	**825.48**	**805.88**
Satkosia	Bhaliadal-I PRF	10.63				10.63	**10.63**	**0**	**0.0**	**10.63**	**10.63**	10.63
Satkosia	Bhaliadal-III PRF	110.79				110.79	**110.79**	**0**	**0.0**	**110.79**	**110.79**	110.79
Satkosia	Bhaliadal-IV PRF	17.67				17.67	**17.67**	**0**	**0.0**	**17.67**	**17.67**	17.67
Satkosia	Mahuldiha-I PRF	23.67				23.67		**0**	**23.7**	**23.67**	**23.67**	23.67
Satkosia	Mahuldiha-II PRF	26.57				26.57		**0**	**26.6**	**26.57**	**26.57**	26.57
	Satkosia PRF Total	**189.33**	**0**	**0**	**0**	**189.33**	**139.09**	**0**	**50.2**	**189.33**	**189.33**	**189.33**
	Division PRF Total	**1487.89**	**0**	**12.1**	**0**	**1475.75**	**480.49**	**0**	**995.3**	**1475.75**	**1475.75**	**1240.85**
Karanjia	Balisahi DPF	40.47				40.47		**0**	**40.5**	**40.47**	**40.47**	40.47
Karanjia	Mayursahi DPF	12.54				12.54		**0**	**12.5**	**12.54**	**12.54**	12.54
Karanjia	Singda DPF	7.28				7.28		**0**	**7.3**	**7.28**	**7.28**	7.28
Karanjia	Milu DPF	19.02				19.02		**0**	**19.0**	**19.02**	**19.02**	19.02
	Karanjia DPF Total	**79.31**	**0**	**0**	**0**	**79.31**	**0.00**	**0**	**79.3**	**79.31**	**79.31**	**79.31**
Dudhiani	Dumuria DPF	4.41				4.41		**0**	4.4	**4.41**	**4.41**	4.41
Dudhiani	Budhipat DPF	1147.77				1147.77	**1137.77**	**10.0**	0.0	**1147.77**	**1147.77**	1147.77
	Dudhiani DPF Total	**1152.18**	**0**	**0**	**0**	**1152.18**	**1137.77**	**10**	**4.4**	**1152.18**	**1152.18**	**1152.18**
Thakurmunda	Ghodabindha DPF	11.56				11.56		**0**	**11.6**	**11.56**	**11.56**	11.56
Thakurmunda	Majurposi DPF	111.48				111.48		**0**	**111.5**	**111.48**	**111.48**	111.48

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
	Thakurumunda DPF Total	**123.04**	**0**	**0**	**0**	**123.04**	**0.00**	**0**	**123.0**	**123.04**	**123.04**	**123.04**
	Division DPF Total	**1354.53**	**0**	**0**	**0**	**1354.53**	**1137.77**	**10**	**206.8**	**1354.53**	**1354.53**	**1354.53**
Karanjia	Halpur VF	2				2		**2.0**	**0.0**	**2.0**	**2.0**	**2.0**
Karanjia	Narsanda VF	1.08				1.08		**1.08**	**0.0**	**1.08**	**1.08**	**1.08**
Karanjia	Chheliaposi VF	7.84				7.84		**7.84**	**0.0**	**7.84**	**7.84**	**7.84**
Karanjia	Kusunpur VF	3.94				3.94		**3.94**	**0.0**	**3.94**	**3.94**	**3.94**
Karanjia	P.Jadunathpur VF	11.92				11.92		**11.92**	**0.0**	**11.92**	**11.92**	**11.92**
Karanjia	Badposi VF	5				5		**5.00**	**0.0**	**5**	**5**	**5**
Karanjia	Bamanposi VF	7.9				7.9		**7.90**	**0.0**	**7.9**	**7.9**	**7.9**
Karanjia	Nanduburu VF	1				1		**1.00**	**0.0**	**1**	**1**	**1**
Karanjia	Palsagadia VF	9				9		**9.00**	**0.0**	**9**	**9**	**9**
Karanjia	KenjheraPanposi VF	1.34				1.34		**1.34**	**0.0**	**1.34**	**1.34**	**1.34**
Karanjia	Rugudi-II VF	11.86				11.86		**11.86**	**0.0**	**11.86**	**11.86**	**11.86**
Karanjia	Kasia VF	5				5		**5.00**	**0.0**	**5**	**5**	**5**
Karanjia	Badposi-III VF	4.18				4.18		**4.18**	**0.0**	**4.18**	**4.18**	**4.18**
Karanjia	Bhramarposi-I VF	12				12		**12.00**	**0.0**	**12**	**12**	**12**
Karanjia	Mandua VF	5.01				5.01		**5.01**	**0.0**	**5.01**	**5.01**	**5.01**
Karanjia	Ankura VF	3				3		**3.00**	**0.0**	**3**	**3**	**3**
Karanjia	Mata VF	3.95				3.95		**3.95**	**0.0**	**3.95**	**3.95**	**3.95**
Karanjia	Nuagan VF	2.8				2.8		**2.80**	**0.0**	**2.8**	**2.8**	**2.8**
Karanjia	Sarubil VF	5				5		**5.00**	**0.0**	**5**	**5**	**5**
Karanjia	Pandarsil VF	1.58				1.58		**1.58**	**0.0**	**1.58**	**1.58**	**1.58**

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Karanjia	Baliposi VF	5				5		5.00	0.0	5	5	5
Karanjia	Saradha VF	6				6		6.00	0.0	6	6	6
Karanjia	Bangriposi VF	6				6		6.00	0.0	6	6	6
Karanjia	Mahadevdeuli VF	5				5		5.00	0.0	5	5	5
Karanjia	Ghosda VF	15.61				15.61		15.61	0.0	15.61	15.61	15.61
Karanjia	B.Jadunathpur VF	6				6		6.00	0.0	6	6	6
Karanjia	Dhakata VF	6.08				6.08		6.08	0.0	6.08	6.08	6.08
Karanjia	Pakamunda VF	5				5		5.00	0.0	5	5	5
Karanjia	Reghasahi VF	8				8		8.00	0.0	8	8	8
Karanjia	Bhramarposi-II VF	2.92				2.92		2.92	0.0	2.92	2.92	2.92
Karanjia	Khadiakudar VF	4.02				4.02		4.02	0.0	4.02	4.02	4.02
Karanjia	Nuabeda VF	4.75				4.75		4.75	0.0	4.75	4.75	4.75
	Karanjia VF Total	**179.78**	**0**	**0**	**0**	**179.78**	**0.00**	**179.78**	**0.0**	**179.78**	**179.78**	**179.78**
Dudhiani	Purunapani-I VF	3.02				3.02		3.02	0.0	3.02	3.02	3.02
Dudhiani	Nuagaon VF	4.4				4.4		4.40	0.0	4.4	4.4	4.4
Dudhiani	Khandbandh VF	6				6		6.00	0.0	6	6	6
Dudhiani	Sunamukhi VF	3.68				3.68		3.68	0.0	3.68	3.68	3.68
Dudhiani	Rugudi-I VF	5				5		5.00	0.0	5	5	5
Dudhiani	Badposi VF	1.59				1.59		1.59	0.0	1.59	1.59	1.59
Dudhiani	B.Badposi VF	0.02				0.02		0.02	0.0	0.02	0.02	0.02
Dudhiani	Bakartala VF	2.28				2.28		2.28	0.0	2.28	2.28	2.28
Dudhiani	KenjheraPanposi-II VF	1.91				1.91		1.91	0.0	1.91	1.91	1.91
Dudhiani	Bakartala-II VF	4.08				4.08		4.08	0.0	4.08	4.08	4.08

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Dudhiani	Khandbandha-II VF	9.37				9.37		9.37	0.0	9.37	9.37	9.37
Dudhiani	Bagdafa VF	2.38				2.38		2.38	0.0	2.38	2.38	2.38
Dudhiani	Jharbeda VF	1.89				1.89		1.89	0.0	1.89	1.89	1.89
Dudhiani	Purunapani-II VF	4.24				4.24		4.24	0.0	4.24	4.24	4.24
Dudhiani	Khandiadar VF	6.6				6.6		6.60	0.0	6.6	6.6	6.6
Dudhiani	Parbatipur VF	1.23				1.23		1.23	0.0	1.23	1.23	1.23
Dudhiani	Nodhagadia VF	0.18				0.18		0.18	0.0	0.18	0.18	0.18
Dudhiani	Patua VF	5.3				5.3		5.30	0.0	5.3	5.3	5.3
Dudhiani	Majurasahi VF	1.49				1.49		1.49	0.0	1.49	1.49	1.49
Dudhiani	Akhaghari VF	3.87				3.87		3.87	0.0	3.87	3.87	3.87
Dudhiani	Tikarpada VF	10				10		10.00	0.0	10	10	10
Dudhiani	Udaysahi VF	3.2				3.2		3.20	0.0	3.2	3.2	3.2
Dudhiani	Balaniposi VF	8				8		8.00	0.0	8	8	8
Dudhiani	Jashipur-I VF	2.5				2.5		2.50	0.0	2.5	2.5	2.5
Dudhiani	Balaniposi VF	5				5		5.00	0.0	5	5	5
Dudhiani	Dhangdiposi VF	9				9		9.00	0.0	9	9	9
Dudhiani	Sanpalsa VF	5				5		5.00	0.0	5	5	5
Dudhiani	Gadapalsa-II VF	10				10		10.00	0.0	10	10	10
Dudhiani	Tingiria VF	0.66				0.66		0.66	0.0	0.66	0.66	0.66
Dudhiani	Chain-Nebda VF	7				7		7.00	0.0	7	7	7
Dudhiani	Jashipur-II VF	5				5		5.00	0.0	5	5	5
Dudhiani	Bhanda VF	10				10		10.00	0.0	10	10	10
Dudhiani	Balijodi VF	10				10		10.00	0.0	10	10	10
Dudhiani	Jamukeshar VF	0.49				0.49		0.49	0.0	0.49	0.49	0.49

Name of the Range	Name of the RF	Notified area in ha	Area Diverted in Ha		Area of Hadgarh Wildlife Sanctuary	Plan Area in Ha.	SWC	PWC	RWC	NTFP (O) WC	Wildlife (O) WC	JFM (O) WC
			FRA	FCA								
Dudhiani	Kajala VF	1.04				1.04		1.04	0.0	1.04	1.04	1.04
Dudhiani	Bakala VF	5				5		5.00	0.0	5	5	5
Dudhiani	Bisida VF	2.49				2.49		2.49	0.0	2.49	2.49	2.49
Dudhiani	Neuti VF	10				10		10.00	0.0	10	10	10
Dudhiani	Bandiraposi VF	4				4		4.00	0.0	4	4	4
Dudhiani	Chhamundia VF	10				10		10.00	0.0	10	10	10
Dudhiani	Kapand VF	5				5		5.00	0.0	5	5	5
Dudhiani	Tilabaddi VF	5				5		5.00	0.0	5	5	5
Dudhiani	Balisudra VF	4				4		4.00	0.0	4	4	4
Dudhiani	Rangamatia VF	10				10		10.00	0.0	10	10	10
	Dudhiani VF Total	**210.91**	**0**	**0**	**0**	**210.91**	0.00	210.91	0.0	**210.91**	**210.91**	**210.91**
Thakurmunda	Hatibandha VF	10.52				10.52		10.52	0.0	**10.52**	**10.52**	**10.52**
	Thakurumunda VF Total	**10.52**	**0**	**0**	**0**	**10.52**	0.00	10.52	0.0	**10.52**	**10.52**	**10.52**
	Division VF Total	**401.21**	**0**	**0**	**0**	**401.21**	0.00	401.21	0.0	**401.21**	**401.21**	**401.21**
	Grand Total	**46810.66**	**81.5**	**68.3**	**3399.02**	**43261.83**	28995.78	1411.81	12854.24	**43261.83**	**43261.83**	21057.50
N .B : Total JFM Area is 21087.71 Ha. Which includes plan Area 21057.50 Ha. And Revenue Area 30.21 Ha.											**Revenue Forest Area**	**30.21**
											Total JFM Area	**21087.71**

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Dudhiani	1	Badampahar_RF	3253.84	25.00	385	186	199	0	2021-22
Dudhiani	2	Badnai_RF	23.2	3.76	33	0	17	16	
Dudhiani	3	Bakartala - I_PRF	4.46	0.76	NA	NA	NA	NA	
Dudhiani	4	Bakartala - II_PRF	2.19	0.68	NA	NA	NA	NA	
Dudhiani	5	Bala_RF	25.2	2.4	17	0	7	10	
Dudhiani	6	Barakmunda PRF	12.14		NA	NA	NA	NA	2022-23
Dudhiani	7	Begunia I_RF	629.60	25.00	132	57	64	11	
Dudhiani	8	Begunia II_RF	107.2	8.5	55	0	39	16	
Dudhiani	9	Binuria_RF	146	8.6	61	0	61	0	
Dudhiani	10	Budhipat_DPF	1147.77	42.06	92	20	72	0	
Dudhiani	11	Chanchabani_RF	63.2	4.5	23	15	8	0	2023-24
Dudhiani	12	Dari I_RF	19.6	3.3	28	10	18	0	
Dudhiani	13	Dari II_RF	51.2	3.00	22	11	11	0	
Dudhiani	14	Dumuria_DPF	4.41	1.01	NA	NA	NA	NA	
Dudhiani	15	Dumuria_RF	174.80	18.00	147	7	66	74	
Dudhiani	16	Ektali II_PRF	215.3	9.11	53	16	37	0	2024-25
Dudhiani	17	Gudidiha_RF	329.2	13.15	88	7	24	57	
Dudhiani	18	Hatimundi_RF	147.60	11.40	84	13	58	13	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Dudhiani	19	Jharbeda_RF	152.8	7.6	34	0	31	3	
Dudhiani	20	Kadadiha_RF	89.2	7.9	12	0	0	12	
Dudhiani	21	Kadambeda_RF	79.2	4.59	26	0	22	4	
Dudhiani	22	Kanthikana_PRF	126.95	7.12	30	17	13	0	
Dudhiani	23	Khandabandha_RF	34	4	30	0	18	12	2025-26
Dudhiani	24	Kudarbisida I_RF	31.2	5.25	31	0	0	31	
Dudhiani	25	Kudarbisida II_RF	356.8	19.33	117	38	74	5	
Dudhiani	26	Kuita_RF	164.8	11.4	105	15	66	24	
Dudhiani	27	Kunjia_RF	125.2	7.3	46	2	8	36	
Dudhiani	28	Malharpada_RF	27.2	3.28	24	0	13	11	2026-27
Dudhiani	29	Masinabila_RF	77.6	6.64	54	24	30	0	
Dudhiani	30	Mata_RF	281.2	18.6	135	106	2	27	
Dudhiani	31	Palasgadia- I RF	33.6	4.25	39	0	0	39	
Dudhiani	32	Palasgadia- II RF	16	4.9	21	0	0	21	
Dudhiani	33	Panposi_RF	33.6	5.28	45	9	18	18	2027-28
Dudhiani	34	Pantho_RF	176	10.7	78	28	50	0	
Dudhiani	35	Purunadeogaon_RF	59.6	4.8	34	3	24	7	
Dudhiani	36	Purunapani_PRF	15.99	1.67	NA	NA	NA	NA	
Dudhiani	37	Raitalia- A_PRF	18.21	3.08	13	10	3	0	2028-29
Dudhiani	38	Raitalia_PRF	26.39	4.03	14	13	1	0	
Dudhiani	39	Ranipat_RF	20.00	2.75	16	0	12	4	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Dudhiani	40	Rasamtala_RF	162.80	9.38	55	0	31	24	2029-30
Dudhiani	41	Rugudi - I RF	19.20	2.62	19	0	0	19	
Dudhiani	42	Rugudi - II RF	36.00	5.25	44	0	0	44	
Dudhiani	43	Sannai_RF	9.2	1.46	13	0	12	1	
Dudhiani	44	Sarlapada_RF	89.20	9.20	47	8	39	0	2030-31
Dudhiani	45	Sialinai_RF	84.00	8.60	63	3	44	16	
Dudhiani	46	Siramanipur_RF	110	6.6	54	28	16	10	
Dudhiani	47	Tato_RF	104	5.08	29	22	7	0	
Karanjia	48	Adipur_RF	39.2	3.6	16		11	5	2021-22
Karanjia	49	Andharjhari_RF	132.8	8.1	53	3	43	7	
Karanjia	50	Ankura_RF	77.6	7.12	48	0	48	0	
Karanjia	51	Badadeuli_RF	227.60	8.01	125	0	100	25	
Karanjia	52	Badbil_RF	107.2	7.5	28	20	8	0	
Karanjia	53	Badsurei_RF	44.8	2.75	9	0	9	0	
Karanjia	54	Balibhol_PRF	8.64	1.81	2	1	1		
Karanjia	55	Balisahi_DPF	40.47	7.29	NA	NA	NA	NA	
Karanjia	56	Bhalughera_PRF	2.08	0.7	NA	NA	NA	NA	
Karanjia	57	Bhanjabeda_RF	145.2	8	23	0	10	13	
Karanjia	58	Bhanra_RF	39.6	5.12	25	0	19	6	2022-23
Karanjia	59	Bhramarposi_RF	157.6	12.00	87	0	66	21	
Karanjia	60	Budamara_RF	8.8	1.1	11	0	0	11	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Karanjia	61	Buruhatu_RF	14.00	1.64	2	0	2	0	
Karanjia	62	Champarei I_PRF	22.26	5.05	14	0	14	0	
Karanjia	63	Champarei II_PRF	3.01	1.31	NA	NA	NA	NA	
Karanjia	64	Champarei III_PRF	2.63	0.9	NA	NA	NA	NA	
Karanjia	65	Chandiahil_RF	26.4	2.6	17	0	12	5	
Karanjia	66	Chaturisahi_RF	113.2	4.4	19	0	16	3	
Karanjia	67	Chauthia_RF	44.8	4.16	27	0	26	1	
Karanjia	68	Chhelianali l_RF	10.40	1.00	10	8	1	1	2023-24
Karanjia	69	Chhelianali ll_RF	34.4	3.00	17	1	8	8	
Karanjia	70	Denua_RF	28.4	2.1	20	0	6	14	
Karanjia	71	Deodhipa_RF	32	2	12	0	1	11	
Karanjia	72	Diajori_RF	56.4	3	28	4	16	8	
Karanjia	73	Dighiposi_RF	82.4	9.76	73	0	65	8	
Karanjia	74	Dumbisahi_RF	42.00	5.09	23	11	12	0	
Karanjia	75	Galusahi_RF	26.4	3.3	17	0	7	10	
Karanjia	76	Gambharia l_RF	14.4	1.38	11	0	4	7	
Karanjia	77	Gambharia ll_RF	14.00	1.13	11	0	3	8	
Karanjia	78	Gambharia lll_RF	12.40	2	9	NA	NA	NA	2024-25
Karanjia	79	Ghagi_RF	227.20	14.5	66	54	9	3	
Karanjia	80	Gharmabeda_RF	188.80	13.24	81	29	44	8	
Karanjia	81	Ghodaghaguri_RF	141.2	8.5	60	0	57	3	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Karanjia	82	Ghosda I_RF	19.2	1.9	7	0	5	2	
Karanjia	83	Ghosda II_RF	140	8.00	45	26	17	2	
Karanjia	84	Haldia II_PRF	7.49	1.14	1	1	0	0	
Karanjia	85	Haldia l_PRF	5.34	1.2	NA	NA	NA	NA	
Karanjia	86	Haldia_RF	113.6	7.2	27	0	21	6	
Karanjia	87	Halpur - I_RF	47.2	4.1	26	10	16	0	
Karanjia	88	Halpur - II_RF	64	4.3	24	10	12	2	
Karanjia	89	Halpur - III_RF	11.6	1.4	5	2	3	0	
Karanjia	90	Hatisalbeda_RF	487.6	19.6	92	61	20	11	
Karanjia	91	Hindola_RF	23.6	3.00	23	1	4	18	
Karanjia	92	Jambani_RF	107.2	7.82	35	0	29	6	
Karanjia	93	Jamunti_RF	260	18.9	114	20	60	34	2025-26
Karanjia	94	Jhaddumuria_RF	56.8	4.2	31	0	26	5	
Karanjia	95	Jhadghosda_RF	36.4	4.84	16	0	4	12	
Karanjia	96	Jhumukapal_RF	28	2.1	13	0	6	7	
Karanjia	97	Kalkad_RF	100	7.5	62	5	47	10	
Karanjia	98	Karanjia_RF	109.2	7	48	20	11	17	
Karanjia	99	Kasia_RF	97.2	4.5	15		14	1	
Karanjia	100	Kendua_RF	152.00	7.5	72	1	31	40	2026-27
Karanjia	101	Kenjhara_RF	117.60	5.43	25	13	7	5	
Karanjia	102	Khaparasahi_RF	33.6	3.87	34	1	22	11	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Karanjia	103	Konika_RF	24.8	2.6	14	0	1	13	
Karanjia	104	Kudarsahi_RF	20.8	2.12	7	0	0	7	
Karanjia	105	Kujiam_RF	155.60	12.2	86	29	38	19	
Karanjia	106	Kuliposi_RF	24	2.00	8	8	0	0	
Karanjia	107	Kusunpur II_RF	43.2	3.88	20	0	11	9	
Karanjia	108	Kusunpur l_RF	18	2.17	9	0	5	4	
Karanjia	109	Mahadevdeuli_RF	37.2	3.9	22	0	6	16	
Karanjia	110	Mahuliasole_RF	153.6	8.15	65	1	17	47	
Karanjia	111	Maricha_RF	24.00	3.9	36	0	18	18	
Karanjia	112	Mayursahi_DPF	12.54	2.29	NA	NA	NA	NA	2027-28
Karanjia	113	Milu_DPF	19.02	3.44	NA	NA	NA	NA	
Karanjia	114	Miludihi_RF	42.07	4.54	47	14	8	25	
Karanjia	115	Naksara_RF	20.4	2.5	15	1	1	13	
Karanjia	116	Nuabeda_RF	18.8	1.7	17	0	17	0	
Karanjia	117	Nuagaon_RF	142.00	8.6	51	0	48	3	
Karanjia	118	Padheidura_RF	457.6	17.9	111	36	75	0	
Karanjia	119	Panideuli_RF	98.4	7	52	0	18	34	
Karanjia	120	Panpatriya_RF	1520	92.3	643	45	238	360	2028-29
Karanjia	121	Paudia_RF	639.2	17.6	140	1	139	0	
Karanjia	122	Phulcomp_RF	42.8	3.12	27	0	15	12	
Karanjia	123	Phulguntha_RF	103.6	6.00	23	3	20	0	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Karanjia	124	Pingu_RF	39.2	3.9	18	0	18	0	
Karanjia	125	Pokamunda_RF	190.00	5.7	35	4	31	0	
Karanjia	126	Pokharia I_RF	145.6	8.4	45	18	22	5	
Karanjia	127	Pokharia II_RF	73.6	4.57	22	17	4	1	
Karanjia	128	Saantabandha_RF	17.6	2.1	19		3	16	2029-30
Karanjia	129	Sanbadposi_RF	201.2	15	102	2	98	2	
Karanjia	130	Sandeuli_RF	120.4	6.42	44	0	35	9	
Karanjia	131	Sankesari l_RF	18	6.3	46	0	0	46	
Karanjia	132	Sankesari ll_RF	38.4	10.00	35	0	30	5	
Karanjia	133	Saragoda l_RF	18	2.5	21	1	15	5	
Karanjia	134	Saranggarh_RF	113.2	7.5	28		26	2	
Karanjia	135	Sarasaposi_RF	115.2	8.00	60	1	16	43	
Karanjia	136	Sarogada ll_RF	36.8	3.00	29	0	4	25	
Karanjia	137	Sarubali_RF	83.2	5.7	31	0	27	4	
Karanjia	138	Sarubhadi_RF	55.20	5.7	29	1	26	2	2030-31
Karanjia	139	Sarubil_RF	99.6	11.3	84	0	65	19	
Karanjia	140	Singada l_RF	23.2	2.61	12	0	12	0	
Karanjia	141	Singada ll_RF	54	3.32	12	7	5	0	
Karanjia	142	Singada lll_RF	112.4	7.6	22	16	4	2	
Karanjia	143	Singda_DPF	7.28	1.24	4	0	4	0	
Karanjia	144	Sunaposi_RF	108.8	7.00	33	0	19	14	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Karanjia	145	Tangia_RF	30	3.5	15	0	11	4	
Karanjia	146	Tikasil_RF	92.8	4.8	25	0	25	0	
Karanjia	147	Tulasipur_RF	28	2.2	12	0	2	10	
Satkosia	148	Bhaliadala I_PRF	10.63	5.02	33	10	23	0	2021-22
Satkosia	149	Bhaliadala III_PRF	110.79	10.28	59	26	33	0	
Satkosia	150	Bhaliadala IV_PRF	17.67	4.29	34	19	15	0	2022-23
Satkosia	151	Gaudiabahali_RF	182.4	18.4	73	32	40	1	
Satkosia	152	Khumthan_RF	240.00	15.8	81	24	17	40	2023-24
Satkosia	153	Mahuldiha I_PRF	23.67	3.27	NA	NA	NA	NA	2024-25
Satkosia	154	Mahuldiha II_PRF	26.57	5.24	NA	NA	NA	NA	2025-26
Satkosia	155	Noda_RF	352	18.8	102	19	20	63	2026-27
Satkosia	156	Satkosia Ib_RF	363.2	10.6	94	13	11	70	2027-28
Satkosia	157	Satkosia II_RF	208.27	10.4	43	1	3	39	2028-29
Satkosia	158	Satkosia III_RF	353.83	12.1	48	3	22	23	2029-30
Satkosia	159	Satkosia_RF	13732.8	40.08	395	142	253	0	2030-31
Thakurmunda	160	Akhapalan_RF	57.52	3.5	19	13	6	0	
Thakurmunda	161	Ambabeda_PRF	19.6	2.01	1	0	1	0	
Thakurmunda	162	Andharikhamana_PRF	28.45	2.81	20	0	20	0	2021-22
Thakurmunda	163	Andharikhamana_RF	48.48	3	31	0	20	11	
Thakurmunda	164	Asankudar_RF	11.86	2.1	11	9	1	1	
Thakurmunda	165	Badabaliposi_RF	27.57	3.9	30	2	3	25	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Thakurmunda	166	Badbil_RF	943.2	28.8	68	42	26	0	
Thakurmunda	167	Banamunda_RF	176.4	7.2	40	0	40	0	
Thakurmunda	168	Basantpur _RF	38.62	3	10	0	7	3	
Thakurmunda	169	Basantpur II_PRF	23.45	2.7	2	0	2	0	
Thakurmunda	170	Baunsadiha_RF	167.2	6	15	10	5	0	2022-23
Thakurmunda	171	Bhadubeda_RF	111.2	10.3	70	12	58	0	
Thakurmunda	172	Bhairanibeda_PRF	12.46	1.49	9	1	8	0	
Thakurmunda	173	Bharandia_PRF	29.26	2.28	15	0	15	0	
Thakurmunda	174	Bharandia_RF	97.6	7.2	39	19	20	0	
Thakurmunda	175	Bisipur I_RF	421.2	28.13	132	26	86	20	
Thakurmunda	176	Bisipur II_RF	74.00	3.93	72	11	61	0	
Thakurmunda	177	Boring_RF	275.2	10.8	35	0	27	8	
Thakurmunda	178	Chainbainsi_RF	70.96	7.75	21	6	15	0	
Thakurmunda	179	Chakulia_RF	10.02	1.8	16	0	5	11	
Thakurmunda	180	Chamakpur_RF	182.8	8	17	6	11	0	2023-24
Thakurmunda	181	Chheratangar_RF	800	20.25	89	0	83	6	
Thakurmunda	182	Chirupada_RF	23.49	4.4	20	1	5	14	
Thakurmunda	183	Dakeipal_RF	120.4	6.8	23	18	5	0	
Thakurmunda	184	Dangadiha II_PRF	44.52	4.45	16	8	8	0	
Thakurmunda	185	Dangadiha_RF	97.2	4.4	23	0	23	0	
Thakurmunda	186	Dangapani_RF	104.8	8.6	26	6	19	1	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Thakurmunda	187	Digdhar_RF	45.1	4.85	43	5	10	28	
Thakurmunda	188	Diliganj_PRF	25.84	2.79	11	0	11	0	
Thakurmunda	189	Gahandia_PRF	19.02	4.21	5	1	4	0	
Thakurmunda	190	Gahandia_RF	14.15	1.5	6	0	4	2	2024-25
Thakurmunda	191	Ghodabindha_DPF	11.56	1.72	NA	NA	NA	NA	
Thakurmunda	192	Ghodabindha_RF	168.4	7.46	19	3	9	7	
Thakurmunda	193	Gourigoda_RF	66.4	3.2	13	0	12	1	
Thakurmunda	194	Handiphuta A_RF	61.32	4.5	13	0	11	2	
Thakurmunda	195	Handiphuta B_RF	154.44	9.50	14	0	0	14	
Thakurmunda	196	Handiphuta_RF	306	21.2	48	29	19	0	
Thakurmunda	197	Hatigoda_RF	108.8	5.6	16	0	16	0	
Thakurmunda	198	Jadbil_RF	187.6	10.8	28	1	26	1	
Thakurmunda	199	Jamunalia_RF	20.17	2.1	10	1	1	8	
Thakurmunda	200	Jarak_RF	48	2.8	21	6	15	0	2025-26
Thakurmunda	201	Kadopani_RF	145.2	7.48	19	9	10	0	
Thakurmunda	202	Kalasira_PRF	32.09	5.03	33	2	31	0	
Thakurmunda	203	Kaliaposi - III_PRF	15.68	2.19	1	0	1	0	
Thakurmunda	204	Kaliaposi II_PRF	8.82	1.49	8	6	2	0	
Thakurmunda	205	Kaliaposi_RF	78.25	3.5	29	7	22	0	
Thakurmunda	206	Kalijhiani I_RF	378.8	17.69	39	0	38	1	
Thakurmunda	207	Kalijhiani II_RF	147.6	4.2	10	0	10	0	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Thakurmunda	208	Kathuanuagaon_RF	68	6	29	8	21	0	
Thakurmunda	209	Keloposi_PRF	23.09	4.44	4	0	4	0	
Thakurmunda	210	Kendujuani_PRF	17.56	2.54	7	0	7	0	2026-27
Thakurmunda	211	Kendumundi I_RF	147.6	8.8	49	32	17	0	
Thakurmunda	212	Kendumundi II_RF	648	17.00	88	69	19	0	
Thakurmunda	213	Keshdiha PRF	42.03	NA	NA	NA	NA	0	
Thakurmunda	214	Khadipal_PRF	6.87	1.27	4	0	4	0	
Thakurmunda	215	Khandabanda_PRF	19.83	2.53	17	0	17	0	
Thakurmunda	216	Khejuri_RF	641.6	24	76	32	44	0	
Thakurmunda	217	Khejuria_RF	15.28	24	72	0	2	70	
Thakurmunda	218	Khudisila_RF	83.6	3.3	23	6	10	7	
Thakurmunda	219	Khuntakata_PRF	7.96	1.44	7	3	4	0	
Thakurmunda	220	Khuntaposi_RF	3.66	1.2	7	1	0	6	2027-28
Thakurmunda	221	Kirkichipal_PRF	34.09	4.73	8	1	7	0	
Thakurmunda	222	Kucheikudar_PRF	65.72	4.63	25	0	25	0	
Thakurmunda	223	Majuraposi DPF	125.46	16.37	NA	NA	NA	NA	
Thakurmunda	224	Majuriposi-I_RF	13.98	1.32	16	13	2	1	
Thakurmunda	225	Majuriposi-II_RF	144.8	6.14	13		12	1	
Thakurmunda	226	Mandaljhari_RF	32.98	5.25	24	8	10	6	
Thakurmunda	227	Mankadabeda_RF	208.4	8.4	27	6	21	NA	
Thakurmunda	228	Mituani-I_RF	106.8	6.5	16	5	11	0	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Thakurmunda	229	Mituani-II_RF	184.4	10	29	16	13	0	
Thakurmunda	230	Mituani-III_PRF	19.51	1.73	1		1	0	2028-29
Thakurmunda	231	Mituani-III_RF	98.08	5.5	29	10	19	0	
Thakurmunda	232	Mituani-IV_PRF	97.41	8.11	6	2	4	0	
Thakurmunda	233	Mulapal_RF	90	4.2	15	4	11	0	
Thakurmunda	234	Nischintapur_RF	7.47	1.75	12	0	1	11	
Thakurmunda	235	Nundiha_PRF	82.72	9.82	18	0	18	0	
Thakurmunda	236	Padiabeda_RF	51.02	4.6	22	9	6	7	
Thakurmunda	237	Panasdiha_RF	8.81	1.9	14	1	1	12	
Thakurmunda	238	Patbil_RF	154.80	9.75	48	7	36	5	
Thakurmunda	239	Patrapada_PRF	73.86	5.45	26	2	24	0	
Thakurmunda	240	Purunapani II_RF	55.77	5.75	65	0	7	58	2029-30
Thakurmunda	241	Purunapani_PRF	26.87	2.67	NA	NA	NA	NA	
Thakurmunda	242	Purunapani_RF	452.8	22.4	54	26	28	0	
Thakurmunda	243	Rengalbeda I_RF	67.2	4.00	15	2	7	6	
Thakurmunda	244	Rengalbeda II_RF	42.67	4.5	35	5	14	16	
Thakurmunda	245	Rugudibeda_RF	58.58	2.2	15	1	11	3	
Thakurmunda	246	Saleibeda_PRF	34.4	2.43	11	0	11	0	
Thakurmunda	247	Saleibeda_RF	125.6	6.6	24	0	22	2	
Thakurmunda	248	Sanaandharikhaman_RF	120	10.6	32	13	15	4	
Thakurmunda	249	Sanrugudibeda_RF	212.8	12.96	31	12	10	9	

ANNEXURE XIV: POSITION OF BOUNDARY PILLARS IN RF/PRF OF KARANJIA FOREST DIVISION WITH 10 YEARS CYCLE OF MAINTENANCE									
Name of the Range	**Sl. No.**	**Name of RF/PRF**	**Area in Ha.**	**Length of Boundary (Km)**	**Condition of Boundary Pillar (No)**				**Year of Maintenance**
					Total	**Good**	**Damaged**	**Missing**	
Thakurmunda	250	Sarubil I_RF	162.00	8.4	28	13	15	0	2030-31
Thakurmunda	251	Sarubil II_RF	83.36	8.2	28	13	14	1	
Thakurmunda	252	Sunariposi_PRF	14.37	2.27	5	0	5	0	
Thakurmunda	253	Sunida_RF	23.93	2.5	12	0	4	8	
Thakurmunda	254	Talpada_RF	145.6	7.2	20	16	4	0	
Thakurmunda	255	Taramara_RF	649.6	19.8	52	9	28	15	
Thakurmunda	256	Thakurmunda_RF	250.8	10.4	23	1	13	9	
Thakurmunda	257	Tikarpada_RF	89.2	4.8	16	5	9	2	
Thakurmunda	258	Vejidiha I_RF	160	9.6	64	9	50	5	
Thakurmunda	259	Vejidiha II_RF	17.88	4.5	22	0	22	0	
Total			**46343.43**	**1845.96**	9776	**2084**	**5294**	**2398**	

ANNEXURE XV(a) BIODIVERSITY INDICES FOR SHRUBS OF KARANJIA DIVISION																									
Sl.No.	species	Common Name	QUADRANT					sps quadrants	Density	relative density	frequency	relative frequency	abundance of species	Association index	Dispersal Pattern	Pi	Pi*Pi	Ln Pi	Pi*Ln Pi	Shannon Index(H)	n(n-1)	N(N-1)	Simpson Raciprocal Index	Simpson Index
			NE	NW	SE	SW	Total																		
1	*cacia sinu*	Acacia	8	21	28	12	**69**	4	17.25	1.776061776	100	2.040816327	17.25	1	0.1725	0	1.89227	-5.44	-0.02365	**1.117028116**	**4692**	**2E+07**	**0.101934081**	**0.89806592**
2	*atoda vas*	Basanga	5	8	2	5	**20**	4	5	0.514800515	100	2.040816327	5	1	0.05	0	2.58981	-6.68	-0.00842		**380**			
3	*ium salvif*	Ankula	2	4	-	7	**13**	3	3.25	0.334620335	75	1.530612245	4.333333333	0.75	0.057777778	0	3.71693	-7.11	-0.00582		**156**			
4	*izia lebba*	Sirisa	7	12	24	11	**54**	4	13.5	1.38996139	100	2.040816327	13.5	1	0.135	0	4.15897	-5.68	-0.01935		**2862**			
5	*Allophyl us*	Pata / Pata Nai	5	8	15	6	**34**	4	8.5	0.875160875	100	2.040816327	8.5	1	0.085	0	5.59454	-6.15	-0.01317		**1122**			
6	*imum occ*	Cashew	6	7	18	23	**54**	4	13.5	1.38996139	100	2.040816327	13.5	1	0.135	0	6.15897	-5.68	-0.01935		**2862**			
7	*raphis par*	Bhuin-neem	1	4	5	7	**17**	4	4.25	0.437580438	100	2.040816327	4.25	1	0.0425	0	7.14863	-6.84	-0.00733		**272**			
8	*igus race*	Satavar	5	23	21	23	**72**	4	18	1.853281853	100	2.040816327	18	1	0.18	0	8.06039	-5.4	-0.02449		**5112**			
9	*ia scaraba*	Bana kolotho	8	9	12	12	**41**	4	10.25	1.055341055	100	2.040816327	10.25	1	0.1025	0	9.68116	-5.96	-0.0154		**1640**			
10	*uhinia val*	Siali	45	67	87	18	**217**	4	54.25	5.585585586	100	2.040816327	54.25	1	0.5425	0	10.00018716	-4.29	-0.05871		**46872**			
11	*inia varig*	kanchan	6	14	9	12	**41**	4	10.25	1.055341055	100	2.040816327	10.25	1	0.1025	0	11.68116	-5.96	-0.0154		**1640**			
12	*Boswelli a*	Salai	7	9	-	-	**16**	2	4	0.411840412	50	1.020408163	8	0.5	0.16	0	12.01748	-6.9	-0.00696		**240**			
13	*Caesalpi nia*	Gila	6	7	8	-	**21**	3	5.25	0.540540541	75	1.530612245	7	0.75	0.093333333	0	13.75276	-6.63	-0.00877		**420**			
14	*Caeseari a*	Giridi	5	7	8	-	**20**	3	5	0.514800515	75	1.530612245	6.666666667	0.75	0.088888889	0	14.58981	-6.68	-0.00842		**380**			
15	*lmus guru*	Kanta beta	-	3	-	1	**4**	2	1	0.102960103	50	1.020408163	2	0.5	0.04	0	15.35922	-8.29	-0.00209		**12**			
16	*ium didy*	lsinnga Kumarchik	8	7	4	-	**19**	3	4.75	0.489060489	75	1.530612245	6.333333333	0.75	0.084444444	0	16.4348	-6.73	-0.00806		**342**			
17	*reya arbo*	Kumbhi	34	7	12	32	**85**	4	21.25	2.187902188	100	2.040816327	21.25	1	0.2125	0	17.87159	-5.23	-0.02802		**7140**			
18	*earia ellip*	Khakada	234	453	126	311	**1124**	4	281	28.93178893	100	2.040816327	281	1	2.81	0	18.00502131	-2.65	-0.18757		**1E+06**			
19	*asia fistul*	Sunari	31	28	45	21	**125**	4	31.25	3.217503218	100	2.040816327	31.25	1	0.3125	0	19.21018	-4.84	-0.03817		**15500**			
20	*oxylon swi*	Bheru	7	32	31	28	**98**	4	24.5	2.522522523	100	2.040816327	24.5	1	0.245	0	20.81712	-5.09	-0.03143		**9506**			
21	*dessa baco*	Nahalbell	8	-	1	1	**10**	3	2.5	0.257400257	75	1.530612245	3.333333333	0.75	0.044444444	0	21.97451	-7.37	-0.00465		**90**			
22	*sena exca*	Agnijhal	4	15	7	13	**39**	4	9.75	1.003861004	100	2.040816327	9.75	1	0.0975	0	22.04524	-6.01	-0.01477		**1482**			
23	*ome visc*	Ban soris	8	34	23	14	**79**	4	19.75	2.033462033	100	2.040816327	19.75	1	0.1975	0	23.48049	-5.3	-0.02641		**6162**			
24	*ma angus*	Palua	1	-	8	-	**9**	2	2.25	0.231660232	50	1.020408163	4.5	0.5	0.09	0	24.21936	-7.47	-0.00424		**72**			
25	*ma arom*	Banhaldi	-	1	5	1	**7**	3	1.75	0.18018018	75	1.530612245	2.333333333	0.75	0.031111111	0	25.94751	-7.73	-0.00341		**42**			
26	*endron gl*	Chauli	21	45	67	24	**157**	4	39.25	4.041184041	100	2.040816327	39.25	1	0.3925	0	26.79678	-4.62	-0.04568		**24492**			
27	*rina subc*	Chauladhua	1	-	3	7	**11**	3	2.75	0.283140283	75	1.530612245	3.666666667	0.75	0.048888889	0	27.80916	-7.27	-0.00504		**110**			
28	*Ficus retusa*	Jida	1	4	8	1	**14**	4	3.5	0.36036036	100	2.040816327	3.5	1	0.035	0	28.79005	-7.03	-0.00621		**182**			
29	*courtia ind*	Baincha	8	9	21	32	**70**	4	17.5	1.801801802	100	2.040816327	17.5	1	0.175	0	29.94751	-5.42	-0.02393		**4830**			
30	*ingia cha*	nidantakathi Bhanc	45	23	66	12	**146**	4	36.5	3.758043758	100	2.040816327	36.5	1	0.365	0	30.47208	-4.69	-0.04315		**21170**			
31	*nia gumm*	uruda/churdu/Ghuru	23	11	21	16	**71**	4	17.75	1.827541828	100	2.040816327	17.75	1	0.1775	0	31.00355	-5.41	-0.02421		**4970**			
32	*denia latif*	Damakurudu	21	17	3	4	**45**	4	11.25	1.158301158	100	2.040816327	11.25	1	0.1125	0	32.04839	-5.87	-0.01664		**1980**			
33	*licteres ise*	Auraphal/ muri mur	8	23	4	6	**41**	4	10.25	1.055341055	100	2.040816327	10.25	1	0.1025	0	33.68116	-5.96	-0.0154		**1640**			
34	*desmus in*	Ananta mula	6	4	-	2	**12**	3	3	0.308880309	75	1.530612245	4	0.75	0.053333333	0	34.7233	-7.19	-0.00544		**132**			
35	*ofera pul*	Girili	21	34	25	21	**101**	4	25.25	2.5997426	100	2.040816327	25.25	1	0.2525	0	35.0544	-5.06	-0.0322		**10100**			
36	*ora arbor*	uinkurwan/telkurw	22	36	12	45	**115**	4	28.75	2.96010296	100	2.040816327	28.75	1	0.2875	0	36.2563	-4.93	-0.03572		**13110**			
37	*Lantana camara*	Lantana/Bholupadi	8	7	-	2	**17**	3	4.25	0.437580438	75	1.530612245	5.666666667	0.75	0.075555556	0	37.14863	-6.84	-0.00733		**272**			
38	*ucas aspe*	Gayas	11	23	-	3	**37**	3	9.25	0.952380952	75	1.530612245	12.33333333	0.75	0.164444444	0	38.44111	-6.06	-0.01414		**1332**			
39	*dhus longi*	Madanga	23	45	-	-	**68**	2	17	1.75032175	50	1.020408163	34	0.5	0.68	0	39.83782	-5.45	-0.02337		**4556**			
40	*nosa pud*	Lajwanti/Lajkulilat	-	-	4	1	**5**	2	1.25	0.128700129	50	1.020408163	2.5	0.5	0.05	0	40.93629	-8.06	-0.00254		**20**			
41	*gyna parv*	Mundi	7	8	1	1	**17**	4	4.25	0.437580438	100	2.040816327	4.25	1	0.0425	0	41.14863	-6.84	-0.00733		**272**			
42	*inda tinct*	Achhu	32	45	12	34	**123**	4	30.75	3.166023166	100	2.040816327	30.75	1	0.3075	0	42.01304	-4.86	-0.03768		**15006**			
43	*thes arbo*	Gangasiuli	89	45	67	21	**222**	4	55.5	5.714285714	100	2.040816327	55.5	1	0.555	0	43.00019588	-4.27	-0.05975		**49062**			

ANNEXURE XV(a) BIO DIVERSITY INDICES FOR SHRUBS OF KARANJIA DIVISION

Sl.No.	species	Common Name	QUADRANT					sps quadrants	Density	relative density	frequency	relative frequency	abundance of species	Association index	Dispersal Pattern	Pi	Pi*Pi	Ln Pi	Pi*Ln Pi	Shannon Index(H)	n(n-1)	N(N-1)	Simpson Raciprocal Index	Simpson Index
			NE	NW	SE	SW	Total																	
44	*um basili*	Bantulasi	6	8	-	2	**16**	3	4	0.411840412	75	1.530612245	5.333333333	0.75	0.071111111	0	44.01748	-6.9	-0.00696		**240**			
45	*num sanc*	Tulsi	9	12	34	2	**57**	4	14.25	1.467181467	100	2.040816327	14.25	1	0.1425	0	45.29132	-5.63	-0.02023		**3192**			
46	*Phoenix sylvastri*	Khajuri	5	33	21	23	**82**	4	20.5	2.110682111	100	2.040816327	20.5	1	0.205	0	46.67246	-5.26	-0.02722		**6642**			
47	*Phyllant hus*	Jajangi	6	8	-	1	**15**	3	3.75	0.386100386	75	1.530612245	5	0.75	0.066666667	0	47.94266	-6.96	-0.00659		**210**			
48	*Sesbani a*	Agasti	9	1	-	-	**10**	2	2.5	0.257400257	50	1.020408163	5	0.5	0.1	0	48.97451	-7.37	-0.00465		**90**			
49	*Spondia s*	Ambada	10	12	23	-	**45**	3	11.25	1.158301158	75	1.530612245	15	0.75	0.2	0	49.04839	-5.87	-0.01664		**1980**			
50	*ermum su*	Padhel Chuin patul	7	8	3	2	**20**	4	5	0.514800515	100	2.040816327	5	1	0.05	0	50.58981	-6.68	-0.00842		**380**			
51	*Streblus asper*	Sahada	9	3	-	-	**12**	2	3	0.308880309	50	1.020408163	6	0.5	0.12	0	51.7233	-7.19	-0.00544		**132**			
52	*nos nuxvo*	Kochila	7	7	-	2	**16**	3	4	0.411840412	75	1.530612245	5.333333333	0.75	0.071111111	0	52.01748	-6.9	-0.00696		**240**			
53	*pesia lam*	Banakapasi	6	3	4	3	**16**	4	4	0.411840412	100	2.040816327	4	1	0.04	0	53.01748	-6.9	-0.00696		**240**			
54	*Urena cinnata*	Jatjatiamota	1	-	1	-	**2**	2	0.5	0.051480051	50	1.020408163	1	0.5	0.02	0	54.58981	-8.98	-0.00113		**2**			
55	*ago dentic*	Kantamaul	1	3	1	-	**5**	3	1.25	0.128700129	75	1.530612245	1.666666667	0.75	0.022222222	0	55.93629	-8.06	-0.00254		**20**			
56	*ex negund*	Begunia	6	-	1	-	**7**	2	1.75	0.18018018	50	1.020408163	3.5	0.5	0.07	0	56.94751	-7.73	-0.00341		**42**			
57	*pedunc u*	Chadaegudi	5	6	1	-	**12**	3	3	0.308880309	75	1.530612245	4	0.75	0.053333333	0	57.7233	-7.19	-0.00544		**132**			
58	*hus xyloca*	Ghanta	-	1	-	9	**10**	2	2.5	0.257400257	50	1.020408163	5	0.5	0.1	0	58.97451	-7.37	-0.00465		**90**			
TOTAL			**87**	**105**	**89**	**44**	**325**	**44**	**81.25**	8.365508366	**1100**	22.44897959	**100.5833333**	**11**	**1.331944444**	**0**	**1738.98**	**-105**	**-0.12721**		**13632**			

ANNEXURE XV(b) BIODIVERSITY INDICES FOR HERBS OF KARANJIA DIVISION

Sl No.	species	Common Name	QUADRANT					sps quadrants	Density	relative density	frequency	relative frequency	abundance of species	Association index	Dispersal Pattern	Pi	Pi*Pi	Ln Pi	Pi*Ln Pi	Shannon Index(H)	n(n-1)	N(N-1)	Raciprocal Index	Simpson Index
			NE	NW	SE	SW	Total																	
1	*le marme*	Apamaranga	15	21	24	18	78	4	19.5	0.864265928	100	1.818181818	19.5	1	0.195	0.003822405	1.46108	-5.5668754	-0.02128	**1.78198463**	**6006**	**8E+07**	**0.06799311**	**0.932006886**
2	*izia lebba*	Sirisa	9	16	13	31	69	4	17.25	0.764542936	100	1.818181818	17.25	1	0.1725	0.003381358	1.14336	-5.6894777	-0.01924		**4692**			
3	*Aloe*	Ghinkuanri	-	-	1	1	2	2	0.5	0.022160665	50	0.909090909	1	0.5	0.02	9.80104E-05	9.60604	-9.2304371	-0.0009		**2**			
4	*raphis pa*	Bhuinimba	231	21	241	31	524	4	131	5.806094183	100	1.818181818	131	1	1.31	0.025678722	0.000659397	-3.6620926	-0.09404		**274052**			
5	*eissus lat*	Dhaura	43	98	78	106	325	4	81.25	3.601108033	100	1.818181818	81.25	1	0.8125	0.015926688	0.000253659	-4.1397591	-0.06593		**105300**			
6	*tida seta*	Khadika grass	13	9	15	16	53	4	13.25	0.587257618	100	1.818181818	13.25	1	0.1325	0.002597275	6.74584	-5.9532923	-0.01546		**2756**			
7	*gus race*	Satavar	36	125	154	98	413	4	103.25	4.576177285	100	1.818181818	103.25	1	1.0325	0.020239145	0.000409623	-3.9001367	-0.07894		**170156**			
8	*irachta in*	Neem	19	23	7	13	62	4	15.5	0.686980609	100	1.818181818	15.5	1	0.155	0.003038322	9.2314	-5.7964499	-0.01761		**3782**			
9	*richoa pe*	Basana	2	-	-	1	3	2	0.75	0.033240997	50	0.909090909	1.5	0.5	0.03	0.000147016	2.16136	-8.824972	-0.0013		**6**			
10	*dellia ret*	Kasi	3	5	2	32	42	4	10.5	0.465373961	100	1.818181818	10.5	1	0.105	0.002058218	4.23626	-6.1859146	-0.01273		**1722**			
11	*anania la*	Char	134	245	231	156	766	4	191.5	8.487534626	100	1.818181818	191.5	1	1.915	0.037537979	0.0014091	-3.2824021	-0.12321		**585990**			
12	*ropis gig*	Arakha	1	-	-	1	2	2	0.5	0.022160665	50	0.909090909	1	0.5	0.02	9.80104E-05	9.60604	-9.2304371	-0.0009		**2**			
13	*nabis sa*	Ganjei	1	6	2	-	9	3	2.25	0.099722992	75	1.363636364	3	0.75	0.04	0.000441047	1.94522	-7.7263597	-0.00341		**72**			
14	*eya arbo*	Kumbhi	10	9	14	2	35	4	8.75	0.387811634	100	1.818181818	8.75	1	0.0875	0.001715182	2.94185	-6.3682362	-0.01092		**1190**			
15	*ssia siam*	Chakunda	5	54	34	6	99	4	24.75	1.096952909	100	1.818181818	24.75	1	0.2475	0.004851514	2.35372	-5.3284644	-0.02585		**9702**			
16	*assia tor*	Banchakunda	1	9	32	4	46	4	11.5	0.509695291	100	1.818181818	11.5	1	0.115	0.002254239	5.08159	-6.0949429	-0.01374		**2070**			
17	*osia arge*	Mayurachulia	67	48	92	45	252	4	63	2.792243767	100	1.818181818	63	1	0.63	0.012349309	0.000152505	-4.3941552	-0.05426		**63252**			
18	*ome visc*	Ban soris	188	195	143	178	704	4	176	7.800554017	100	1.818181818	176	1	1.76	0.034499657	0.001190226	-3.3668059	-0.11615		**494912**			
19	*endrum vi*	Kharkhari	7	1	3	-	11	3	2.75	0.121883657	75	1.363636364	3.666666667	0.75	0.048888889	0.000539057	2.90583	-7.525689	-0.00406		**110**			
20	*ia procu*	Gandhuri	9	16	3	-	28	3	7	0.310249307	75	1.363636364	9.333333333	0.75	0.124444444	0.001372145	1.88278	-6.5913797	-0.00904		**756**			
21	*Curcum*	Ada (Ambakasi)	-	1	-	7	8	2	2	0.088642659	50	0.909090909	4	0.5	0.08	0.000392042	1.53697	-7.8441427	-0.00308		**56**			
22	*rcuma lon*	Haladi	32	21	-	4	57	3	14.25	0.631578947	75	1.363636364	19	0.75	0.253333333	0.002793296	7.8025	-5.880533	-0.01643		**3192**			
23	*dan Dac*	Duba	122	117	234	199	672	4	168	7.44598338	100	1.818181818	168	1	1.68	0.032931491	0.001084483	-3.4133259	-0.11241		**450912**			
24	*ra stramo*	Dudura	-	3	-	1	4	2	1	0.04432133	50	0.909090909	2	0.5	0.04	0.000196021	3.84241	-8.5372899	-0.00167		**12**			
25	*lium gan*	Salaparni	16	24	34	6	80	4	20	0.886426593	100	1.818181818	20	1	0.2	0.003920416	1.53697	-5.5415576	-0.02173		**6320**			
26	*ros melan*	Kendu	456	278	231	675	1640	4	410	18.17174515	100	1.818181818	410	1	4.1	0.080368519	0.006459099	-2.5211327	-0.20262		**2687960**			
27	*ica offici*	Amla	21	45	41	11	118	4	29.5	1.307479224	100	1.818181818	29.5	1	0.295	0.005782613	3.34386	-5.1528996	-0.0298		**13806**			
28	*nia heyn*	Karhjamu	6	5	2	1	14	4	3.5	0.155124654	100	1.818181818	3.5	1	0.035	0.000686073	4.70696	-7.2845269	-0.005		**182**			
29	*liopsis bi*	Sabai grass	3	3	-	7	13	3	3.25	0.144044321	75	1.363636364	4.333333333	0.75	0.057777778	0.000637068	4.05855	-7.3586349	-0.00469		**156**			
30	*ourtia in*	Baincha	76	12	45	62	195	4	48.75	2.16066482	100	1.818181818	48.75	1	0.4875	0.009556013	9.13174	-4.6505847	-0.04444		**37830**			
31	*ellaria in*	Banachanda	5	2	-	1	8	3	2	0.088642659	75	1.363636364	2.666666667	0.75	0.035555556	0.000392042	1.53697	-7.8441427	-0.00308		**56**			
32	*ewia elast*	Mirgichra/Barenga	6	-	1	-	7	2	1.75	0.077562327	50	0.909090909	3.5	0.5	0.07	0.000343036	1.17674	-7.9776741	-0.00274		**42**			
33	*ewia hirs*	Kukurabicha	-	-	-	1	1	1	0.25	0.011080332	25	0.454545455	1	0.25	0.04	4.90052E-05	2.40151	-9.9235843	-0.00049		**0**			
34	*pogon co*	Sinkulia	43	48	32	67	190	4	47.5	2.105263158	100	1.818181818	47.5	1	0.475	0.009310987	8.66945	-4.6765602	-0.04354		**35910**			
35	*a arundi*	Channa grass	12	52	69	103	236	4	59	2.614958449	100	1.818181818	59	1	0.59	0.011565226	0.000133754	-4.4597524	-0.05158		**55460**			
36	*ora arbor*	uinkurwan/telkurw	12	1	3	45	61	4	15.25	0.675900277	100	1.818181818	15.25	1	0.1525	0.002989317	8.93602	-5.8127104	-0.01738		**3660**			
37	*um arbor*	Banmalli	1	-	5	23	29	3	7.25	0.32132964	75	1.363636364	9.666666667	0.75	0.128888889	0.001421151	2.01967	-6.5562884	-0.00932		**812**			
38	*cia adha*	Basanga	7	9	13	24	53	4	13.25	0.587257618	100	1.818181818	13.25	1	0.1325	0.002597275	6.74584	-5.9532923	-0.01546		**2756**			
39	*ucas aspe*	Gayas	17	7	24	56	104	4	26	1.152354571	100	1.818181818	26	1	0.26	0.00509654	2.59747	-5.2791934	-0.02691		**10712**			
40	*rpha Sph*	Mutha Grass	98	82	74	79	333	4	83.25	3.689750693	100	1.818181818	83.25	1	0.8325	0.01631873	0.000266301	-4.1154418	-0.06716		**110556**			
41	*hus longi*	Madanga	18	7	17	6	48	4	12	0.531855956	100	1.818181818	12	1	0.12	0.002352249	5.53308	-6.0523832	-0.01424		**2256**			
42	*us philip*	Kamalagundi	4	5	-	-	9	2	2.25	0.099722992	50	0.909090909	4.5	0.5	0.09	0.000441047	1.94522	-7.7263597	-0.00341		**72**			
43	*ynia dian*	Baghanakhi	7	11	23	11	52	4	13	0.576177285	100	1.818181818	13	1	0.13	0.00254827	6.49368	-5.9723405	-0.01522		**2652**			

ANNEXURE XV(b) BIODIVERSITY INDICES FOR HERBS OF KARANJIA DIVISION

Sl No.	species	Common Name	QUADRANT					sps quadrants	Density	relative density	frequency	relative frequency	abundance of species	Association index	Dispersal Pattern	Pi	Pi*Pi	Ln Pi	Pi*Ln Pi	Shannon Index(H)	n(n-1)	N(N-1)	Raciprocal Index	Simpson Index
			NE	NW	SE	SW	Total																	
44	*Mimosa pudica*	Lajwanti/Lajkulilata	5	8	2	1	16	4	4	0.177285319	100	1.818181818	4	1	0.04	0.000784083	6.14786	-7.1509955	-0.00561		**240**			
45	*Nyctanthes arboririatis*	Gangasiuli	45	12	11	32	100	4	25	1.108033241	100	1.818181818	25	1	0.25	0.004900519	2.40151	-5.3184141	-0.02606		**9900**			
46	*Ocimum basilicum*	Bantulasi	34	56	78	31	199	4	49.75	2.20498615	100	1.818181818	49.75	1	0.4975	0.009752034	9.51022	-4.6302794	-0.04515		**39402**			
47	*Ocimum sanctum*	Tulasi	-	2	1	2	5	3	1.25	0.055401662	75	1.363636364	1.666666667	0.75	0.022222222	0.000245026	6.00377	-8.3141463	-0.00204		**20**			
48	*Opuntia vulgaris*	Nagapheni	7	1	-	-	8	2	2	0.088642659	50	0.909090909	4	0.5	0.08	0.000392042	1.53697	-7.8441427	-0.00308		**56**			
49	*Phoenix sylvestris*	Bankhajuri/Pinokhajuri	8	13	1	-	22	3	5.5	0.243767313	75	1.363636364	7.333333333	0.75	0.097777778	0.001078114	1.16233	-6.8325418	-0.00737		**462**			
50	*Phyllanths raticularis*	Jajang	-	43	32	-	75	2	18.75	0.831024931	50	0.909090909	37.5	0.5	0.75	0.00367539	1.35085	-5.6060961	-0.0206		**5550**			
51	*Phyllanthus fraternus*	Badianla	6	-	9	-	15	2	3.75	0.166204986	50	0.909090909	7.5	0.5	0.15	0.000735078	5.4034	-7.2155341	-0.0053		**210**			
52	*Pogostemon benghalensis*	Poksunga	123	98	83	234	538	4	134.5	5.961218837	100	1.818181818	134.5	1	1.345	0.026364795	0.000695102	-3.6357257	-0.09586		**288906**			
53	*Rauwolfia serpentina*	Patalgaruda	18	21	45	23	107	4	26.75	1.185595568	100	1.818181818	26.75	1	0.2675	0.005243556	2.74949	-5.2507554	-0.02753		**11342**			
54	*Santalum album*	Chandan	8	-	1	1	10	3	2.5	0.110803324	75	1.363636364	3.333333333	0.75	0.044444444	0.000490052	2.40151	-7.6209992	-0.00373		**90**			
55	*Semicarpus anacardium*	Bhalia	9	-	6	8	23	3	5.75	0.254847645	75	1.363636364	7.666666667	0.75	0.102222222	0.001127119	1.2704	-6.78809	-0.00765		**506**			
56	*Sida spinosa*	Bajramuli	9	5	34	21	69	4	17.25	0.764542936	100	1.818181818	17.25	1	0.1725	0.003381358	1.14336	-5.6894777	-0.01924		**4692**			
57	*Smilax macrophylla*	Muturi	7	27	36	38	108	4	27	1.1966759	100	1.818181818	27	1	0.27	0.005292561	2.80112	-5.241453	-0.02774		**11556**			
58	*Strychnos potatorum*	Katakala Nirmala	6	12	34	6	58	4	14.5	0.64265928	100	1.818181818	14.5	1	0.145	0.002842301	8.07868	-5.8631412	-0.01666		**3306**			
59	*Terminalia belerica*	Bahada	8	14	3	7	32	4	8	0.354570637	100	1.818181818	8	1	0.08	0.001568166	2.45915	-6.4578484	-0.01013		**992**			
60	*Thespesia lampas*	Banakapasi	18	12	7	10	47	4	11.75	0.520775623	100	1.818181818	11.75	1	0.1175	0.002303244	5.30493	-6.0734367	-0.01399		**2162**			
61	*Tridax procumbens*	Bisalyakarani	9	-	5	1	15	3	3.75	0.166204986	75	1.363636364	5	0.75	0.066666667	0.000735078	5.4034	-7.2155341	-0.0053		**210**			
62	*Urginea indica*	Banpiaja	6	34	29	3	72	4	18	0.797783934	100	1.818181818	18	1	0.18	0.003528374	1.24494	-5.6469181	-0.01992		**5112**			
63	*Vigna radiata*	Banbiri	-	6	9	-	15	2	3.75	0.166204986	50	0.909090909	7.5	0.5	0.15	0.000735078	5.4034	-7.2155341	-0.0053		**210**			
64	*Wedelia calendulacea*	Bhrungaraj	9	2	-	11	22	3	5.5	0.243767313	75	1.363636364	7.333333333	0.75	0.097777778	0.001078114	1.16233	-6.8325418	-0.00737		**462**			
65	*Woodfordia fruticosa*	Dhatiki	3	1	4	6	14	4	3.5	0.155124654	100	1.818181818	3.5	1	0.035	0.000686073	4.70696	-7.2845269	-0.005		**182**			
TOTAL			**338**	**367**	**430**	**435**	**1570**	**74**	**392.5**	17.39612188	**1850**	33.63636364	**428.8333333**	**18.5**	**4.961111111**	**0.076938155**	**77.6473**	**-139.72813**	**-0.38064**		**385568**			

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
1	Karanjia	Adipur	39.2	0	0	3.75	0	0	251.5125	251.5125
2	Karanjia	Andharjhari	132.8	0	76.57	18.16	0	7395.1306	1217.9912	8613.1218
3	Karanjia	Ankura	77.6	0	48.77	8.41	0	4710.2066	564.0587	5274.2653
4	Karanjia	Badbil	107.2	11.94	706.55	115.84	1474.59	68238.599	7769.3888	77482.5778
5	Karanjia	Badadeuli	227.6	0	114.7	53.57	0	11077.726	3592.9399	14670.6659
6	Karanjia	Badsurei	44.8	0	29.49	7.36	0	2848.1442	493.6352	3341.7794
7	Karanjia	Bhanjabeda	145.2	0	46.39	28.99	0	4480.3462	1944.3593	6424.7055
8	Karanjia	Bhanra	119.6		8.14	15.44	0	786.1612	1035.5608	1821.722
9	Karanjia	Bhramarposi	157.6	0	0	91.51	0	0	6137.5757	6137.5757
10	Karanjia	Budamara	8.8	0	0	0	0	0	0	0
11	Karanjia	Buruhatu	14	0	0	0	0	0	0	0
12	Karanjia	Gambharia-I	14.4	0	0	0.23	0	0	15.4261	15.4261
13	Karanjia	Gambharia-II	14	0	0	0	0	0	0	0
14	Karanjia	Gambharia-III	12.4	0	0	0	0	0	0	0
15	Karanjia	Chandiahil	26.4	0	22	2.8	0	2124.76	187.796	2312.556
16	Karanjia	Chaturisahi	113.2	0	52.08	55.92	0	5029.8864	3750.5544	8780.4408
17	Karanjia	Chhelianali-I	10.4	0	0	0	0	0	0	0
18	Karanjia	Chhelianali-Ii	34.4	0	0	0	0	0	0	0
19	Karanjia	Chauthia	44.8	0	41.72	2.97	0	4029.3176	199.1979	4228.5155
20	Karanjia	Denua	28.4	0	0	3.45	0	0	231.3915	231.3915
21	Karanjia	Deodhipa	32	0	0	0	0	0	0	0
22	Karanjia	Diajodi	56.4	0	7.1	33.27	0	685.718	2231.4189	2917.1369
23	Karanjia	Dighiposi	82.4	0	0	30	0	0	2012.1	2012.1
24	Karanjia	Dumbisahi	42	0	31.65	2.08	0	3056.757	139.5056	3196.2626
25	Karanjia	Galusahi	26.4	0	0	7.37	0	0	494.3059	494.3059

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
26	Karanjia	Ghagi	227.2	0	3.36	29.49	0	324.5088	1977.8943	2302.4031
27	Karanjia	Gharmabeda	188.8	0	35.64	45.22	0	3442.1112	3032.9054	6475.0166
28	Karanjia	Ghodaghaguri	141.2	0	22.42	71.25	0	2165.3236	4778.7375	6944.0611
29	Karanjia	Ghosda-I	19.2	0	44.85	52.72	0	4331.613	3535.9304	7867.5434
30	Karanjia	Ghosda-II	140	0	2.53	0	0	244.3474	0	244.3474
31	Karanjia	Haldia	113.6	0	30.94	46.6	0	2988.1852	3125.462	6113.6472
32	Karanjia	Halpur-I	47.2	0	9.06	7.03	0	875.0148	471.5021	1346.5169
33	Karanjia	Halpur-II	64	0	37.06	8.82	0	3579.2548	591.5574	4170.8122
34	Karanjia	Halpur-III	11.6	0	0	0	0	0	0	0
35	Karanjia	Hatisalbeda	487.6	9.75	325.64	72.04	1204.125	31450.3112	4831.7228	37486.159
36	Karanjia	Hindola	23.6	0	0	0	0	0	0	0
37	Karanjia	Jambani	107.2	0	4.2	40.77	0	405.636	2734.4439	3140.0799
38	Karanjia	Jamunti	260	0	0	23.48	0	0	1574.8036	1574.8036
39	Karanjia	Jhaddumuria	56.8	0	27.07	13.25	0	2614.4206	888.6775	3503.0981
40	Karanjia	Jhadghosda	36.4	0	2.12	14.64	0	204.7496	981.9048	1186.6544
41	Karanjia	Jhumkapal	28	0	0	14.49	0	0	971.8443	971.8443
42	Karanjia	Kalkad	100	0	25.51	51.3	0	2463.7558	3440.691	5904.4468
43	Karanjia	Konika	24.8	0	0	0	0	0	0	0
44	Karanjia	Karanjia	109.2	0	6.85	39.21	0	661.573	2629.8147	3291.3877
45	Karanjia	Kasia	97.2	0	15.37	59.4	0	1484.4346	3983.958	5468.3926
46	Karanjia	Kendua	152	0	0	40.91	0	0	2743.8337	2743.8337
47	Karanjia	Kenjhera	117.6	0	19.34	62.04	0	1867.8572	4161.0228	6028.88
48	Karanjia	Khaparasahi	33.6	0	0	0	0	0	0	0
49	Karanjia	Kudarasahi	20.8	0	0	4.8	0	0	321.936	321.936
50	Karanjia	Kujiam	155.6	0	2.97	131.17	0	286.8426	8797.5719	9084.4145

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
51	Karanjia	Kuliposi	24	0	16.57	1.91	0	1600.3306	128.1037	1728.4343
52	Karanjia	Kusunpur-I	18	0	6.1	2.2	0	589.138	147.554	736.692
53	Karanjia	Kusunpur-II	43.2	0	3.4	2.17	0	328.372	145.5419	473.9139
54	Karanjia	Mahadevdeuli	37.2	0	0	0	0	0	0	0
55	Karanjia	Mahuliasole	153.6	0	39.4	32.41	0	3805.252	2173.7387	5978.9907
56	Karanjia	Maricha	24	0	2.78	52.79	0	268.4924	3540.6253	3809.1177
57	Karanjia	Miludihi	42.07	0	84.01	9.75	0	8113.6858	653.9325	8767.6183
58	Karanjia	Naksara	20.4	0	0	0	0	0	0	0
59	Karanjia	Nuabeda	18.8	0	4.71	0	0	454.8918	0	454.8918
60	Karanjia	Nuagaon	142	0	88.93	23.59	0	8588.8594	1582.1813	10171.0407
61	Karanjia	Padheidura	457.6	0	319.2	127.35	0	30828.336	8541.3645	39369.7005
62	Karanjia	Panpatria	1520	0	0.62	8.44	0	59.8796	566.0708	625.9504
63	Karanjia	Panideuli	98.4	0	0	29.87	0	0	2003.3809	2003.3809
64	Karanjia	Paudia	639.2	63.07	273.2	159.84	7789.145	26385.656	10720.4688	44895.2698
65	Karanjia	Phulcomp	42.8	0	7.06	10.28	0	681.8548	689.4796	1371.3344
66	Karanjia	Phulguntha	103.6	0	27.16	24.02	0	2623.1128	1611.0214	4234.1342
67	Karanjia	Pingu	39.2	0	0	9.43	0	0	632.4701	632.4701
68	Karanjia	Pokamunda	190	0	73.49	45.52	0	7097.6642	3053.0264	10150.6906
69	Karanjia	Pokharia-I	145.6	0	20.42	36.8	0	1972.1636	2468.176	4440.3396
70	Karanjia	Pokharia-II	73.6	0	49.36	63.05	0	4767.1888	4228.7635	8995.9523
71	Karanjia	Sandeuli	120.4	0	90.55	14.38	0	8745.319	964.4666	9709.7856
72	Karanjia	Sankesari-I	18	0	1.3	11.67	0	125.554	782.7069	908.2609
73	Karanjia	Sankesari-II	38.4	0	0	3.36	0	0	225.3552	225.3552
74	Karanjia	Saantabandh	17.6	0	0	0	0	0	0	0
75	Karanjia	Saranggarh	113.2	0	37.72	31.77	0	3642.9976	2130.8139	5773.8115

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
76	Karanjia	Sarasposi	115.2	0	0	29	0	0	1945.03	1945.03
77	Karanjia	Saragoda-I	18	0	0	12.72	0	0	853.1304	853.1304
78	Karanjia	Saragoda-II	36.8	0	0	0.31	0	0	20.7917	20.7917
79	Karanjia	Sarubali	83.2	0	47.48	15.99	0	4585.6184	1072.4493	5658.0677
80	Karanjia	Sarubil	99.6	0	20.5	23.92	0	1979.89	1604.3144	3584.2044
81	Karanjia	Sarubhadi	55.2	0	39.31	7.06	0	3796.5598	473.5142	4270.074
82	Karanjia	Sanabadaposi	201.2	0	57.52	81.51	0	5555.2816	5466.8757	11022.1573
83	Karanjia	Singda-I	23.2	0	2.94	9.38	0	283.9452	629.1166	913.0618
84	Karanjia	Singda-II	54	0	64.84	33.5	0	6262.2472	2246.845	8509.0922
85	Karanjia	Singda-III	112.4	0	65	34.9	0	6277.7	2340.743	8618.443
86	Karanjia	Sunaposi	108.8	0	26.15	45.6	0	2525.567	3058.392	5583.959
87	Karanjia	Tangia	30	0	0	14.51	0	0	973.1857	973.1857
88	Karanjia	Tikasil	92.8	0	13.32	51.85	0	1286.4456	3477.5795	4764.0251
89	Karanjia	Tulasipur	28	0	2.57	8.66	0	248.2106	580.8262	829.0368
90	Satkosia	Gaudiabahali	182.4	0	19.44	81.24	0	1877.5152	5448.7668	7326.282
91	Satkosia	Khumthan	240	0	59.25	89.65	0	5722.365	6012.8255	11735.1905
92	Satkosia	Noda	352	0	32.13	215.87	0	3103.1154	14478.4009	17581.5163
93	Satkosia	Satkosia	13732.8	479.79	7074.35	2391.39	59254.07	683240.723	160390.5273	902885.3153
94	Satkosia	Satkosia-Ib	363.2	0	54.2	266.52	0	5234.636	17875.4964	23110.1324
95	Satkosia	Satkosia-II	208.27	0	84.49	79.08	0	8160.0442	5303.8956	13463.9398
96	Satkosia	Satkosia-III	353.83	1.16	109.91	30.69	143.26	10615.1078	2058.3783	12816.7461
97	Thakurmunda	Akhapalan	57.52	0	48.65	0	0	4698.617	0	4698.617
98	Thakurmunda	Andharikhaman	48.48	0	4.22	10.1	0	407.5676	677.407	1084.9746
99	Thakurmunda	Badabaliposi	27.57	0	4.45	0	0	429.781	0	429.781
100	Thakurmunda	Badbil	943.2	11.94	706.55	115.84	1474.59	68238.599	7769.3888	77482.5778
101	Thakurmunda	Banamunda	176.4	0	22.2	61.02	0	2144.076	4092.6114	6236.6874
102	Thakurmunda	Baunsadiha	167.2	0	45.89	87.34	0	4432.0562	5857.8938	10289.95
103	Thakurmunda	Basantpur	38.62	0	23.69	7.26	0	2287.9802	486.9282	2774.9084

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
104	Thakurmunda	Bhadubeda	111.2	0	88.95	10.02	0	8590.791	672.0414	9262.8324
105	Thakurmunda	Bharandia	97.6	2.92	46.5	20.9	360.62	4490.97	1401.763	6253.353
106	Thakurmunda	Chainbainsi	70.96	0	21.51	7.51	0	2077.4358	503.6957	2581.1315
107	Thakurmunda	Chakulia	10.02	0	97.95	38.04	0	9460.011	2551.3428	12011.3538
108	Thakurmunda	Chamakpur	182.8	0	142.32	50.07	0	13745.2656	3358.1949	17103.4605
109	Thakurmunda	Chirupada	23.49	0	2	0	0	193.16	0	193.16
110	Thakurmunda	Dakeipal	120.4	0	111.98	6	0	10815.0284	402.42	11217.4484
111	Thakurmunda	Dangadiha	97.2	6.13	75.26	11.39	757.055	7268.6108	763.9273	8789.5931
112	Thakurmunda	Digdhar	45.1	0	3.44	34.74	0	332.2352	2330.0118	2662.247
113	Thakurmunda	Gahanndia	14.15	0	0	11.97	0	0	802.8279	802.8279
114	Thakurmunda	Ghodabindha	168.4	1.99	98.36	17.9	245.765	9499.6088	1200.553	10945.9268
115	Thakurmunda	Handiphuta	306	0	97.29	252.16	0	9396.2682	16912.3712	26308.6394
116	Thakurmunda	Handiphuta_A	61.32	0	24.17	29.08	0	2334.3386	1950.3956	4284.7342
117	Thakurmunda	Handiphuta_B	154.44	0	0	70.29	0	0	4714.3503	4714.3503
118	Thakurmunda	Hatigoda	108.8	0	81.09	1.36	0	7831.6722	91.2152	7922.8874
119	Thakurmunda	Jamunalia	20.17	0	3.06	2.76	0	295.5348	185.1132	480.648
120	Thakurmunda	Jarak	48	0	22.8	1.42	0	2202.024	95.2394	2297.2634
121	Thakurmunda	Kaliaposi	78.25	0	66.37	11.87	0	6410.0146	796.1209	7206.1355
122	Thakurmunda	Kathuanuagaon	68	0	42.94	15.01	0	4147.1452	1006.7207	5153.8659
123	Thakurmunda	Khejuria	15.28	0	427.8	159.5	0	41316.924	10697.665	52014.589
124	Thakurmunda	Khejuri	641.6	0	510.2	128.3	0	49275.116	8605.081	57880.197
125	Thakurmunda	Khudisila	83.6	0	22.38	9.35	0	2161.4604	627.1045	2788.5649
126	Thakurmunda	Khuntaposi	3.66	0	0	6.24	0	0	418.5168	418.5168
127	Thakurmunda	Mandalijhari	32.98	12.44	38.7	10.15	1536.34	3737.646	680.7605	5954.7465
128	Thakurmunda	Mankadbeda	208.4	46.48	205.72	9.25	5740.28	19868.4376	620.3975	26229.1151
129	Thakurmunda	Mulapal	90	0	45.64	16.47	0	4407.9112	1104.6429	5512.5541
130	Thakurmunda	Mituani_I	106.8	0	72.81	16.85	0	7031.9898	1130.1295	8162.1193

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
131	Thakurmunda	Mituani_II	184.4	0	150.22	26.46	0	14508.2476	1774.6722	16282.9198
132	Thakurmunda	Mituani_III	98.08	0	86.42	1.05	0	8346.4436	70.4235	8416.8671
133	Thakurmunda	Nishchintpur	7.47	0	0	4.68	0	0	313.8876	313.8876
134	Thakurmunda	Panasdiha	8.81	0	0	0	0	0	0	0
135	Thakurmunda	Purunapani_II	55.77	0	334.59	139.06	0	32314.7022	9326.7542	41641.4564
136	Thakurmunda	Sunida	23.93	0	7.45	9.65	0	719.521	647.2255	1366.7465
137	Thakurmunda	Talpada	145.6	0	85.3	29.1	0	8238.274	1951.737	10190.011
138	Thakurmunda	Taramara	649.6	2.83	7.15	1.66	349.505	690.547	111.3362	1151.3882
139	Thakurmunda	Thakurmunda	250.8	0	149.68	80.78	0	14456.0944	5417.9146	19874.009
140	Thakurmunda	Vejidiha_I	160	31.54	137.78	10.01	3895.19	13306.7924	671.3707	17873.3531
141	Thakurmunda	Vejidiha_II	17.88	23.39	41.92	0.19	2888.665	4048.6336	12.7433	6950.0419
142	Thakurmunda	Rugudibeda	58.58	0	21.76	17.86	0	2101.5808	1197.8702	3299.451
143	Thakurmunda	Asankudar	11.86	0	0	0	0	0	0	0
144	Thakurmunda	Bisipur_1	421.2	23.31	273.19	63.64	2878.785	26384.6902	4268.3348	33531.81
145	Thakurmunda	Bisipur_2	74	0	35	22.2	0	3380.3	1488.954	4869.254
146	Thakurmunda	Boring	275.2	0	117.45	84.19	0	11343.321	5646.6233	16989.9443
147	Thakurmunda	Chheratangar	800	104.23	573.38	78.36	12872.41	55377.0404	5255.6052	73505.0506
148	Thakurmunda	Dangapani	104.8	3.37	71.74	10.58	416.195	6928.6492	709.6006	8054.4448
149	Thakurmunda	gourigoda	66.4	0	27.56	36.57	0	2661.7448	2452.7499	5114.4947
150	Thakurmunda	Jadbil	187.6	0	110.14	70.67	0	10637.3212	4739.8369	15377.1581
151	Thakurmunda	Kadopani	145.2	0	59.67	76.24	0	5762.9286	5113.4168	10876.3454
152	Thakurmunda	kalijhiani_1	378.8	0	306.71	42.27	0	29622.0518	2835.0489	32457.1007
153	Thakurmunda	kalijhiani_2	147.6	0	50.85	9.06	0	4911.093	607.6542	5518.7472
154	Thakurmunda	kendumuni_1	147.6	2.61	39.58	66.17	322.335	3822.6364	4438.0219	8582.9933
155	Thakurmunda	kendumundi_2	648	27.13	439.2	173.42	3350.555	42417.936	11631.2794	57399.7704

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
156	Thakurmunda	Majuriposi II	144.8	0	77.24	24.38	0	7459.8392	1635.1666	9095.0058
157	Thakurmunda	Padiabeda	51.02	0	10.2	20.4	0	985.116	1368.228	2353.344
158	Thakurmunda	Patbil	154.8	0	70.84	56.58	0	6841.7272	3794.8206	10636.5478
159	Thakurmunda	Purunapani	452.8	0	334.59	139.06	0	32314.7022	9326.7542	41641.4564
160	Thakurmunda	Rengalbeda_1	67.2	0	29.44	30.87	0	2843.3152	2070.4509	4913.7661
161	Thakurmunda	Rengalbeda_2	42.67	0	16.45	22.36	0	1588.741	1499.6852	3088.4262
162	Thakurmunda	Saleibeda	125.6	7	75.26	22.89	864.5	7268.6108	1535.2323	9668.3431
163	Thakurmunda	Sanandharikhaman	120	0	33.23	43.13	0	3209.3534	2892.7291	6102.0825
164	Thakurmunda	Sanarugudibeda	212.8	0	138.71	49.84	0	13396.6118	3342.7688	16739.3806
165	Thakurmunda	Sarubil_1	162	0	47.48	15.99	0	4585.6184	1072.4493	5658.0677
166	Thakurmunda	Sarubil_2	83.36	0	20.5	23.92	0	1979.89	1604.3144	3584.2044
167	Thakurmunda	Tikarpada	89.2	0	41.44	36.4	0	4002.2752	2441.348	6443.6232
168	Thakurmunda	Majurposi I	13.98	0	77.24	24.38	0	7459.8392	1635.1666	9095.0058
169	Dudhiani	Badnai	23.2	0	0	7.29	0	0	488.9403	488.9403
170	Dudhiani	Biunria	146	0	10.74	28.36	0	1037.2692	1902.1052	2939.3744
171	Dudhiani	Chanchbani	63.2	0	40.16	25.34	0	3878.6528	1699.5538	5578.2066
172	Dudhiani	Dari_1	19.6	0	0	17.36	0	0	1164.3352	1164.3352
173	Dudhiani	Dari_2	51.2	0	0	14.45	0	0	969.1615	969.1615
174	Dudhiani	Dumuria	174.8	0	77.12	24.75	0	7448.2496	1659.9825	9108.2321
175	Dudhiani	Gudidiha	329.2	0	47.56	107.15	0	4593.3448	7186.5505	11779.8953

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
176	Dudhiani	Hatimundi	147.6	0	14.69	106.49	0	1418.7602	7142.2843	8561.0445
177	Dudhiani	Jharbeda	152.8	0	20.09	68.61	0	1940.2922	4601.6727	6541.9649
178	Dudhiani	Kadambeda	79.2	0	25.99	12.43	0	2510.1142	833.6801	3343.7943
179	Dudhiani	Khandbandh	34	0	0	0	0	0	0	0
180	Dudhiani	Kuita	164.8	0	34.46	91.44	0	3328.1468	6132.8808	9461.0276
181	Dudhiani	Kunjia	125.2	0	0	9.1	0	0	610.337	610.337
182	Dudhiani	Malharpada	27.2	0	1.94	29.1	0	187.3652	1951.737	2139.1022
183	Dudhiani	Masinabila	77.6	0	57.24	16.41	0	5528.2392	1100.6187	6628.8579
184	Dudhiani	Mota	281.2	0	150.03	49.86	0	14489.8974	3344.1102	17834.0076
185	Dudhiani	Palasgodia_1	33.6	0	0	6.09	0	0	408.4563	408.4563
186	Dudhiani	Palasgodia_2	16	0	0	0	0	0	0	0
187	Dudhiani	Panposi	33.6	0	0	26.8	0	0	1797.476	1797.476
188	Dudhiani	Pantho	176	0	80.03	0	0	7729.2974	0	7729.2974
189	Dudhiani	Purunadeogaon	59.6	0	4.05	37.82	0	391.149	2536.5874	2927.7364
190	Dudhiani	Ranipat	20	0	0	4.28	0	0	287.0596	287.0596
191	Dudhiani	Rasamtala	162.8	0	58.23	36.08	0	5623.8534	2419.8856	8043.739
192	Dudhiani	Rugudi_1	19.2	0	0	20.49	0	0	1374.2643	1374.2643
193	Dudhiani	Rugudi_2	36	0	0	0	0	0	0	0
194	Dudhiani	Salarpada	89.2	0	30.96	26.46	0	2990.1168	1774.6722	4764.789
195	Dudhiani	Sananai	9.2	0	0	0.63	0	0	42.2541	42.2541
196	Dudhiani	Siramanipur	110	0	22.08	65.08	0	2132.4864	4364.9156	6497.402
197	Dudhiani	Sialinai	84	0	45.18	44.16	0	4363.4844	2961.8112	7325.2956
198	Dudhiani	Tato	104	0	0	87.61	0	0	5876.0027	5876.0027
199	Dudhiani	Kadadiha	89.2	0	4.84	34.65	0	467.4472	2323.9755	2791.4227
200	Dudhiani	Bala	25.2	0	0	0	0	0	0	0

ANNEXURE-XV(c) RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of RF	Area in Hac.	Forest Cover			Carbon Stock (tonnes /ha)			Total Carbon Stock (tonnes /ha)
				VDF	MDF	OF	VDF	MDF	OF	
201	Dudhiani	Badampahar (P)	3253.84	263.6	2142.82	1009.69	32554.6	206953.5556	67719.9083	307228.0639
202	Dudhiani	Begunia-I	629.6	0	90.56	299.25	0	8746.2848	20070.6975	28816.9823
203	Dudhiani	Begunia-II	107.2	0	0	5.36	0	0	359.4952	359.4952
204	Dudhiani	Kudarbisida-I	31.2	0	0	169.47	0	0	11366.3529	11366.3529
205	Dudhiani	Kudarbisida-II	356.8	0	35.6	142.7	0	3438.248	9570.889	13009.137
Total				**263.6**	**2268.98**	**1626.47**	**32554.6**	**219138.09**	**109087.34**	**360780.0313**

ANNEXURE-XV(d) PROPOSED RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl. No.	**Name of Range**	**Name of PRF**	**Area in Ha.**	**Forest Cover**			**Carbon Stock (tonnes/ha)**			**Total Carbon Stock (tonnes/ha)**
				VDF	**MDF**	**OF**	**VDF**	**MDF**	**OF**	
1	Karanjia	Balibhol	8.64	0	2.6	1.95	0	251.108	130.7865	381.8945
2	Karanjia	Bhalughera	2.08	0	1.6	0	0	154.528	0	154.528
3	Karanjia	Champarei-I	22.26	0	6.19	8.85	0	597.8302	593.5695	1191.3997
4	Karanjia	Champarei-II	3.01	0	0	0	0	0	0	0
5	Karanjia	Champarei-III	2.63	0	0	0	0	0	0	0
6	Karanjia	Haldia-I	5.34	0	0	0	0	0	0	0
7	Karanjia	Haldia-II	7.49	0	0	0	0	0	0	0
8	Satkosia	Bhaliadal-I	10.63	0	9.03	7.03	0	872.1174	471.5021	1343.6195
9	Satkosia	Bhaliadal-III	110.79	0	88.6	0	0	8556.988	0	8556.988
10	Satkosia	Bhaliadal-IV	17.67	0	15.9	0	0	1535.622	0	1535.622
11	Satkosia	Mahuldiha-I	23.67	0	0.7	0	0	67.606	0	67.606
12	Satkosia	Mahuldiha-II	26.57	0	0	0.92	0	0	61.7044	61.7044
13	Thakurmunda	Ambabeda	19.6	0	0	3.9	0	0	261.573	261.573
14	Thakurmunda	Andharikhaman	28.45	0	0.02	15.58	0	1.9316	1044.9506	1046.8822
15	Thakurmunda	Basantapur-II	23.45	0	23.69	7.26	0	2287.9802	486.9282	2774.9084
16	Thakurmunda	Bharandia	29.26	0	6.41	27.81	0	619.0778	1865.2167	2484.2945
17	Thakurmunda	Dangadiha-II	44.52	6.13	75.26	11.39	757.055	7268.6108	763.9273	8789.5931
18	Thakurmunda	Diligang	25.84	0.16	14.58	4.07	19.76	1408.1364	272.9749	1700.8713
19	Thakurmunda	Gahandia	19.02	0	3.25	1.19	0	313.885	79.8133	393.6983
20	Thakurmunda	Kaliaposi-II	8.82	0	66.37	11.87	0	6410.0146	796.1209	7206.1355
21	Thakurmunda	Kaliaposi-III	15.68	0	0	6.78	0	0	454.7346	454.7346
22	Thakurmunda	Keshdiha	42.03	8.57	15.25	0.04	1058.395	1472.845	2.6828	2533.9228
23	Thakurmunda	Khadipal	6.87	0	0	9.05	0	0	606.9835	606.9835
24	Thakurmunda	Kirkichipal	34.09	4.49	18.26	1.76	554.515	1763.5508	118.0432	2436.109
25	Thakurmunda	Kucheikudar	65.72	0	5.85	41.28	0	564.993	2768.6496	3333.6426

ANNEXURE-XV(d) PROPOSED RESERVED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl. No.	Name of Range	Name of PRF	Area in Ha.	Forest Cover			Carbon Stock (tonnes/ha)			Total Carbon Stock (tonnes/ha)
				VDF	MDF	OF	VDF	MDF	OF	
26	Thakurmunda	Mituani-III	19.51	0	27.8	5.87	0	2684.924	393.7009	3078.6249
27	Thakurmunda	Mituani-IV	97.41	0	1.7	0.51	0	164.186	34.2057	198.3917
28	Thakurmunda	Nunadiha	82.72	0	24.41	7.3	0	2357.5178	489.611	2847.1288
29	Thakurmunda	Patrapada	73.86	3.48	72.89	9.63	429.78	7039.7162	645.8841	8115.3803
30	Thakurmunda	Purunapani	26.87	0	0	10.07	0	0	675.3949	675.3949
31	Thakurmunda	Bhairanibeda	12.46	0	0	3.53	0	0	236.7571	236.7571
32	Thakurmunda	Kalasira	32.09	0	3.64	6.99	0	351.5512	468.8193	820.3705
33	Thakurmunda	Keloposi	23.09	0	17.5	10.12	0	1690.15	678.7484	2368.8984
34	Thakurmunda	Kendujiani	17.56	0	3.95	11.27	0	381.491	755.8789	1137.3699
35	Thakurmunda	Khandabandha	19.83	0	0	14.85	0	0	995.9895	995.9895
36	Thakurmunda	Khuntakata	7.96	0	2.62	0	0	253.0396	0	253.0396
37	Thakurmunda	Saleibeda	34.4	0	0	0	0	0	0	0
38	Thakurmunda	Sunariposi	14.37	0	2.87	0.28	0	277.1846	18.7796	295.9642
39	Dudhiani	Bakartala - I	4.46	0	2.15	0	0	207.647	0	207.647
40	Dudhiani	Bakartala - II	2.19	0	1.39	0	0	134.2462	0	134.2462
41	Dudhiani	Barakmunda	12.14	0	0	0.29	0	0	19.4503	19.4503
42	Dudhiani	purunapani	15.99	0	0	10.07	0	0	675.3949	675.3949
43	Dudhiani	Raitalia	26.39	0	14.16	34.97	0	1367.5728	2345.4379	3713.0107
44	Dudhiani	Raitalia A	18.21	0	0	0.36	0	0	24.1452	24.1452
45	Dudhiani	Kanthikana	126.95	0	2.62	0	0	253.0396	0	253.0396
46	Dudhiani	Ektali-II	215.3	10.76	96.8	85.1	1328.86	9348.944	5707.657	16385.461
Total				**14.24**	**274.5**	**211.21**	**1758.64**	**26511.21**	**14165.855**	**42435.7047**

ANNEXURE-XV(e) DEMARCATED PROTECTED FOREST WISE CARBON STOCK IN KARANJIA DIVISION										
Sl No	Name of Range	Name of DPF	Area in Ha.	Forest Cover			Carbon Stock (tonnes/ha)			
				VDF	MDF	OF	VDF	MDF	OF	Total Carbon Status
1	Karanjia	Mayursahi	12.54	0	5.01	6.27	0	483.8658	420.5289	904.3947
2	Karanjia	Singda	7.28	0	13.99	26.9	0	1351.1542	1804.183	3155.3372
3	Karanjia	Milu	19.02	4.34	8.77	12.91	535.99	847.0066	865.8737	2248.8703
4	Karanjia	Balisahi	40.47	0	3.22	19.52	0	310.9876	1309.2064	1620.194
5	Thakurmunda	Ghodabindha	11.56	0	10.4	5.7	0	1004.432	382.299	1386.731
6	Thakurmunda	Majuraposi	111.48	0	35.91	27.93	0	3468.1878	1873.2651	5341.4529
7	Dudhiani	Dumuria	4.41	0	0	1.9	0	0	127.433	127.433
8	Dudhiani	Budhipat	1147.77	6.81	330.88	847.56	841.035	31956.3904	56845.8492	89643.2746
Total				**11.15**	**408.18**	**948.69**	**1377.03**	**39422.024**	**63628.638**	**104427.6877**

ANNEXURE XV: IVI OF DIFFERENT TREE SPECIES

Sl No.	Scientific Name	Local Name	No. of plots of occurance	No. of trees	Average Dia (in Mtr)	Density	Frequency	Base Area	RD	RF	RBA	IVI
1	*Adina cordifolia*	Haldu (kurum)	12	19	0.22	0.463414634	0.02955665	0.152024	0.42735	0.883652	1.510047	2.82105
2	*Aegle marmelos*	Bela	8	9	0.17	0.219512195	0.019704433	0.090775	0.202429	0.589102	0.90166	1.693191
3	*Ailanthus excelsa*	Mahanimba	1	1	0.19	0.024390244	0.002463054	0.11339	0.022492	0.073638	1.126295	1.222425
4	*Alangium lamarckii*	Ankula	1	1	0.15	0.024390244	0.002463054	0.070673	0.022492	0.073638	0.701984	0.798114
5	*Albizzia lebbek*	Siris	23	33	0.22	0.804878049	0.056650246	0.152024	0.74224	1.693667	1.510047	3.945954
6	*Albizzia stipulata*	Ghodalanja	1	1	0.1	0.024390244	0.002463054	0.03141	0.022492	0.073638	0.311993	0.408123
7	*Annona squamosa*	Badhial/Sitaphal	1	1	0.16	0.024390244	0.002463054	0.08041	0.022492	0.073638	0.798702	0.894832
8	*Anogeissus acuminata*	Phasi	1	1	0.24	0.024390244	0.002463054	0.180922	0.022492	0.073638	1.79708	1.89321
9	*Anogeissus latifolia*	Dhaura	103	415	0.22	10.12195122	0.253694581	0.152024	9.334233	7.584683	1.510047	18.42896
10	*Avicennia officinalis*	Bani	3	3	0.21	0.073170732	0.007389163	0.138518	0.067476	0.220913	1.37589	1.664279
11	*Baringtonia acutangula*	Hinjal	1	2	0.2	0.048780488	0.002463054	0.12564	0.044984	0.073638	1.247972	1.366594
12	*Bauhinia variegata*	Kanchan	1	1	0.28	0.024390244	0.002463054	0.246254	0.022492	0.073638	2.446026	2.542156
13	*Bombax ceiba*	Simili	8	9	0.22	0.219512195	0.019704433	0.152024	0.202429	0.589102	1.510047	2.301577
14	*Bridelia retusa*	Kasi	38	74	0.21	1.804878049	0.093596059	0.138518	1.664417	2.798233	1.37589	5.83854
15	*Buchanania lanzan*	Char	93	232	0.17	5.658536585	0.229064039	0.090775	5.218174	6.848306	0.90166	12.96814
16	*Butea parviflora*	Handiphuta	1	1	0.12	0.024390244	0.002463054	0.04523	0.022492	0.073638	0.44927	0.5454
17	*Careya arborea*	Kumbhi	37	56	0.17	1.365853659	0.091133005	0.090775	1.259559	2.724595	0.90166	4.885814
18	*Casearia elliptica*	Khakada	23	29	0.15	0.707317073	0.056650246	0.070673	0.652272	1.693667	0.701984	3.047923
19	*Cassia fistula*	Sunari	21	27	0.15	0.658536585	0.051724138	0.070673	0.607287	1.546392	0.701984	2.855664
20	*Chloroxylon swietenia*	Bheru	4	7	0.2	0.170731707	0.009852217	0.12564	0.157445	0.294551	1.247972	1.699968
21	*Cleistanthus collinus*	Karada	78	313	0.15	7.634146341	0.192118227	0.070673	7.040036	5.743741	0.701984	13.48576
22	*Cordia macleodii*	Samarsinga	3	4	0.16	0.097560976	0.007389163	0.08041	0.089969	0.220913	0.798702	1.109584
23	*Dalbergia latifolia*	Pahadi Sisoo	21	26	0.2	0.634146341	0.051724138	0.12564	0.584795	1.546392	1.247972	3.37916
24	*Dalbergia sissoo*	Sissoo	6	14	0.19	0.341463415	0.014778325	0.11339	0.31489	0.441826	1.126295	1.883011
25	*Dillenia pentagyna*	Rai	40	65	0.29	1.585365854	0.098522167	0.264158	1.461988	2.945508	2.623862	7.031358

ANNEXURE XV: IVI OF DIFFERENT TREE SPECIES

Sl No.	Scientific Name	Local Name	No. of plots of occurance	No. of trees	Average Dia (in Mtr)	Density	Frequency	Base Area	RD	RF	RBA	IVI
26	*Diospyros embryopteris*	Mankada kendu	7	13	0.18	0.317073171	0.017241379	0.101768	0.292398	0.515464	1.010858	1.818719
27	*Diospyros melanoxylon*	kendu	32	48	0.2	1.170731707	0.078817734	0.12564	1.079622	2.356406	1.247972	4.684001
28	*Diospyros montana*	Halda	7	11	0.18	0.268292683	0.017241379	0.101768	0.247413	0.515464	1.010858	1.773735
29	*Diospyros sylvatica*	Kalachua	6	36	0.19	0.87804878	0.014778325	0.11339	0.809717	0.441826	1.126295	2.377838
30	*Elaeodendron glaucum*	Chauli	6	7	0.18	0.170731707	0.014778325	0.101768	0.157445	0.441826	1.010858	1.610129
31	*Emblica officinalis*	Amla	3	5	0.14	0.12195122	0.007389163	0.061564	0.112461	0.220913	0.611506	0.94488
32	*Eugenia heyneana*	Kathjamu	1	1	0.17	0.024390244	0.002463054	0.090775	0.022492	0.073638	0.90166	0.99779
33	*Ficus religiosa*	Aswatha	3	3	0.38	0.073170732	0.007389163	0.45356	0.067476	0.220913	4.505181	4.79357
34	*Ficus virens*	Jida	2	3	0.2	0.073170732	0.004926108	0.12564	0.067476	0.147275	1.247972	1.462724
35	*Gardenia latifolia*	Damkuruda	6	10	0.16	0.243902439	0.014778325	0.08041	0.224921	0.441826	0.798702	1.46545
36	*Gmelina arborea*	Gamhari	2	3	0.19	0.073170732	0.004926108	0.11339	0.067476	0.147275	1.126295	1.341047
37	*Grewia tiliaefolia*	Dhaman	3	3	0.18	0.073170732	0.007389163	0.101768	0.067476	0.220913	1.010858	1.299247
38	*Hymenodictyon excellsum*	Kansa	8	19	0.18	0.463414634	0.019704433	0.101768	0.42735	0.589102	1.010858	2.02731
39	*Kydia calycina*	Kapasia	4	7	0.27	0.170731707	0.009852217	0.228979	0.157445	0.294551	2.27443	2.726425
40	*Lagerstroemia parviflora*	Sidha	24	28	0.19	0.682926829	0.0591133	0.11339	0.62978	1.767305	1.126295	3.52338
43	*Lagerstroemia speciosa*	Patuli	10	17	0.16	0.414634146	0.024630542	0.08041	0.382366	0.736377	0.798702	1.917446
44	*Lannea coromandelica*	Mai	13	24	0.23	0.585365854	0.032019704	0.166159	0.539811	0.95729	1.650444	3.147545
45	*Madhuca indica*	Mahula	75	177	0.24	4.317073171	0.184729064	0.180922	3.981107	5.522828	1.79708	11.30101
46	*Mangifera indica*	Amba	5	9	0.42	0.219512195	0.012315271	0.554072	0.202429	0.368189	5.503558	6.074176
47	*Miliusa velutina*	Gandha palas	1	1	0.18	0.024390244	0.002463054	0.101768	0.022492	0.073638	1.010858	1.106988
48	*Morinda tinctoria*	Anchhu	14	24	0.16	0.585365854	0.034482759	0.08041	0.539811	1.030928	0.798702	2.369441
49	*Murraya paniculata*	Kamini	3	7	0.23	0.170731707	0.007389163	0.166159	0.157445	0.220913	1.650444	2.028802
50	*Naringi crenulata*	Benta	1	1	0.16	0.024390244	0.002463054	0.08041	0.022492	0.073638	0.798702	0.894832
52	*Nyctanthes arbortristis*	Ganga siuli	3	5	0.16	0.12195122	0.007389163	0.08041	0.112461	0.220913	0.798702	1.132076
53	*Ochna obusata*	ıgarchampa/Patharchar	2	2	0.13	0.048780488	0.004926108	0.053083	0.044984	0.147275	0.527268	0.719528
54	*Oroxylon indicum*	Phanphana/Phanpuni	2	2	0.14	0.048780488	0.004926108	0.061564	0.044984	0.147275	0.611506	0.803766
55	*Ougeinia oojeinensis*	Bandhan/Tinsa	15	36	0.21	0.87804878	0.036945813	0.138518	0.809717	1.104566	1.37589	3.290172
56	*Pongamia pinnata*	Karanj	3	6	0.19	0.146341463	0.007389163	0.11339	0.134953	0.220913	1.126295	1.482161
57	*Pterocarpus marsupium*	Piasal/ Bijasal	27	33	0.2	0.804878049	0.066502463	0.12564	0.74224	1.988218	1.247972	3.978431
58	*Pterospermum acirifolium*	Muchkunda	3	3	0.15	0.073170732	0.007389163	0.070673	0.067476	0.220913	0.701984	0.990374
59	*Pterospermum canescens*	Giringa	10	26	0.18	0.634146341	0.024630542	0.101768	0.584795	0.736377	1.010858	2.33203
60	*Saraca asoca*	Ashok	2	4	0.19	0.097560976	0.004926108	0.11339	0.089969	0.147275	1.126295	1.363539

ANNEXURE XV: IVI OF DIFFERENT TREE SPECIES

Sl No.	Scientific Name	Local Name	No. of plots of occurance	No. of trees	Average Dia (in Mtr)	Density	Frequency	Base Area	RD	RF	RBA	IVI
61	*Scheichera oleosa*	Kusum	90	195	0.25	4.756097561	0.221674877	0.196313	4.385965	6.627393	1.949957	12.96332
62	*Semecarpus anacardium*	Bhalia	28	39	0.18	0.951219512	0.068965517	0.101768	0.877193	2.061856	1.010858	3.949906
63	*Shorea robusta*	Sal	131	1535	0.22	37.43902439	0.322660099	0.152024	34.52542	9.646539	1.510047	45.682
64	*Soymida febrifuga*	Rohini	6	14	0.16	0.341463415	0.014778325	0.08041	0.31489	0.441826	0.798702	1.555418
65	*Spondias mangifera*	Ambada	1	1	0.18	0.024390244	0.002463054	0.101768	0.022492	0.073638	1.010858	1.106988
66	*Sterculia urens*	Genduli	2	3	0.15	0.073170732	0.004926108	0.070673	0.067476	0.147275	0.701984	0.916736
67	*Sterculia villosa*	Kodala	2	2	0.18	0.048780488	0.004926108	0.101768	0.044984	0.147275	1.010858	1.203117
68	*Strychnos nuxvomica*	Kochila	5	7	0.19	0.170731707	0.012315271	0.11339	0.157445	0.368189	1.126295	1.651929
69	*Strychnos potatorum*	Katakala	15	35	0.19	0.853658537	0.036945813	0.11339	0.787224	1.104566	1.126295	3.018085
70	*Symplocos racemosa*	Lodha	1	1	0.18	0.024390244	0.002463054	0.101768	0.022492	0.073638	1.010858	1.106988
71	*Syzigium cumini*	Jamu	39	67	0.22	1.634146341	0.096059113	0.152024	1.506973	2.87187	1.510047	5.88889
72	*Syzygium caryophyllifolium*	Poijamu/Bhatjamu	4	5	0.18	0.12195122	0.009852217	0.101768	0.112461	0.294551	1.010858	1.417869
73	*Tamarindus indica*	Tentuli	1	2	0.27	0.048780488	0.002463054	0.228979	0.044984	0.073638	2.27443	2.393052
74	*Tectona grandis*	Saguan	2	34	0.13	0.829268293	0.004926108	0.053083	0.764732	0.147275	0.527268	1.439276
75	*Terminalia arjuna*	Arjuna	4	15	0.29	0.365853659	0.009852217	0.264158	0.337382	0.294551	2.623862	3.255795
76	*Terminalia belerica*	Bahada	15	23	0.21	0.56097561	0.036945813	0.138518	0.517319	1.104566	1.37589	2.997774
77	*Terminalia chebula*	Harida	54	80	0.18	1.951219512	0.133004926	0.101768	1.79937	3.976436	1.010858	6.786664
78	*Terminalia tomentosa*	Asan/ Sahaja	113	452	0.2	11.02439024	0.278325123	0.12564	10.16644	8.32106	1.247972	19.73547
80	*Vitex leucoxylon*	Chadheigudi	10	15	0.27	0.365853659	0.024630542	0.228979	0.337382	0.736377	2.27443	3.348189
81	*Wrightia tinctoria*	Phaukuruni	1	1	0.17	0.024390244	0.002463054	0.090775	0.022492	0.073638	0.90166	0.99779
82	Xylia xylocarpa	Kangada	1	1	0.21	0.024390244	0.002463054	0.138518	0.022492	0.073638	1.37589	1.472019
83	*Zizyphus xylopyra*	Ghanta	1	1	0.13	0.024390244	0.002463054	0.053083	0.022492	0.073638	0.527268	0.623398
Total			**526**	**2528**		**61.65853659**	**1.2955665**	**2.81057**	**56.8601**	**38.7334**	**27.9171**	**123.511**

ANNEXURE XVI: LIST OF WATER BODIES CREATED IN LAST 10 YEARS				
Year	**Name of the Range**	**Name of the Site**	**Expr incurred**	**Size**
1	**2**	**3**	**4**	**5**
2009 – 10	Gurguria	Kankadakocha	3,00,000	40 m×30 m×3 m
	Dudhiani	Ranipat	3,00,000	40 m×30 m×3 m
		Mota	3,00,000	40 m×30 m×3 m
		Tulsiposi	2,50,000	40 m×30 m×3 m
	Karanjia	Kalakada R.F.	3,00,000	40 m×30 m×3 m
		Kuliposi R.F.	3,00,000	40 m×30 m×3 m
		Paudia R.F.	3,00,000	40 m×30 m×3 m
		Padeidhuda R.F.	3,00,000	40 m×30 m×3 m
2010-11	Thakurmunda	Talpada	3,00,000	40 m×30 m×3 m
		Khejuria	3,00,000	40 m×30 m×3 m
	Dudhiani	Purunapani	3,00,000	40 m×30 m×3 m
	Karanjia	Baddeuli R.F.	3,00,000	40 m×30 m×3 m
		Nuagaon R.F.	3,00,000	40 m×30 m×3 m
		Bhrmarposi R.F.	3,00,000	40 m×30 m×3 m
		Tikasil R.F.	3,00,000	40 m×30 m×3 m
		Hatisalbeda R.F.	3,00,000	40 m×30 m×3 m
		Kalakad R.F.	3,00,000	40 m×30 m×3 m
		Hatisalbeda R.F.	3,00,000	40 m×30 m×3 m
	Satkosia	Satkosia RF – I – B	3,00,000	40 m×30 m×3 m
		Satkosia RF – I – B	3,00,000	40 m×30 m×3 m
2011 – 12	Gurguria	Khejuri	3,00,000	40 m×30 m×3 m
	Kendumundi	Kendumundi	3,00,000	40 m×30 m×3 m
		Sanranibhol	3,00,000	40 m×30 m×3 m
		Khaparkhai	3,00,000	40 m×30 m×3 m
		Dangapani	3,00,000	40 m×30 m×3 m
		Asankudar	3,00,000	40 m×30 m×3 m
	Karanjia	Baddeuli R.F.	3,00,000	40 m×30 m×3 m
		Baddeuli R.F.	3,00,000	40 m×30 m×3 m

		Sunaposi R.F.	3,00,000	40 m×30 m×3 m
		Kendua R.F.	3,00,000	40 m×30 m×3 m
		Paudia R.F.	1,50,000	
	Satkosia	Satkosia RF – I – B	1,50,000	
		Satkosia RF Compt. – No - 5	3,00,000	40 m×30 m×3 m
		Satkosia RF Compt. No. – 20	3,00,000	40 m×30 m×3 m
2012 – 13	Dudhiani	Badramchandrapur		40 m×30 m×3 m
	Gurguria	Nawana	2,00,000	40 m×30 m×3 m
		Ramasahi	2,00,000	40 m×30 m×3 m
		Nuhamalia	2,00,000	40 m×30 m×3 m
		Niunti	2,00,000	40 m×30 m×3 m
	Karanjia	Baddeuli R.F.	2,50,000	40 m×30 m×3 m
		Paudia R.F.	3,50,000	40 m×30 m×3 m
	Satkosia	Satkosia RF Compt. No. – 13	3,00,000	40 m×30 m×3 m
		Satkosia RF Compt. No. – 13	3,00,000	40 m×30 m×3 m
	Satkosia	Satkosia RF Compt. No. – I – B	2,50,000	40 m×30 m×3 m
2013 – 14	Gurguria	Jamda	2,50,000	40 m×30 m×3 m
		Gurguria	2,50,000	40 m×30 m×3 m
		Jharbeda	2,50,000	40 m×30 m×3 m
		Batisahi	2,50,000	40 m×30 m×3 m
		Ramasahi	2,50,000	40 m×30 m×3 m
		Genteisahi	2,50,000	40 m×30 m×3 m
		Tangurusahi	2,50,000	40 m×30 m×3 m
		Nuhamalia	2,50,000	40 m×30 m×3 m
	Dudhiani	Gudidiha	2,50,000	40 m×30 m×3 m
		Mota	2,50,000	40 m×30 m×3 m
	Kendumundi	Badranibhol	2,50,000	40 m×30 m×3 m
		Burusahi	2,50,000	40 m×30 m×3 m
		Bisipur RF – II	2,50,000	40 m×30 m×3 m
	Thakurmunda	Mandaljhari	2,50,000	40 m×30 m×3 m
		Karkatbeda	2,50,000	40 m×30 m×3 m
		Sudarsanpur	2,50,000	40 m×30 m×3 m
		Hatigoda	2,50,000	40 m×30 m×3 m
		Chirupada	2,50,000	40 m×30 m×3 m

		Sunida	2,50,000	40 m×30 m×3 m
		Khediaposi	2,50,000	40 m×30 m×3 m
		Purunapani	2,50,000	40 m×30 m×3 m
	Karanjia	Balasahi	2,50,000	40 m×30 m×3 m
	Satkosia	Satkosia Rf compt. No. – 6	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 1	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 1b	2,50,000	40 m×30 m×3 m
2014 – 15	Karanjia	Sarangoard R.F.	2,50,000	40 m×30 m×3 m
		Jamubani R.F.	2,50,000	40 m×30 m×3 m
		Sarbhadi R.F.	2,50,000	40 m×30 m×3 m
		Baddeuli RF	2,50,000	40 m×30 m×3 m
		Kalakada	2,50,000	40 m×30 m×3 m
		Panpatria RF	2,50,000	40 m×30 m×3 m
		Ghosda RF	2,50,000	40 m×30 m×3 m
		Ghagi RF	2,50,000	40 m×30 m×3 m
	Thakurmunda	Ghadabindha	2,50,000	40 m×30 m×3 m
		Hatikana	2,50,000	40 m×30 m×3 m
		Patrapada	2,50,000	40 m×30 m×3 m
		Gudurubani	2,50,000	40 m×30 m×3 m
		Khediaposi	2,50,000	40 m×30 m×3 m
	Kendumundi	Boring	2,50,000	40 m×30 m×3 m
		Khadidamak	2,50,000	40 m×30 m×3 m
		Khaparkhai	2,50,000	40 m×30 m×3 m
		Rugudisahi	2,50,000	40 m×30 m×3 m
	Dudhiani	Barapanposi	2,50,000	40 m×30 m×3 m
		Pokamunda	2,50,000	40 m×30 m×3 m
		Bankati RF	2,50,000	40 m×30 m×3 m
		Surubil	2,50,000	40 m×30 m×3 m
		Pahadmadak	2,50,000	40 m×30 m×3 m
		Dudhiani	2,50,000	40 m×30 m×3 m
	Gurguria	Kuanribil	2,50,000	40 m×30 m×3 m
		Ektali DPF	2,50,000	40 m×30 m×3 m
		Chemundia	2,50,000	40 m×30 m×3 m
		Ektali DPF	2,50,000	40 m×30 m×3 m

		Dhulia	2,50,000	40 m×30 m×3 m
	Satkosia	Satkosia Rf compt. No. – 06	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 06	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 05	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 08	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 08	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 07	2,50,000	40 m×30 m×3 m
		Satkosia Rf compt. No. – 12	2,50,000	40 m×30 m×3 m
2015 – 16	Gurguria	Dhulia	2,50,000	40 m×30 m×3 m
2016 – 17	Karanjia	Sanbadposi	4,00,000	40 m×30 m×3 m
	Karanjia	Chitraposi	4,00,000	40 m×30 m×3 m
	Gurguria	Gudurubani	4,00,000	40 m×30 m×3 m
	Thakurmunda	Kerketabeda	4,00,000	40 m×30 m×3 m
	Satkosia	Satkosia RF	4,00,000	40 m×30 m×3 m
	Satkosia	Kundei RF	4,00,000	40 m×30 m×3 m
	Thakurmuda	Sirkasahi	4,00,000	40 m×30 m×3 m
	Dudhiani	Kaikasahi	4,00,000	40 m×30 m×3 m
2017 – 18	Satkosia	Majuraposi	4,00,000	40 m×30 m×3 m
	Thakurmunda	Khediaposi	4,00,000	40 m×30 m×3 m
	Satkosia	Dhatikidiha	10,00,000	40 m×60 m×3 m
	Kendumundi	Jadbil	10,00,000	40 m×60 m×3 m
	Satkosia	Nakjhari	5,00,000	40 m×30 m×3 m
	Satkosia	Godbhanga	5,00,000	40 m×30 m×3 m
	Satkosia	Benudhar	5,00,000	40 m×30 m×3 m
	Satkosia	Mundasahi	5,00,000	40 m×30 m×3 m
	Dudhiani	Sanramchandrapur	4,00,000	40 m×30 m×3 m
	Dudhiani	Gudidiha	4,00,000	40 m×30 m×3 m
	Gurguria	Rangamatia	5,00,000	40 m×30 m×3 m
	Dudhiani	Tainsira	4,00,000	40 m×30 m×3 m
	Gurguria	Batisahi	4,00,000	40 m×30 m×3 m
2018 – 19	Gurguria	Kanthikana	4,00,000	40 m×30 m×3 m
	Kendumundi	Kendumundi RF	4,50,000	40 m×30 m×3 m

	Thakurmunda	Sudarsanpur	4,50,000	40 m×30 m×3 m
	Satkosia	Nunkhai	10,00,000	40 m×60 m×3 m
	Gurguria	Thakurgoda	3,00,000	40 m×30 m×3 m
	Thakurmunda	Talpada	3,00,000	40 m×30 m×3 m
2019 – 20	Karanjia	Chaturisahi	10,00,000	40 m×60 m×3 m
	Thakurmunda	Khediaposi	5,00,000	40 m×30 m×3 m
	Karanjia	Sarngarh	5,00,000	40 m×30 m×3 m
	Dudhiani	Kaleitumba RF	5,60,000	40 m×30 m×3 m
	Thakurmunda	Mankadbeda RF	5,60,000	40 m×30 m×3 m
2020 – 21	Satkosia	Kumbalor	6,00,000	40 m×30 m×3 m
	Thakurmunda	Badbil RF	5,96,000	40 m×30 m×3 m
	Thakurmunda	Ghodabindha RF	5,96,000	40 m×30 m×3 m
	Thakurmunda	Mandaljhari RF	5,96,000	40 m×30 m×3 m
	Satkosia	Panpatria RF	5,96,000	40 m×30 m×3 m

ANNEXURE-XVII

Kind information of Sri Pravakar ~~Behera~~, IFS, CF, Working Plan. 1966 6-03-13

Seen 28/2/13

PROCEEDING OF THE DISTRICT LEVEL PRICE FIXATION COMMITTEE FOR NON-TIMBER FOREST PRODUCE IN THE DISTRICT OF MAYURBHANJ HELD ON 16.02.2013 AT 4.45PM IN THE OFFICE CHAMBER OF COLLECTOR AND DISTRICT MAGISTRATE, MAYURBHANJ.

Members Present :

1. Collector and District Magistrate, Mayurbhanj - ***Chairman***
2. Divisional Forest Officer, Baripada Division - ***Member***
3. Divisional Forest Officer, Karanjia Division - ***Member***
4. Divisional Forest Officer, Rairangpur Division - ***Member***
5. District Welfare Officer, Mayurbhanj - ***Member***
6. Divisional Manager, O.F.D.C. Ltd., Baripada - ***Member***

The Collector and District Magistrate, Mayurbhanj presided over the meeting. Initiating the discussion the Divisional Forest Officer, Baripada Division placed before the committee, the list of the minimum procurement price of 28 N.T.F.P. items for last 2 years other than those 69 N.T.F.P. items, which are not handed over to Gram Panchayat. It was also placed before the committee the quantity of sal leaves collected in the district during last 3 years for preparation of sal leaf plate and Dopati.

As reviewed by the committee, during last 3 years out of the 28 of N.T.F.P. items, only the sal leaves is collected. After thorough discussion over the quantity of N.T.F.P. items collected in the district and minimum procurement price fixed for the items the committee decided not to increase the procurement price of any items for 2011-12.

MINIMUM PROCUREMENT PRICE OF 28 MINOR FOREST PRODUCE ITEMS WHICH ARE OTHER THAN 69 NON-TIMBER FOREST PRODUCE ITEMS HANDED OVER TO GRAMPANCHAYAT.

Sl No.	Name of NTFP items	2010-11 (Rs. Per Qntl.)	2011-12 (Rs. Per Qntl.)	2012-13 (Rs. Per Qntl.)
1	2	3	4	5
1	Char Gum	290.00 per Qtl	300.00 per Qtl	300.00 per Qtl
2	Dhaura Gum	1000.00 per Qtl	1025.00 per Qtl	1025.00 per Qtl
3	Genduli Gum, Grade-I	9500.00 per Qtl	9700.00 per Qtl	9700.00 per Qtl
	Genduli Gum, Grade-II	8100.00 per Qtl	8200.00 per Qtl	8200.00 per Qtl
	Genduli Gum, Grade-III	6600.00 per Qtl	6700.00 per Qtl	6700.00 per Qtl
4	Kusumi Lac	2800.00 per Qtl	2850.00 per Qtl	2850.00 per Qtl
5	Antia Fibre	340.00 per Qtl	350.00 per Qtl	350.00 per Qtl
6	Siali Fibre	1200.00 per Qtl	1300.00 per Qtl	1300.00 per Qtl
7	Bahada Gum	870.00 per Qtl	880.00 per Qtl	880.00 per Qtl
8	Cane	7.00 per Pc	8.00 per Pc	8.00 per Pc
9	Bee Wax	5500.00 per Qtl	5600.00 per Qtl	5600.00 per Qtl
10	Bana Tulasi	770.00 per Qtl	780.00 per Qtl	780.00 per Qtl
11	Nageswar seed	615.00 per Qtl	625.00 per Qtl	625.00 per Qtl
12	Pollanga seed	565.00 per Qtl	575.00 per Qtl	575.00 per Qtl
13	Vanda Tesselate	230.00 per Qtl	235.00 per Qtl	235.00 per Qtl
14	Asparangua (fresh)	2200.00 per Qtl	2250.00 per Qtl	2250.00 per Qtl
15	Palasa Atha	970.00 per Qtl	980.00 per Qtl	980.00 per Qtl
16	Babul Atha	970.00 per Qtl	980.00 per Qtl	980.00 per Qtl
17	Siali Atha	970.00 per Qtl	980.00 per Qtl	980.00 per Qtl
18	Asana fruits	340.00 per Qtl	350.00 per Qtl	350.00 per Qtl
19	China Climber	340.00 per Qtl	350.00 per Qtl	350.00 per Qtl
20	Chuna Alu Fruits with seed	235.00 per Qtl	245.00 per Qtl	245.00 per Qtl
21	Ambada fruits	270.00 per Qtl	280.00 per Qtl	280.00 per Qtl
22	Dambhudru Fruits	340.00 per Qtl	350.00 per Qtl	350.00 per Qtl
23	Kaintha	270.00 per Qtl	280.00 per Qtl	280.00 per Qtl
24	Betkuli	1200.00 per Qtl	1250.00 per Qtl	1250.00 per Qtl
25	Lac	4200.00 per Qtl	4300.00 per Qtl	4300.00 per Qtl
26	Sunari Fruits	235.00 per Qtl	245.00 per Qtl	245.00 per Qtl
27	Palasa Flower	340.00 per Qtl.	350.00 per Qtl	350.00
28	Sal leaf plate (Khali) per chaki 80pcs.	20.00 (12" size) 22.00 (14" size) Per Chhaki 80 pcs)	23.00 (12" size) 25.00 (14" size) Per Chhaki 80 pcs)	23.00 (12" size) 25.00 (14" size) Per Chhaki 80 pcs)
	Sal leaf Dopati (Dona) per Chaki 1000 dopati	25.00 Per chakki (1000 Dopati)	28.00 Per chakki 1000 Dopati)	28.00 Per chakki (1000 Dopati)

As regards sal leaf plates (Khali) the Divisional Forest Officer, Baripada Forest Division intimated that Sal leave trade has suffered set back due to stiff competition from Thermo-cool plate. Any increase in minimum procurement price will affect the trade and ultimately the plucker. It was proposed to formulate policy to strengthen sal leave trade and strengthening the plate making cottage industries in interior areas of Mayurbhanj.

The Collector and District Magistrate, Mayurbhanj impressed upon all the members present to ensure proper implementation of the decision and the rural poor people involved in collection of sal leaves to get fair price. The Collector and District Magistrate, Mayurbhanj also emphasized wide publicity of the minimum procurement price of the N.T.F.P. through Gram Panchayat, Panchayat Samity and through official and non-official organizations to ensure proper implementation of the decision taken the District level Price fixation Committee and to protect the interest of the Rural people. In this connection it was also decided that Poster and Leaflet etc. are to be printed in sufficient numbers and distributed in the rural areas for wide publicity and awareness of the people. It was also decided in the meeting that the field level officials should take strong action against the traders found cheating the primary collectors as per the existing provision.

The meeting ended with vote of thanks to the chair and participants.

Collector and District Magistrate,
Mayurbhanj

Memo No. 287 ***/ Dt.*** 22/02/13

Copy forwarded to the Secretary, R.D.C. (C.D.), Cuttack for information.

Collector and District Magistrate,
Mayurbhanj

Memo No. 288 ***/ Dt.*** 22/02/13

Copy forwarded to the Divisional Forest Officer, Baripada/ Karanjia / Rairangpur Divisions / District Panchayat Officer, Mayurbhanj, Baripada / Divisional Manager, O.F.D.C. Ltd., Baripada (C) Division / Branch Manager, T.D.C.C. Ltd., Udala / District Welfare Officer, Mayurbhanj, Baripada for information.

Copy forwarded to the Dy. Secretary to Govt., F & E Department, Orissa Bhubaneswar / Dy. Secretary to Govt. Panchayatiraj (Gram Panchayat) Department, Orissa, Bhubaneswar / all Sub-Collector of Mayurbhanj for information and necessary action.

Collector and District Magistrate,
Mayurbhanj

Annexure-XVIII

NTFP policy of 2000

For quite some time NTFP trade was monopolized mostly by private business houses that were granted lease on a long term basis to procure specific forest produces from specific forest divisions. Such monopoly trade arrangement created problems of low payment to tribal, erratic and arbitrary procurement, and revenue loss to the state. Therefore, in order to streamline the system of collection and disposal of NTFP, which are major source of livelihood of the rural poor, especially women, the State Govt came out with a new policy guideline on 31.03.2000. This gives ownership rights to the Gram Panchayat (village councils - lowest unit of local self governance) not only in scheduled areas but also in the entire State. The policy had become over due after promulgation of PESA and subsequent state confirmatory act, Orissa Gram Panchayat Act in 1997.

The policy of March 2000 tried to regularize procurement and trade of NTFP as well as abolish monopoly lease in interest of proper price realization by primary gatherers. However, the most prominent feature of the new policy is the transfer of ownership rights over MFP to Gram Panchayats (GP). This policy introduced many things for the first time. It is for the first time that the State Government recognized importance of MFP in forest dweller's life as well as demonstrated a strong political will to strike a balance between state revenue and protection of livelihood which in the past favored the former. Secondly, it initiated a process of transfer of ownership over MFP from the FD to the GPs. Thirdly, it introduced multiple buyers doing away with monopoly trade arrangement that had restricted primary collectors' choice as regards sale, store and market. Fourthly, the policy decentralized and de-bureaucratized, as far as possible, the trading arrangements to encourage and motivate producer's co-operatives, primary groups, people's organizations to get into processing and trading at the local level.

With this, GPs were entrusted with the responsibility of facilitating and supervising MFP trade in their territorial jurisdiction, i.e., within the revenue boundary of the GPs. Business houses and Govt corporations who earlier controlled the trade would now operate as traders provided they get themselves registered with the concerned GPs as traders for particular MFP items for a particular season.

On 26th May 2000, Panchayat raj Department, in exercise of power under section 152 of the OGP Act, issued an administrative order prescribing the manner in which the rights transferred to the GPs shall be dealt with. Since royalty was withdrawn a token amount of Rs. 100/ was fixed as registration fee per each produce that is to be given to the GP in which the traders intend to procure. There is no restriction on the traders on number and volume of produces that they want to trade and transact provided they pay the registration fee. It specified the way registration would be done, keep a record of monthly transaction and most importantly the way the quasi-judicial power of reprimanding unscrupulous traders will be carried out. As

per the policy, the GPs cannot use their discretion in registering the traders though they can always reprimand unscrupulous ones involved in low payment, irregular procurement etc.

Other salient features of the Policy are –

- ✓ Abolition of royalty system
- ✓ Abolition of transit permit system inside the state
- ✓ In matters of collection, primary gatherers will be subject to reasonable control by the Divisional Forest Officer through imposition of temporary ban if collection method is found to be harmful.
- ✓ The DFO reserves the right to set a minimum target for procurement for respective items for the dealer(s).
- ✓ VSS will continue to enjoy rights of ownership over MFP and NTFP in reserve forest areas.
- ✓ After some uncertainty, it was decided that a district level committee would decide the prices of NTFP till the time PRIs were empowered to do the same.

ANNEXURE XIX

The Orissa GramaPanchayats (Minor Forest Produce Administration) Rules, 2002

Published vide Notification S.R.O. No.934/2002, dated 14th November, 2002, Orissa Gazette Extraordinary No. 2091 dated 15.11.2002

Panchayati Raj (G.P.) Department

S.R.O. No.934/2002 dated 14th November, 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 GramaPanchayats 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 Panchayati Raj (GramaPanchayat) Department NO.9570/G.P., dated the 6th July 2002 bearing 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 Subsection (1) of Section 44 read with Section 150 of the said Act, the State Government do hereby make the following rules, namely :-

1. Short title and commencement. - (1) These rules may be called the Orissa GramaPanchayats (Minor Forest Produce Administration) Rules, 2002.

(2) They shall come into force on the date of their publication in the *Official Gazette*.

2. Definitions. - (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) **"Training 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. Regulating procurement and trading of minor forest produce. - (1) The GramaPanchayat 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 VanaSanrakshyanaSamiti has been formed the GramaPanchayats shall give priority to such Samities and its members in the matter of collection and trading of minor forest produce.

4. Registration of trades. - (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 GramaPanchayat.

(2) Any person intending to be registered as a trader in minor forest produce shall apply to the GramaPanchayat in Form No.1. All such applications shall be placed before the GramaPanchayat immediately in its next meeting and with the approval of the GramaPanchayat the Sarpanch shall register the applicant as a trader in minor forest produce for one 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 GramaPanchayat.

(4) At the time of filing of application under Sub-rule (2) the applicant shall deposit with the GramaPanchayats 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. Fixation of minimum price of the minor forest produce. - (i) (a) In the month of September every year the PanchayatSamiti shall, by adopting a resolution to that affect., 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 GramaPanchayats within the Block;

Provided the GramaPanchayat shall be competent to modify the minimum price so fixed under this Sub-rule or Sub-rule (3) by the PanchayatSamiti according to the local need by adopting a resolution to that effect.

(b) The representatives of Divisional Forest Office, Tribal Development Cooperative Corporation, Orissa Forest Development Corporation and Tribal Co-operative 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 PanchayatSamiti and copies thereof shall be communicated to the Collector, Divisional Forest Officer. District Panchayat Officer, Sub-Collector and all the GramaPanchayat within the Block.

(3) If at any time or in any case it appears to the Collector that a PanchayatSamiti 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 PanchayatSamiti 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 GramaPanchayat shall place the same before the GramaSabha in its next meeting for ratification.

6. Furnishing of returns. - (1) A trader registered under these rules shall furnish a monthly return of Minor Forest Produce to the GramaPanchayat 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 GramaPanchayat shall communicate a copy of the annual return received under sub-rule (2) to the Forest Range Officer concerned.

7. Cancellation. - (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 GramaPanchayat in Minor Forest Produce;

(ii) register himself in the GramaPanchayat; 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 report before the GramaPanchayat 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 GramaPanchyayat are satisfied that circumstances specified in Sub-rule (1) exist in relation to such trader or person, the GramaPanchayat shall resolve to cancel the registration of the dealer for the trading year and may also refuse 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 GramaPanchayat the Sarpanch or Secretary of the GramaPanchayat 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 GramaPanchayat 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 lode the complaint with the concerned Divisional Forest Officer.

(5) If after cancellation of the registration under Sub-rule (4) it appears to the Sarpanch/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. Appeal. - Any person aggrieved by the decision of the GramaPanchayat 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. Deemed traders. - (1) Public Sector undertakings like the Orissa Forest Development Corporation, Tribal Development Co-operative Corporation and Tribal Co-operative 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 3 shall apply to these public sector undertakings.

10. Issuance of instructions. - 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 Minor Forest Produces

1. Tamarind, de-seeded Tamarind, Tamarind seeds.
2. Mahua Flower
3. Hill Brooms
4. Thorn Broom (Jhadu or GhodaLanji)
5. PhulaJhadu
6. Broom Grass
7. Nux Vomica (Kochila Seeds)
8. Hardad
9. Bahada
10. Anla
11. Soap Nut (RithaPhala)
12. Marking Nut (Bhalia)
13. Cleaning Nut (Nirmala)
14. Honey
15. Siali Leaves
16. Sabai Grass
17. Mango Kernel
18. Thatch Grass
19. Simul Cotton
20. Arrow Root (Palua)
21. Dhatuki Flower
22. Putrani
23. Sikakai
24. Jungal Jada or Gaba

25. Palasa Seed
26. Siali Seed
27. IndraJaba (Korai Seed)
28. Gila (Seed and Coat)
29. Benachera
30. BanaHaladi
31. Gaba
32. Basil
33. BanaKalatha
34. Makhena Seed (Kanta Padma)
35. TalaMakhana Seed
36. Baidanka Seeds
37. Baghanakhi Seeds
38. Kamala Gundi Fruit
39. LandaBaguli
40. Bela
41. Chiraita (BhuiNeem)
42. Khajuripata
43. Riohini Fruit
44. Bhurusunga Leaves
45. Phenaphena Fruit
46. Rasana Root
47. Sidha Fruit
48. Sethabari
49. KithaLal
50. AundiLal
51. KheluaLal
52. SuamLal
53. Eksira Fruit
54. Katha Chhatu (Mushroom)
55. Mat Reed(SapaMasina Grass)
56. AnaniaMula
57. AntiaPata
58. Nageswar Flower
59. MankadKendu
60. Atundi Fruit
61. Mahula Seed

62. Kusum Seed

63. Karanja Seed

64. Neem Seed

65. Char Seed

66. Chakunda Seed

67. Babul Seed

68. Baibirang Seed

Form No.1

[*See* rule 4(2)]

Application Form for registration of trading in Minor Forest Produce.

To

The Sarpanch.....GramaPanchayat

Sir,

I Sri..... Village/Post.....do hereby apply for registration as a dealer in Minor Forest Produce in GramaPanchayat.

Detail of Trade

1. Name of the business organisation with full address
2. Relationship of the applicant with the organisation-
3. Applicants name/Fathers name/Permanent Address :
4. The name of the Minor Forest Produce the dealer wants to deal:
5. Type of business;

   Retail/Wholesale or both
6. Amount deposited for registration with registration with receipt number and date
7. Trading year for which registration is applied for
8. Name and address of the place where Minor Forest Produce to be stored

I hereby declare that.....

1. I Shall abide the rules and regulations framed by Govt, for trading in Minor Forest Produce.
2. I Undertake that I shall not default in making payment the registration fees and other dues fixed by the GramaPanchayat.
3. That facts stated above are true to the best of my knowledge and belief.

Yours faithfully,
Signature of the Applicant.

Received Rs (Rupees) only towards registration for vide receipt No dated.....

Secretary

Order

The application be placed in the next GramaPanchayat meeting for consideration.

Sarpanch
GramaPanchayat

Form No.2

[See rule 4(2)]

Certificate of registration for trading in Minor Forest Produce.....GramaPanchayat.....

Sri.....Son of.....

Village.....Post.....Dist.....

Registered as a dealer in Minor Forest Produce.

1. Registration No.
2. Trading year for which the registration is granted.
3. Description of Minor Forest Produce to be dealt with by the dealer
   (a)
   (b)
   (c)
   (d)

Secretary — Sarapanch

.....GramaPanchayat — .....GramaPanchayat

N.B : Rules and regulations of registration noted backside:-

Renewal Report

Date of renew	Trading year for which renewal is granted	Signature of Secretary	Signature of Sarpanch
(1)	(2)	(3)	(4)

Conditions of Registration

1. Registered Minor Forest Produces shall be purchased only from the Primary gatherers as per the price fixed from time to time.
2. While purchasing the Minor Forest Produce from the Primary gatherers the Registered dealer shall ensure proper weight of the produces so purchased and the full cost thereof shall be paid to the primary gatherers on the spot.
3. The registered dealer shall submit a monthly return in the prescribed form to the concerned Forest Ranger and the GramaPanchayat.
4. The registered dealer shall abide by all such guidelines as may be issued from time to time.

Form No.3

[See Rule 4(3)]

Minor Forest Produce

Monthly/annual Return.

For The Month/trading Year

Name of the dealer Registration No.

Name of the GramaPanchayat: District.....

Sl. No.	Item of MFP	Opening balance in Kg.	Quantity procured during the month trading year	Total in Kg.	Rate paid	Quantity sold or diverted during the period	Balance at the end of the reporting period
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Declaration : I declare that the above information are true and correct to my knowledge.

Signature of the dealer.

Form No.4

[See rule 6(3)]

Register Of M.F.P. Dealers

Name of the GramaPanchayat: Trading year:

Sl. No.	Name and address of the dealer	Registration No	Date of registration	Trading year	Remarks

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Karanjia	Satkosia (WL)	Satkosia	Duarsuni	Duarsuni	Satkosia	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
2	Karanjia	Satkosia (WL)	Satkosia	Karnabarei	Karnabarei	Satkosia	Satkosia RF	50	0	0	0	50	Yes	No	Yes	No
3	Karanjia	Satkosia (WL)	Satkosia	Gojapathar	Gojapathar	Satkosia	Satkosia RF	100	0	0	0	100	Yes	No	Yes	No
4	Karanjia	Satkosia (WL)	Satkosia	Chauljhari	Chauljhari	Salchua	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
5	Karanjia	Satkosia (WL)	Godbhanga	Dhatkidiha	Dhatkidiha	Salchua	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
6	Karanjia	Satkosia (WL)	Godbhanga	Colonysahi	Colonysahi	Salchua	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
7	Karanjia	Satkosia (WL)	Godbhanga	Chiliriposi	Chiliriposi	Satkosia	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
8	Karanjia	Satkosia (WL)	Godbhanga	Godbhanga	Godbhanga	Dhatikidiha	Satkosia RF	100	0	0	0	100	Yes	No	Yes	No
9	Karanjia	Satkosia (WL)	Godbhanga	Mahulhotho	Mahulhotho	Dhatikidiha	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
10	Karanjia	Satkosia (WL)	Mahuldiha	Khudisila	Khudisila	Jarak	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
11	Karanjia	Satkosia (WL)	Mahuldiha	Jambani	Jambani	Bhaliadal	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
12	Karanjia	Satkosia (WL)	Mahuldiha	Bagdafa	Bagdafa	Bhaliadal	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No
13	Karanjia	Satkosia (WL)	Mahuldiha	Goudiabahali	Goudiabahali	Mahuldiha	Goudiabahali RF	200	0	0	0	200	Yes	No	Yes	No
14	Karanjia	Satkosia (WL)	Mahuldiha	Baula	Baula	Bhaliadal	Satkosia RF	100	0	0	0	100	Yes	No	Yes	No
15	Karanjia	Satkosia (WL)	Mahuldiha	Jharjhari	Jharjhari	Bhaliadal	Satkosia RF Compt No-18	100	0	0	0	100	Yes	No	Yes	No
16	Karanjia	Satkosia (WL)	Mahuldiha	Asurkhal	Asurkhal	Bhaliadal	Satkosia RF Compt No-18	150	0	0	0	150	Yes	No	Yes	No
17	Karanjia	Satkosia (WL)	Mahuldiha	Bhaliadal (Kusunsahi)	Kusunsahi	Bhaliadal	Satkosia RF Compt No-15	150	0	0	0	150	Yes	No	Yes	No
18	Karanjia	Satkosia (WL)	Mahuldiha	Benuadar	Benuadar	Bhaliadal	Satkosia RF Compt No-19	150	0	0	0	150	Yes	No	Yes	No
19	Karanjia	Satkosia (WL)	Noda	Noda	Noda	Salchua	Noda RF	200	0	0	0	200	Yes	No	Yes	No
20	Karanjia	Satkosia (WL)	Noda	Kundei	Kundei	Salchua	Satkosia RF	200	0	0	0	200	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
21	Karanjia	Satkosia (WL)	Noda	Mushaghati	Balidiha	Salchua	Satkosia RF	50	0	0	0	50	Yes	No	Yes	No
22	Karanjia	Satkosia (WL)	Noda	Baghamara (Rangiabeda)	Baghamara (Rangiabeda)	Salchua	Satkosia RF	100	0	0	0	100	Yes	No	Yes	No
23	Karanjia	Satkosia (WL)	Noda	Baunspani	Baunspani	Salchua	Satkosia RF	150	0	0	0	150	Yes	No	Yes	No
24	Karanjia	Satkosia (WL)	Noda	Karadapal	Karadapal	Salchua	Satkosia RF	150	0	0	0	150	Yes	No	Yes	No
	Total Satkosia Range :-							**450.00**	**0**	**0**	**0**	**450.00**				
25	Karanjia	Thakurmunda	Thakurmunda	Akhapalan	Akhapalan	Hatigoda	Akhapalan RF	57.52	0	0	0	57.52	Yes	No	Yes	No
26	Karanjia	Thakurmunda	Baliposi	Ambabeda VSS	Ambabeda	Padiabeda	Sanrugudibeda RF	100	0	0	0	100	Yes	No	Yes	No
27	Karanjia	Thakurmunda	Kendumundi	Asanbani	Asanbani	Kendujiani	Kendumundi RF-II	50	0	0	0	50	Yes	No	Yes	No
28	Karanjia	Thakurmunda	Thakurmunda	Baliabeda	Baliabeda	Taramara	Badbil RF	150	0	0	0	150	Yes	No	Yes	No
29	Karanjia	Thakurmunda	Baliposi	Baliposi	Baliposi	Khanbandh	Kalasira PRF	0	50	0	0	0	Yes	No	Yes	No
30	Karanjia	Thakurmunda	Champajhar	Banamunda	Banamunda	Jarak	Banamunda RF	150	0	0	0	150	Yes	No	Yes	No
31	Karanjia	Thakurmunda	Thakurmunda	Baunsdiha	Baunsdiha	Bharandia	Baunsdiha RF	167	0	0	0	167	Yes	No	Yes	No
32	Karanjia	Thakurmunda	Kendujiani	Badmahuldiha	Badmahuldiha	Saleibeda	Chheratangar RF	50	0	0	0	50				
33	Karanjia	Thakurmunda	Thakurmunda	Betjhari	Betjhari	Thakurmunda	Khejuria RF	20	0	0	0	20	Yes	No	Yes	No
34	Karanjia	Thakurmunda	Champajhar	Bhadubeda	Bhadubeda	Jarak	Bhadubeda RF	100	0	0	0	100	Yes	No	Yes	No
35	Karanjia	Thakurmunda	Kendujiani	Bhairanibeda	Bhairanibeda	Tatigoda	Kaliajiani RF	50	0	0	0	50	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
36	Karanjia	Thakurmunda	Thakurmunda	Bhalughora	Handiphuta (Bhalughora)	Taramara	Handiphuta RF	100	0	0	0	100	Yes	No	Yes	No
37	Karanjia	Thakurmunda	Thakurmunda	Bharandia	Bharandia	Bharandia	Bharandia RF	75		0	0	75	Yes	No	Yes	No
38	Karanjia	Thakurmunda	Baliposi	Boring	Boring	Padiabeda	Boring RF	100	0	0	0	100	Yes	No	Yes	No
39	Karanjia	Thakurmunda	Kendumundi	Burudihi VSS	Burudihi	Kendujiani	Purunapani RF	50	0	0	0	50	Yes	No	Yes	No
40	Karanjia	Thakurmunda	Thakurmunda	Chainbainsi	Chainbainsi	Hatigoda	Chainbainsi RF	70	0	0	0	70	Yes	No	Yes	No
41	Karanjia	Thakurmunda	Thakurmunda	Chakulia	Chakulia	Talapada	Chakulia RF	10	0	0	0	10	Yes	No	Yes	No
42	Karanjia	Thakurmunda	Thakurmunda	Chamakpur	Chamakpur	Thakurmunda	Chamakpur RF	100	0	0	0	100	Yes	No	Yes	No
43	Karanjia	Thakurmunda	Kendujiani	Chheratangar	Chheratangar	Kendujiani	Chheratangar RF	200	0	0	0	200	Yes	No	Yes	No
44	Karanjia	Thakurmunda	Champajhar	Dakeipal	Dakeipal	Jarak	Handiphuta RF	100	0	0	0	100	Yes	No	Yes	No
45	Karanjia	Thakurmunda	Thakurmunda	Digdhar	Digdhar	Digdhar	Digdhar RF	30	0	0	0	30	Yes	No	Yes	No
46	Karanjia	Thakurmunda	Champajhar	Dilliganj	Dilliganj	Champajhar	Dilliganj PRF	0	25	0	0	0	Yes	No	Yes	No
47	Karanjia	Thakurmunda	Thakurmunda	Dirba	Dirba	Bharandia	Taramara RF	200	0	0	0	200	Yes	No	Yes	No
48	Karanjia	Thakurmunda	Kendumundi	Dumurdiha	Dumurdiha	Kendujiani	Kendumundi RF-II	50	0	0	0	50	Yes	No	Yes	No
49	Karanjia	Thakurmunda	Thakurmunda	Ghodabindha	Ghodabindha	Hatigoda	Ghodabindha RF	100	0	0	0	100	Yes	No	Yes	No
50	Karanjia	Thakurmunda	Champajhar	Giribeda	Giribeda	Champajhar	badbil RF	20	0	0	0	20	Yes	No	Yes	No
51	Karanjia	Thakurmunda	Thakurmunda	Gobarjoda	Gobarjoda	Digdhar	Badbil RF	20	0	0	0	20	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
52	Karanjia	Thakurmunda	Baliposi	Gourigoda VSS	Gourigoda	Padiabeda	Gourigada RF	66	0	0	0	66	Yes	No	Yes	No
53	Karanjia	Thakurmunda	Thakurmunda	Guhaldihi	Guhaldihi	Thakurmunda	Thakurmunda RF	50	0	0	0	50	Yes	No	Yes	No
54	Karanjia	Thakurmunda	Thakurmunda	Hatigoda	Hatigoda	Hatigoda	Hatigoda RF	100	0	0	0	100	Yes	No	Yes	No
55	Karanjia	Thakurmunda	Kendujiani	Jamposi	Jamuposi	Saleibeda	Saleibeda RF	50	0	0	0	50	Yes	No	Yes	No
56	Karanjia	Thakurmunda	Champajhar	Jamukhenjuri	Jamukhenjuri	Champajhar	Badbil RF	103	0	0	0	103	Yes	No	Yes	No
57	Karanjia	Thakurmunda	Kendumundi	Jamunalia VSS	Jamunalia	Patbil	Bisipur RF	50	0	0	0	50	Yes	No	Yes	No
58	Karanjia	Thakurmunda	Thakurmunda	Jhalbeda	Jhalbeda	Bharandia	Bharandia RF	50	0	0	0	50	Yes	No	Yes	No
59	Karanjia	Thakurmunda	Kendujiani	Jodibil	Jodibil	Kendujiani	Jodbil RF	100	0	0	0	100	Yes	No	Yes	No
60	Karanjia	Thakurmunda	Kendujiani	Kadapani	Kadapani	Hatigoda	Kadapani RF	50	0	0	0	50	Yes	No	Yes	No
61	Karanjia	Thakurmunda	Kendujiani	Kaliajiani	Kaliajiani	Hatigoda	Kaliajiani RF	50	0	0	0	50	Yes	No	Yes	No
62	Karanjia	Thakurmunda	Champajhar	Kathua-Nuagaon	Kathua-Nuagaon	Jarak	Kathuanuagaon RF	50	0	0	0	50	Yes	No	Yes	No
63	Karanjia	Thakurmunda	Baliposi	Keloposi	Keloposi	Khanbandh	Purunapani RF	100	0	0	0	100	Yes	No	Yes	No
64	Karanjia	Thakurmunda	Kendujiani	Kendujiani	Kendujiani	Kendujiani	Kendujiani PRF	0	15	0	0	0	Yes	No	Yes	No
65	Karanjia	Thakurmunda	Thakurmunda	Khamdiha VSS	Khamdiha	Thakurmunda	Handiphuta RF	30	0	0	0	30	Yes	No	Yes	No
66	Karanjia	Thakurmunda	Baliposi	Khandabandh VSS	Khandbandh	Khandbandh	Purunapani RF	30	0	0	0	30	Yes	No	Yes	No
67	Karanjia	Thakurmunda	Baliposi	Khandbandh	Khandbandh	Khandbandh	Khandbandh PRF	0	15	0	0	0	Yes	No	Yes	No
68	Karanjia	Thakurmunda	Kendujiani	Khaparkhai	Khaparkhai	Saleibeda	Dangapani RF	50	0	0	0	50	Yes	No	Yes	No
69	Karanjia	Thakurmunda	Thakurmunda	Khumdiha	Khumdiha	Thakurmunda	Handiphuta RF	30	0	0	0	30	Yes	No	Yes	No
70	Karanjia	Thakurmunda	Thakurmunda	Khuntaposi	Khuntaposi	Digdhar	Handiphuta RF	10	0	0	0	10	Yes	No	Yes	No

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Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
71	Karanjia	Thakurmunda	Champajhar	Kirkichipal	Kirkichipal	Champajhar	Mankadbeda RF	58.4	0	0	0	58.4	Yes	No	Yes	No
72	Karanjia	Thakurmunda	Baliposi	Lunadiha	Lunadiha	Bharandia	Lundiha DPF	70	0	0	0	70	Yes	No	Yes	No
73	Karanjia	Thakurmunda	Champajhar	Mankadbeda	Mankadbeda	Champajhar	Mankadbeda RF	150	0	0	0	150	Yes	No	Yes	No
74	Karanjia	Thakurmunda	Keshdiha	Mituani	Mituani	Keshdiha	Mituani RF	200	0	0	0	200	Yes	No	Yes	No
75	Karanjia	Thakurmunda	Champajhar	Muktajhari	Muktajhari	Taramara	Dakeipal RF	120	0	0	0	120	Yes	No	Yes	No
76	Karanjia	Thakurmunda	Champajhar	Mulapal	Mulapal	Jarak	Mulapal RF	60	0	0	0	60	Yes	No	Yes	No
77	Karanjia	Thakurmunda	Thakurmunda	Nipania	Nipania	Thakurmunda	Basantpur DPF	50	0	0	0	50	Yes	No	Yes	No
78	Karanjia	Thakurmunda	Baliposi	Nischitpur	Nischitpur	Bharandia	Nischitpur RF	7	0	0	0	7	Yes	No	Yes	No
79	Karanjia	Thakurmunda	Thakurmunda	Nuagaon	Nuagaon	Padiabeda	Nundiha RF	80	0	0	0	80	Yes	No	Yes	No
80	Karanjia	Thakurmunda	Kendujiani	Padhiarsahi VSS	Padhiarsahi	Kendujiani	Chheratangar RF	50	0	0	0	50	Yes	No	Yes	No
81	Karanjia	Thakurmunda	Kendumundi	Patbil	Patbil	Patbil	Patbil RF	100	0	0	0	100	Yes	No	Yes	No
82	Karanjia	Thakurmunda	Thakurmunda	Patiapada	Patiapada	Talapada	Majuraposi DPF	0	0	84	0	0	Yes	No	Yes	No
83	Karanjia	Thakurmunda	Thakurmunda	Patratula	Patratula	Taramara	Taramara RF	200	0	0	0	200	Yes	No	Yes	No
84	Karanjia	Thakurmunda	Keshdiha	Purunapani	Purunapani	Khandbandh	Purunapani RF	170	0	0	0	170	Yes	No	Yes	No
85	Karanjia	Thakurmunda	Mituani	Purunapani	Purunapani	Keshdiha	Badbil RF	50	0	0	0	50	Yes	No	Yes	No
86	Karanjia	Thakurmunda	Kendumundi	Ranibhol	Ranibhol	Hatigoda	Kendumundi RF-II	50	0	0	0	50	Yes	No	Yes	No
87	Karanjia	Thakurmunda	Kendumundi	Rengalbeda	Rengalbeda	Patbil	Rebgalbeda RF-I & II	50	0	0	0	50	Yes	No	Yes	No

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Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
88	Karanjia	Thakurmunda	Kendumundi	Rugudisahi	Rugudisahi	Saleibeda	Kendumundi RF-II	100	0	0	0	100	Yes	No	Yes	No
89	Karanjia	Thakurmunda	Baliposi	Sanrugudibeda	Sanrugudibeda	Padiabeda	Sanrugudibeda RF	100	0	0	0	100	Yes	No	Yes	No
90	Karanjia	Thakurmunda	Kendumundi	Sarubil	Sarubil	Kendujiani	Sarubil RF	100	0	0	0	100	Yes	No	Yes	No
91	Karanjia	Thakurmunda	Baliposi	Simdiha	Simdiha	Padiabeda	Boring RF	100	0	0	0	100	Yes	No	Yes	No
92	Karanjia	Thakurmunda	Champajhar	Sudarsanpur	Sudarsanpur	Champajhar	Badbil RF	20	0	0	0	20	Yes	No	Yes	No
93	Karanjia	Thakurmunda	Kendujiani	Sunariposi VSS	Sunariposi	Kendujiani	Sunariposi DPF	0	0	14.37	0	0	Yes	No	Yes	No
94	Karanjia	Thakurmunda	Thakurmunda	Sunida	Sunida	Digdhar	Sunida RF	20	0	0	0	20	Yes	No	Yes	No
95	Karanjia	Thakurmunda	Thakurmunda	Talapada	Talapada	Talapada	Talpada RF	100	0	0	0	100	Yes	No	Yes	No
96	Karanjia	Thakurmunda	Thakurmunda	Taramara	Taramara	Digdhar	Taramara RF	200	0	0	0	200	Yes	No	Yes	No
97	Karanjia	Thakurmunda	Thakurmunda	Thakurmunda	Thakurmunda	Digdhar	Thakurmunda RF	100	0	0	0	100	Yes	No	Yes	No
98	Karanjia	Thakurmunda	Baliposi	Tikarpada	Tikarpada	Khandbandh	Tikarpada RF	32	0	0	0	32	Yes	No	Yes	No
	Total Thakurmunda Range:-							**872**	**0**	**14.37**	**0**	**872**				

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Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
99	Karanjia	Dudhiani	Tato	Chanchbani	Chanchbani	Batpalsa	Chanchabani RF	50	0	0	0	50	Yes	No	Yes	No
100	Karanjia	Dudhiani	Tato	Rasamtala	Rasamtala	Rasamtala	Rasamtala RF	100	0	0	0	100	Yes	No	Yes	No
101	Karanjia	Dudhiani	Tato	Gudidiha	Gudidiha	Miriginendi	Gudidhia RF	200	0	0	0	200	Yes	No	Yes	No
102	Karanjia	Dudhiani	Tato	Salarapada	Salarapada	Batpalsa	Salarapada RF	70	0	0	0	70	Yes	No	Yes	No
103	Karanjia	Dudhiani	Tangabilla	Tulasiposi	Tulasiposi	Dari	Hatimundi RF	100	0	0	0	100	Yes	No	Yes	No
104	Karanjia	Dudhiani	Tato	Biunria	Biunria	Tato	Biunria RF	100	0	0	0	100	Yes	No	Yes	No
105	Karanjia	Dudhiani	Dari	Mata	Mata	-do-	Mota RF	200	0	0	0	200	Yes	No	Yes	No
106	Karanjia	Dudhiani	Tato	Tato	Tato	-do-	Tato RF	100	0	0	0	100	Yes	No	Yes	No
107	Karanjia	Dudhiani	Dari	Dumuria	Dumuria	Dari	Dumuria RF	100	0	0	0	100	Yes	No	Yes	No
108	Karanjia	Dudhiani	Dari	Bala	Bala	Bala	Bala RF	50	0	0	0	50	Yes	No	Yes	No
109	Karanjia	Dudhiani	Dari	Dari	Dari	Dari	Dari RF	50	0	0	0	50	Yes	No	Yes	No
110	Karanjia	Dudhiani	Dari	Purunadeogao	Purunadeogao	-do-	Purunadeogaon	50	0	0	0	50	Yes	No	Yes	No
111	Karanjia	Dudhiani	Tato	Kadambeda	Kadambeda	Rasamtala	Kadambeda RF	60	0	0	0	60	Yes	No	Yes	No
112	Karanjia	Dudhiani	Tangabilla	Kuita	Kuita	Pantho	Kuita RF	100	0	0	0	100	Yes	No	Yes	No
113	Karanjia	Dudhiani	Tabgabilla	Badnai	Badnai	Tangabila	Badnai RF	20	0	0	0	20	Yes	No	Yes	No
114	Karanjia	Dudhiani	Tabgabilla	Kaleitumba	Kaleitumba	Ektali	Kaleitumba DPF	0	50	0	0	50	Yes	No	Yes	No
115	Karanjia	Dudhiani	Tabgabilla	Bankati	Bankati	Pantho	Pantho RF	50	0	0	0	50	Yes	No	Yes	No
116	Karanjia	Dudhiani	Dari	Jarali	Jarali	Dari	Siramanipur RF	50	0	0	0	50	Yes	No	Yes	No
117	Karanjia	Dudhiani	Dari	Siramanipur	Siramanipur	Rugudi	Siramanipur RF	100	0	0	0	100	Yes	No	Yes	No
118	Karanjia	Dudhiani	Tabgabilla	Palasgodia	Palasgodia	-do-	Palasgodia RF	30	0	0	0	30	Yes	No	Yes	No
119	Karanjia	Dudhiani	Tabgabilla	Khandbandh	Khandbandh	-do-	Khandbandh RF	30	0	0	0	30	Yes	No	Yes	No
120	Karanjia	Dudhiani	Tabgabilla	Masinabila	Masinabila	Pantho	Masinabilla RF	60	0	0	0	60	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
121	Karanjia	Dudhiani	Tabgabilla	Tainsira	Tainsira	Badgaon	Nuagaon Revenue Forest	30	0	0	0	30	Yes	No	Yes	No
122	Karanjia	Dudhiani	Tabgabilla	Jaunriposi	Jaunriposi	Rugudi	Siramanipur RF	10	0	0	0	10	Yes	No	Yes	No
123	Karanjia	Dudhiani	Tabgabilla	Nuagaon	Nuagaon	-do-	Nuagaon Revenue Forest	20	0	0	0	20	Yes	No	Yes	No
124	Karanjia	Dudhiani	Tabgabilla	Ranipat	Ranipat	-do-	Ranipat Rf	20	0	0	0	20	Yes	No	Yes	No
125	Karanjia	Dudhiani	Tabgabilla	Malharpada	Malharpada	-do-	Malharpada RF	20	0	0	0	20	Yes	No	Yes	No
126	Karanjia	Dudhiani	Tabgabilla	Sangaon	Sangaon	-do-	Ranipat RF	20	0	0	0	20	Yes	No	Yes	No
127	Karanjia	Dudhiani	Barakamuda	Barakamuda	Barakamuda	Dudhiani	Barakamuda PRF	10	0	0	0	10	Yes	No	Yes	No
128	Karanjia	Dudhiani	Barakamuda	Badramchandrapur	Badramchandrapur	-do-	Barakamuda PRF	0	20	0	0	20	Yes	No	Yes	No
129	Karanjia	Dudhiani	Barakamuda	Hatibari	Hatibari	Miriginendi	Barakamuda PRF	0	20	0	0	20	Yes	No	Yes	No
130	Karanjia	Dudhiani	Tabgabilla	Khandiadara Relocation Colony V.S.S	Khandiadara	-	Kaleitumba DPF	0	0	100	0	100	Yes	No	Yes	No
131	Karanjia	Dudhiani	Tangabila	Raitalia	Raitalia	Badgaon	Ratitalia PRF	0	44.6	0	0	44.6	Yes	No	Yes	No
132	Karanjia	Dudhiani	Tangabila	Sunamuhin	Sunamuhin	Tangabila	Revenue Forest	0	0	0	18.21	18.21	Yes	No	Yes	No
133	Karanjia	Dudhiani	Tangabila	Badposi	Badposi	Rugudi	Revenue Forest	0	0	0	12	12	Yes	No	Yes	No
134	Karanjia	Dudhiani	Tangabila	Sananai	Sananai	Tangabila	R.F	9.2	0	0	0	9.2	Yes	No	Yes	No
135	Karanjia	Dudhiani	Dori	Dama Sahi	Dama Sahi	Kerkera	Bagadafa VF	50	0	0	0	50	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
136	Karanjia	Dudhiani	Jashipur	Rangamatia	Rangamatia	Begunia	Kudarbisda RF	100	0	0	0	100	Yes	No	Yes	No
137	Karanjia	Dudhiani	Jashipur	Kudarbisida	Kudarbisida	-do-	Kudarbisda RF	100	0	0	0	100	Yes	No	Yes	No
138	Karanjia	Dudhiani	Jashipur	Anukulpur	Anukulpur	Jashipur	Begunia RF	100	0	0	0	100	Yes	No	Yes	No
139	Karanjia	Dudhiani	Jashipur	Kalapathar	Kalapathar	Begunia	Sannoi RF	50	0	0	0	50	Yes	No	Yes	No
140	Karanjia	Dudhiani	Jashipur	Jhagada	Jhagada	-do-	Begunia RF	50	0	0	0	50	Yes	No	Yes	No
141	Karanjia	Dudhiani	Jashipur	Begunia	Begunia	-do-	Begunia RF	50	0	0	0	50	Yes	No	Yes	No
142	Karanjia	Dudhiani	Jashipur	Kankadani	Kankadani	Matiagarh	Kankadani VF	0	50	0	0	50	Yes	No	Yes	No
143	Karanjia	Dudhiani	Jashipur	Nebda	Nebda	Begunia	Kudarbisda RF	50	0	0	0	50	Yes	No	Yes	No
144	Karanjia	Dudhiani	Jashipur	Angarpada	Angarpada	Jashipur	Jashipur Matho area	50	0	0	0	50	Yes	No	Yes	No
145	Karanjia	Dudhiani	Jashipur	Bhupad	Bhupad	Jamdasahi	Badampahadpur RF	50	0	0	0	50	Yes	No	Yes	No
146	Karanjia	Dudhiani	Jashipur	Padmapur	Padmapur	-do-	Revenue Forest	50	0	0	0	50	Yes	No	Yes	No
147	Karanjia	Dudhiani	Jashipur	Sirampur	Sirampur	Nuagaon	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
148	Karanjia	Dudhiani	Jashipur	Sanjambilla	Sanjambilla	-do-	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
149	Karanjia	Dudhiani	Ektali	Ektali	Ektali	Ektali	Ektali PRF	0	50	0	0	50	Yes	No	Yes	No
150	Karanjia	Dudhiani	Ektali	Kumdabadi	Kamdabadi	-do-	Ektali PRF	0	50	0	0	50	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
151	Karanjia	Dudhiani	Ektali	Mangarh	Mangarh	-do-	Ektali PRF	0	40	0	0	40	Yes	No	Yes	No
152	Karanjia	Dudhiani	Bhanda	Nawana	Nawana	Manda	Budhipat DPF	0	100	0	0	100	Yes	No	Yes	No
153	Karanjia	Dudhiani	Bhanda	Ramasahi	Ramasahi	Baunsnali	Budhipat DPF	0	100	0	0	100	Yes	No	Yes	No
154	Karanjia	Dudhiani	Bhanda	Chhamundia	Chhamundia	Jamukeswar	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
155	Karanjia	Dudhiani	Bhanda	Champabalda	Champabalda	-do-	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
156	Karanjia	Dudhiani	Bhanda	Banapandugandi	Banapandugandi	Chakidi	Badampahd RF	100	0	0	0	100	Yes	No	Yes	No
157	Karanjia	Dudhiani	Bhanda	Chakidi	Chakidi	-do-	Badampahd RF	100	0	0	0	100	Yes	No	Yes	No
158	Karanjia	Dudhiani	Bhanda	Dayaposi	Dayaposi	Niunti	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
159	Karanjia	Dudhiani	Bhanda	Baunsnali	Baunsnali	Baunsnali	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
160	Karanjia	Dudhiani	Bhanda	Dhulia	Dhulia	Jamkeswar	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
161	Karanjia	Dudhiani	Bhanda	Niuntyi-Chamrasahi	Niuntyi-Chamrasahi	Niunty	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
162	Karanjia	Dudhiani	Bhanda	Balanposi	Balanposi	-do-	Revenue Forest	0	50	0	0	50	Yes	No	Yes	No
163	Karanjia	Dudhiani	Bhanda	Machkandana	Machkandana	Mojarajapalsa	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
164	Karanjia	Dudhiani	Bhanda	Siltia	Siltia	Chakidi	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
165	Karanjia	Dudhiani	Bhanda	Badpahad	Badpahad	Baunsnali	Budhipat DPF	0	50	0	0	50	Yes	No	Yes	No
166	Karanjia	Dudhiani	Bhanda	Pahadpur	Pahadpur	-do-	Budhipat DPF	0	100	0	0	100	Yes	No	Yes	No
167	Karanjia	Dudhiani	Bhanda	Bhagabandi	Bhagabandi	Bhanjkia	Revenue Forest	0	50	0	0	50	Yes	No	Yes	No
168	Karanjia	Dudhiani	Bhanda	Laugudari	Laugudari	Chakidi	Badampahad RF	100	0	0	0	100	Yes	No	Yes	No
169	Karanjia	Dudhiani	Bhanda	Luhamalia	Luhamalia	-do-	Badampahad RF	50	0	0	0	50	Yes	No	Yes	No
170	Karanjia	Dudhiani	Jashipur	Beldi	Jamda	Begunia	Begunia RF	70	0	0	0	70	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
171	Karanjia	Dudhiani	Jashipur	Goudgaon	Goudgaon	Jamda	Badampahar RF	30	0	0	0	30	Yes	No	Yes	No
172	Karanjia	Dudhiani	Bhonda	Dalkibeda	Dalkibeda	Chakdi	Badampahar RF	30	0	0	0	30	Yes	No	Yes	No
173	Karanjia	Dudhiani	Jashipur	Nijheri	Nuagaon	Nuagaon	Badampahar RF	30	0	0	0	30	Yes	No	Yes	No
174	Karanjia	Dudhiani	Jashipur	Batapandugand	Batapandugand	Jashipur	Begunia RF	15	0	0	0	15	Yes	No	Yes	No
175	Karanjia	Dudhiani	Bhonda	Baliaban	Baliaban	Chakdi	Badampahar RF	10	0	0	0	10	Yes	No	Yes	No
176	Karanjia	Dudhiani	Bhonda	Badmoronda	Badmoronda	Chakdi	Badampahar RF	10	0	0	0	10	Yes	No	Yes	No
177	Karanjia	Dudhiani	Bhonda	Uski	Uski	Chakdi	Badampahad RF	10	0	0	0	10	Yes	No	Yes	No
178	Karanjia	Dudhiani	Dari	Purunadeogaon	Purunadeogaon	Dari	Purunadeogaon RF	69.6	0	0	0	69.6	Yes	No	Yes	No
179	Karanjia	Dudhiani	Tangabilla	Tangabilla	Kadadiha	Rugudi	Kadadiha RF	60	0	0	0	60	Yes	No	Yes	No
						Total Dudhiani Range		**264.6**	**0**	**0**	**0**	**264.6**				
180	Karanjia	Karanjia	Karanjia	Ankura	Ankura	NAC,Karanjia	Ankura RF	50	0	0	0	50	Yes	No	Yes	No
181	Karanjia	Karanjia	Karanjia	Ghodaghaguri	Ghodaghaguri	Rasamtala	Ghadaghaguri RF	100	0	0	0	100	Yes	No	Yes	No
182	Karanjia	Karanjia	Karanjia	Pokamunda	Pokamunda	Rasamtala	Pokamunda RF	100	0	0	0	100	Yes	No	Yes	No
183	Karanjia	Karanjia	Karanjia	Sarubhadi	Sarubhadi	Rasamtala	Sarubhadi RF	50	0	0	0	50	Yes	No	Yes	No
184	Karanjia	Karanjia	Karanjia	Diajodi	Diajodi	Bala	Diajodi RF	50	0	0	0	50	Yes	No	Yes	No
185	Karanjia	Karanjia	Karanjia	Andharjhari	Andharjhari	Baddeuli	Andharjhari RF	-	50	0	0	50	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
186	Karanjia	Karanjia	Karanjia	Sanbadposi	Sanbadposi	Bala	Sanbadposi RF	150	0	0	0	150	Yes	No	Yes	No
187	Karanjia	Karanjia	Karanjia	Jhaddumuria	Jhaddumuria	Baddeuli	Jharddumuria RF	50	0	0	0	50	Yes	No	Yes	No
188	Karanjia	Karanjia	Karanjia	Sandeuli	Sandeuli	Baddeuli	Sandeuli RF	100	0	0	0	100	Yes	No	Yes	No
189	Karanjia	Karanjia	Karanjia	Mahabir-Bhimsen VSS, Badadeuli	Mahabir-Bhimsen VSS, Badadeuli	Baddeuli	Baddeuli RF	200	0	0	0	200	Yes	No	Yes	No
190	Karanjia	Karanjia	Karanjia	Garhsahi	Garhsahi	NAC,Karanjia	Karanjia RF	50	0	0	0	50	Yes	No	Yes	No
191	Karanjia	Karanjia	Karanjia	Chauthia	Chauthia	Baddeuli	Chauthia RF	40	0	0	0	40	Yes	No	Yes	No
192	Karanjia	Karanjia	Karanjia	Bhanra	Bhanra	Baddeuli	Bhanra RF	100	0	0	0	100	Yes	No	Yes	No
193	Karanjia	Karanjia	Karanjia	Kalikapur	Kalikapur	Bala	Pokamunda RF	30	0	0	0	30	Yes	No	Yes	No
194	Karanjia	Karanjia	Ghagarbeda	Nanduburu	Nanduburu	Nuagaon	Panpatria RF	30	0	0	0	30	Yes	No	Yes	No
195	Karanjia	Karanjia	Raruan	Manoharpur	Manoharpur	Teranti	Bhramarposi RF	30	0	0	0	30	Yes	No	Yes	No
196	Karanjia	Karanjia	Raruan	Kujiam	Kujiam	Teranti	Kujiam RF	100	0	0	0	100	Yes	No	Yes	No
197	Karanjia	Karanjia	Raruan	Nuabeda	Nuabeda	Baidyanath	Nuabeda RF	15	0	0	0	15	Yes	No	Yes	No
198	Karanjia	Karanjia	Raruan	Denua	Denua	Nuagaon	Denua RF	20	0	0	0	20	Yes	No	Yes	No
199	Karanjia	Karanjia	Raruan	Santabandha	Santabandha	Baidyanath	Santhbondh RF	15	0	0	0	15	Yes	No	Yes	No
200	Karanjia	Karanjia	Raruan	Jamuti	Jamuti	Baidyanath	Jamunti RF	200	0	0	0	200	Yes	No	Yes	No
201	Karanjia	Karanjia	Raruan	Galusahi	Galusahi	Angarpada	Galusahi RF	20	0	0	0	20	Yes	No	Yes	No
202	Karanjia	Karanjia	Raruan	Baunspur	Baunspur	Angarpada	Tulsipur RF	20	0	0	0	20	Yes	No	Yes	No
203	Karanjia	Karanjia	Raruan	Angarpada	Angarpada	Angarpada	Jamunti RF	50	0	0	0	50	Yes	No	Yes	No
204	Karanjia	Karanjia	Raruan	Khuntapada	Khuntapada	Raruan	Bhanjabeda RF	30	0	0	0	30	Yes	No	Yes	No
205	Karanjia	Karanjia	Raruan	Jhumkapal	Jhumkapal	Raruan	Jhumkapal RF	20	0	0	0	20	Yes	No	Yes	No

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Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
206	Karanjia	Karanjia	Raruan	Reteisahi	Reteisahi	Tilakuti	-	0	20	0	0	20	Yes	No	Yes	No
207	Karanjia	Karanjia	Raruan	Mamunipani	Mamunipani	Tilakuti	-	0	30	0	0	30	Yes	No	Yes	No
208	Karanjia	Karanjia	Raruan	Jethama	Jethama	Chaturanjali	Kujiam RF	20	0	0	0	20	Yes	No	Yes	No
209	Karanjia	Karanjia	Raruan	Adipur	Adipur	Arjunbila	Adipur RF	30	0	0	0	30	Yes	No	Yes	No
210	Karanjia	Karanjia	Raruan	Sarubil	Sarubil	Chaturanjali	Sarubil RF	60	0	0	0	60	Yes	No	Yes	No
211	Karanjia	Karanjia	Ghagarbeda	Chhelianali	Chhelianali	Panpatria	Chhelianali RF - I	30	0	0	0	30	Yes	No	Yes	No
212	Karanjia	Karanjia	Ghagarbeda	Madhiaposi	Madhiaposi	Panpatria	Panpatria RF	100	0	0	0	100	Yes	No	Yes	No
213	Karanjia	Karanjia	Ghagarbeda	Righa	Righa	Panpatria	Panpatria RF	30	0	0	0	30	Yes	No	Yes	No
214	Karanjia	Karanjia	Ghagarbeda	Sulgada	Sulgada	Panpatria	Panpatria RF	100	0	0	0	100	Yes	No	Yes	No
215	Karanjia	Karanjia	Ghagarbeda	Panpatria	Panpatria	Panpatria	Panpatria RF	200	0	0	0	200	Yes	No	Yes	No
216	Karanjia	Karanjia	Ghagarbeda	Manikpur	Manikpur	Budamora	Panpatria RF	50	0	0	0	50	Yes	No	Yes	No
217	Karanjia	Karanjia	Ghagarbeda	Sankesari	Sankesari	Budamora	Sankeshari RF	50	0	0	0	50	Yes	No	Yes	No
218	Karanjia	Karanjia	Ghagarbeda	Parabeda	Parabeda	Ghagarbeda	Panpatria RF	50	0	0	0	50	Yes	No	Yes	No
219	Karanjia	Karanjia	Ghagarbeda	Batisahi	Batisahi	Ghagarbeda	Panpatria RF	30	0	0	0	30	Yes	No	Yes	No
220	Karanjia	Karanjia	Ghagarbeda	Righasahi	Righasahi	Ghagarbeda	Panpatria RF	50	0	0	0	50	Yes	No	Yes	No
221	Karanjia	Karanjia	Ghagarbeda	Kusumbandh	Kusumbandh	Nuagaon	Panpatria RF	50	0	0	0	50	Yes	No	Yes	No
222	Karanjia	Karanjia	Ghagarbeda	Banakati	Banakati	Nuagaon	Panpatria RF	0	30	0	0	30	Yes	No	Yes	No
223	Karanjia	Karanjia	Ghagarbeda	Nuagaon	Nuagaon	Nuagaon	Panpatria RF	50	0	0	0	50	Yes	No	Yes	No
224	Karanjia	Karanjia	Ghagarbeda	Fhulcomp	Fhulcomp	Nuagaon	Fulcomp RF	40	0	0	0	40	Yes	No	Yes	No
225	Karanjia	Karanjia	Ghagarbeda	Sagada	Sagada	Budamara	Sagada - I and II	50	0	0	0	50	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
226	Karanjia	Karanjia	Ghagarbeda	Sarasposi	Sarasposi	Panpatria	Sarasposi RF	50	0	0	0	50	Yes	No	Yes	No
227	Karanjia	Karanjia	Ghagarbeda	Kudarsahi	Kudarsahi	Narsandha	Kudarsahi RF	20	0	0	0	20	Yes	No	Yes	No
228	Karanjia	Karanjia	Singda	Pokharia	Pokharia	Haldia	Pokharia RF	100	0	0	0	100	Yes	No	Yes	No
229	Karanjia	Karanjia	Singda	Jhadghosda	Jhadghosda	Jhadghosda	Jhadghosda RF	30	0	0	0	30	Yes	No	Yes	No
230	Karanjia	Karanjia	Singda	Gharmabeda	Gharmabeda	Jamuti	Gharmabeda RF	150	0	0	0	150	Yes	No	Yes	No
231	Karanjia	Karanjia	Kadadiha	Miludihi	Miludihi	Kuliposi	Miludihi RF	0	50	0	0	50	Yes	No	Yes	No
232	Karanjia	Karanjia	Kadadiha	Gopalpur	Gopalpur	Kuliposi	Padheidhuda RF	20	0	0	0	20	Yes	No	Yes	No
233	Karanjia	Karanjia	Kadadiha	Bhalughera	Bhalughera	Kuliposi	Bhalughara PRF	0	20	0	0	20	Yes	No	Yes	No
234	Karanjia	Karanjia	Kadadiha	Tungurusahi	Tungurusahi	Kuliposi	Padheidhuda RF	20	0	0	0	20	Yes	No	Yes	No
235	Karanjia	Karanjia	Kadadiha	Kenjhera	Kenjhera	Patbil	Kenjhara RF	100	0	0	0	100	Yes	No	Yes	No
236	Karanjia	Karanjia	Kadadiha	Paudia	Paudia	Kuliposi	Paudia RF	200	0	0	0	200	Yes	No	Yes	No
237	Karanjia	Karanjia	Kadadiha	Tikasil	Tikasil	Kuliposi	Tikasil RF	70	0	0	0	70	Yes	No	Yes	No
238	Karanjia	Karanjia	Kadadiha	Singda	Singda	Kuliposi	Singda RF- III	100	0	0	0	100	Yes	No	Yes	No
239	Karanjia	Karanjia	Karanjia	Sarubali	Sarubali	Rasamtala	Sarubali RF	83	0	0	0	83	Yes	No	Yes	No
240	Karanjia	Karanjia	Karanjia	Hudisahi	Hudisahi	Badadeuli	Bhanra RF	119.6	0	0	0	119.6	Yes	No	Yes	No
241	Karanjia	Karanjia	Karanjia	Chauthia	Chauthia	Badadeuli	Chauthia RF	44.8	0	0	0	44.8	Yes	No	Yes	No
242	Karanjia	Karanjia	Karanjia	Nuagaon	Nuagaon	Badadeuli	Nuagaon RF	142.2	0	0	0	142.2	Yes	No	Yes	No
243	Karanjia	Karanjia	Kadadiha	Maa Sunamani VSS	Bajunisila	Patbil	Padheidhara RF	228	0	0	0	228	Yes	No	Yes	No
244	Karanjia	Karanjia	Kadadiha	Fagubaba VSS	Padheidhara	Kuliposi	Padheidhara RF	229.6	0	0	0	229.6	Yes	No	Yes	No
245	Karanjia	Karanjia	Kadadiha	Baba Andha Kuanr VSS	Goudgaon	Kuliposi	Paudia RF	159	0	0	0	159	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
246	Karanjia	Karanjia	Ghagarbeda	Buruhatu VSS	Buruhatu	Narsandha	Digiposi RF	41	0	0	0	41	Yes	No	Yes	No
247	Karanjia	Karanjia	Ghagarbeda	Digiposi VSS	Digiposi	Narsandha	Digiposi RF	41.4	0	0	0	41.4	Yes	No	Yes	No
248	Karanjia	Karanjia	Ghagarbeda	Maa Swarna Thakurani VSS	Hindola	Ghagarbeda	Hindola RF	23.6	0	0	0	23.6	Yes	No	Yes	No
249	Karanjia	Karanjia	Raruan	Bhramarposi VSS	Bhramarposi	Teranti	Bhramarposi RF	50.6	0	0	0	50.6	Yes	No	Yes	No
250	Karanjia	Karanjia	Raruan	Mahuldiha VSS	Mahuldiha	Baidyanath	Kendua RF	50	0	0	0	50	Yes	No	Yes	No
251	Karanjia	Karanjia	Raruan	Kujiam VSS	Kujiam	Teranti	Kujiam RF	80	0	0	0	80	Yes	No	Yes	No
252	Karanjia	Karanjia	Raruan	Chungusahi VSS	Chungusahi	Baidyanath	Chungusahi VF	10	0	0	0	10	Yes	No	Yes	No
253	Karanjia	Karanjia	Singda	Sunaposi VSS	Sunaposi	Jamunti	Sunaposi RF	108	0	0	0	108	Yes	No	Yes	No
254	Karanjia	Karanjia	Singda	Dumbisahi VSS	Dumbisahi	Kerkera	Dumbisahi RF	42	0	0	0	42	Yes	No	Yes	No
255	Karanjia	Karanjia	Singda	Khaparasahi VSS	Khaparasahi	Jamunti	Khaparasahi RF	33.6	0	0	0	33.6	Yes	No	Yes	No
256	Karanjia	Karanjia	Singda	Singda VSS	Singda	Kerkera	Singda RF-II	54	0	0	0	54	Yes	No	Yes	No
257	Karanjia	Karanjia	Singda	Budsorei VSS	Budsorei	Kerkera	Saranggarh RF	56	0	0	0	56	Yes	No	Yes	No
258	Karanjia	Karanjia	Kadadiha	Balibhol VSS	Balibhol	Kuliposi	Hatisalbeda RF	100	0	0	0	100	Yes	No	Yes	No
259	Karanjia	Karanjia	Kadadiha	Chheliaposi VSS	Chhheliposi	Kuliposi	Paudia RF	100	0	0	0	100	Yes	No	Yes	No
260	Karanjia	Karanjia	Kadadiha	Jaheraaya VSS	Hatisalbeda	Kuliposi	Hatisalbeda RF	162	0	0	0	162	Yes	No	Yes	No

ANNEXURE XX: LIST OF VSSs IN KARANJIA DIVISION

Sl No.	Name of the Division	Name of the Range	Name of the Section	Name of the VSS	Name of the village	Name of the G.P	Area asigned from	Name and status of forest land				Area in ha.asigned to VSS	Whether executive committee formed	Whether MoU formed	Whether Miro Paln prepared	Whether registred under the society Act. by C.F as
								RF	PRF	DPF	Revenue forest land					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
261	Karanjia	Karanjia	Kadadiha	Chaturisahi VSS	Chaturisahi	Kuliposi	Chaturisahi RF	113	0	0	0	113	Yes	No	Yes	No
262	Karanjia	Karanjia	Singda	Saranggarh VSS	Saranggarh	Saranggarh	Saranggarh RF	113	0	0	0	113	Yes	No	Yes	No
263	Karanjia	Karanjia	Singda	Ghosda VSS	Ghosda	Ghosda	Ghosda RF	140	0	0	0	140	Yes	No	Yes	No
264	Karanjia	Karanjia	Raruan	Bhanjabeda VSS	Bhanjabeda	Raruan	Bhanjabeda RF	93	0	0	0	93	Yes	No	Yes	No
265	Karanjia	Karanjia	Singda	Kasia VSS	Kasia	Haldia	Kasia RF	50	0	0	0	50	Yes	No	Yes	No
266	Karanjia	Karanjia	Raruan	Dhudipani VSS	Dhudipani	Chaturanjali	Bhramarposi RF	50	0	0	0	50	Yes	No	Yes	No
267	Karanjia	Karanjia	Raruan	Godhimara VSS	Godhimara	Chaturanjali	Bhramarposi RF	50	0	0	0	50	Yes	No	Yes	No
268	Karanjia	Karanjia	Kadadiha	Baba Barakhanda VSS	Kuliposi	Kuliposi	Kuliposi RF	24	0	0	0	24	Yes	No	Yes	No
269	Karanjia	Karanjia	Kadadiha	Kalakada VSS	Kalakada	Batbil	Kalakada RF	50	0	0	0	50	Yes	No	Yes	No
270	Karanjia	Karanjia	Singda	Ghagi VSS	Ghagi	Galusahi	Ghagi RF	50	0	0	0	50	Yes	No	Yes	No
271	Karanjia	Karanjia	Singda	Halpur VSS	Halpur	Ghosda	Halpur RF - I	47.2	0	0	0	47.2	Yes	No	Yes	No
272	Karanjia	Karanjia	Singda	Badbil VSS	Badbil	Haldia	Badbir RF	50	0	0	0	50	Yes	No	Yes	No
						Karanjia Total		**6258.6**	**200**	**0**	**0**	**6458.60**				
						.Total:-		**19128.32**	**1329.60**	**198.37**	**30.21**	**20686.50**				
											Village Forest Area	**401.21**				
											G. Total	**21087.71**				

ANNEXURE XXI

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EXTRAORDINARY

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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

ANNEXURE-A

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.

ANNEXURE -B

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.	

Form – 2

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

Form – 3

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 Signature of the Secretary

_____ VSS / EDC _____ 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
_____ VSS / EDC

Witnesses:
1.
2.
3.

Signature of R.O.
Range:
Division:
Witnesses:
1.
2.
3.

_____

Printed and published by the Director, Printing, Stationery and Publication, Orissa, Cuttack-10
Ex. Gaz. 1440-193+100

ANNEXURE XXIa

The Odisha Gazette

EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 914 CUTTACK, THURSDAY, JUNE 11, 2015/JAISTHA 21, 1937

[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

Printed and published by the Director, Directorate of Printing, Stationery and Publication, Odisha, Cuttack-10
Ex. Gaz. 408—173+100

ANNEXURE XXIb

GOVERNMENT OF ODISHA

FOREST & ENVIRONMENT DEPARTMENT

*****

RESOLUTION

No. FE-PLANT-PLANT-0009-2015- 286 /F&E , Bhubaneswar , Dated- 4.1.19
(PLANTATION)

Sub: Amendment to Joint Forest Management Resolution,2011.

In continuation of this Department Resolution Number-1F-Affn-17/2011-16524/F&E,Dated 09.09.2011,there shall be constituted a "Range Level VSS & EDC Forum"with the following members, role and responsibilities.

15(xvii) The forum shall comprise of the following members:

1. Range officer : Chairperson
2. Forester posted : Member Convener
   at Range Hqrs.
3. Chairpersons of each VSS : Member
   (in absence of Chairperson Vice- chairperson of the concerned VSS shall attend as member)
4. One additional member from each VSS who takes active interest in forest protection and development activities : Member
5. All Section Foresters and all Beat Forest Guards posted in the Range : Members
6. One active NGO or any person having deep interest & knowledge on community and working in the area, may be nominated by the DFO on the basis of recommendation of the concerned Range Officers on rotation basis for 3 year period at a time to attend the meetings as members.

15(xviii) Role and Responsibilities of the Forum:

(a) To review the progress of functioning of VSS/EDC
(b) To guide and provide necessary support to VSS/EDC
(c) To maintain record of suggestions/ grievances received from VSS/EDC members on different aspects of forest management and other development works
(d)To discuss and materialize the issues / confusion if any with respect to JFM policy, FRA, etc.
(e) To prepare a compliance report for sending the same to DFO so as to place the same before the meeting of Sub Divisional Level Steering Committee,
(f)To assist in capacity building of VSS/EDC members relating to forest as well as village development,
(g) To identify the cases of conflict and resolve these cases for smooth functioning of VSS/EDC, and
(h)To ensure effective coordination among VSS/EDC in the Range & ensure their effective functioning

15(xix)The forum shall meet atleast once in a month & keep a record of attendance of members present and decisions taken in the meeting

ORDER

Orders that the Resolution be published in the Extraordinary issue of the Odisha Gazette.

By Order of the Governor

3/1/2019

S.C. Mahapatra
Additional Chief Secretary to Government
Forest & Environment Department

SLC

Memo no. 287 /dated, 4.1.19

Copy forwarded to the Director, Printing, Stationery and Publications, Odisha, Cuttack with a request to publish the resolution in the next issue of Odisha Gazette and supply 100 copies to this Department.

3/1/19

Additional Secretary to Government

Memo No. 288 /dated 4.1.19

Copy forwarded to the Commissioner-cum-Secretary to Governor, Odisha / Principal Secretary to Chief Minister, Odisha / Private Secretaries to all Hon'ble Ministers, Odisha for information and necessary action

3/1/19

Additional Secretary to Government

Memo No. 289 /dated 4.1.19

Copy forwarded to all Departments of Government / Accountant General (A&E), Odisha, Bhubaneswar for information and necessary action.

3/1/19

Additional Secretary to Government

Memo No. 290 /dated 4.1.19

Copy forwarded to the Principal Chief Conservator of Forests, Odisha / Principal Chief Conservator of Forests (WL) & Chief Wildlife Warden, Odisha / Principal Chief Conservator of Forests (KL)/ Project Director, OFSDP, Ghatikia, Bhubaneswar / Managing Director, OFDC Ltd., Bhubaneswar / Managing Director, TDCC, Bhubaneswar / Project Director, OTELP, Bhubaneswar / Project Director, Western Odisha Livelihood Project / Director, Odisha Watershed Development Mission, Bhubaneswar / All Regional Chief Conservator of Forests, Odisha / All Chief Conservator of Forests, Office of the PCCF, Odisha / Chief Conservator of Forests, Wildlife, Office of the PCCF (WL), Odisha / All conservators of Forests /All RCCFs/ All Divisional Forest Officers (T & WL)/ All Deputy Conservators of Forests, Office of the PCCF, Odisha for their information and necessary action

3/1/19

Additional Secretary to Government

Memo No. 291 /dated 4.1.19

Copy forwarded to the RDC (CD), Cuttack / RDC (ND), Sambalpur/ RDC (SD), Berhampur / All Collectors for their information and necessary action

3/1/19

Additional Secretary to Government

Memo No. 292 /dated 4.1.19

Copy forwarded to the Private Secretaries to Hon'ble Chief Minister / Chief Secretary / Development Commissioner-cum-ACS/Agriculture Production Commissioner / Secretaries, Finance, Home Department / Agriculture Department / Revenue & Disaster Management Deprtment / Rural Development Department / ST & SC Development Department / Special Secretary, Forest & Environment Department / Special Secretary, P&C Department for favour of information of Hon'ble Chief Minister / Chief Secretary / Development Commissioner-cum-ACS/Agriculture Production Commissioner/ Secretaries, Finance, Home Deptt / Agriculture Deptt / Revenue & Disaster Management Deptt / Rural Development Deptt / ST & SC Development Deptt / Special Secretary, F&E Deptt / Special Secretary, P&C Deptt. for their information and necessary action

3/1/19

Additional Secretary to Government

Memo No. 293 /dated 4.1.19

Copy forwarded to Guard File, Plantation & Regeneration Section of F&E Department action

3/1/19

Additional Secretary to Government

ANNEXURE XXII

REVENUE AND EXPENDITURE OF KARANJIA FOREST DIVISION FOR LAST 10 YEARS			
Year	**Revenue**	**Expenditure**	**Revenue-Expenditure ratio**
2010 - 11	6743550	20114545	0.335257397
2011 - 12	8740497	17223432	0.507477081
2012 - 13	8687002	32191836	0.269851089
2013 - 14	6590319	49999387	0.131807996
2014 - 15	9442269	53589013	0.176197852
2015 - 16	11326258	49722438	0.227789675
2016 - 17	15136935.09	65222004	0.232083257
2017 - 18	5860119	55190468	0.106179911
2018 - 19	6041761	41305377	0.146270569
2019 - 20	658731	121063500	0.005441202
Total	**79227441.09**	**505622000**	0.156693026

ANNEXURE XXIII

Yield calculation of different forest blocks of Karanjia Division

Name of the Forest Block	Sl. No.	Comptt. No.	Coupe No.	Area in Ha.	Shorea		Others		Available Harvest (Yield)		Available harvest per Ha	
					I	II	I	II	Shorea	Others	Shorea	Others
Chaturisahi	1	NRSC - 271	P-III	110.59	289	266	480	521	19	31	0.17	0.28
Barakmuda	2	NRSC-204	G-VIII	2.71	0	0	3	0	0	0	0	0
Kanthikana	3	NRSC-127	G-X	54.22	179	175	332	166	11	20	0.21	0.37
	4	NRSC-128	G-VIII	32.26	75	94	154	79	5	9	0.15	0.29
	5	NRSC-129	G-IX	50.54	135	153	281	151	9	17	0.17	0.28
Hatisalbera	6	NRSC-250	P-V	91.76	231	263	522	547	15	34	0.16	0.37
	7	NRSC-252	P-VI	188.21	525	720	1155	1504	34	75	0.18	0.4
	8	NRSC - 407	P-VII	143.06	535	259	548	380	32	34	0.22	0.24
Kalakada	9	NRSC-277	P-IV	81.06	274	234	442	421	17	28	0.22	0.35
Kenjhara	10	NRSC-276	T-V	106.2	344	266	519	459	22	33	0.2	0.31
Kuliposi	11	NRSC-251	P-VII	19.53	47	29	57	44	3	4	0.15	0.18
Milludihi	12	NRSC - 249	P – VI	127.06	443	277	529	480	27	34	0.22	0.27
Paudia	13	NRSC-246	P-VIII	234.48	828	672	1349	1120	52	86	0.22	0.27
	14	NRSC-247	P-IX	117.21	451	329	662	557	28	42	0.24	0.36
	15	NRSC - 248	P - X	196.44	791	446	891	691	48	56	0.25	0.29
Singra	16	NRSC - 272	P -IV	100.25	254	231	398	409	16	26	0.16	0.26
Tikasil	17	NRSC –274	P- III	65.68	273	90	230	71	16	13	0.24	0.2
Poraidhara	18	NRSC-279	P-I	259..82	866	596	1204	1089	54	77	0.21	0.30
	19	NRSC-273	P-II	205	834	436	970	646	51	60	0.25	0.29
Asankudar	20	NRSC-296	TK-VI	25.7	218	193	350	193	14	21	0.54	0.83
Bisipur	21	NRSC-255	TK-I	97.06	799	1248	775	522	53	48	0.54	0.5
	22	NRSC-256	TK-I	315.2	2114	3406	2758	1633	139	170	0.44	0.54
Borin	23	NRSC-328	TK-X	214.98	1659	2548	2525	2627	109	157	0.51	0.73
Cherratangar	24	NRSC-283	TK-IV	250.77	2509	3485	7906	2616	164	232	0.66	0.93
	25	NRSC-287	TK –V	580.95	2714	2728	7495	6341	175	477	0.3	0.82
Dangapani	26	NRSC-292	TK-II	98.45	1020	1610	1136	733	67	71	0.68	0.7226
Gourigoda	27	NRSC-321	TK-VVIII	61.69	487	561	878	505	32	54	0.51	0.87
Jaribil	28	NRSC-286	TK-VI	191.4	1718	2834	2367	1485	113	147	0.59	0.77
Kadopani	29	NRSC-293	TK-VI	144.23	1575	2500	1645	1077	104	102	0.72	0.71

ANNEXURE XXIII

Yield calculation of different forest blocks of Karanjia Division

Name of the Forest Block	Sl. No.	Comptt. No.	Coupe No.	Area in Ha.	Shorea		Others		Available Harvest (Yield)		Available harvest per Ha	
					I	II	I	II	Shorea	Others	Shorea	Others
Kaliajiani	30	NRSC-294	TK-VIII	356.24	9888	4436	1863	2453	580	122	1.65	0.34
	31	NRSC-295	TK-IX	62.83	672	1071	765	486	44	47	0.7	0.76
Kendumundi	32	NRSC-257	TK-II	119.54	1224	1791	1626	1120	80	102	0.67	0.85
	33	NRSC-260	TK-II	136.93	1164	1868	1808	1009	77	111	0.56	0.81
	34	NRSC-261	TK-III	539.7	5119	10770		3866	341	477	0.63	0.88
Paribeda	35	NRSC-322	TK-IX	74.52	597	864	1010	531	39	61	0.53	0.82
Patbil	36	NRSC-280	TK-IV	124.96	1012	1558	1225	761	67	76	0.53	0.61
Purunapani	37	NRSC-289	TK-VII	523.78	3995	6561	5785	3455	264	357	0.5	0.68
Rengalbeda	38	NRSC-258	TK-II	55.28	579	869	715	494	38	45	0.69	0.81
	39	NRSC-259	TK-IV	37.95	383	569	508	356	25	32	0.66	0.84
Saleibeda	40	NRSC-281	TK-VI	131.88	797	1237	1166	725	52	72	0.4	0.55
Sanrugudibeda	41	NRSC-331	TK-X	196.14	1812	2555	2680	1857	119	168	0.61	0.85
Bhaliadal 1	42	NRSC-377	S-VII	20.01	141	102	491	300	9	30	0.44	1.52
Bhaliadal 2	43	NRSC-378	S-VII	161.88	1241	875	4139	2489	78	255	0.48	1.58
Bhaliadal 4	44	NRSC-379	S-VII	41.71	211	148	359	185	13	22	0.32	0.52
Khudisila	45	NRSC 376	TA - I	69.81	554	306	1481	836	34	91	0.49	1.3
Satkosia	46	1	S-X	498.17	681	578	4955	3310	43	309	0.09	0.62
	47	10	S-V	529.2	2932	1844	10668	5463	182	647	0.34	1.22
	48	11	S-V	757.27	3434	2490	14505	11337	216	917	0.28	1.21
	49	12	S-VI	473.36	2378	3368	15524	4469	156	862	0.33	1.82
	50	13	S-VI	701.48	4470	3378	17558	12305	282	1099	0.4	1.57
	51	14	S-VII	515.31	6622	5335	10530	7481	419	660	0.81	1.28
	52	15	S-VII	518.73	3367	2661	9897	6447	213	615	0.41	1.19
	53	16	S-VIII	573.38	4789	4688	13246	6083	308	792	0.54	1.38
	54	17	S-VIII	639.32	3433	2734	12364	7809	217	767	0.34	1.2
	55	18	S-IX	457.62	3623	1491	8576	11093	213	560	0.47	1.22
	56	19	S-IX	575.65	3175	1803	13432	10039	195	846	0.34	1.47
	57	2	S - I	537.22	1690	581	4424	1675	97	257	0.18	0.48
	58	20	S – X	639.44	1909	5447	11553	6631	128	709	0.2	1.11
	59	3	S-I	371.38	2959	1911	8308	4587	184	508	0.49	1.37
	60	4	S-II	704	9635	6018	16848	9018	597	1026	0.85	1.46
	61	5	S-II	564.29	6700	3641	11602	6541	409	711	0.72	1.26

ANNEXURE XXIII

Yield calculation of different forest blocks of Karanjia Division

Name of the Forest Block	Sl. No.	Comptt. No.	Coupe No.	Area in Ha.	Shorea		Others		Available Harvest (Yield)		Available harvest per Ha	
					I	II	I	II	Shorea	Others	Shorea	Others
	62	6	S-III	614.42	9870	4292	14960	6737	586	892	0.95	1.45
	63	7	S-III	589.42	10666	3519	7172	4543	607	445	1.03	0.75
	64	8	S-IV	500.23	3294	1458	9445	4187	196	562	0.39	1.12
	65	9	S-IV	448.83	1121	992	7140	3580	72	432	0.16	0.96
Akhapalan	66	NRSC-300	TA-II	53.06	606	941	515	406	40	33	0.75	0.61
Andharikhaman	67	NRSC-343	TA-III	16.28	205	375	180	133	14	11	0.83	0.7
Badbaliposi	68	NRSC-307	TA-I	31	248	533	176	183	16	11	0.53	0.37
Badbil	69	NRSC-317	TA-IV	370.46	3474	6256	3862	3142	230	245	0.62	0.66
	70	NRSC-318	TA-V	573.35	5076	9296	5300	4262	336	336	0.59	0.59
Banmunda	71	NRSC-375	TA-III	127.9	752	1434	577	534	50	37	0.39	0.29
Basantpur	72	NRSC-410	TA-II	23.87	263	468	210	170	17	13	0.73	0.56
Baunsdiha	73	NRSC-335	TA-VIII	155.19	1390	2656	1351	1135	92	86	0.59	0.55
Bhadubeda	74	NRSC-358	TA-II	113.36	1126	2008	1077	827	75	68	0.66	0.6
Bharandia	75	NRSC-333	TA-VIII	94.64	975	1736	863	718	65	55	0.68	0.58
Chainbainsi	76	NRSC-408	TA-II	30.72	289	515	291	225	19	18	0.62	0.6
Chakulia	77	NRSC-341	TA-VIII	154.15	1820	3298	1732	1305	121	109	0.78	0.71
Chamakpur	78	NRSC-352	TA-III	200.3	2333	4291	2047	1530	155	129	0.77	0.64
Dakeipal	79	NRSC-359	TA-VIII	126.72	1520	2779	1401	1037	101	88	0.79	0.7
Dangadiha	80	NRSC-366	TA-X	88.57	1002	1810	942	701	66	59	0.75	0.67
Dangadiha 1	81	NRSC-365	TA-X	95.76	949	1692	1009	809	63	64	0.66	0.67
Digdhar	82	NRSC-314	TA-III	43.33	266	571	240	236	18	15	0.41	0.36
Gahandia	83	NRSC-340	TA-III	13.89	126	241	97	90	8	6	0.6	0.45
Ghorabindha	84	NRSC-297	TA-II	131.03	1332	2470	1214	921	88	77	0.67	0.58
Handiphuta	85	NRSC-315	TA-VI	451.26	6098	13408	4795	1184	407	258	0.9	0.57
Hatighora	86	NRSC-299	TA-II	90.14	1162	2152	978	692	77	61	0.85	0.68
Jarak	87	NRSC-360	TA-X	37.71	307	555	287	235	20	18	0.54	0.48
Kaliaposi	88	NRSC-348	TA-III	84.79	988	1844	871	649	65	55	0.77	0.65
Kathuanuagaon	89	NRSC-361	TA-VII	64.35	648	1177	795	633	43	50	0.67	0.78
Khejuria	90	NRSC-345	TA-VII	301.37	2964	5545	2353	2051	197	150	0.65	0.5
	91	NRSC-346	TA-VIII	17.83	165	310	127	116	11	8	0.61	0.46
	92	NRSC-347	TA-VI	308.74	4029	7472	3354	2374	267	210	0.87	0.68
Khuntaposi	93	NRSC-319	TA-III	11.41	101	198	76	72	7	5	0.59	0.43
Kirkichipal	94	NRSC-368	TA-X	32.31	257	486	245	216	17	16	0.53	0.48

ANNEXURE XXIII

Yield calculation of different forest blocks of Karanjia Division

Name of the Forest Block	Sl. No.	Comptt. No.	Coupe No.	Area in Ha.	Shorea		Others		Available Harvest (Yield)		Available harvest per Ha	
					I	II	I	II	Shorea	Others	Shorea	Others
Majurapasi	95	NRSC-337	TK-IX	116.71	1229	2241	1048	833	81	66	0.7	0.57
Mandalijhain	96	NRSC-303	TA-I	47.29	446	815	373	326	30	24	0.62	0.5
	97	NRSC-305	TA-I	29.59	346	640	358	267	23	23	0.77	0.76
Mankadabeda	98	NRSC-369	YA-X	269.43	1531	4899	4960	1590	103	281	0.38	1.04
Mituani 1	99	NRSC-312	TA-I	110.64	1263	2290	1125	852	84	71	0.76	0.64
Mituani 2	100	NRSC-308	TA-I	185.22	2171	3947	2097	1579	144	132	0.78	0.71
Mituani 3	101	NRSC-311	TA-I	100.27	1239	2231	1061	774	82	67	0.82	0.66
Mulapal	102	NRSC-362	TA-VIII	75.9	523	988	608	526	35	39	0.46	0.51
Patarpoda	103	NRSC-367	TA-X	103.56	1058	1905	1189	946	70	75	0.68	0.73
Ruguribera	104	NRSC-350	TA-III	42.64	394	805	315	285	26	20	0.61	0.47
Suninda	105	NRSC-316	TA-II	24.18	197	417	142	145	13	9	0.54	0.38
Taramara	106	NRSC-301	TA-I	25.72	231	446	175	165	15	11	0.60	0.44
	107	NRSC-356	TA-IX	742.07	5892	11119	5457	4773	391	348	0.53	0.47
Thakurmunda	108	NRSC-354	TA-IV	236.55	2261	4333	1981	1717	150	126	0.63	0.53
Tikarpada	109	NRSC-342	TK-IX	78.95	913	1625	965	735	60	61	0.77	0.77
Vejidiha (I)	110	NRSC-411	TA-X	186.17	2053	3695	1844	1413	136	116	0.73	0.62
Vejidiha(II)	111	NRSC-412	TA-X	63.5	779	1400	679	496	52	43	0.81	0.67

Annexure XXIV

Area treated under Soil and Water along & Water conservation year wise data.

Name of the Scheme	Year	Itemm of work	Name of the Range	Name of the site
OMBADC - SMC	2019 - 20	Earthen graded bund	Dudhiani	Badampahad RF – **6999.82 Rmt**.
		LBCD work	Dudhiani	Badampahad RF – 260 **Nos. (4998.34 Cum)**
		Stone bonding	Dudhiani	Badampahad RF – **3700 Rmt.**
		Staggered Trench	Dudhiani	Badampahad RF – **100 Nos.**
		Percolation pit	Dudhiani	Badampahad RF – **130 Nos.**
		Creation of WHS -2	Dudhiani	Badampahad RF -2 Nos.
OMBADC - SMC	2021 - 22	Check Dam	Thakurmunda	Badbil RF -2 Nos.
		Earthen bund	Thakurmunda	Badbil RF - 2650Rmt.
OMBADC - SMC		Check Dam	Satkosia (WL)	Satkosia RF 1B- 1 No.
		Earthen bund	Satkosia (WL)	Satkosia RF 1B - 1.521 mtr
		Sub-Surface Dyke	Satkosia (WL)	Satkosia RF 1B- 1 No.

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA	2020 - 21	Digging of Treanches arround RF boundary	Dudhiani	Kadambeda RF	1
MGNREGA			Dudhiani	Dari-I RF	1
MGNREGA			Dudhiani	Dumuria RF	1
MGNREGA			Dudhiani	Mota RF	1
MGNREGA			Dudhiani	Masinabilla	1
MGNREGA			Dudhiani	Kuita	1
MGNREGA			Dudhiani	Hatimundi	1
MGNREGA			Dudhiani	Khandbandh	1
MGNREGA			Dudhiani	Pantho	1
MGNREGA			Dudhiani	Biunria	1
MGNREGA			Dudhiani	Chanchabani	1
MGNREGA			Dudhiani	Kunjia	1
MGNREGA			Dudhiani	Rasamtala	1
MGNREGA			Dudhiani	Sialinoi	1
MGNREGA			Dudhiani	Tato	1
MGNREGA			Dudhiani	Dari-II	1
MGNREGA			Dudhiani	Bola	1
MGNREGA			Dudhiani	Purunadeogaon	1
MGNREGA			Dudhiani	Siramanipur	1
MGNREGA			Dudhiani	Kudarbisda RF	1
MGNREGA			Dudhiani	Begunia RF	1
MGNREGA			Dudhiani	Budhipat DPF (A)	1
MGNREGA			Dudhiani	Budhipat DPF (B)	1
MGNREGA			Karanjia	Panpatria RF	1
MGNREGA			Karanjia	Panpatria RF	1
MGNREGA			Karanjia	Digposi RF	1
MGNREGA			Karanjia	Digposi RF	1

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA			Karanjia	Baddeuli RF	1
MGNREGA			Karanjia	Chauthia RF	1
MGNREGA			Karanjia	Padheidhuda RF	1
MGNREGA			Karanjia	Ghadaghaguri RF	2
MGNREGA			Karanjia	Sarubhadi RF	1
MGNREGA			Karanjia	Pokamunda RF	1
MGNREGA			Karanjia	Pokharia RF	1
MGNREGA			Karanjia	Kendua RF	1
MGNREGA			Karanjia	Chaturisahi RF	1
MGNREGA			Karanjia	Badbil RF	1
MGNREGA			Karanjia	Panpatria RF	1
MGNREGA			Karanjia	Sandeuli RF	1
MGNREGA			Karanjia	Jhumkapal RF	1
MGNREGA			Thakurmunda	Kadapani RF	1
MGNREGA			Thakurmunda	Jodbil RF	1
MGNREGA			Thakurmunda	Majuraposi RF	1
MGNREGA			Thakurmunda	Kendumundi RF-II	1
MGNREGA			Thakurmunda	Mituani RF-I	1
MGNREGA			Thakurmunda	Mituani RF-II	1
MGNREGA			Thakurmunda	Mituani RF-III	1
MGNREGA			Thakurmunda	Padiabeda RF	1
MGNREGA			Thakurmunda	Boring RF	1
MGNREGA			Thakurmunda	Akhapalan RF	1
MGNREGA			Thakurmunda	Kathuanuagaon RF	1
MGNREGA			Thakurmunda	Vejidiha RF-I	1
MGNREGA			Thakurmunda	Patbil RF	1
MGNREGA			Thakurmunda	Rengalbeda RF	1
MGNREGA			Thakurmunda	Bisipur RF	1

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA			Thakurmunda	Padiabeda RF	2
MGNREGA			Thakurmunda	Gourigoda RF	2
MGNREGA			Thakurmunda	Bhadubeda RF	1
MGNREGA			Thakurmunda	Badbil RF	1
MGNREGA			Thakurmunda	Jarak RF	1
MGNREGA			Thakurmunda	Mituani RF - III	1
MGNREGA			Thakurmunda	Mituani RF - II	1
MGNREGA			Thakurmunda	Jadbil RF	1
MGNREGA			Thakurmunda	Kadapani RF	1
MGNREGA			Thakurmunda	Majuraposi RF	1
MGNREGA			Thakurmunda	Handifuta RF	1
MGNREGA			Thakurmunda	Boring RF	1
MGNREGA			Thakurmunda	Thakurmunda RF	1
MGNREGA			Satkosia(WL)	Satkosia RF-compt.-20	1
MGNREGA			Satkosia(WL)	Khumthan RF	1
MGNREGA			Satkosia(WL)	Khumthan RF	1.5
MGNREGA			Satkosia(WL)	Goudiabahali RF	1
MGNREGA			Satkosia(WL)	Satkosia RF Compt No-14 &15	1
MGNREGA			Satkosia(WL)	Satkosia RF-compt.-7	1
MGNREGA			Satkosia(WL)	Satkosia RF-compt.-4	1
MGNREGA			Satkosia(WL)	Satkosia RF1(b)	1
MGNREGA			Satkosia(WL)	Noda RF	1
MGNREGA	2021 - 22	Digging of Treanches arround RF boundary	Thakurmunda	Badbil RF	1
MGNREGA			Thakurmunda	Jarak RF	1
MGNREGA			Thakurmunda	Sanrugudibeda RF	1
MGNREGA			Thakurmunda	Purunapani RF	1
MGNREGA			Thakurmunda	Nundiha PRF	2

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA			Thakurmunda	Khejuria RF	1
MGNREGA			Thakurmunda	Thakurmunda RF	1
MGNREGA			Thakurmunda	Jadbil RF (1st site)	2
MGNREGA				Jadbil RF (2nd site)	1
MGNREGA				Kucheikudar PRF	1
MGNREGA				Kadapani RF	2
MGNREGA				Keshdiha PRF	1
MGNREGA				Mituani RF - III	2
MGNREGA				Rengalbeda RF - I	1
MGNREGA			Thakurmunda	Chirupada RF	1
MGNREGA				Khejuria RF	1
MGNREGA				Banamunda RF	2
MGNREGA				Taramara RF	1
MGNREGA			Thakurmunda	Khejuria RF	3
MGNREGA			Thakurmunda	Baunsdiha RF	1
MGNREGA			Thakurmunda	Nuapada PRF	1
MGNREGA			Thakurmunda	Padiabeda RF	1
MGNREGA			Dudhiani	Begunia RF	1
MGNREGA			Dudhiani	Kudarbisda RF	1
MGNREGA			Dudhiani	Dhulia	1
MGNREGA			Dudhiani	Pahadpur	1
MGNREGA			Dudhiani	Kuita RF	1
MGNREGA			Dudhiani	Hatimundi RF	1
MGNREGA			Dudhiani	Nuagaon Revenue Forest	1
MGNREGA			Dudhiani	Gudidhiha RF	1
MGNREGA			Dudhiani	Tato RF	1
MGNREGA			Dudhiani	Biunria RF	1
MGNREGA			Dudhiani	Sialinoi RF	1

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA			Dudhiani	Tainsira	1
MGNREGA			Dudhiani	Nuagaon	1
MGNREGA			Dudhiani	Khandiadhar	1
MGNREGA			Dudhiani	Mota RF	1
MGNREGA				Dumuria RF	2
MGNREGA				Sialinoi RF	1
MGNREGA				Hatimundi RF	1
MGNREGA				Gudidiha RF	2
MGNREGA				Dari RF - II	1
MGNREGA				Jharbeda RF	1
MGNREGA				Salarapada RF	1
MGNREGA			Dudhiani	Begunia RF	1
MGNREGA				Kudarbisda RF	1
MGNREGA			Karanjia	Panpatria RF	1
MGNREGA			Karanjia	Adipur RF	1
MGNREGA			Karanjia	Bhamarposi RF	1
MGNREGA			Karanjia	Kasia RF	1
MGNREGA			Karanjia	Mahuliasuli RF	1
MGNREGA			Karanjia	Ghosda RF	1
MGNREGA			Karanjia	Ghadaghaguri RF	2
MGNREGA			Karanjia	Diajodi RF	1
MGNREGA			Karanjia	Andharjhari RF	1
MGNREGA		Digging of Treanches arround RF boundary	Karanjia	Panpatria RF near Madhiaposi	1
MGNREGA				Panpatria RF near Salgada	2
MGNREGA				Chaturisahi RF	1
MGNREGA				Kasia RF	1
MGNREGA				Hatisalbeda RF	2

Annexure XXIV					
Name of the Scheme	**Year**	**Itemm of work**	**Name of the Range**	**Name of the site**	**Area in Kms.**
MGNREGA				Digposi	2
MGNREGA			Karanjia	Saranggarh RF	1
MGNREGA				Badbil RF	1
MGNREGA				Ghadaghaguri RF	1
MGNREGA				Sanbadposi RF	1
MGNREGA				Baddeuli RF	1
MGNREGA				Tikasil RF	1
MGNREGA				Ghosda RF	1
MGNREGA			Karanjia	Kasia RF	2
MGNREGA			Satkosia (WL)	Satkosia RF Compt. NO. 1	2
MGNREGA				Satkosia RF Compt. NO.14	1
MGNREGA				Goudiabahali RF	2
MGNREGA				Satkosia RF Compt. NO. 19	1
MGNREGA				Satkosia RF Compt. NO. 4	1
MGNREGA				Satkosia RF Compt. NO. 7	1
MGNREGA				Satkosia RF Compt. NO. 1	2
MGNREGA			Satkosia (WL)	Satkosia RF Compt No-14	2
MGNREGA				Satkosia RF Compt No-16	1
MGNREGA				Satkosia RF Compt No-20	1
MGNREGA				Satkosia RF Compt No-06	1