PART-I
CHAPTER-I
THE TRACT DEALT WITH

1.1 NAME AND SITUATION

1.1.1 The area dealt with in this Working Plan covers all the Reserved Forest Blocks notified under section 21 of the Orissa Forest Act, Proposed Reserved Forests notified under section 4(1) of the Orissa Forest Act, DPFs in the process of notification under section 4(1) of the Orissa Forest Act and all the Village Forests of Rourkela Forest Division including part of Ex-Gangpur Khalsa, Ex-Zamindary of Nagara & Hatibari areas under Panposh Civil Sub-Divisions of Sundargarh District. The Division shares its boundary with Jharkhand State in East & North Direction & with Bonai Forest Division in South & Sundargarh in west.

1.1.2 The Division contains 84 Reserved Forests, 14 Proposed Reserved Forests, 36 Demarcated Protected Forests, 269 UDPF and 35 Village Forests along with all un-classed forest, DLC land having total area of 79414.64 hectares. From the above no of RF,PRF ,DPF,UDPF and Village forest 14 RF ,8 PRF,3 DPF and 16 village forests are from Bonai working plan. The head quarter of this forest division is at Rourkela. This division is well connected with National Highway 23 and state highways. The nearest Air Ports are located at Rourkela. The nearest sea port is at Paradeep which is 445 kilometers away. The distance from Rourkela to the adjoining and nearby important places is given in the following table.

From	To	Routes followed	Distance (in Kms.)
(1)	(2)	(3)	(4)
Rourkela	Sundargarh	-	100 Kms.
-do-	Rajgangpur	-	30 Kms.
-do-	Bisra	-	25 Kms.
-do-	Kuarmunda	-	10 Kms.
-do-	Biramitrapur		35 Kms.
-do-	Vedvayas		5 Kms.
-do-	Banki	-	17Kms.
-do-	Lathikata	-	12 Kms.
-do-	Nuagaon	-	40 Kms.
-do-	Ranchi	-	255 Kms.
-do-	Bonai	-	70 Kms.
-do-	Pitamahal Dam	-	20 Kms.
-do-	Kutra	-	45 Kms.
-do-	Barkot	-	100 Kms.
-do-	Mandaria Dam	-	30 Kms.

The Railway line connecting Kolkota with Mumbai passes through this Division and Rourkela is one of the important stations of this route. The detailed list of CD Blocks, Tahsils and NAC within the jurisdiction of Sundargarh District is given in the following table.

	Block		Tahsil	N.A.C.
1	Nuagaon	1	Biramitrapur	Biramitrapur (NAC)
2	Kuarmunda	2	Kuarmunda	
3	Lathikata	3	Lathikata	**Municipality**
4	Rajgangpur	4	Rajagangpur	1. Rajgangpur
5	Kutra (Part)	5	Kutra(Part)	2. Rourkela C.T
6	Lahunipara(Part)	6	Lahunipara(Part)	3. Rourkela S.T
7	Gurundia(Part)	7	Gurundia(Part)	
8	Bisra	8	Bisra	
9.	Koida(Part)	9.	Koida(Part)	

1.2 CONFIGURATION OF THE GROUND

The Division comprises of an elongated patch of land running in East-West direction whereas the central part contains a vast plain area with isolated hillocks along with small chain of mountains. The plain land gradually ascends in western and southern direction of Sundergarh District. In this hill range the highest peak is Didarpahad having an altitude of 766 meters. The other peaks of Division are Katang (604 meters) and Bhainsamunda (681 meters) in the south-eastern side having good forest located bordering Saranda forests of Jharkhand State. The North-Eastern portion is almost plain area dominated by cultivated land. Adjoining northern border Sagjore and Raibaga village are located. The highest peaks of Sundergarh District are (652 mtrs.) Sagjorpahad (487 mts.) and Nuagaonpahad (533 mts.) etc.

1.3 GEOLOGY, ROCK AND SOIL

1.3.1 GEOMORPHOLOGY

The oldest rock formations found in Rourkela Division are those belonging to Gangpur series, which are prevalent in the former Gangpur state. The major rock types of the Gangpur series are phyllites, mica schist, and carbon phyllites, calcitic and dolomitic marbles which are followed by the rock formations belonging to the iron-ore series, viz. mica-schist, phyllites and quartzitic rocks. The low mounds and hills occurring here and there amidst the plains are covered with laterite derived from weathering of the underlying rocks.

The Division occupies a prominent position on the mineral map of the state. The important minerals available in the division are limestone, manganese, dolomite and fire-clay. Beside, a few other minerals like mica, bauxite, lead, copper and zinc are also found. Limestone and dolomite are available in Sundargarh and Panposh sub-divisions. The economic minerals of lesser importance found in this Division are coal, kyanite and silimanite, pyrite, building materials and kaolin etc.

1.3.2 ROCKS

A large part of the Division is occupied by the para-metamorhic rocks of Gangpur series occurring under the soil and alluvium occupying mainly the plain land and low lying hill slopes between Jareikela-Birmitrapur, Sundargarh and Lephripara. The lower carbonaceous phyllites zone called Kuarmunda stage is most conspicuously developed in this area. The mica schist, phyllites of iron ore series are found extensively in the area from north of Biramitrapur, Hatibari around Jareikela up to Bamra.

In this Division in Khalsa area graphite and granite-gneiss cover a vast area near and around Sundargarh and in the north and north-east. Athkosia tract of this Division is mainly of schistose type of rock. Abundance of Quartz veins intersects the rock making the surface soil rocky. The lower Gondwana formations which rest unconformably over the older.Rock types of Rourkela forest division is given in Annexure-1(Page-1, Vol-II).

Dharwars carry the principal ore deposits of the country, i.e., those of gold, manganese, iron, chromium, copper, tungsten and lead etc. These with their associated rocks are also rich in industrially useful products such as mica etc. The percentage of minerals in the ores appears to be quite high. The lower Gondwana formations of the Division contain pink colored sand stones. Large deposits of carbonaceous clay are used in manufacture of fire resistant bricks. The peat coal deposits are not of much use even as cooking coal. However they are used in burning of bricks by mixing 20 to 25 percent with good variety coal. The detailed list of mineral deposits of Sundargarh District is given in Annexure 2 (Page -2, Vol-II).

1.3.3 SOIL TYPES

Soil derived from mica-schist and gneiss cover the major portion of the forest area and forests on alluvium is on a limited area. The forest located on the alluvial soil shows good density and qualities where as those located in the former are of poor quality and open type. The lowest density of forest on the hill slopes are seen mainly on quartzite the major portion of which are grassy blanks. The soil derived from mica-schist phyllites is red in color. They are immature in nature and there is still scope for further disintegration of mineral constituents. It does not show any clear profile. It is poor in water containing capacity but supports good forests cover both Sal and non-Sal depending upon the aspect. Quartzite and quartzite schist are tough in nature and more weather resistant. These rocks are usually found in association with granite or schist which forms soil and its fertility depends upon the percentage of argillaceous matter present in the rock. The detailed list of soil type and soil related constraints of Sundargarh District (Block wise) are given in Annexure 3 (Page-3, Vol-II) and 4 (Page-6, Vol-II).

SOIL CHARACTERISTICS OF UPPER DHARWAR ROCKS

Mica schist and Gneiss are the best soil formers but soils derived from those are red in color. The soils on hilly and sloping grounds are washed down to the plain grounds where there is no forest. The forest blocks located on the hill slopes have very shallow and infertile soil, often sterile with quartz crystals. In the valleys good depth of soil is met with and it supports good vegetation. Calcareous soils are generally not met widely within the forest blocks except in

Biramitrapur area, Patipahad, Bangla pahad blocks etc. where tree crop has almost vanished and shows remnants of valuable tree with miscellaneous species like Asan, Bheru, Kendu etc. Soil which are calcarouse in nature has limited fertility. It supports poor type of miscellaneous crop consisting of Bheru, Asan, Senha and bamboos are almost absent. Soil type and soil related informations of Sundergarh District (Revenue block wise) are furnished below:

Sl. No.	Revenue Block	Types of soil	Acidity (%)	Nutrient status Kg/ha		
				N	P	K
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Kutra (Part)	Black soil, Red soil, Mixed soil, Brown Forest soil	61%	1.30	1.54	2.24
2	Rajgangpur	Yellow, Mixed soil, Red soil	61%	1.30	1.67	2.31
3	Kuarmunda	Brown Forest soil	62%	1.24	1.61	2.25
4	Nuagaon	Black soil, Red soil, Mixed soil	68%	1.24	1.76	2.33
5	Lathikata	Mixed soil Yellow soil, Red soil, Mixed soil	65%	1.32	1.73	2.30
6	Bisra	Black, Red, Yellow, Brown Forest soil	72%	1.32	1.58	2.27

The acidity of soil is more in Kuarmunda and Bisra Range as compared to other Ranges.

1.4 CLIMATE, RAINFALL AND HUMIDITY

The summer starts from March and continues up to June. The rainy season continues from July to October where as winter season continues from November to February. The maximum temperature recorded is 45.5^{o} C during the month of May where as minimum temperature recorded is 6^{o}C in the month of January. Prolonged summer with severe forest fires results in high percentage of mortality of forests seedlings. Thus dry deciduous types of forests are noticed in this Division. The southern hill range check the south western monsoon for which plain area of Rajgangpur and Panposh receives less rainfall resulting in high humidity which supports good forests cover. Storms and cyclones are very rare in this Division. However, desiccating wind during summer causes some damages to young seedlings. The Tabular Statement of rainfall from 1981 to 2000 is given in Annexure 5(Page-10, Vol-II).

1.5 HEALTH

The general health condition in the plain area is better than the interior forest tracts especially those of Lathikata, Jareikela etc. which are malaria prone. Over the years much development has taken place to improve medical facilities, which has reduced the threat of epidemics. The following table shows blocks wise hospital, dispensary, PHC, CHC etc. in the Division as on 31.03.1997.

Sl. No.	Name of block	Hospital	Dispensaries	PHC	CHC	Addl. PHC	Sub-Health Centre
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

	RURAL						
1	Bisra	-	1	3	1	-	-
2	Kuarmunda	-	1	4	-	-	-
3	Kutra	-	1	4	1	-	-
4	Lathikata	-	1	4	-	-	-
5	Nuagaon	-	2	1	1	-	-
6	Rajgangpur	-	-	3	-	-	-
7							
8	**URBAN**	-	1	1	-	-	-
9	Rajgangpur	1	-	1	-	-	-
10	Rourkela (ST)	1	-	2	-	-	-

1.6 WATER SUPPLY

Besides the rivers, there are very few perennial streams inside the forest blocks. Most of the nallas go dry during the summer seasons. Water supply in hot seasons is usually scanty and restricted to some shallow pools in river beds. As a result of which the villagers mostly depend upon the tank which are not hygienic. Only the big villages have the wells but the remote hamlets depend upon scoop holes dug in dry nallas. The general water table falls by 25 feet to 30 feet during May. The detailed list of water level of Rourkela Division is given in Annexure 6 (Page-11, Vol-II).

The Division drains towards South-west and South-east directions by river Ib and Brahmani. The lowest point of this Division is near Banki near Bonai border (190 mts.) and the next lowest being 223 mts. near the union point of Sapainadi with river Ib. The two tributaries of Brahmani, i.e., Koel and Sankha flow through the Division and both unite at Panposh near Railway Bridge at Vedvyas to from the Brahmani River. The Sankha River starts from Ranchi of Jharakhand state and Mandira dam is located over the river to store water for supply to Rourkela Township and steel plant on sustained basis. These rivers are perennial and hold water during summer season also.

Name of Range	**Tube Well/ Place**		**Condition**	**Well / Place**		**Condition**
Rajgangpur	Rajgangpur	Range Office	Good	Rajgangpur	Range Office	Good
	Jharbeda	Check Gate	Good			Good
	Ratakhandi		Good			
Kuarmunda	Kuarmunda	Range Office Campus	Good	Kuarmunda	Range Office	Damaged
	Birda	Section Qtr.	Good			
Bisra	Bisra	Range Office Campus - 2nos.	Good	Bisra	Range Office Campus	Not working
				Bisra	Khairtola Section	Damage
				Bisra	Sanramloi Section	Not working

1.7 SURVEY

This area was topographically surveyed by Survey of India during the year 1981-82 to 1985-86. Topo maps used in this Division are available in 1: 2,50,000 and 1:50,000 & 1:25,000 Scale. The total forest area tackled in this plan is covered by 5 topo sheets of 1:250,000 scale, 19 numbers in 1:50,000 scales and 59 nos. in 1:25,000. The entire Forest Division is covered by the following topo sheets of scale 1: 50,000 and 1:25,000.

1:50,000 Scale	1:25,000 Scale
73 B/ 7 (Part)	73 B/ 7 NE, NW, SE, SW
73 B/ 8 (Part)	73B/ 8 NE, NW - SW
73 B/11	73 B/ 11 NE, NW, SE, SW
73 B/12	73B/ 12 NE, NW, SE, SW
73 B/15	73B/ 15 NE, NW, SE, SW
73 B/16	73B/ 16 NE, NW, SE, SW
73 F/ 3 (Part)	73F/ 3 NW, -, -, SW
73 F/ 4 (Part)	73 F/ 4 NE, NW, - SW
73 C/ 13 (Part)	
73 G/ 1 (Part)	

1.8. DISTRIBUTION OF AREA

1.8.1 This plan covers 70 numbers of Reserve Forest blocks, 6 nos. Proposed Reserve Forest blocks duly notified U/s-4 of O.F.A. 1972, 33 numbers of Demarcated Protected Forests, 123 numbers of UDPF and 19 numbers of duly notified Village Forests extending over the entire Panposh and part of Sundergarh Sub-Division of Sundergarh District.

LIST OF RF:

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of RF	Area
1	Sundargarh		**Rajgangpur**	Chatamb RF	7527.42
2				Haldipani RF	9591.39
3				Laing RF	562.533
4				Mandirapahar RF	26.3055
5				Chirobema RF	15.3786
6				Chudia pahar RF	263.055
7				Laimurapahar RF	124.2429
8				Datni RF	530.157
9				Jharbeda (Katang) RF	80.7376
10				Pathuria RF	40.47

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of RF	Area
11	Sundargarh			Datarampur RF	82.9635
12				Gudiali RF	922.716
				Total	**19767.369**
13			**Kuarmunda**	Chadri RF	251.7234
14				Brahmanipahar RF	396.606
15				Mudra RF	385.2744
16				Harpali RF	304.7391
17				Tangarani RF	177.6633
18				Rion RF	266.6973
19				Rangamati RF	694.4652
20				Bhaisamunda RF	2062.7559
21				Rutukupedi RF	6440.3958
22				Badmaren RF	78.1071
23				Kumarpahad RF	117.363
24				Madalia RF	137.1933
25				Jugsahi RF	67.1802
26				Vedvyas RF	19.4200
				Total	**11399.5840**
27			**Panposh**	Ergeda RF	520.0395
28				Lathikata RF	70.8225
29				Sunaprbat RF	900.0528
30				Hatibandha RF	278.0289
31				Durgapur RF	352.089
32				Bandamunda RF	21.4491
				Total	**2142.4818**
33			**Biramitrapur**	Jhumur RF	352.089
34				Darlipahar	829.635
35				Jharbeda RF	40.47
36				Jaidega RF	82.9635
37				Andhari RF	318.0942
38				Ghoghari RF	812.2329
39				Jalangbira RF	196.6842
40				Jhitingora RF	112.5066
41				Lasse RF	101.9844
42				Satbhaya RF	322.1412
43				Jatia RF	382.4415
44				Makarchuan RF	41.3522
45				Dhunagada RF	407.1282
46				Barpani RF	95.1045
47				Purnapani RF	327.807
48				Lahanda RF	218.9427

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of RF	Area

49	Sundargarh			Kalighat RF	35.2089
50				Bhalutungari RF	36.423
51				Beurpahad RF	80.1306
52				Lanki RF	12.5457
53				Patipahad RF	216.9192
54				Biringahudi RF	55.8486
55				Khindapahar RF	80.94
56				Bangnopahad RF	164.7129
				Total	**5324.306**
57			**Bisra**	KudahudungaRF	335.4963
58				Luaram RF	106.4361
59				(N) Sukuda RF	628.0944
60				(S) Sukuda RF	323.3553
61				Lindidiri RF	200.7312
62				Ajaykela RF	31.5666
63				Baribeda RF	29.5431
64				Baghdega RF	424.1256
65				Mahipani RF	658.0422
66				Santoshpur RF	59.8956
67				Jharabeda RF	508.3032
68				Gainjore RF	48.3899
69				(S)Chirobeda	6126.7533
70				(N) Chirodeda	3654.8457
				Total	**13135.579**
Grand Total of Rourkela WP(RF Area)					**51769.31**
71			**Banki**	Kucheita	395.791
72				Kukia	467.017
73				Kuradhi	489.68
74				Kuradhi Extn.	38.445
75				North Champajharan.	1092.675
76				South Champajharan.	1450.667
77				Silkuta - I	2042.088
78				Silkuta - II	885.876
79				Silikuta-Extn-I	153.783
80				Silkuta -Extn- II	186.159
81				Dhanghar.	894.374
82				Jharbeda	3615.54
83				Mohura	1381.626
84				Jharbeda - Exten.	224.605
				Total	**13318.326**
				Grand Total	**65087.63**

LIST OF DPF

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of DPF	Area
1	Sundargarh	Rajgangpur	**Rajgangpur**	Sunakhan-Dubku DPF	45.82
2				Dandapahad DPF	135.57

3				Saplata DPF	167.13
4				Bhursulia DPF	150.14
5				Sakumbahal DPF	14.16
6				Budham DPF	81.34
				Total	**594.16**
7	Sundargarh	Kuarmunda	**Kuarmunda**	Ratakhandi DPF	53.77
8				Putrikhaman DPF	34.91
9				Tangarani DPF	80.93
10				Tainsar DPF	182.3
11				Khukhundubahal DPF	87.41
12				Teliposh DPF	14.52
13				Balanda DPF	258.23
14				Kacharu DPF	33.99
15				Vedvyas DPF	18.21
16				Rani Patak	29.27
17				Jalataranga DPF	44.97
				Total	**838.51**
18	Sundargarh	Panposh	**Panposh**	Manko'A'DPF	50.45
19				Baribeda-Manko 'B' DPF	38.76
20				Karlakhaman DPF	88.62
21				Lathikata DPF	38.44
22				Sapdarah DPF	96.53
23				Baribeda DPF	94.29
24				Kanarsuan DPF	45.54
25				Ramjodi DPF	16.39
				Total	**469.02**
26	Sundargarh	Biramitrapur	**Biramitrapur**	Ulhani DPF	19.85
27				dulha dulhi DPF	51.39
28				Motipahad DPF	542.29
				Total	**613.53**
29	Sundargarh	Bisra	**Bisra Range**	Titheiposh DPF	20.63
30				Katepur DPF	33.18
31				Koilsuta DPF	21.04

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of DPF	Area
32				Sorda DPF	27.66
33				Kaliaposh DPF	14.56
				Total	**117.07**
				Grand Total	**2632.29**
34	Sundargarh	Banki	**Banki**	Nuangaon DPF	310.065
35				Dhanghar DPF	855.927
36				Karda DPF	60.137
				Total	**1226.129**
			Grand Total		**3858.419**

LIST OF PRF

Sl. No	Name of District	Name of Tehsil	Name of Range	Name of PRF	Area
1	Sundargarh	Rajgangpur	**Rajgangpur**	Chhatabar PRF	76.86
2	Sundargarh	Kuarmunda	**Kuarmunda**	Birual PRF	24.43
3	Sundargarh	Panposh	**Panposh**	Lohadarha PRF	88.62
4	Sundargarh	Biramitrapur	**Biramitrapur**	Deuli PRF	149.73
5				Dulhadulhin PRF	56.33
6	Sundargarh	Bisra	**Bisra Range**	Surda PRF	29.62
			Total of Rourkela WP(PRF)		**425.59**
7	Sundargarh	Banki	**Banki**	Purunapani-Budhikutuni	432.95
8				Thelakudar	78.915
9				Mohura	282.476
10				Hatioda	52.772
11				South Champajharan	594.496
12				Norh Champajharan	177.256
13				Birtola	27.114
14				Jharbeda-II	71.63
				Total of Banki	**1717.609**
			Grand Total of Rourkela Division		**2143.199**

LIST OF VF

SL. No.	Name of District	Name of Range	Name of VF	Area
1	Sundargarh	Rajgangpur	Kukuda	9
2			Bhalu duma	8
3			Kutunia	10
4			Mandia kudar	12.8
5			Jamenkira	4.5
6			Jharbeda	5
7			Jharbeda	4
8			Sonakhandi	10
9			Mandia kudar	7.2
10			Kansbahal	5
			(10 villages)	**75.5**
11	Sundargarh	Kuarmunda	Balposh	10
12			Gobira	7
13			Lanjiberna	4
14			Gobira	1.67
15			Sahilata	5
16			Bijadihi	6.72
17			Dumer Munda	9.81
			(7 Villages)	**44.2**
18		Biramitrapur	Hati Bari	1.25
19			Nuagaon	4.51
			(2villages)	**5.76**
	Total of Rourkela WP(VF) 19 no.			**125.46**
20	Sundargarh	Banki	Bandu para	4
21			Bad Purunapani	3.2
22			Gamlei	6.9
23			Thia berna	8
24			Bad - Tumkela	5.968
25			Mishra pali	5
26			Gada pali	8
27			Gouduni posh	5
28			Darjing	7
29			Kenapali	5.04
30			Gadruan	8
31			Kenapali	0.88
32			Arkei kela	4.82
33			Budhi Kutuni	8
34			Nuapara	9.5
35			Kapanda	14.4
			(16 nos)	**103.708**
Grand Total of Rourkela Division(35 no. VF)				**229.168**

LIST OF UDPF

1	Sundargarh	Banki	(146 village)	11330.997
				11330.997
2	Sundargarh	Rajgangpur	20 villages	642.04
3	Sundargarh	Kuarmunda	33 villages	1607.75
4	Sundargarh	Bisra	70 villages	2348.926
			123 villages	**4598.716**
			269 villages	**15929.713**

Non recorded forest land having forest growth (DLC) land.

Rourkela Working Plan	Rajgangpur	35 nos. Village	4381.902 Ha.
	Kuarmunda	54 nos. village	5372.06 ha.
	Bisra	78 nos. village	2995.176 ha.
	Biramitrapur	120 nos. village	7083.74 Ha
	Panposh	2 nos. village	9.78 Ha.
Total			**19842.658 ha.**
Bonai Working plan	Banki Range	146 nos. village	1032.434 ha.
G. Total		**435 nos. village**	**20875.09 ha.**

UNCLASSED FOREST

Rourkela Working Plan	:	20.60 ha.
Bonai Working Plan (Banki Range)	:	9.269 ha.
Total	**:**	**29.869 ha.**

Abstract

	Bonai WP	Rourkela WP	Total (in Ha.)
RF	13,318.326 (14Nos)	51769.31(70 RF)	65087.636
PRF	1717.609 (8 Nos)	425.59 (6 Nos)	2143.199 (14 Nos)
DPF	1226.129 (3 Nos)	2632.29(33 DPF)	3779.369 (36 Nos)
VF	103.708(16 no.)	125.468(19 no.)	229.176(35 no.)
Total WP Area	**16365.772 Ha**	**54952.67 Ha**	**71318.442 Ha**
UDPF	11330.997(146 Nos)	4598.716(123 Nos)	15,929.713 (269 Nos)
DLC LAND	1032.464 (146 Nos)	19842.658 (289 Nos)	20875.109 (435 Nos)
UNCLASS	9.269	20.6	29.869
TOTAL	**28,738.502 Ha**	**79414.64 Ha**	**10853.13 Ha**

1.8.2 Besides the above forest area, un-classed forest area over 20.60 hectares is available in revenue records which carries the buildings and forest roads of this Division. Moreover 19842.658 hectares of revenue land with record of rights as 'Forests' are mentioned in the revenue records.

The details list of non-forest land of Sundargarh Forest Division with record of rights is given in Annexure 7(Page-14, Vol-II).

1.9 DIVERSION OF LAND FOR NON-FORESTRY PURPOSES

During the last plan period some forest land have been diverted for non-forestry purposes, a list of which is given below with details of compensatory plantations raised in this Division.

Sl. No.	Name of Project	Name of Range	Name and status of forest area diverted	Area
(1)	(2)	(3)	(4)	(5)
1	Kansbahal Irrigation project	Rajgangpur	Chudia RF(P) Kunaria RF(P) Bad nuagaon VF Ranipia VF Durgajore VF Badnuagaon VF	3.28 Ha 0.32 Ha 20.44 Ha 2.93 Ha 21.48 Ha 2.38 Ha 50.83 Ha
2	Orissa Cement Rajgangpur	Rajgangpur	-	62.29 Ha
3	Low Power T.V. relay Stn.Rourkela	Panposh	Durgapur	2.82 Ha 0.15 Ha
4	Setting up 2.3 KV Transmitter of AIR, Rourkela.	Panposh	Durgapur	0.1175 Ha
5	Construction of 400 K.V. DC line from Jamshedpur Rourkela	Kuarmunda Kuarmunda	Kundelpost Santirjhar KF	3.6504 Ha 4.1496 Ha 7.8 Ha
6	Construction of DV & work at Nuagaon	Kuarmunda	San-Nuagaon VF	0.570 Ha
7	Construction of water storage reservoir to supply water to RKL town.	Panposh	Durgapur RF	0.364 Ha
8	Construction of time divisibulmulti axix system of RKL- Steel plant (TDMA)	Panposh	Durgapur RF	0.220 Ha
9	Transmission line from Tarkera to Traction substation, Nuagaon	Kuarmunda	VF	11.910 Ha
10	Construction 400 KV Dc line RKL to Raipur	Sundargarh Kuarmunda	Revenue Forest	23.308 Ha
11	Construction of Bisrapada MIP	Kuarmunda	Village Forest Putri Khaman KF Kubabeda KF Dumaagudi KF	12.750 Ha
12	Construction of 400 KV/DC transmission line from Rourkela to Raigarh	Panposh	Durgapur RF-3.68 ha Kamarpahad RF-2.07 ha Revenue forest-17.519 ha	23.269 Ha
13	Expansion of Existing Integrated Steel plant of Adhunik Metallic ltd	Kuarmunda	Chadri RF	24.34 Ha
14	Laying of Paradip-New Sambalpur-Ranchi Petroleum Product Pipe line	Kuarmunda, Biramitrapur	Revenue forest-6.291 ha RF-0.551 ha	7.05 ha

The detailed list of compensatory afforestation of Rourkela Forest Division is given in Annexure 8(Page-27, Vol-II).

1.10 STATE OF BOUNDARIES

The boundaries are of two types, one is of natural origin and the rest are artificially maintained with stone cairns around wooden posts/ RCC pillars. The inter-state boundaries are 60 feet in width whereas other boundaries are 20 feet to 40 feet wide. Most of the Reserved Forests

boundaries have not been maintained properly in spite of detailed prescriptions for regular maintenance. This may be due to paucity of funds. Hence specific attention should be given for this important work which forms the baseline of forest management. The details of block wise "state of boundary" report are given below.

Sl. No.	Forest Block	Length of boundry (in K.M.s)	No. of Boundary Pillars	No. of damaged Pillars	Encroachment along the boundary line
(1)	(2)	(3)	(4)	(5)	(6)
Range	**Rajgangpur**				
1	ChhatamRF				
	(a)Hatidharsa	36.83	209	99	545 patches
	(b)Chhatam Comp	90.66	757	757	239 patches
2	Haldipani RF				
	(a)Jambua comp	32.73	283	218	3 patches
	(b) Sagjore comp	43.4	421	390	1 patch
	(c)Kumaria comp	19.37	164	139	Nil
	(d)Topkuru comp	45.88	344	344	10 patches
3	Laing RF	13.67	57	57	Nil
4	Mandira RF	3.5	27	27	Nil
5	Lamptipahad RF	18.7	118	118	Nil
6	Jharbeda RF	12.89	74	74	Nil
7	Chiroberna RF	2.1	12	12	Nil
8	Khindapahad RF	8.43	48	48	Nil
9	Chudiapahad RF	19.6	184	184	6patches
10	Loimurapahad RF	5.9	23	23	Nil
11	Datni RF	12.87	66	66	Nil
	Jharbeda RF				
12	(Katang)	12.89	78	56	1patch
13	Pathuria RF	3.42	17	17	Nil
14	Datarampur RF	4.12	24	24	Nil
	Gudiali RF				
	(a)Gudiali comp	14.48	71	65	4 patches
15	(b)Tunmura comp	14.44	73	73	3 patches
	Total	**415.88**	**3050**	**2791**	**812 patches**
Range	**Biramitrapur**				
16	Bangalapahad RF	10.92	47	47	Nil
17	Jhurmur RF	11.27	71	71	1patch
18	Jaidega RF	21.92	172	172	Nil
	Darlipahad				
19	(Jhandapahad) RF	10.46	62	8	Nil
20	Bhalu Dungri	3.2	19	19	Nil
21	Makarchua RF	2.3	25	25	1 patch
22	Andhari RF	9.60	55	Nil	Nil
23	Ghogari RF	27.70	167	167	1 Patch
24	Jalangbira RF	12.75	73	73	Nil
25	Jhitingiara RF	5.20	40	40	Nil
26	Lasse RF	9.94	32	32	Nil
27	Satbhaya RF	6.20	85	85	Nil
Sl. No.	Forest Block	Length of boundry (in K.M.s)	No. of Boundary Pillars	No. of damaged Pillars	Encroachment along the boundary line
(1)	(2)	(3)	(4)	(5)	(6)
28	jatia RF	6.20	42	42	Nil
29	Dhumagada RF	9.60	79	24	2 Patches
30	Barpani RF	8.20	69	69	2 Patches
31	Purnapani RF	10.60	109	109	3 Patches
32	Lahanda RF	10.20	89	89	20 Patches
33	Kalighat RF	3.50	31	31	15 Patches
34	Bhalutunguri RF	2.80	19	19	Nil

35	Beurapahad RF	8.60	54	54	7 Patches
36	Lampi RF	1.24	21	21	7 Patches
37	Patipahar RF	7.50	129	129	4 Patches
38	Biringahudi RF	3.60	27	27	2 Patches
39	Bangalpahar RF	10.60	67	67	Nil
	Total	**214.1**	**1584**	**1420**	**65 patches**
Range	**Kuarnmunda**				
40	Brahamani RF	28.88	172	172	2 patches
41	Chadri RF	11.40	82	82	Nil
42	Jugsahi RF	34.00	28	28	Nil
43	Kamarpahar RF	5.70	36	36	Nil
44	B.pahar RF	12.50	64	64	1 Patch
45	Mudra RF	9.10	61	61	1 Patch
46	Harapali RF	12.20	82	82	14 Patches
47	Tangrani RF	6.50	35	35	1 Patch
48	Rion RF	14.40	76	76	2 Patches
49	Rangamati RF	16.00	142	142	1 Patch
50	Bhaisamunda RF	20.40	198.00	198	1 Patch
51	Rutukupedi RF	98.00	711	711	5 Patches
52	Badmaren RF	5.00	37	37	Nil
	Total	**274.08**	**1724**	**1724**	**28 Patches**
Range	**Panposh**				
53	Argeda RF	12.40	198	198	2 Patches
54	Lathikata RF	3.60	24	24	3 Patches
55	Sunaparbata RF	12.80	131	128	2 Patches
56	Durgapur RF	23.20	118	118	17 Patches
57	HatiBandha RF	7.60	60	60	3 Patches
58	Bondamunda RF	4.219	15	15	Nil
	Total	**63.819**	**546**	**543**	**27 Patches**
Range	**Bisra**				
59	Kudahundang RF	14.8	94	94	6 Patches
60	Madlia RF	4.70	42	42	Nil
61	Luaram RF	5.128	141	141	Nil
62	N. Sukuda RF	11.505	155	92	5 Patches
63	S. Saluda RF	6.168	90	47	3 Patches
64	Lindidiri RF	11.465	185	185	4 Patches
65	Ajaikela RF	2.609	15	15	Nil
66	Baribeda RF	4.158	20	20	Nil
67	Baghdega RF	16.773	118	117	Nil
68	Mahipani RF	28.318	134	63	3 Patches
69	Santoshpur RF	6.639	46	46	Nil
70	Jharbeda RF	9.696	122	88	1 Patch
71	N.Chirobeda RF	30.66	275	275	3 Patches
72	S.Chirobeda RF	102.2	909	679	6 Patches
73	Gainjore RF	3.26	29	29	Nil
	Total	**258.079**	**2375**	**1933**	**31 Patches**

ABSTRACT OF STATUS OF BLOCK BOUNDARY(Source: D.F.O. Sundergarh Division)

Sl. No.	**Range**	**Total no. of blocks (RF)**	**Total length of block boundary (Km)**	**Total No. of pillars**	**No. of pillars damaged**	**Encroa -chment**
1	Rajgangpur	15	415.88	3050	2791	812
2	Kuarnmunda	13	274.08	1724	1724	28
3	Bisra	15	258.079	2375	1933	31
4	Biramitrapur	24	214.1	1584	1420	65
5	Panposh	6	63.819	546	543	27

1.11 ENCROACHMENT

1.11.1 This Division is highly affected by encroachments. A good portion of forest land including R.Fs, P.R.Fs and D.P.F s with gentle slope adjoining to village areas in remote corners of this Division are under control of encroachers. Attempt has been made to regularize pre-1980 encroachments.

1.11.2 PRE–1980 ENCROACHMENT CASES AND THEIR REGULARISATION

As per instruction of Government of Orissa, Revenue Department Letter No. GE (GL)-S-17/ 2000/21060/F dt 4.5.2000. Fifty number of encroached forest settlements/habitations were identified in different Reserved Forests of this Forest Division. The joint verification of Revenue and Forest officials were done for 30 habitations and the proposal for 10 habitation containing 264 encroachers over 2926.177 ha for declaring Revenue Villages have been submitted to the Principal Chief Conservator of Forests, Orissa, Bhubaneswar. The joint verification for rest of the 20 habitations/ settlement is under progress. The details of encroachers, eligible encroachers, area encroached upon for 10 villages are as follows:

Number of total encroachers	702
Area in hectares	873.62
Eligible encroachers in surveyed village	449
Area in hectares	479.485
Area with ineligible encroachers in hectares	222.515
S.C.	06
S.T.	422
O.B.C.	-
Others	21
Legal Status	
R.F.	434.415 ha
P.F.	-
Others	15.070 ha

1.12 FOREST VILLAGE

There is no forest village in this Division.

1.13 LEGAL POSITION

The process of reservation of forest land started prior to 1911 when the Khalsa area were first converted into Reserved Forest. Subsequently during 1963, 1967 most of the Forests were notified as reserve. In the recent past during 1984, 1985, 1999, 2000 seven P.R.F. land have been converted into Reserved Forests. During 1991, 1992, 1993 165 numbers Village Forests raised under SIDA program have been notified as Village Forests.

1.14 RIGHTS AND CONCESSIONS

No Rights are admitted in the Reserve Forest blocks of this Division. But tribals are allowed to collect edible fruits, roots, leaves and grasses for their own consumption free of charge. Presently at the times of natural calamity like flood and f ire, forest materials are supplied at schedule of rates to the effected people from the 'B' class R.Fs. The tenants are allowed to take bamboos from annual coupes at schedule of rates. They are also allowed to collect dry fire wood from Khesra Forests at half the current schedule of rate subject to their payment of Nistar cess. Free grazing has been abolished since 1954. Schedule of rates as given in "Forest Produce, Orissa – 1977" is in force in this Division since its inception, i.e., 24th November 1977, a list of which has been given below.

Schedule of Rates			
Rate for Timber & Poles			
Quality Class	**Size**	**Girth Class (in. cm.)**	**Rate**
(1)	**(2)**	**(3)**	**(4)**
		90 to under 120 cm	Rs. 94.60 per cum.
	Round	120 to under 150 cm	Rs. 139.751 - do -
	Timber	150 to under 180 cm	Rs. 199.40 - do -
		180 to under 210 cm	Rs. 199.40 - do -
		210 cm and above	Rs. 199.40 - do -
Class - I			
		Under 30 cm	Rs. 00.55 Per Piece
		30 to under 45 cm	Rs. 01.10 - do -
	Poles	45 to under 60 cm	Rs. 02.15 - do -
		60 to under 75 cm	Rs. 05.40 - do -
		75 to under 120 cm	Rs. 10.75 - do -
		90 to Under 120 cm	Rs. 69.60 Per cum
	Round	102 to under 150 cm	Rs. 112.85 - do -
	Timber	150 to under 180 cm	Rs. 127.95 - do -
		180 to under 210 cm	Rs. 127.95 - do -
		210 and above	Rs. 127.95 - do -
Class - II			
		Under 30 cm	Rs. 00.45 Per piece
		30 to under 45 cm	Rs. 00.85 - do -
	Poles	45 to under 60 cm	Rs. 01.60 - do -
		60 to under 75 cm	Rs. 03.25 - do -
		75 to under 90 cm	Rs. 07.55 - do -
		90 to Under 120 cm	Rs. 47.00 Per cum
	Round	102 to under 150 cm	Rs. 67.65 - do -
	Timber	150 to under 180 cm	Rs. 97.85 -do -
		180 to under 210 cm	Rs. 97.85 -do -
		210 and above	Rs. 97.85 -do -
Class - III			
		Under 30 cm	Rs. 0.20 Per piece
		30 to under 45 cm	Rs. 0.55 - do -
	Poles	45 to under 60 cm	Rs. 0.85 - do -
		60 to under 75 cm	Rs. 1.60 - do -
		75 to under 90 cm	Rs. 4.30 - do -
Schedule of rate for Bamboo			
	Salia per 100 pieces	-	Rs. 04.30
	Daba per 100 pieces	-	Rs. 06.45
Rate for Fire Wood			
	Head load	-	Rs. 00.20
	Bahar load	-	Rs. 00.40
	Bullack Cart load	-	Rs. 02.00

	Buffalo Cart load	-	Rs. 03.00
	Per quintal	-	Rs. 01.00
Rate for Charcoal			
	Head load	-	Rs. 00.55
	Bahar load	-	Rs. 01.10
	Bullack Cart load	-	Rs. 10.80
	Buffalo Cart load	-	Rs. 16.20
	Per quintal	-	Rs. 02.70

Schedule of Rate for Non-Timber Forest Produce

Sl. No.	Particulars	Per head load	Per bhar load	Per cart load	Per buffalo load	Per bullock load	Per 100 nos.	Per quintal	Per K.G
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Thorn & leave	0.10	0.20	1.10	1.60	-	-	-	-
2	Brush wood	0.10	0.20	1.10	1.60	-	-	-	-
3	Fodder grass	0.10	0.20	0.85	1.10	-	-	-	-
4	Thatching grass	0.20	0.55	-	3.25	2.70	-	-	-
5	Sabal & Panasi								
	grass	0.20	0.55	-	3.25	2.70	-	-	-
6	Creepers	0.10	0.20	-	2.15	1.60	-	-	-
7	Palm leaves	0.85	1.60	-	21.50	1.60	-	-	-
8	Ashes (Khar)	0.20	0.45	-	-	15.05	-	5.75	-
9	Siali bark	0.20	-	-	2.15	-	-	-	-
10	Rual	-	-	-	-	1.10	-	-	-
11	Bhalia fruit	-	-	-	-	-	-	2.90	-
12	Tamarind	-	-	-	-	-	-	1.70	-
13	Honey	-	-	-	-	-	-	-	0.90
14	Wax	-	-	-	-	-	-	-	1.70
15	Myrabolans	-	-	-	-	-	-	2.90	-
16	Simul cotton	-	-	-	-	-	-	-	0.25
17	Sunari bark	-	-	-	-	-	-	5.75	-
18	Asan bark	-	-	-	-	-	-	2.90	-
19	Other tanning								
	bark	-	-	-	-	-	-	1.70	-
20	Sal resin	-	-	-	-	-	-	-	0.55
21	Natural gum	-	-	-	-	-	-	-	0.55
22	Lac	-	-	-	-	-	-	17.30	-
23	Tassar cocoons	-	-	-	-	-	0.15	-	-
24	other fruits	-	-	-	-	-	-	2.30	-
25	Kuchila	-	-	-	-	-	-	2.90	-
26	Bones	-	-	-	-	-	-	11.50	-

(Source: D.F.O. Sundergarh Division)

1.15 JOINT FOREST MANAGEMENT (J.F.M.)

Joint Forest management is not a new concept for this Division, In the forests of Ex-Zamindary areas of Hatibari, the nearby villagers were permitted with concession to remove edible roots, fruits, leaves and dry fallen fire wood. Grazing by their cattle was allowed with the condition that they will assist in extinguishing forest fire and clear boundary lines as and when required by the forest department. In course of time these rules turned obsolete and are no more in vogue.

The State Govt. in their resolution No. 10F (prone)-47/88/17240/FFAH dt.01.08.1988 introduced the concept of J.F.M. in the State for protection of Reserved Forests by community. Again another resolution No.10F (prone)-4/90/29825/FFAH dt.11.12.1990 was promulgated for

protection of Reserved Forest and Protected Forests by community and enjoyment of certain usufructs by them. The next Resolution No.16700 dt.03.07.1993 provided a broad base for J.F.M. including constitution of Vana Samrakshan Samiti (V.S.S.) for protection of Reserved Forest and Protected Forests and enjoyment of usufructs. A supplementary to this resolution has been passed vide resolution No.23180 dt.30.09.1996. Basing on these resolutions as much as 364 number of V.S.S. have been formed in this division which covers 31435.03 hectares of forest area throughout the Division. Details of these Samities are given in Annexure 9(Page-41, Vol-II). The range wise abstract of V.S.S. is furnished below in tabular form.

RANGE-WISE ABSTRACT OF V.S.S.

Sl. No.	Range	RF	PRF	DPF	VF	KF	Total(Ha)
1	Panposh	2939.8	0	300.2	200.59	309.33	3749.92
2	Biramitrapur	2512.2	250.8	109	40	971.8	3883.8
3	Bisra	3605.51	0	50	0	294.49	3950
4	Kuarmunda	5021.29	0	1099.89	1115.55	230	7466.73
5	Rajgangpur	5831.23	0	229.91	80	500	6641.14
6	Banki	1861.4	1702.01	0	274.41	1905.62	5743.44
						Total	**31435.03**

1.16. FOREST DEVELOPMENT AGENCY (2002-03 TO 2006-07)

As per the National Afforestation Programme (NAP) guidelines FDA in Sundargarh was registered as society under the Society Registration Act, 1860 on 07.09.2002 with 30 VSS in the erstwhile Sundargarh Division. Upon reorganization of the Forest Department on 01.10.2003, only 8 are in Sundargarh Forest Division. In the year 2003-04, 2400 ha. of degraded forest was taken up for treatment through FDA, out of which 2000 ha. was taken for Aided Natural Regeneration (ANR), 250 ha. for Artificial Regeneration (AR), 50 ha. bamboo plantation and 100 ha. silvipasture.The detail list of plantation done under FDA since 2005-06 to 2012-13 is given in annexure 27D.

The Forest Development Agency in Sundargarh was formed under the orders of Government of India by taking 30 V.S.S. of the Division under National Afforestation Programme. The scheme of Govt. of India provided for treating 2400 ha. of land at a cost of Rs.311.64 lakhs during the period 2002-03 to 2006-07. Out of the 30 sanctioned V.S.S. one Sahajbahal V.S.S. was disputed V.S.S. So it was discarded and area of Sahajbahal V.S.S. was distributed to Khairkhaman and Padampur V.S.S. after getting approval of Conservator of Forests, Rourkela circle. The components are:

A.N.R.	-	2000 Ha.	-	200 Plants per Ha.
A.R.	-	250 Ha.	-	1100 -do-
P.D.	-	100 Ha.	-	400 -do-
B.P.	-	50 Ha.	-	625 -do-
	Total -	2400 Ha.		

Release of funds to the VSS. during 2003-04, 2004-05 and 2005-06

Sl. No.	Name of the Range	Name of VSS	Type of plantation in Ha.						Funds Released
			ANR	AR	PD	BP	MP	TOTAL	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Rajgangpur	Ranipia	100	-	-	-	-	100	501780/-
2	-do-	Alanda	100	-	10	-	-	110	567432/-
3	-do-	Malidihi (Bhogotola)	100	-	-	-	-	100	501780/-
4	Kuarmunda	Teliposh	15	50	-	30	-	95	626344/-
5	-do-	Sandalakudar	100	25	10	10	-	145	813680/-
6	Panposh	Ergeda	90	25	-	-	-	115	638984/-
7	-do-	Kuderbahal	100	25	-	-	-	125	679480/-
8	Biramitrapur	Dalki (Mugdand)	80	-	-	-	-	80	401429/-
		Total	**685**	**125**	**20**	**40**		**870**	**4730909/-**

PART-I
CHAPTER-II

THE FOREST

2.1 COMPOSITION AND CONDITION OF THE CROP

The forests of this Division are dry in nature except some damp plant communities which occur in the moist and shady aspects along perennial nallah and streams. The forests are located on all the three main geographical formations, i.e., igneous, sedimentary and metamorphic rocks. The geological formations, which are resistant to weathering, mostly contain dry type of forests. The Ghagarai blocks are ideal examples where igneous rocks are very resistant to weathering.

The metamorphic rocks are represented by a wide variety of rock types i.e. phyllites, gneiss and schist which are found in Rajgangpur, Kuarmunda and Bisra Ranges. Out of these Bisra area is a bit moist than the rest part but drier than the adjoining forests of Saranda and Bonai. The forests of Kuarmunda and part of Rajgangpur, i.e., Chhatamba Forest blocks represent transition between the tropophyllous vegetation of Bonai and dry type of forests of Chhotanagpur plateau of Jharkhand state. Besides the climatic influence, the erophytic character of this transition belt is mainly due to edaphic influence. To add to it, the aridity has been added by heavy encroachments in the Reserved Forests. The forests of North and South Chirobeda, Jharbeda, Ergeda blocks, which are adjoining Saranda forest, are comparatively less moist because of edaphic reasons.

The schistose rock types in this block do not hold water where as the shale and hematite quartzites of Bonai and Saranda have good water retaining capacity and are more moist. The Kuarmunda portion generally gives a degraded look. The Baghdega block has almost pure Sal patch with pole crop, which has resulted due to coppicing in the past. It shows that area is capable to produce fine stand of Sal in natural sites by natural regeneration. Similar is the case in Luaram North, South Sukuda, Satbhaya, Jatia, Rohini, Tangrani, Kudahudang blocks etc. Due to uncontrolled grazing and illicit felling most of the forest blocks have been reduced to scrub jungles now.

2.2. FLORA AND FAUNA

2.2.1 As per Champion and Seth classification this Division comes under peninsular Sal and dry deciduous mixed forest types. Sal, the dominant species fully established and abundant in these forests varying from a fairly pure to a mixed crop and occurs throughout the area. The main associates of Sal are Asan, Kurum, Bija or Piasal etc. The other note worthy tree species are *Buchanania, Semecarpus, Terminalia, Cassia, Adina etc.* Mixed with these, species *Cochlospermum, Boswellia, Hardwickia* and *Bassia* etc are seen. *Dendrocalamus strictus* is the prominent bamboo species available.

2.2.2 FOREST TYPES AND SUB-TYPES

According to Champion and Seth classification of Forest Types, the forests of this Division can be divided into following forest types and sub-types basing on regeneration status and composition of young available crops.

I. Moist Tropical Forests

Group- 3 - Tropical Moist Deciduous Forest

Sub Group-3C: North Indian Tropical Moist Deciduous Forests

C2 / 2c (iii) - Moist Peninsular Valley Sal

II. Dry Tropical Forests

Group – 5- Tropical Dry Deciduous Forests

Sub-Group 5 B Northern Tropical Dry Deciduous Forests

C1 / 1c- Dry Peninsular Sal Forests

C2 - Northern Dry Mixed Deciduous Forests

Degradation stages of tropical dry deciduous forests are

Ds. 1 – Dry Deciduous scrubs.

E9 - Dry Bamboo Brakes

The above main forest types are easily recognised and are more or less well defined. Besides these broad classifications there are minor classifications and local variations of both dry and moist types.

3C2 / 2c (iii) Moist Peninsular Valley Sal

This type occurs in some compartments of South Chirobeda, Bhainsamunda, Ergeda and Jharbeda blocks and over part of north Chirobeda block. The crop is very well stocked with Sal. More middle aged patches are seen but mature crops of Sal are rarely noticed where Sal forms almost 90 percent of the crop, Quality of Sal is generally II / III. In few sheltered patches and in valley bottoms quality II crop and very rarely quality I is available. Regeneration of Sal is excellent and stocking is generally good and there is no difficulty for its establishment although fire occurs and causes some damage to young seedlings.

The common associates of Sal in this type are *Pterocarpus marsupium, Terminalia tomentosa, Terminalia bellerica, Terminalia chebula, Adina cordifolia, Syzygium cumuni, Madhuca latifolia*, *Bauhinia latifolia and Diospyros*. *Albizzia species, Mangifera indica* are seen particularly along the perennial nalla. In less moist area, i.e., a little higher up on the slopes, *Ougenia dalbergiodes, Anogeissus latifolia*, *Lannea grandis* do occur. The common shrubs *Flemingia chhappar, Indigofera* species etc. are found. The climbers that are usually met with are *Bauhinia vahlii, Milletia auriculata, Smilax macrophylla* etc. In the valley broom grass *Thyanolena maxima* are seen frequently.

5 B-C1 / 1c - Dry Peninsular Sal

These types are represented by almost all Sal forests of the Division except the moist type mentioned above. The occurrence of Sal is minimum 30% and maximum up to 60% in certain small blocks like Jharabeda (Katang,) Baghadega, & Luaram. Besides, there are number of other

blocks where Sal occurs up to 60% of crop even on northern aspects of the hills and in valleys. The crop is mainly in pole stage except in the blocks worked under long rotation/ selection. The blocks worked under short rotation coppice system have depleted cover due to repeated working and illicit/unauthorized cutting. The crop in general is in pole stage with few bigger trees left as standards. Regeneration is mostly of coppice origin. Due to lack of adequate protection, the fate of many well stocked blocks has been reduced to scrub forests. In Hemgir areas bamboo is decreasing at an alarming rate due to ecological retrogression and a stage will come when probably bamboo will vanish.

The common associates of Sal in this area are *Terminalia tomentosa, Terminalia bellerica, Terminalia chebula, Pterocarus marsupium*, *Eugenia operculata, Madhuca latifolia, Diospyros melanoxylon, Buchnania latifolia, Dalbergia latifolia (Rare), Cleistanthus collinus*, and in drier areas *Emblica officinalis, Eugenia caryophylifolia, Anogeisus latifolia, Ougenia dalbergoides, Bosewellia serrata* etc. In the moist locality Mango and *Adina cordifolia* are seen. Common shrubs are *Gardenia gummifera, Nyctanthes arboristis*, *Woodfordia fruticosa, Indigofera pulchella, Flemingia chhapar, Zizyphus xylopyra, Zandia uliginosa, Helectres ixora, Strobilanthus auriculata, Strebylus asper*. Common climbers are *Bauhinia vahlii* and *Butea superba*. Common grasses are *Eulaliopsis binata, Sehima nervosum* and *Heteropogon contortus*.

5-B.C 2 NORTHREN DRY MIXED DECIDUOUS FORESTS

This type is the characteristic of more dry areas having infertile shallow soil. The blocks that represent this type are Kukuda RF, Chhelgudri compartment of Dhangergudi RF etc .The crop is of semi xerophyte type and it is composed of very little percentage of sal of very poor quality which is stunted. Most conspicuous among the trees species are *Cleistanthus collinus, Terminlia tomentosa, Anogeissus latifolia, Diospyros melanoxylon, Emblica officinalis, Madhuca latifolia, Boswellia serrata, Swietenia, Cochlospermum gossipium*. Amongst the shrubs the most common are *Gardenia gummifera*, *Nyctanthus arboretis, Zizyphus xylopyra, Woodfordia fruticosa*. Only few woody thorny climbers like *Zizyphus cenoplia, Celastrus paniculata* are seen. The common grasses are *Aristida setacea*, *Andropogon* species etc.

5. B-C2 Ds 1-Dry Deciduous Scrub

This type occurs in many compartments of Pundripani, Dhumasara, Budapahar, Lalma, Ranjisarwa, Lahanda, Kolighat, Gudhiali, Hatibandha, Jarmal, Laing, Datni and Datarampur etc. The crop is open and mostly in bushy form. The tree species are struggling for their existence and show stunted growth due to biotic interference. The species mainly found are *Chloroxylon swietenia, Cleistanthus collinus, Terminlia tomentosa, Diospyros melanoxylon, Shorea robusta, Zizyphus xylopyra, Gardenia gummifera, Bowsellia serrata and Nyctanthes arborestis*. Some blocks with bamboo are seen but they are mostly in bushy form due to repeated cutting. The clumps have turned to look like umbrella with its rhizomes raised above the ground forming a small mound. Mostly unpalatable dry grasses are found. Regeneration is very poor.

5. B C2 / E 9- DRY BAMBOO BRAKES

Dendrocalamus strictus is more commonly found in this Division. *Cephalostachium purgracile* bamboo occurs along a few perennial nalla in Chirobeda, Jamkani forest blocks. The forest where this species occurs is a woody tract and are put under type 1 and 2. The presence of bamboo is found as pure crop and about 60 percent of the crop is met within Hemgir areas. Salia bamboo occurs sporadically in certain compartments of South Chirobeda RF, Kukuda, Chelgudri compartment of Dhangerigudi RF, and Chhatamb RF etc. The regeneration of indigenous species is hindered due to repeated fire and grazing. Due to this phenomenon the soil layer which is being washed down further make it difficult for the tree species to establish on ground. But for a bamboo the little soil is enough to establish itself. The common associates of bamboo in this type are *Cleistanthus collinus, Madhuca latifoli, Pterocarpus marsupium Sterculia urens, Solmalia malabarica, Diospyros melanoxylon and Shorea robusta*.It is worthwhile to mention here that during 1939-40 there was semi-gregarious flowering and since then no such phenomenon have been recorded in the divisional records.

2.2.3 CONDITION OF THE CROP

The blocks of Sundergarh Forest division can be divided into four types basing on the extent of degradation. The four types of forests found are as follows.

2.2.4 GOOD FORESTS

The degradation has started although the forest is prone to illicit felling. The factors like uncontrolled grazing, forest fire and encroachment are not rampant. Still there are many reports of illicit felling. The blocks which belong to this category are Dhanubans, Garjanpahad and South Chirobeda. Density is about 0.6-0.8.

2.2.5 PARTIALLY DEGRADED FORESTS

These forest blocks are degraded and the crown is open at many places. The two main factors are illicit felling and grazing. The other factors are encroachment; old extraction paths and soil erosion contribute to the degradation. Few blank patches are present in these blocks and some areas may be termed as completely degraded forest. The forest blocks that belong to these

categories are Haldipani, Rutukupedi, Sunaparbat and North Chirobeda. Density varies from 0.5 to 0.6.

2.2.6 HIGHLY DEGRADED FORESTS

These forest blocks are in advanced stage of degradation. Forest canopy is open at large number of places. Blank patches are common. The undergrowth is dense and mostly covered with weeds. All types of erosion are present. The factors responsible are heavy illicit felling, uncontrolled grazing and encroachment besides quarrying and soil erosion. The blocks belonging to this category are Ghoghar, Mahabir, Kumaria, Bandomunda and Santoshpur etc. Density varies from 0.3 to 0.5.

2.2.7 FULLY DEGRADED/SCRUB FORESTS

The canopy is generally open. Most of the areas have non-forest but blank patches. Even the under growing stills and rocks are exposed. The flora consists of scrubs of hardy and thorny species. Heavy soil erosion and grazing takes place. Some patches have become unfit for grazing. Even the root stocks are not available at some places. The blocks of this category are Lahanda, Kalighat, Lamki, Patipahad, Banglopahad, Bhursulia, Pathuria & Datarampur etc. The density varies between nil vegetation to 0.3.

2.3. REGENERATION STATUS

Regeneration survey has been carried out in 132 forest blocks of the Division as mentioned below along randomly selected grid lines of 100 mts length. 50 Nos. of quadrants of 4 sq. meters each was laid on either side of the grid line and enumeration of established, woody, whippy and recruit regenerations were completed. The established, woody, whippy and recruit seedlings were given each a numeric value of 5, 4, 2 and 0.5 respectively and the value of all the 50 quadrants were added to determine the status of regeneration which is shown in the following table. Presence of either established or woody is considered sufficient for scoring a quadrant. Regeneration Survey has been done in 132 blocks of this Division and Range wise regeneration status of different blocks is presented in Table below:

Regeneration Survey					**Regeneration Status**			
Name of Range	**RF**	**PRF**	**DPF**	**Total**	**Range**	**Score**	**Status**	**Symbol**
Rajgangpur	31	6	13	50	**Rajga-ngapur**	201-250	Established	E
Kuarmunda	36	2	19	57	**Kuarm-Unda**	0-50	Deficient	D
Bisra	17	1	07	25	**Bisra**	151-200	Good	G
Total	**84**	**9**	**39**	**132**				

The regeneration survey shows that excellent regeneration is coming up in Bisra Ranges. It is moderate in Rajgangpur range and it is less in Kuarmunda Range. Details of Regeneration Survey are given in Annexure 10(Page-81, Vol-II).

2.4 FOREST HEALTH

The health of Forest blocks according to density i.e. dense, open, scrub is given in the following table.

Sl. No.	Range	Name of the Forest Block	Density	Type of the forests dense/open/ scrub	Remarks
1	Kuarnmunda	All blocks	0.1 to 0.3	Scrub	Deficient
2	Bisra Rajgangpur	-do-	0.5 to 0.7	Dense	Good and established

The regeneration survey indicates the presence of good root stocks of various species which can be taken into consideration before taking up plantations. This also indicates soil fertility status and potentiality of each forest block.

2.5 FLORISTIC DIVERSITY SURVEY

The biodiversity survey has been taken up in all forest blocks to develop the quantitative base line. Biodiversity indices of forests of the division have been calculated. The index is "modified Simson's Florostic Diversity Index". The survey aims at calculation of maximum diversity in the area.

Methodology

The biodiversity survey was conducted in all forest blocks of the division. These forest blocks represent all the four types of forests mentioned earlier. Good forest (b) Partially Degraded Forests (c) Highly degraded forests and (d) Scrub Forests. Random sampling techniques have been adopted for the biodiversity survey. Three samples in most of the forest blocks were laid out. The size of each sample was 20 mt X 20 mt, for the enumeration of all the trees above 30 cm girth and 10 mt X10 mt. sample size for species below 30 Cm. girth including all shrubs, herbs, climbers and grasses. The help of local villagers was taken for identification of species for total enumeration. The calculation was done on the basis of modified Simpson's Floristic Index Diversity Formula. $D = 1 - \Sigma (n/N)^2$. The floristic diversity index comes to 0.98282591. The abstract of Floristic Index of forest blocks is furnished in Annexure 11(Page-84, Vol-II).

2.6 PLANTATIONS RAISED IN THE DIVISION

Plantation target during the last plan period was 21,910 Ha but achievement was to the tune of 14,980 Ha only and it was not done in the prescribed blocks as per the plan. Exotic species like Teak, Acacia were raised in the Division along with species like Asan, Arjun, Sisoo, Cassia, Bija, Gambhar etc. M.F.P. species like Bamboo, Sisal, Neem, Karanja, Anla etc. have also been planted but to a limited extent. Other wings like O.F.D.C. Ltd. (plantation wing), Social Forestry Project Division have taken up plantations in this Division. They have resorted to planting of Acacia and Cassia mainly. List of plantation raised in different R.Fs of this Division since 1981-82 to 2000-2001 is given in Annexure-12 (Page-91, Vol-II) Most of the plantations raised by other wings are not in proper condition and are surviving only as coppice shoots with stunted growth. Subsequent silvicultural operations have not been carried out probably due to resource crunch. Plantations taken up under protection of J.F.M.C have shown better results. Natural regeneration of

indigenous species is noticed in many sites of the plantation areas. However, existing plantations need improvement through proper protection and post- planting silvicultural operations. Detailed list of Old Plantation of Rourkela Division is given in Annexure 13 (Page-92, Vol-II).

2.7 INJURIES TO WHICH THE CROP IS LIABLE

The main injuries to which the crop is liable are as follows:

2.7.1 HUMAN AGENCY

Human being are directly as well as indirectly responsible to a great extent for depletion and degradation of valuable forest of this Division through illicit felling, uncontrolled grazing, girdling, lopping, fires and encroachment of forest land etc. A good number of forest blocks of Panposh, Rajgangpur and Kuarmunda Range are surrounded by thickly populated villages where poverty and unemployment is common feature. The poor people of these villages are fully dependent upon the forests for meeting their requirements of firewood, fuel, timber and NTFP.

Increasing population of these villages coupled with wide spread poverty and unemployment is exerting more and more pressure on the adjoining forests and as a result causing the gradual depletion and degradation of the forest. Gradually more and more local people are resorting to illicit felling and removal of forest produce for domestic and trading purposes. They are viewing the forest as a source of earning easy and quick money. Entry of some intermediaries having vested interest, which are involved in illegal commercial trade of timber, has further accelerated the illicit felling and removal of forest produce.

The incidence of illicit felling and removal is prevalent in almost all the forest blocks of this Division. In Bamboo growing areas of this Division, there is heavy illicit removal of juvenile bamboo shoot for food and trade purpose. This pernicious practice has already caused severe damage to the bamboo forests in many places of all Ranges. Human agency has affected adversely the ecology and environment of forests of this Division and the pace of depletion and destruction of valuable forest resource is increasing. List of supply of railway sleepers is given in Annexure 14 (Page-93, Vol-II).

2.7.2 FIRE

During dry weather, i.e. from March to middle of June most of the forest areas of this Division are prone to fire hazards. The forest fire has already become regular phenomenon and most of the forests blocks are severely affected from it. Annual repeated fires are causing damage both directly and indirectly to the forests .It burns leaves and other residues lying on the forest floor and destroys microbial population of the soil. It is one of the main factors responsible for the mortality of seedlings, saplings and even of pole size crops. It also makes trees unsound and hollow and is responsible for desiccation and hardening of the soil which accelerates the process of soil erosion. It is responsible for increasing dryness of the tract which in turn gives way to the intervention of weeds, grasses and xerophytic fire hardy species. It is responsible for whippy and

sub-whippy stages of Sal regeneration and its dying back phenomenon; Setting of forest fire is mostly intentional and rarely accidental in this Division. The list of fire damage report is given in Annexure 15 (Page-95, Vol-II).

The fire hazard is a great problem of this division. Every year a lot of ground regeneration is damaged severely due to ground fire, which leads to devastation of the forest. Hence modern equipments for forest fire and mobility of staff with vehicles is very much necessary especially during summer season. Intensive motivation and organizing VSS co-ordination meeting can bring awareness among citizens regarding fire hazards. The main factors responsible for causing fire in the forests.

(i) Setting fire in beginning of dry season in the forest floor for clearing ground for collection of mohua flower.

(ii) Setting fire for increasing production of young tender kendu leaves.

(iii) Setting forest fires in forest areas by the tribal during the summer season for driving wild animals for poaching purpose.

(iv) Setting accidental forest fire by the labourers camping inside the forest due to their carelessness and by the local people carrying torches during night time.

(v) The poachers put fire in certain forest blocks to drive animals to other forest blocks with intentional ill-motive.

A sizable amount has been spent every year under fire protection which includes cost of extinguishing fire in the forest, engaging fire Watchers and signage etc. The details of the forest affected by the fire each year is not available. However, the year wise money spent under this head is given in the following table:

2.7.3

1979-80	4000	1991-92	40000
1980-81	9921	1992-93	39999
1981-82	10020	1993-94	40000
1982-83	10000	1994-95	40000
1983-84	13985	1995-96	40000
1984-85	15000	1996-97	40000
1985-86	15000	1997-98	10000
1986-87	40000	1998-99	30000
1987-88	29990	1999-2000	23214
1988-89	30000	2000-01	20000
1989-90	28900	2001-02	15998
1990-91	35000		

ANIMALS

Severe damage is caused to the forest crop due to the grazing by domestic animals. Like human population, the population of the domestic animals has also increased over the years causing pressure on the division. It is observed that large herds of cattle, buffallows, goats and sheep are kept by the villagers for their domestic requirements. The villagers spend negligible amount for the maintenance of their domestic animals and animals are left loose for grazing and browsing purpose inside forest areas. This uncontrolled grazing and browsing in the forest area causes severe damage to the forest vegetation. Excessive grazing is also one of the factors affecting

adversely natural regeneration and establishment of seedlings of Sal and others species. In some of the forest areas adjacent to the human habitations, uncontrolled and excessive grazing has led to the replacement of mesophytic flora by relatively more xerophytic, dry and thorny types of vegetation. In some places it has exposed forest floor and made it prone to soil erosion. The incidence of grazing is more in the forest areas of Kuarmunda Range while it is less in other Ranges.

Except south and north Chirobeda, Jharbeda, Bhainsamunda some remote blocks like Chhatamb and Sagjore rest all blocks are heavily grazed. Although the grazing rules have been prescribed but in the absence of sufficient UDPF there is hardly any thing left for the cattle. So the R.Fs have to bear the pressure. Strict adherence to grazing rule is now felt essential. The cattle population of Rourkela Division stands at almost 10 lakhs as per 1995 census in comparison to 8 lakhs of human population as per 1991 census. Hence per capita cattle population comes to 1.2. This may be slightly higher due to four years gap in both census operations. Such a huge population of cattle depends on forests for grazing. The stall feeding concept is only for cross breed animals which is only 0.74 % of total cattle population.

Severe damage to young seedlings is caused by grazing and particularly the goats eat away even unpalatable and thorny species. Trampling by cattle hardens the soil which hinders regeneration. Lopping of fodder species also degrades the growth of forest. On the whole, cattle grazing accelerate the process of degradation of the forests. Revenue collected from grazing in this Division during the last plan period is provided in the following table for better understanding of the quantum of grazing which needs to be discontinued for protection of forests.

REVENUE ON GRAZING

Year	Amount	Year	Amount
1979-80	11.891.50	1990-91	6,579.60
1980-81	19,822.13	1991-92	3,736.00
1981-82	20,021.65	1992-93	5,528.15
1982-83	13,302.75	1993-94	6,756.10
1983-84	9,125.30	1994-95	3,409.85
1984-85	12,009.05	1995-96	2,944.00
1985-86	11,156.85	1996-97	3,442.20
1986-87	7,557.00	1997-98	669.00
1987-88	5,465.50	1998-99	289.00
1988-89	7,551.10	1999-2000	185.00
1989-90	3,967.25	2000-01	0

Sub-Division wise 15th quinquennial live stock Census-1995					
	Sundargarh Sub Division		**Panposh Sub Division**		
Sl. No. Category	Rural	Urban	Rural	Urban	Total
1. Cow (a+b)	55001	5535	57912	9580	228028
(a) Cross Breed	4608	1443	1838	6211	
(b) Indigenous	150393	4092	56074	3369	
2. Cattle (a+b)	366081	8929	14839	3413	536818
(a) Cross breed	6523	1772	2155	7039	

	(b) Indigenous	359558	7157	146240	6374	
3.	Buffallow	27378	1151	14545	5639	48713
4.	Sheep	21110	85	29069	404	50668
5.	Goats	468001	4249	90519	6257	56902
6.	Pigs	38903	1268	29499	1779	71449

(Source: D.S.O.Sundergarh)

2.7.4 (a) INSECTS: The damage caused to the natural forest vegetation and to the plantation by defoliators, borers and other insects appears to be very less. The Sal wood borer (*Holocerambyx spinicornis*) is the only heart wood borer found in dead and diseased Sal trees and in unbarked logs. Green healthy trees are rarely attacked**.**

(b) LORANTHUS: The parasite is noticed in few Sal trees but the incidence and intensity of the attack is neither serious nor wide spread.

(c) FUNGI : Dry rot is prevalent in the forests of Rourkela. However, in most cases the rot is confined to only a few feet from the ground and damage caused by it is less.

(d) CLIMBER: There is considerable damage to the pole crop of Sal and other species due to climber attack. As such the climbers are in abundance in all parts of the division. Their incidence is much heavier in most regions of the Division. The common climbers available are *Acacia piñata, Combretum decandrum, Bauhinia vahlii, Milletia auriculata, Smilax microphylla* and *Butea superba*. The menace of climber is increasing day by day as very less climber cutting operations have been carried out in the past.

(e) WEEDS: *Eupatorium odoratum* is the main weed adversely affecting the growth of forest vegetation. Its attack is more in PRF. Weeds have also come up in the areas which were subjected to continuous heavy grazing by domestic cattle. *Lantana camara* is another weed whose impact is more in Kuarmunda and Rajgangpur Ranges.

2.7.5 CLIMATE

(i) DROUGHT: The forest of this division except the moist blocks are exposed to severe drought due to the fact that rainfall is experienced only within span of about 3 months. Drought helps forest fires to occur and hinders establishment of seedlings.

(ii) WIND: Strong wind storms are generally experienced during the month of April, May and June and sometime in the October but their adverse affect is very much localized and extent of damage is negligible. However, some damage occurs at irregular intervals when the intensity of cyclone is severe.

(iii) FROST: Damage due to frost is rare in winter season. It is not severe to cause substantial damage to the forest crops.

2.7.6 ILLICIT FELLING

It is the worst form of damage to crops. At places due to illicit felling particularly the very character of vegetation has changed. Sal forests now present miscellaneous look as Sal trees have been the target of illicit removal. Many small blocks have been reduced to bushy forests. In case of remote forests like South and North Chirobeda, Jharbeda it is no less rampant. Removal of

young bamboo shoots (karadi) for food is very rampant in this Division which hinders great deal in the production of bamboos. Besides trades on bamboo, mat making is a cottage Industry in this Division. Formerly it was only limited to Turies, Betras, Dhanwar tribes only, but now there is no such class barrier. Anybody can follow this occupation and the young bamboos particularly one year old are chosen. Rourkela Town and Kuarmunda Range are highly prone to illicit felling and smuggling of Timber and also highly problematic in the sense of protection. Presence of Saw Mills in township area along with good road communication facility increases illicit removal of timber. Effective steps have been taken by the Divisional staff to check illicit removal of timber but these are much less in comparison to the vast quantum of illicit removal. Offence cases booked in this Division during last 7 years has been given in tabular form for easy understanding of this problem.

OFFENCE CASES BOOKED								
Year	**U/s - 56**	**P.R.**	**Others**	**Total of O.R. Cases**	**U.D. Cases**	**Offence Cases**	**O.R. Cases**	**U.D. Cases**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
95-96	70	148	-	5008	514	5740	4985	461
96-97	78	198	-	5597	335	6208	5562	317
97-98	90	210	-	4774	383	5457	4754	334
98-99	98	152	-	4482	341	5073	4472	315
99-00	123	190	-	5268	410	5991	5243	362
00-01	123	120	-	4822	480	5553	4792	448
01-02	138	151	-	3685	494	4468	3618	437

(Source: D.F.O.Sundargarh)

The general problems are as under:

1. Lack of adequate number of staff.
2. Lack of adequate instruments like jeep, motor cycle, van etc and lack of funds for their maintenance.
3. Lack of adequate funds for repair and maintenance of Govt. quarters in the interior pockets of this Division.
4. Lack of modern arms & ammunitions with the field staff.
5. Inadequate allotment of funds under T.E to meet traveling expenses for frequent touring
6. Lack of Refresher Course training for Sub-ordinate staffs.
7. Lack of communication facilities like walky-talkies V.H.F etc at Beat and Section headquarters.
8. Low rate of conviction by the Court.

All these facts may be considered at appropriate level and proper action should be taken to tackle this menace. Illicit Felling Survey was done in 277 Forest Blocks of Division.

2.7.7 ENCROACHMENTS

The Division is seriously affected by this menace. Except forest on western parts i.e. North Chirobeda, Jharbeda, Bhainsamunda, Rangamatia, Sagjore, Chhatamb, the encroachment for both dry and wet cultivation is rampantly being practised since long. People from neighboring districts of Chhatishgarh and Jharkhand used to encroach into reserved forests with the help of their relations inhabiting this Division. Some middle men at times used to take the advantage of the

situation and induce others to go for encroachments. It is observed that the valley portions adjoining to perennial streams are mostly affected by this menace. List of Post-1980 encroachments ars given in Annexure 16 (Page-96, Vol-II).

2.7.8. WILD ANIMALS

The damage caused by wild animals is very less except elephant problem which causes loss to crops and human beings.

2.7.9 FAMINE

Famine is not experienced. These areas do not have sufficient irrigation facility and agricultural practices are dependent upon the rains.

2.7.10 FLOOD

Flood is not experienced. Except localized once of very short duration usually the banks of big nalla are affected. The damage to crop is rather negligible. The main attributing factors of these floods are the denudation of hills plateau of adjoining portions.

2.7.11 SOIL EROSION

Soil erosion in all its manifestations starting from sheet erosion to gully erosion including land slide and land slip are met with in the Division particularly in Hemgir area due to sedimentary rock formation and high table lands. The main contributing factors for soil erosion are:-

(1) Large scale deforestation on the hill slopes particularly in the central part of the Division.

(2) Besides, in the lime stone quarry area where the mining has been completed no measures have been taken to consolidate the soil.

(3) The encroachment into the forest at steep slopes i.e. areas actually unsuitable for cultivation are encroached for shifting cultivation.

(4) Improper method of cultivation by the aboriginals inside Division and by outsiders poses a serious problem of soil erosion. The problem is acute in plain forest areas.

PART-I
CHAPTER-III
UTILISATION OF THE PRODUCE

3.1 AGRICULTURE CUSTOMS AND WANTS OF THE PEOPLE

3.1.1 DEMOGRAPHIC FEATURES

As per census report, 2001 the total population of this District is 7,69,566 out of which 61046 belong to S.C and 350338 to S.T. The male constitutes 52.6% of the total population. The sex ratio is 931 women per 1000 men. The rural population account for 49.1 percent of total population. The list of census data of Sundargarh District is given in Annexure 17 (Page-99, Vol-II). The detailed block wise population data is given below.

DETAILED BLOCK-WISE AND SEX-WISE DISTRIBUTION OF POPULATION (2001 census)

Sl. No.	Name of Block/ Town RURAL	SC			ST			OTHERS			TOTAL
		Male	Female	Total	Male	Female	Total	Male	Female	Total	
1	2	3	4	5	6	7	8	9	10	11	12
1	Bisra	1606	1560	3166	13781	13599	27380	8171	7793	15964	46510
2	Kuarm-unda	2026	2063	4159	28498	28283	56781	5511	5024	10530	71475
3	Kutra	2324	2233	4557	24134	24212	48386	5577	5301	10878	63781
4	Lathikata	1766	1664	3430	23388	23057	46445	7418	6509	13927	63802
5	Nuagaon	2992	2936	5928	25733	26084	51817	11527	10857	22384	80129
6	Rajgang-pur	1800	1794	3594	27989	28332	56321	3237	2652	5889	65804
	URBAN										
1	Panposh (C.T)	273	273	546	2338	2239	4577	2318	2123	4441	9564
2	Rajgang-pur (M)	1565	1339	2904	4654	4986	9640	14776	12229	27005	39549
3	Rourkela (M)	5586	4920	10506	9590	8532	18122	62681	49099	111780	140408
4	Rourkela (S.T) NAC	11811	10445	22256	15985	14884	30869	89984	72400	162384	215509
	Total	**31749**	**29227**	**61046**	**176090**	**174208**	**350338**	211200	173987	385182	796566

(Source: D.S.O. Sundergarh)

DENSITY OF POPULATION

The density of population comes to 188people per square kilometer. The low density of population is due to availability of extensive agricultural land, medium and small scale industries and large tract of forest area. Among the scheduled tribes Kisan, Oram, Dhanuar, Munda, Kharia and Routia are predominating and they confined mostly to tribal pockets scattered though out the Division. The population growth is increasing rapidly and its pressure is felt on encroachment of forest land, destruction of forest cover, poaching and conversion of forest land into agriculture land.

3.1.2 DISTRIBUTION OF VILLAGES, TOWNS AND HOUSEHOLDS

The census reveals 1148 number of revenue villages in the combined Division out of which 1128 number is inhabited and 20 numbers is un-inhabited. There are 252,218 nos. of household. There are 135 numbers of Gram Panchayats and 6 numbers of towns in the combined Division. The detailed block-wise distribution of villages, households etc are given below.

DISTRIBUTION OF VILLAGES, TOWNS AND HOUSE HOLDS

Sl. No.	Name of C.D Block / Town	No. of Gram Panchayat	No. of villages		Total	No. of residential house	No. of house holds
			Inhabited	Un Inhabited			
	RURAL						
1	Bisra	10	68	1	69	8834	8871
2	Kuarmunda	11	105	2	107	12079	13546
3	Kutra	9	58	-	58	11591	11936
4	Lathikata	15	82	1	83	12018	12109
5	Nuagaon	15	119	1	120	14744	1518
6	Rajgangpur	9	70	2	72	10660	12013
	Total	**69**	**502**	**7**	**509**	**69926**	**59993**
	URBAN						
1	Panposh (CT)	-	-	-	-	1910	1910
2	Rajgangpur(M)	-	-	-	-	8005	8147
3	Rourkela(ST) NAC	-	-	-	-	44994	45363
4	Rourkela(M)	-	-	-	-	29352	30004
5	Kalunga Industrial Estate	-	-	-	-	2561	2645
	Total	-	-	-	-	**86822**	**88069**

(Source: D.S.O.Sundergarh)

3.1.3 OCCUPATIONAL STRUCTURE

The census shows that there are 5, 08,805 workers in this Division out of which 88,233 are marginal and 4,20,572 are main workers. Among the total main labour population, male workers are 84.40 percent while male labour percentage among marginal workers are 9.18 percent. The workers are mainly engaged in cultivation, industries, trade, commerce and transportation. The detailed Block-wise and Sex-wise distribution of labour force is furnished below in a tabular form.

TOTAL NUMBER OF MAIN WORKERS, MARGINAL WORKERS BY SEX IN DIFFERENTBLOCKS AND URBAN AREAS

Sl. No.	Dist./Block/ Urban	Total workers			Main workers			Marginal workers		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Rural									
1	Bisra	13005	5569	18574	12190	2360	14550	815	3209	4024
5	Kutra	17174	8700	25874	16692	3302	19994	482	5398	5880
6	Lathikata	17402	6872	24274	17077	2732	19809	325	4140	4465
8	Nuagaon	22950	14012	36962	21864	5413	27277	1086	8599	9685
9	Rajgangpur	18019	9231	27250	17494	3512	21006	525	6036	6244

13	Kuarmunda	19390	9197	28587	18645	4031	22676	745	5166	5911
	Urban									
1	Biramitrapur (M)	7715	1921	9636	7686	1879	9565	29	71	42
2	Hatibandha (T)	2176	216	2392	2108	201	2309	68	15	83
3 (i)	I.D.I Factory & Other colony (OG)	1484	257	1741	1456	144	1600	28	113	141
(ii)	I.D.I Factory & Other colony (OG	256	234	2800	2556	226	2782	13	5	18
4	Jalda (T)	3007	455	3462	2863	420	3283	144	35	179
5	Kalunga Industrial Estate (O.G)	3650	326	3976	3638	309	3947	12	17	29
6	Panposh (C.T)	2280	216	2496	2264	179	2443	16	37	53
7	Rajgangpur (M)	10508	1557	12065	10432	1168	11600	76	389	465
8	Rourkela (M)	39718	3817	43535	39543	3682	43225	175	135	310
9	Rourkela(ST) NAC	35037	5186	58223	52512	4818	57330	525	368	893
	Total	**363099**	**145706**	**508805**	**354996**	**65576**	**420572**	**8103**	**80130**	**88233**

(Source: D.S.O. Sundergarh)

THE DETAILS OF BLOCK/TOWN WISE AND PROFESSION WISE DISTRIBUTION OF MAIN WORKERS IS FURNISHED IN THE TABLE
(Classification of main workers in different blocks and urban areas)

Name of the Block /U.L.B	**Cultivator**	**Agricultural Laborers**	**Livestock forestry fishing hunting & plantation orchard & allied**	**Mining and quarrying**	**Manufacturing processing servicing and repairs in house hold industries**	**Other than house hold**	**Constructions**	**Trade And Commerce.**	**Transport, Storage and Communication**	**Other services**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Bisra	7447	2223	243	98	436	1269	92	645	1129	968
Kuarmunda	12594	4664	187	689	606	1520	249	394	216	1557
Kutra	12047	3020	75	1984	500	317	90	558	164	1239
Lathikata	9593	2655	267	405	471	3815	145	634	248	1575
Nuagaon	16758	4488	81	2154	527	562	86	576	200	1845
Rajgangpur	10983	2979	494	762	689	2524	153	275	218	1929
Urban										
Biramitrapur	1027	572	100	3560	204	488	131	1520	526	1447
(M)										
Hatibandha (CT)	186	204	13	6	39	1030	49	184	37	561
(i) I.D.L.	38	67	16	26	46	610	210	149	77	361
Factory &	**Other**	**colony**	**Area (OG)**							

(ii) I.D.L.	15	17	4	13	30	2053	70	131	58	391
Factory &	**Other**	**colony**	**Area (OG)**							
Jalda (C.T)	224	362	3	264	26	1360	48	204	63	729
Calunga	645	341	162	3	21	1468	69	505	148	585
Industrial	**Estate**	**(OG)**								
Panposh (CT)	424	101	26	2	18	1254	33	68	37	480
Rajgangpur	652	346	133	25	208	3907	315	2091	591	3432
Rourkela (M)	327	202	686	83	406	9631	2565	10586	8451	10281
Rourkela	**(ST)**									
N.A.C.	633	867	836	54	529	29609	1880	6182	3401	13339
Total	**151308**	**70120**	**4617**	**11009**	**980**	**63690**	**6670**	**29097**	**16263**	**57994**

(Source: D.S.O. Sundergarh)

3.1.4 L I T E R A C Y R A T E

According to census figure there are 698,935 literate persons within this Division out of which 440,907 are male and they constitutes 69.08 % of total literate population while the female literacy percentage is 30.92 %. The detailed block wise and Sex wise literacy chart is provided in the following table.

DETAILED BLOCK-WISE AND SEX-WISE LITERACY RATE

Sl. No.	Name of C.D. Block/ Towns	No. of Male Literate	No. of Female Literate	Total literate(Male + Female)	Percentage of Literacy
1	**2**	**3**	**4**	**5**	**6**
1	B i s r a	12766	5763	18529	39.84
2	Kuarnmunda	18345	9394	27739	38.80
3	Kutra	17949	9644	27593	43.26
4	Lathikata	17875	8282	26157	41.00
5	Nuagaon	20239	9315	29554	36.87
6	Rajgangpur	15816	7591	23407	35.59
	URBAN				
1	Panposh (C.T)	3815	2849	6664	69.68
2	Rajgangpur	16741	11264	28005	70.68
3	Rourkela (M)	65221	40889	106110	75.57
4	Rourkela(ST)NAC	101679	68273	169952	78.86
5	Kalunga Industrial	11215	8450	19665	55.93
	TOTAL	**440907**	**258028**	**698935**	-

(Source: D.S.O. Sundergarh)

3.1.5 LAND USE PATTERN AND CROPPING PATTERN

The census shows density of 196 persons per sq k.m. whereas the per capita forest area is about 0.00142 hactares. 48 % of total population is scheduled tribes belonging mainly to Oram, Munda, Kharia, Dhanuar and Routia whereas 9 % are scheduled caste. The size of land holding by them is small and comes to below one acre per person at many places. The Agarias are the pioneer among the people practising agriculture. Kultas are ancient agriculturist. In the Industrial areas the main labour force of young and able bodied male and female are drawn towards the industries and mining. Agriculture is practiced by people who own the land and can't afford to keep it fallow. The agricultural technique is of primitive type. The Agharias though a little bit advanced are far behind

the labourers of adjoining Sambalpur District. This is mainly due to lack of irrigation facility. The river system in this Division is such that it is not possible to construct big irrigation projects. The other alternative i.e. lift irrigation is yet to take lift in this regard.

Crops like rice, maize, wheat, arhar, kulthi, millet, jawar, ragi and oil seeds like til, groundnut are cultivated. Sugar cane is grown in a limited area and it is mainly used in preparation of gur (raw sugar). Rice production is much less because it is fully dependent upon unpredictable rain. Industrial and mining operations in this Division cause lot of food scarcity for which rice is imported from Sambalpur. Requirement of forest produce by the local people are mainly firewood for fuel, timber big and small. Though firewood is compensated by gas in urban area, it still has its importance in the rural areas where it is the cheapest and readily available cooking fuel. The land is mostly utilized for one crop and rarely for two crops every year. The irrigation facility is not available and agriculture is dependent upon monsoon.

3.2 PEOPLES NEED FOR FOREST PRODUCE

There is huge gap in demand and supply of forest materials in urban area. The urban area meets the supply of fuel with gas, kerosene and electricity but rural population depends fully upon forest for fodder, fuel and firewood. People depend on forest in many ways. Various forest products e.g. timber, bamboos, thatch grass, and fibers are used in their house construction. Economically well off people use timber for door, windows, beams, and furniture. The rural poor use timber and bamboos for beams and other supports, grass is used for thatching of roofs, small timber is used for cots, furniture, carts and other agricultural implements. Firewood remains the main source of domestic energy and even valuable species like teak are used for this purpose. Poles and saplings are used for fencing homestead lands and field. Cattle graze in forests for more than ten months a year. People collect a variety of non-timber forest product (flowers, seeds, barks, fibers, fruit and leaves) from the forests and several medicinal plants find use in local health traditional uses in rural areas.

Forests are being exploited due to increase in human and cattle population. The increasing demand of various forest products by urban population and changing life style is putting enormous pressures on forest. Heavy incidence of poverty and other unfavorable socio-economic conditions in rural areas also compel people to extract more and more from forests. Most rural families, particularly those below poverty line, fall back on forests for their sustenance for 8-10 month every year. Collection of timbers, firewood, bamboos and several NTFP items, including Kendu leaves, Mahua flowers and seeds, Sal seeds, siali leaves and fibers are undertaken by many families. Forestry sector also provides labor work to many families.

Domestic energy requirements are mostly met from forests. According to one estimate, total annual requirement of fire wood alone for the entire Division is approximately 50 lakh quintals. As availability of firewood from legal means is extremely limited, must of the firewood, timbers and other removals are illegal. It has been estimated that value of forest produce illegally removed from forest of this division is about Rs. 50 crores per year. Main timbers species used by ocal people for a variety of purpose are given in table.

Principal Timber species locally used

Sl. No.	Botanical Name	Oriya Name	Uses
1.	*Mitragyna parviflora*	Mundi	Planks
2.	*Shorea robusta*	Sal	Building purpose, sleepers, cart frame, plough etc.
3.	*Pterocarpus marsupium*	Piasal	Doors, window shutter, planks and furniture.
4.	*Ougenia ougenensis*	Bandhan	Wheels cart.
5.	*Madhuca indica*	Mohul	Cattle troughs
6.	*Dalbergia latifolia*	Sisoo	Furniture
7.	*Grewia tilaefolia*	Dhaman	Axe handle, cross pick, cart frame.
8.	*Gmelina arborea*	Gambhari	Furniture
9.	*Diospyros melanoxylon*	Kendu	Beam rafters
10.	*Anogeissus latifolia*	Dhaura	Axles and plough
11.	*Adina cardifolia*	Haland	Rafter, planks, furniture
12	*Terminalia tomentosa*	Asan (Sahaj)	Buidling purpose
13.	*Chloroxylon swetenia*	Bheru	Fancy box, yolks and axe handle.
14	*Cleistanthus collinus*	Karada	Rafters in house buildings, bark for tanning.
15.	*Soymida febrifuga*	Rohini	Cattle trough, agricultural implements
16.	*Terminalia arjuna*	Arjun	Bark used for tanning, tassar being reared on these plants.

3.3 NON-TIMBER FOREST PRODUCTS

3.3.1 No study has been done so far to quantify the NTFPs of the division, even the qualitative assessment of different NTFPs in different forest areas is lacking. During the present revision of the plan attempt has been made to record commonly available NTFP species while conducting strip sampling for crop enumeration. Criteria as shown in Table have been used for representing the availability status of NTFP in different forest blocks.

3.3.2 Criteria for NTFP availability status

Sl. No.	Plants/ Ha	Availability status
1.	More than 800 plants per ha.	Abundant
2.	Between 400 to 800 plants per ha.	Good
3.	Less than 400 plants per ha.	Sparse
4.	No NTFP plants available	Nil

Further a survey was conducted in different villages of this division to ascertain the order of preference given by the local people to NTFP items and the average earning per family in a year. The results are shown in the table.

3.3.3 Composition of NTFP collection

Name of NTFP items	Weightage on total NTFP collection
1. Kendu leaf	52 %
2. Mohua flowers & Seed	28 %
3. Siali fibre and leaf	08 %
4. Sal seed	07 %
5. Other items	05 %

Survey revealed that an average family of five members earns approximately Rs. 5500 per year from the collection of NTFP items, if all the members of family are involved in the collection. Kendu leaf provides major income up to 55 % to 65 % of the total income from the NTFP collection in a family This income is more important as it comes in lean period between October to May when they are virtually free from agricultural activities. Important fruit bearing trees, fibers, oil, tannin, gum, and resin yielding forest species found in this division are given below on the table.

3.3.4 Important Fruit bearing trees

Sl. No.	Common Name	Scientific Name	Period of consumption	Utilization
1	Amba	*Mangifera indica*	April/May	Ripe fruit are eaten and raw are used for making pickles etc.
2	Anla	*Emblica officinalis*	Oct/April	Fruit is eaten raw and used in pickles
3	Ban Khajuri	*Phaseolus acaulis*	May/June	Ripe fruit are eaten
4	Ata	*Anona squamosa*	July/Aug	Ripe fruit are eaten
5	Barkoli	*Zizyphus jujube*	Jan/Mar	Ripe fruit are eaten and used for making pickles
6	Bel	*Aegle marmelos*	One year after fruiting	Ripe fruits are eaten
7	Bhalia	*Semicarpus anacardium*	June/July	Fruit Kernel eaten and use for pickles
8	Bhursunga	*Murraya koenigi*	Through out the year	Leaves eaten and used in curry
9	Jamu	*Syzygium cumini*	June/July	Ripe fruits are eaten
10	Kadmba	*Anthocephalous cadamba*	October	Ripe fruits are eaten
11	Kaju	*Anacardium occidentale*	March/April	Hypothalamus and seeds are eaten
12	Kendu	*Diospyros melanoxylon*	May/June	Ripe fruit is eaten
13	Kusum	*Schleichera oleosa*	June/July	Flesh of the fruit is eaten
14	Mohul	*Madhuca indica*	May / June	Flowers eaten and used for

				preparation of country liquor, unripe fruit used as vegetable, oil from seeds used for cooking
15	Panas	*Artocarpus integrifolia*	May/Aug	Unripe fruit as vegetable pickles, ripe fruits and seeds are eaten
16	Rai	*Dillenia poentagyana*	August	Young fruits are cooked and eaten
17	Sajana	*Moringa pterigosperma*	Through out the year	Flowers, leaves and fruits used as vegetable
18.	Tentuli	*Tamarindus indica*	Dec/Jan	Fruits, flowers and leaves are used for vegetation.

3.3.5 Important fiber yielding forest species

Sl. No.	Common Name	Botanical Name	Part yielding	Utilization
1	Bamboo	*Bambusa arundinacea*	Stem	Manufacture of paper
2	Bamboo	*Dendrocalamus strictus*	Stem	Manufacture of paper
3	Dhaman	*Grewia tiliaefolia*	Inner bark	Used for rope making
4	Kanchan	*Bauhinia variegate*	Bark	Used as cordage
5	Palash	*Butea frondosa*	Bark	Used for rope making and for boats
6	Siali	*Bauhinia vahlii*	Inner bark	Used as cordage
7	Sisal	*Agave sisalana*	leaves	Used for rope making and weaving mats

3.3.6 Important oil yielding forest species

Sl. No.	Common Name	Botanical Name	Part yielding fibre	Utilization
1	Karanja	*Pongamia pinnata*	seeds	Oil used as medicine, antiseptic, soap making, perfume and leather tanning
2	Kusum	*Schleichera oliosa*	Seed karnels	Oil as hair oil , for cooking, lighting, soap making
3	Mohua	*Madhuca indica*	seeds	Oil used for soap, hair oil, and adulterant for ghee.
4	Neem	*Azadirachta indica*	seeds	Oil used as medicine, for soap making, oil cake as fertilizer.
5	Sal	*Shorea robusta*	seeds	For cooking, lighting soap making in confectionary.

3.3.7 Important tannin yielding forest species

Sl. No.	Common Name	Scientific Name	Part yielding tannin	Utilization
1	Babul	*Acacia arabica*	Bark of tree	Tanning of leather
2	Dhaura	*Anogeissus latifolia*	Dry matured leaves	Dyeing
3	Sunari	*Cassia fistula*	Bark	Blending and tanning of leather

3.3.8 Important gum and resin yielding plants

Sl. No.	Common Name	Botanical Name	Part yielding gum and resin	Utilization
1	Asan	*Terminalia tomentosa*	Stem	Gum used as incense and in cosmetic
2	Genduli	*Stercullia urens*	Stem	Gum karaya, used in confectionary
3	Moi	*Lannea coromandellica*	Stem (thingan gum)	In calico painting, paper and cloth sizing, varnishes and confenctioary, adhesive
4	Piasal	*Pterocarpus marsupium*	Stem (Kino gum)	Used as medicine
5	Sal	*Shorea robusta*	Stem (Oleoresin) Dhupa	Used as an incense and disinfectant, fumigant
6	Salai	*Boswellia serrata*	Stem (Guggal)	Used in incense, curing rheumatism and nervous disorders.

The pasture is not adequately available in most areas. The area where most of the Khesra jungles have been converted into agricultural land, the dearth of pasture is being felt more. The reserved forests generally do not provide good quality grasses due to repeated fire hence the less palatable grasses come up. In the absence of alternatives the live stock used to graze in the forest. This is more or less equally felt throughout the Division. Cattle population has already been described in the last chapter and it is seen that 536,818 nos. of cattle, 48,713 nos. of buffalos, and 71,449 nos. of pigs are available as per census report. Out of all these cattle population about 85 % are totally dependent on near by forest area which poses a great threat to the regeneration of forest species.

3.4 MARKETS AND MARKETABLE PRODUCTS

The main market for the forest products like timber, Charcoal and fire wood etc are Rajgangpur and Rourkela. For kendu leaf there is no market in the Division. For kendu leaf nearest market is Sambalpur. Since Howrah-Mumbai Railway line passes through this Division almost all forest produce are easily transported to different parts of Central and North India. Mohua flower is mostly utilized locally in country liquor distillation. myrobalans, kusum seeds, char seeds, gum (Stercullia and Dhaura) are collected and exported outside. Sal seed is also collected and utilized for oil extraction. The details list of production of kendu leaves under the jurisdiction of Rourkela Forest Division is given in Annexure 18 (Page-100, Vol-II).

3.4.1 DESCRIPTION OF MARKETS

In the past sal was mainly utilized for railway sleeper purpose. As the use of sal for Railway Sleeper has been banned in the State, there is less market for forest timber and other important forest produces. Most of the forest timbers and minor forest produces are exported outside the Division. They are mainly transported to Rourkela and Jharsuguda from where these are

sent to Calcutta, Delhi and other places. Now demand for all varieties of timber has increased in the towns and cities in side and out side the State. The lease of forest produce has been banned in the State and O.F.D.C. Ltd is the marketing agency for timber and firewood extracted from this Division. Bamboo coupes were leased out to O.F.D.C. Ltd in the past and now bamboo working is stopped.. The main marketable products of this Division are timber of various species, Fire wood, Bamboo, Charcoal, Tasar and other minor forest products.

1	Timber
2	Poles
3	Fire wood
4	Charcoal
5	bamboo
6	Kendu leaves
7	Sal seeds
8	Mahua flowers and
9	seeds
10	Siali leaves and fibers
	other N.T.F.P.

1. Timber: Sal which constitutes more than 75 % of total timber production of this Division is the main demand of the present market. Other species like Asan, Piasal, Sisoo, Kusum, Kasi, Senha etc. are marketed in form of logs and poles, scantlings, sizes etc.

2. Poles: Poles of Sal and other misc. species are in huge demand for centering in building construction and mining purposes.

3. Fire wood: Salvaging of fallen and uprooted tree will produce fire wood which has great demand in the industrial markets of Rourkela and Rajgangpur etc.

4. Charcoal: Main consumption of charcoal is for domestic fuel. Goldsmith and blacksmiths use a little quantity. Other charcoal based industries at Rourkela and Kalunga use charcoal to great extent.

5. Bamboo: Salia bamboo is the main species available in this Division. Local demands of bamboos are met from Khesra Forest where as Coupes were being worked by O.F.D.C.ltd and paper Mills. The coupe working has since been stopped as per Govt. decision.

6. Sal seeds: Sal seed is an important item and O.F.D.C. Ltd has been appointed as Agent for collection and marketing of the said produce. The list of production of sal sheeds is given in Annexure-19 (Page-101, Vol-II).

7. Kendu leaves: It is the highest revenue yielding item worked out departmentally through out the Division by K.L. Wing and its marketing is done by O.F .D.C. Ltd. The production of kendu leaves is given in Annexure-20 (Page-101, Vol-II).

8. Other NTFP items: New N.T.F.P. Policy came into force with effect from 31.3.2000 as per Govt. Resolution no.5503/F & E dt. 31.03.2000 and in pursuance to this all MFP items will be exploited by the traders through Gram Panchayats. The N.T.F.P. items like Gums, Lac, Siali fibres, Tassar Cocoons and Sal Seeds will be worked out through O.F.D.C. Ltd. /T.D.C.C. Ltd. / M/S.STSCS Ltd or through other Cooperative Societies of Govt. of Orissa undertaking. For Sal Seeds O.F.D.C. Ltd. and for Tassar cocoons M/S STSCs are sole agents of this Division at present. The annual potential of various NTFP items of the Division is given below:

Sl.No.	Name of N.T.F.P.	Approximate annual potential

(1)	(2)	(3)
1.	Siali leaves	300 M.T.
2.	Mohua flower	5000 M.T.
3.	Tamarind	200 M.T.
4.	Myrobalans	300 M.T.
5.	Broom grass	100 M.T.
6.	Mohua seed	1000 M.T.
7.	Karanja seed	100 M.T.
8.	Kusum seed	150 M.T.
9.	Chakunda seed	100 M.T.
10.	Mango kernel	100 M.T.
11.	Siali fibre	50 M.T.
12.	Gum	10 M.T.
13.	Lac	10 M.T.
14.	Sal Seed	1000 M.T.
15.	Tassar Cocoon (280000 no.)	800 Kahana

Markets and marketable Products

(i) Main marketable products are timber, firewood, bamboos, bamboo basket, Kendu leaf and some NTFP items like Siali leaf and fibres, Mohua flower, Sabai grass, Sal seeds, Harida, Bahada and Nux vomica etc. Timbers of Sal, Asan, Piasal, Sisoo, Mundi, Kasi, Dhaura, and Kendu are delivered to the OFDC Ltd by DFO Rourkela as salvaged and offence case materials. The OFDC Ltd conducts public auction of seized materials to meet the local demand. After the ban on green felling in 1988, no coupe is being worked by OFDC Ltd. and only dead and dry trees are being salvaged in the Division.

(ii) Bamboo is a major source of revenue. It is concentrated mainly in Rajgangapur.

After nationalization of bamboo the OFDC Ltd is working bamboo coupes. M/s O.P. Mills was working as raw material procurer (RMP) of M/s OFDC Ltd and was buying product from the OFDC Ltd. No bamboo working has been done from 1999 to 2004. Long Bamboo is also supplied to the public at concessional rates by the OFDC Ltd.

(iii) Kendu leaf is the highest revenue fetching forest produce in Sundergarh. High quality leaves are available both in Khesra and Reserved Forests. After nationalization in 1973, the Kendu leaves wing of the forest department collects and processes kendu leaves, which are then delivered to the OFDC Ltd.

(iv) Main local markets are Rourkela, Rajgangapur and Bisra.

Local Handicrafts and cottage Industries:

There is very few organized cottage industry in this division. Some local activities depend on forests for their raw materials. These activities include:

(a) Cart making.

(b) Mat making from ban khajuri by local people.

(c) Baskets and mats from bamboos

(d) Brooms from brooms grass

(e) Ropes from grasses, siali fibres for binding of kendu leaf,

(f) Bidi making

(g) Collection of NTFPs like siali leaf, karanja seeds, neem seeds, mahua, sal seeds, char and kusum.

3.5 INDUSTRIES AND OTHER AVENUES

There are few cottage industries like bidi making, comb making, basket making and toy making. Damkurudu, kurum species and bamboos are mainly used for this purpose. Two species of grasses are used in making the brooms. Sabai grass is not available in sizeable quantity. Ropes are prepared from sabai grass which is mainly used in preparing the cot. Lac is grown in this area but the quantity of Lac produced is not much although there are sufficient lac host plants available particularly in Bisra and Kuarmunda Ranges. The lac is not used in this area and it is exported out. Tassar Cocoons are utilized locally. As regards timbers for building constructions, plough heads, carts, agricultural implements, small poles, rafters, bamboos are the chief forest products required by the people. Thatch grass and brush wood is some times used by rural people for house construction. Pot-tiles are commonly used for roofing purpose. Young bamboos of 1 year or more are removed for preparing mats, baskets and small hand fans. Bamboo shoots (Karadi) are eaten by the people. The Betras, Turias, Dhanuars generally cut and use the bamboos at the stump site and the left over bamboos create fire hazard.

3.6 LINES OF EXPORT

3.6.1 RAIL, ROAD AND RIVER NETWORK

The main means of transportation of forest products is the railways. The Division is connected with a network of good road system connected by a number of Village road, Forest roads, State High Way No.10 and MDR-23. The transportation is mainly done by trucks. Occasionally the bullock carts are utilized for transporting Kendu leaf, Mohua flowers and Sal seeds from the interior villages to the market places, road side depots for onward transport by rail or truck. River channels are now obsolete for transport of forest produces though these were used previously for the purpose.

3.7 METHODS OF EXPLOITATION

3.7.1 The exploitation of forest produce was done previously by contractors on royalty basis. But after merger of the Khalsa area annual sale by public auction was introduced. M.F.P. items were leased out for short term leases. Since 1962, O .F. D .C. Ltd was working the annual Coupes on royalty basis. From 1988, annual bamboo coupes were leased out to O .F .D .C .Ltd and from 1993 Paper Mills are directly working the bamboo coupes. From 1973 Kendu Leaf is collected departmentally by Rourkela, Jharsuguda and Kuchinda K.L.Divisions and marketed through O .F. D .C .Ltd. Since 1995 Sal seeds were collected by M/s Utkal Forest Products. Siali Fibres were collected by Rourkela (K.L) Division while Siali Leaf is being collected by T .D. C. C .Ltd. Now as

per Government decision most of N.T.F.P. items are given to Gram Panchayats for collection and a few to private sector as mentioned in the last section.

In this Division, usually tree felling is done by axe and logging and debarking are done at stump site. These logs are then dragged manually or by buffaloes to truck able points from where those are transported to depots. Lops and tops are converted in to fire wood and stacks of size 12' x 3' x 3' are made at convenient places for transportation. The exploitation of timer, bamboo and firewood is generally done by local people and tribals with the help of axe. The exploitation through traditional means leads to wastage of forest materials and destruction of regeneration of young shoots inside the forest.

Bamboo felling is usually done by axe and they are converted in to pieces of 2.3 meters length. 21 such pieces makes a bundle. In case of Daba bamboo each bundle contains 7 pieces each of 2.3 mt. length. These bundles are stacked near truckable points from where they are transported to nearest bamboo depots of O .F. D. C. Ltd. and finally despatched to different Paper Mills of Brajarajnagar. In case of Kendu leaves collection, purchasing and bagging is done departmentally. During processing leaves are graded quality wise and are bundled into 5 kg; each .12 such bundles make a bag and 100 such bags form a lot. These lots are sold by O .F .D. C. Ltd through tender/auction sale.

3.7.2 COST OF EXPLOITATION

Cost of exploitation of various forest produce is given below:

Head of Service	Items	Cost
	Felling, logging and debarking of trees	Rs. 38/- to Rs.40/- per cft.
	Conversion of ballies	Rs. 14.75 per cum
	Passing of timber	Rs. 3/- per cum
	Dragging and stacking of timber in plain areas	Rs. 80/- per cum
	Dragging and stacking of in hilly areas	Rs.150/- per cum
	Felling of hollow trees	Rs.1.50 to Rs.2.00 per foot girth
Production cost of Timber at site	Conversion and stacking of T.L.	Rs.1.50 per place
	Conversion and stacking	Rs.190/- per truck load of 14'x7'x11' (Specific approval of D.M. is required)
	Fire protection	Rs. 10/- per hact.
	Temporary camp shed	Rs.2500/- per camp
	Sundry expenditure (K.Oil, stationeries, coupe marking etc.)	Rs.5/- to Rs.6/- per Camp
	Camp watcher	Rs.25/- per day per camp
	Conveyance expenditure	Rs.4./- per cum
	Construction and repairing of extraction path	Rs. 100/- to 110/- per day
	Spreading, remeasurement, dressing, numbering, stacking of U.D. and salvaged materials during joint verification.	Rs.16/- per cum.
Production cost	Cutting, bundling and dragging	Rs.195/- per sale unit

of Bamboo at site	Construction and maintenance of extraction path	Rs. 62/- per sale unit
	Transport including loading and unloading	Rs. 125/- per sale unit
	Sabai string	Rs. 17/- per sale unit
	Construction and maintenance of camp shed	Rs. 5/- per sale unit
	Fire protection	Rs. 6/- per sale unit
	Cleaning of clumps	Rs. 2/- per sale unit
	Recruitment of labourers	Rs. 4/- per sale unit
	Contingent expenditure	Rs. 4/- per sale unit
Production cost of bamboo at Depot	Site preparation	Rs. 2/- per sale unit
	Rebundling stacking	Rs.10/- per sale unit
	Fire protection	Rs.1/- per sale unit
	Construction and maintenance of Depot shed	Rs.
	Insurance	Rs.6/- per sale unit
	Sabai string	Rs.7/- per sale unit
	Contingent expenditure	Rs.5/- per sale unit
Procurement price	For one K.G. of sal seed	Rs.1.75
Procurement price	For one K.G. of mohua flower	Rs.3/-
	Re measurement / numbering of logs including cost of paints	Rs.16/- per cum
	Stacking of round timber lot into sale lots	Rs.22/- per cum
	Stacking of ballies	Rs.19/- per cum
	Stacking other than above restacking	Rs.16/- per cum
	Passing and stacking of colliery DG and SD timber	Rs.19/- per lcum
Production cost of Timber at Depot	Cross cutting of lots	Rs.25/- on daily wage basis
	Sawing charges	Rs.per tender / actual
	Feeding to saw bench at Sambalpur	Rs.23/- per cum
	Feeding to saw bench at Rourkela	Rs.31/- per cum
	Stacking of sawn sizes	Rs.46/- per cum
	End cutting of sawn sizes	Rs.25/- on daily wage basis
	Spreading and passing of sleepers	Rs.13/- per cum
	Stacking of T.L sleepers	Rs.13/- per stack
	Weighment of fire wood	Weigh bridge rate where available @ per quintals
	Wagon loading (round and sawn timber)	Rs.400/- per
	Conventional expenditure	Rs.500/- per depot
Production cost of fire wood	Conversion and stacking of fire wood at conversion rate	Rs.63/- per stack (12' X 3' X 3')
	Stacking of fire wood at depot	Rs.63/- per stack (12' X 3' X 3')
		(Source: O.F.D.C. Ltd)

The details schedule of rate of outstanding royalty against O.F.D.C.Ltd and T.D.C.C.Ltd., Orissa is given in Annexure 21 (Page-102, Vol-II).

3.7.3 PAST REVENUE FROM FOREST PRODUCES OF SUNDERGARH DIVISION

ROYALTY / REVENUE

Sl. No.	Year	(Timber+Fire wood)	Bamboo	M.F.P item
1	**2**	**3**	**4**	**5**
2	79-80	N.A	Not worked	2,42,248.87
3	80-81	39,13,965	Not worked	1,57,373.25
4	81-82	11,27,221	N.A	2,62,213.76

5	82-83	30,63,240	N.A	53,562.27
6	83-84	24,62,120	N.A	12,90,198.80
7	84-85	20,87,269	N.A	5,08,649.85
8	85-86	20,11,958	N.A	25,51,865.00
9	86-87	24,54,100	N.A	6,97,654.99
10	87-88	24,39,500	N.A	6,70,285.75
11	88-89	19,99,700	5,21,236	45,855.00
12	89-90	18,43,000	7,26,084	65,400.00
13	90-91	18,06,300	19,72,201	4,87,319.00
14	91-92	3,24,600	8,96,985	5,99,982.00
15	92-93	Not worked	4,15,022	59,067.00
16	93-94	1,09,030	8,64,308	93,283.00
17	94-95	Not worked	15,88,263	54,327.00
18	95-96	Not worked	7,17,008	59,997.00
19	96-97	29,38,722	6,27,332	1,13,708.00
20	97-98	18,46,977	11,54,547	3,65,407.00
21	98-99	**21,47,500**	**14,62,618**	**2,68,486.00**
22	99-2000	**N.A**	Not worked	**2,98,038.00**
23	00-01	**N.A**	Not worked	**4,84,498.00**
24	01-02	**N.A**	Not worked	**1,38,707.00**

3.8 LOGGING AND HARVESTING

Axe was the only equipment used for logging and debarking during earlier times. Bigger logs were converted into rough squarish timber sizes inside the forest and dragged to the depot. The situation changed during working of corporation and saws were introduced to reduce the wastage. At present logging is done by Saw. Use of power chain is not in practice. The principle of logging is to get the longest straight logs of 9-5', 6-7', 12-15', 18' or 22' or their combinations. These are based on the demand of timber for frame, window, doors, bodies of truck etc. The longer the length of the straight log more the price it fetches when they are transported to the depot. The use of power chain saw greatly reduces the time for cutting and wastage. Hence, the use of power chain saw is recommended for logging operation in future. It not only saves time and material but also reduces the cost of salvaging. Details of list of saw mills in Rourkela Division is given in Annexure-22 (Page-102, Vol-II).

3.9 PRESENT STATUS OF INDUSTRIAL UTILIZATION

There is only one saw mill at Rourkela of Orissa Forest Development Corporation. The approximate capacity of the above saw mill is 8000 cubic feet per month. There is no other forest based industry in the division. The bamboo production of this division is very small and hardly meets the demand of local people. The quantum of other NTFP produced is not very high and it is sent out side for consumption in industries. The Siali plates are made by local people in the rural area. The Sal seeds are collected by TDCC and are taken outside the district for marketing. There is no other forest based industry in the division.

3.10 SCOPE OF INDUSTRIAL DEVELOPMENT

Manufacturing of Siali plate, ropes, brooms are some of cottage industries in this division. There is no major industry in this Division. Value addition to NTFP collected should be

encouraged. There is plenty of forest produce in the division on which the sustainable forest based industries can be established. The production of forest produce is to be considered as viable source to cater to the needs of the forest based industry like furniture industry and it should be encouraged and alternatives should be searched for the same.

PRODUCTION OF MINOR FOREST PRODUCE

Sl. No.	Name of the items	1990-91	1991-92	1992-93	1993-94
(1)	(2)	(3)	(4)	(5)	(6)
1	Sal seeds	3.0855 MT	2502.435 MT	2001.514 MT	2633.075 MT
2	Tassar cocoons	K515.16.17	K.594.12.11	K.625.1.13	K.715.41.12
3	Mahua Flowers	98,946 Qtl	93,531.25 Qtl	53510 Qtl	70,950 Qtl
4	Mohua seeds	249.47 Qtl	117.26 ,,	27.896 ,,	248.72 ,,
5	Tamarind	4891.52 ,,	2228.33 ,,	601.77 ,,	85.17 ,,
6	Myrobalans	1966.56,,	2372.48 ,,	1486.00 .,,	-
7	Kusum seeds	151.45 ,,	85.80 ,,	38.999 MT	235.40 ,,
8	G u m	99.50.,,	154.26 ,,	206.00Qtl	304.20 ,,
9	Siali leaves	1959.00,,	2186.12 ,,	795.00 Qtl	1563.53 ,,
10	L a c	2.55,,	0.20 ,,	-	20.17 ,,
11	Dhatuki Flowers	50.00,,	6.82 ,,	-	210.75 ,,
12	Broom Grass	NA	540.00 ,,	1170.00Qtl	1543.40 ,,
13	Char Seed	237.62,,	170.90 ,,	629.00 ,,	1.91 ,,
14	Karanja seeds	N.A	122.61 ,,	21.930 ,,	59.67 ,,
15	Chakunda	N.A	2171.27 ,,	24.145 ,,	352.90 ,,
16	Gilo	4.30,,	32.22 ,,	2.00 ,,	8.67 ,,
17	N e e m	N.A	N.A	0.440 MT	1.05 ,,
18	Palas	N.A	N.A	0.022 MT	-
19	Bantulsi	2205.91,,	331.90 ,,	4.500 MT	629.75 ,,
20	Mango Karnel	6.40 ,,	8.70 ,,	0.060 MT	134.96 ,,
21	Lodha Bark	-	955.00 ,,	510.00 Qtl	746.76 ,,
22	Moida Bark	-	940.00 ,,	585.00 Qtl	1280.77 ,,
23	Phenphena Bark	-	22.10 ,,	N.A	203.40 ,,

Sleeper production during last plan period

YEAR	B.G.SLEEPER	M.G./SLEEPER	N.G.SLEEPER	SPL.SLEEPER	TOTAL
(1)	(2)	(3)	(4)	(5)	(6)
80-81	335	665	220	2145	3355
81-82	198	140	125	1925	2388
82-83	1010	630	525	992	3087
83-84	1199	635	-	366	2200
84-85	1740	2337	2000	1865	7942
85-86	1091	1130	-	1290	3511
86-87	750	550	112	2046	3458
87-88	-	-	-	3899	3899
88-89	-	-	-	-	-
89-90	-	-	-	6314	6314
90-91	-	-	-	638	638
Total	**6323**	**6077**	**2982**	**21,410**	**36,792**

(Source: D.F.O. Sundergarh Division)

REVENUE FROM N.T.F.P. (1979-80 ONWARDS)

Year	Name of NTFP Item	Out turn	Royalty of MFP Divn. Office (in Rupees)
(1)	(2)	(3)	(4)
1979-80	-	-	2,42,248.87
1980-81	-	-	1,57,373.25

1981-82	-	-	2,62,213.76
1982-83		-	53,562.27
1983-84	-	-	12,90,198.80
1984-85	-	-	5,08,649.85
1985-86	-	-	25,51,865.00
1986-87	-	-	6,97,654.99
1987-88	-	-	6,70,285.75
1988-89	-	-	45,855.00
1989-90	-	-	65,400.00
1990-91	Available from 1990-91 to1998-99	-	4,87,319.00
1991-92	-	-	5,99,982.00
1992-93	-	-	59,067.00
1993-94	-	-	93,283.00
1994-95	-	-	54,327.00
1995-96	-	-	59,997.00
1996-97	-	-	1,13,708.00
1997-98	-	-	3,65,407.00
1998-99	Detailed xerox copy enclosed	-	2,68,486.00
1999-00	-	-	2,98,038.00
2000-01	-	-	4,84,498.00
2001-02	-	-	1,38,707.00

REVENUE FROM 79-80 TO 1990-91 ON MAJOR FOREST PRODUCE

Sl No.	Year	Timber and firewood Out turn in cum.	Royalty in Rs.	Bamboos Out turn in S.U	Royalty (in Rs.)
(1)	(2)	(3)	(4)	(5)	(6)
1	1979-80	Not available	-	not worked	-
2	1980-81	do-	39,13,965	-do-	-
3	1981-82	do-	11,27,221	8,087.50	Not available
4	1982-83	do-	30,63,240	12,752.50	Not available
5	1983-84	do-	24,62,120	4,026.92	Not available
6	1984-85	do-	20,87,269	3,976.83	Not available
7	1985-86	do-	20,11,958	5,120.51	Not available
8	1986-87	do-	24,54,100	8,857.84	Not available
9	1987-88	do-	24,39,500	1,627.68	Not available
10	1988-89	do-	19,99,700	1,627.69	5,21,236
11	1989-90	do-	18,43,000	2,135.54	7,26,084
12	1990-91	(T) 406 cum	18,06,300	5,554.98	19,72,016
		(FW) 709 stack			

(Source: D.F.O. Sundergarh Division)

PAST REVENUE AND EXPENDITURE FROM 79-80 ONWARDS

YEAR	REVENUE	EXPENDITURE	EXPENDITURE
		TOTAL FIELD ESTT.	FORESTRY & WILD LIFE (N.P)
(1)	(2)	(3)	(4)
1979-80	34,55,640.09	-	17,46,760.14
1980-81	39,96,167.47	14,15,014.80	17,41,435.04
1981-82	59,34,901.71	17,53,770.20	21,88,823.67
1982-83	44,46,772.51	24,75,328.77	28,22,465.27
1983-84	55,14,736.16	25,28,619.70	38,32,797.36

1984-85	55,36,042.76	24,63,991.91	28,68,509.70

Sl. No.	Name of the lease holder	Name of the MFP	Potentiality in	Quantity Produced	Quantity sold	Royalty due for the year	Royalty realized	Balance royalty for
1985-86	77,66,562.57	28,43,358.27	33,56,358.27					
1986-87	59,39,886.76	30,16,811.70	38,05,051.68					
1987-88	58,62,876.75	36,16,288.93	43,43,383.89					
1988-89	39,10,269.33	37,73,081.68	03,02,264.60					
1989-90	48,52,470.42	44,92,848.50	51,93,013.02					
1990-91	36,17,214.15	46,43,461.26	54,32,571.04					
1991-92	72,58,139.67	55,40,765.63	64,64,368.14					
1992-93	39,02,532.12	73,49,302.00	90,11,050.32					
1993-94	20,21,190.38	79,03,638.90	86,86,937.40					
1994-95	13,63,866.75	80,75,145.44	02,23,888.50					
1995-96	48,27,740.00	86,41,329.03	04,34,331.60					
1996-97	24,66,799.37	98,05,317.80	1,16,20,315.32					
1997-98	24,28,588.40	1,03,96,058.00	1,20,96,979.42					
1998-99	24,05,679.60	1,19,86,392.10	02,62,203.50					
1999-00	27,63,195.00	1,55,78,558.70	03,05,550.60					
2000-01	45,80,481.00	1,53,29,754.74	1,63,84,505.46					
2001-02	28,63,601.00	1,41,20,360.00	03,40,852.00					
			(Source: D.F.O. Sundergarh)					

1999-2000

The validity of the working plan was up to 31.03.1999. The validity was extended up to 30.06.2001 by Govt. of India M.O.E.F., Bhubaneswar vide No.13-FCWP-OS-SUNDERGARH dt.13.04.2000 received during May 2000. Hence, the coupes could not be worked due to shortage of time and non fulfillment of condition No.5 of the Govt. order in time.

2000-2001

As per decision of the Empowered committee dt.06.01.2001 the O.F.D.C.Ltd will work bamboo coupes to produce commercial bamboo only during 2000-2001. The O.F.D.C.Ltd intimated vide Letter No.1939/ Dated 08.11.2000 about non-availability of commercial bamboo in Division. Hence, the coupes remained un- worked during 2000-2001.

(Source: D.F.O. Sundergarh)

			MT	in MT 1998-99				the year to be realized
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M/s ST&SCs Ltd Bhuba -neswar	Tassar cocoons	800K	505.03.12K	505.03.12K	61,108.00 Provisional royalty	55,324.00	5,784.00
2	OFDC Ltd.	Sal seed	340 MT	259.065 MT	259.065 MT	51,813.00	51,813.00	-
3	TDCC Ltd.	Lac		-	-	3,867.00		
		Tamarind	300 MT	2.55 MT	2.55MT	20,691.00		
		Myrobolans	300 MT	12.545 MT	12.545 MT	11,495.00		
		Broom grass	100 MT	5.8 MT	5.8 MT	42,593.00		
		Siali leaves	300 MT	26.70 MT	26.70 MT	1,96,625.00		
		Honey	5 MT	-	-	7,000.00		
		Char gum	30 MT	1.218 MT	1.218 MT	23,480.00		
						3,05,751.00	NIL	3,05,751.00
4	Rorukela KL	Siali fibres	20 MT	-	-	20,320.00	NIL	20,320.00
5	P.K. Agarwala, Bisra	Siali leaves	300 MT	344.90 MT	344.90 MT	1,96,625.00	1,96,625.00	-
6	Sawarmal Gododia Rajgangapur	Char gum	30 MT	17.5 MT	17.5 MT	6000.00	6000.00	-
7	S.S. Kerhari, JSG	Broom grass	100 MT	46.4 MT	46.4 MT	12,000.00	12,000.00	-
8	Excise License holder	Mohua flowers	5000 MT	3,535.0MT	963.3 MT	3,23,500.00	3,23,500.00	-
9	M/s Priti Oils, Sambalpur	Mango kernel	100 MT	-	As per export permit	-	-	-

Quantity of Forest Produce sold and royalty realised from 90-91 to 98-99

		1990-	91	1991-	92	1992-	93	1993-	94	1994-	95	1995-	96	1996-	97	1997-	98	1998-	99
Sl. No.	Forest produce	Produ ction	Royalty	Produ ction	Royalty	Produc -tion	Royalty	Produc -tion	Royalty	Produc -tion	Royalty	Produc -tion	Royalty	Produc -tion	Royalty	Produc -tion	Royalty	Produc -tion	Royalty
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
1	Timber			406 cum		107		289 cum		352 cum	-	345 cum	-	583 cum		205 cum		433 cum	
2	FW			709 st		792st		652st		120 st	-	425 st	-	726 st	2938722	672 st	1846977	559 st	
3	Bamboo	5553 su	1971201	2411su	896985	1064 MT	415022	1878 su	864308	3288 su	1588263	1347 su	717008	1122 su	627332	1966 su	1154547	2374 su	1462618
4	Sal seed	3 MT	1626	2502 MT	5207843	2001 MT	4165371	2633 MT	5479719	238 MT	496801	1615 MT	192662	435 MT	180000	259 MT	51813	-	
5	Tassar	515k	4275	594k	4703	625k	5180	715k	5700	736 k	6270	106k	6900	-	7590	688k	8350	452k	
6	Mohua flower	5456 MT	401016	9894 MT	727209	5660 MT	416010	7095 MT	521480	5672 MT	416892	2296 MT	168756	4083 MT	300100	2928 MT	218200	3535 MT	323500
7	Tamarind	489 MT	17100	222 MT	17100	60 MT	17100	8 MT	17100	-	18810	58 MT	3097	2 MT	3097	-	20691	-	
8	Myrobalan	196 MT	9500	237 MT	9500	148 MT	9500	-	9500	52 MT	10450	26 MT	10450	42 MT	10450	-	11495	Do	
9	Gum	9 MT	21345	16 MT	21345	20 MT	21345	30 MT	21345	14 MT	23480	-	23480	0.4 MT	23480	no sale	-	unsold	
10	Siali leaves	195 MT	90000	218 MT	90000	79 MT	258500	156 MT	258500	82 MT	284350	61 MT	162500	207 MT	162500	215 MT	162500	307 MT	
11	Lac	0.2 MT	3195	0.2 MT	3195	-	3195	2 MT	3195	1 MT	3515	1.2 MT	3515	1 MT	3515	0.5 MT	3867	unsold	
12	Dhatki flower	5 MT	-	0.6 MT	-	31 MT	-	23 MT	-	28 MT	-	9.6 MT	-	-	-	-	-	Do	
13	Broom grass	7.5 MT	35201	54 MT	35201	117 MT	35201	154 MT	35201	115 MT	38721	136 MT	38721	84 MT	38721	-	42593	79 MT	
14	Siali fibres	11 MT	-	-	-	10 MT	-	10 MT	-	19 MT		-		-		-		-	
15	Baghnakhi			0.1 MT				-		-		-		-		-		do	
16	Mahua seed	24 MT	centrally	11 MT	centrally	28 MT		15 MT		57 MT		41.4 MT		1.2 MT		3.6 MT		do	
17	Karanj seed	-	paid in	12 MT	paid	22 MT		3 MT		6 MT		0.4 MT	centrally	0.2 MT		0.4 MT		do	
18	Kusum seed	15 MT	0/0 the	122 MT		39 MT	centrally	3 MT	centrally	2 MT	centrally	1 MT	paid	1 MT	centrally	10.4 MT	centrally	do	
19	Palas seed	-	PCCF	0.1 MT		0.2 MT	paid	-	paid	0.1 MT	paid	0.1 MT		-	paid		paid	do	
20	Char seed	23 MT	Orissa	17 MT		0.6 MT		0.1 MT				-		-				do	
21	Gaba	-		-		-		-				-		0.2 MT				do	
22	Indrajob	0.1 MT		0.1 MT		-		0.3 MT				-		-				do	
23	Chakunda	-		217 MT		24 MT		35 MT		16 MT		-		28 MT				do	
24	Mango kernel	0.6 MT														135.1 MT		do	
											(Source: D.F.O. Sundergarh)									

PART-I

CHAPTER-IV

STAFF AND LABOUR SUPPLY

4.1 STAFF AND ORGANISATIONAL STRUCTURE

Sundergarh Division was created on 01.04.1958 with merger of forests of Hemgir, Nagra and Hatibari Ex-zamindary State with Gangpur State. The Division was bifurcated into Sundergarh and Rourkela Divisions during reorganization on 1.10.2003. The incumbency chart of D.F.Os in charge of RourkelaDivision is as follows.

Sl. No.	Name of the Officer	Form	To
1	Sri K. C. Hansda, IFS	01.10.2003	11.10.2006
2	Dr K.Murugeson, IFS	11.10.2006	05.05.2010
3	Sri G. Behera, OFS-I	05.05.2010	14.07.2010
4	Sri A. Behera, IFS	14.07.2010	02.05.2012
5	Sri B. Pati, OFS-I(Sr.)	02.05.2012	31.08.2012
6	Sri Arjun Behera, OFS-I(Sr)	03.09.2012	10.05.2013
7	Dr. Sanjeet Kumar,IFS	10.05.2013	Continuing

This Division is headed by a Deputy Conservator of forests under the administrative control of Conservator of Forests, Rourkela Circle. Sundargarh Division has been divided into two divisions with effect from 01.10.2003 due to reorganization of Forest Department. Out of seven ranges, Gopalpur Range, Hemgir Range, Ujalpur Range and Sundargarh Ranges have been included in Sundargarh Division where as Rajgangpur Range, Kuarnmunda Range and Bisra Ranges have been included in Rourkela Division. The details of administrative setup and other details after reorganization are given in Annexure 23 to 27 (Page-102 to 105, Vol-II). Later after reorganization the Rourkela Division was divided in to 6 ranges.

The detailed statement showing the distribution of section and beats in different Ranges is given below in a tabular form.

RANGE, SECTION AND BEAT OF ROURKELA FOREST DIVISION

Name of Range	Name of Section	Name of the Beat
1. Panposh	1. Panposh 2.Dolakudar 3.Bondamunda 4.Steel Township	Panposh, Durgapur, Sonaparbat Dalakudar, Lathikata, Matkumjharan Bandamunda, Barkani STS, Rourkela.
2. Kuarmunda	1.Kuarmunda 2.Kacharu 3.Kalunga 4.Birda	Kuarmunda, Ushra Kacharu, Jharbeda Kulunga, Balanda, Garjan Birda, Dalki, Birkera
3. Biramitrapur	1.Biramitrapur 2.Raibaga 3.Hatibari	Biramitrapur, Kumjharia Raibaga, Jhurmur, Kendumunda, Dalki, Hatibari, Kokerama, Ranakata
4.Rajgangpur	1.Rajgangpur 2.Sonakhan, 3.Malidihi	Rajgangpur, Dungajore, Sagjore, Laing, Alanda, Sonakhan, Kahachuan, Chandiposh, Buchukupada, Malidhi, Lodhabasa,

		Bankhaman
5.Banki	1.Banki, 2. Rajamunda, 3. K.Bolang	Banki, Chandiposh, Barghat, Chandrapur, Jharbeda, Rajamunda, Birtola, Lahunipada, K.Bolang, Bimlagarh, Patisahi, Silikuta, Langalkata
6. Bisra	1.Khairtola 2. San-Ramloi, 3. Bisra	Khairtola, Sukuda, Katepur Sanramloi, Barsuan, Birkera Bisra, Mahipani
Total 6 nos.	**20 nos. Section**	**61 nos. Beat**

Name of Range	Name of Check Gate
Rajgangpur	Jharbeda Check Gate
Bisra	Bisra Check Gate
Biramitrapur	Unified Check Gate, Biramitrapur
Banki	Jodabandh Check Gate

4.2 LABOUR SUPPLY

4.2.1 Unskilled labourers are available throughout the year except during cultivation period and harvesting seasons when there is shortage of labor for forestry operations. However, in the interior forest blocks, especially towards Gundiadihi there is shortage of labourers due to low population density.Large numbers of unskilled labourers are being engaged in various mining operations in different ranges still there is no dearth of unskilled labourers for various forestry operations. Large number of Kolha and Santhals from Bihar work in the mining areas while the local labourers prefer forestry work.

4.2.2 Skilled labourers such as masons, carpenters, technicians etc., are available in limited numbers around Sundargarh and Rourkela. Their number is less in interior areas. In such areas, they are procured from the nearby towns. In general, in most of the areas, higher wages are to be paid to skilled labourers for inducing them to forest work and even with higher wages they are not always willing or available.

4.2.3 WAGE RATE

Wages have gone up enormously during last few years. The Govt. prescribed wage rates prevalent at different periods in this Division are given in table. The current wage rate for skilled and unskilled labors as fixed by Govt. of Orissa, Labor Department Notification no.8536 Dated 6th October,2012 is given below.

Minimum wage rate

Unskilled	: Rs. 150.00
Semi -skilled	: Rs. 170.00
Skilled	: Rs. 190.00
Highly skilled	: Rs. 205.00

Govt. has fixed the minimum wage rate to prevent exploitation. The minimum wage rate is revised from time to time keeping in view rise in price and higher cost of living. The people of this district are aware that they get minimum wage rate fixed by the Govt. The wage rates change from time to time and wages shall be paid according to current prevailing rate of Government of Orissa.

PART-I

CHAPTERR-V

PAST SYSTEM OF MANAGEMENT

5.1 GENERAL HISTORY OF THE FOREST

5.1.1 1900 –1910

In 1909 Sri Kasiram Das, a Dehra Dun trained Ranger was appointed but he did not stay longer and the department was again placed in charge of Sri Bohidar who was the then Tahasildar. In 1911 Sri S.N. Khanna was appointed in charge of the Department, which he held till his retirement in 1937.

5.1.2 1911-1924

It is from this year that the history of forest management in Gangapur Khalsa commenced. Separate arrangements were made for administration of forest in Zamindaries. Till 1910 there was no systematic forest management and the revenue was obtained from the nistar cess and a small sum was realized from villagers as royalty for wood used by them for house construction.

The land revenue settlement started (Connolly's settlement) and several blocks were declared as reserved forests, which were reserved previously by the Maharaja. Many other forests were also reserved. These forests were demarcated by the forest officers and for a decade the forest staffs were engaged in this job without paying attention towards exploitation of trees. The policy followed by Mr. A. N. Grieve, the then Agency forest officer of Orissa feudatory State, was to provide closure to the forests, which were over exploited over the years. The policy was sound. To rehabilitate the forests was the primary need and for a quarter century strict restraint was put for exploitation of forests. It was a period when very sound policy for forest protection was framed. In 1920 a set of forest rules were framed by Mr. G. M. Cooper, the then Agency Forest Officer. The first working plan was prepared by Sri S. N. Khanna under the guidance of Mr. H. F. Mooney, IFS. The plan period was for a short period and it did not bring any significant change in the existing forest management practices.

The first working plan was preliminary in nature with 3 working circles, i.e., (1) the High forest working circle (2) the Coppice working circle and (3) the Miscellaneous working circle. Its prescriptions were very simple because the forests were in most irregular condition and had not recovered from previous maltreatment even after 25 years. It was necessary by that time to introduce some sort of order in the management of the forest.

5.1.3 The 1925 Working Plan

The plan was prepared for a period of ten years but its prescriptions were extended from time to time by the order of darbar because of lack of time and staff to revise the plan. Then the Second World War came in the way and staff was busy in meeting the demands of war.

High Forest Working Circle

The high forest working circle covered an area of 82,411 acres and comprised of six felling series, i.e., Chhatamb, Panchora, Lamti-banglaphad, Kiralaga, Rungaon and Athkosia. The system prescribed was selection combined with improvement felling on a 20 years felling cycle. On the whole result of the working circle was satisfactory as the young crops gradually came up with sal. The system of clear felling gave better results than the selection system. It gave good financial returns. There were a few blocks in khalsa, where only possible system was selection owing to inaccessibility and poor and open nature of crop.

COPPICE WORKING CIRCLE

There were six felling series. This number was increased by two in 1935 by the inclusion of Panchora and part of Chhatam and a further one in 1939 by the inclusion of Datni RF. The coppice felling gave good results. The new crop was very promising and was said to be better than the previous ones. The thinning which was prescribed to follow and the main fellings in the 10^{th} or 11^{th} year were neglected and were done only during the war period i.e. 1942-1945.

5.1.4 HEMGIR EX-ZAMINDARY AREA

The Dhanuars and the Pabias constitute aboriginal class, who used to practice shifting cultivation in the past. As a result of repeated cutting, grazing and burning the soil condition deteriorated with development of an open bamboo forest. Prior to 1913, there was no sign of forest conservation in the estate although some rules were framed by government for disposal of forest produce during the regime of the then Jamindar Chandan Singh. Before introduction of these rules the local people used to get their requirements from any forest on payment of Rs.5.00 per plough. The outsiders were permitted to remove and export as much timber as they wanted on payment of three mounds of rice to the Jamindar. The Dhanuars and Pabias were allowed to practice shifting cultivation on payment of Rs.12.00 per acre but no limit was put to the area that they utilized for shifting cultivation. At that time it was practiced with the idea that forest is the inexhaustible resource and this gift of nature will continue to retain its productivity in perpetuity. The selection and demarcation of the reserved forests were taken up at the close of the settlement in 1910. Progress in pillar erection and survey work was very slow. The visit of Agency forest officer, Mr. Grieve in 1913 geared up the work and it was completed in 1944.

Little work seems to have been done in the forest prior to the opening of the sleeper operation by M/S Bengal Trading Company in 1893. There was no provision in the lease as regards to proper working of the forest and on economic conversion of timber. No limit was fixed on the number of trees to be felled in one year or during the period of contract. This type of work continued for 15 years and the forests were stripped of all sound trees over 3 feet girth.

The forests of the estate were inspected by Mr. Grieve, the first Agency forest officer in 1930. In his inspection report he felt sorry for the over exploited condition of the forest and recommended for a policy of self denial with a view to build up the depleted growing stock. He advocated a policy of strict prohibition of felling of all green trees. He drew up a scheme for cutting of bamboos on three year cutting cycle. When Dr. Mooney visited the forests in 1923, he appreciated the policy of Mr. Grieve because considerable improvement had taken place in stocking and condition of regeneration has

improved. By this time bamboos were being extracted only from the forests lying closer to the railway station on payment of royalty.

COPPICE SYSTEM AND ITS RESULTS

In 1931 Mr. Heart drew up a scheme for working of forest lying south of the railway line prescribing coppice system on a rotation of 40 years. Four coppice felling series were formed in 1933 and the work commenced. At this stage such low rotation was not desirable. In those days there must not have been such heavy demand for medium sized timber and poles when the forest was capable of producing big size timber.

BAMBOO WORKING

A three years lease for extraction of bamboos was granted to one Sarangi of Chakradharpur in 1936 on payment of prescribed rates of royalty. Sarangi's lease expired in 1941 and the T.S.T Co. of Chakradharpur was granted a 12 years lease for the exploitation of bamboo on prescribed terms. In 1940 on the advice of Dr. H. F. Mooney, a few felling series were added to Bamboo Working Circle to include forest lying north of Garjanpahar Block. The cutting cycle was increased to four years.

EXPLOITATION OF MFP

Kendu leaves were leased out in favour of Shri Abudul Rehman Hamid on payment of Rs. 10.000/- per annum to estate for a period of 5 years which expired in 1947. Among the minor forest produce harida, mahua seeds and char seeds were leased out to the same contractor on annual payment of Rs.10, 000/- for a period of three years from 1943 onwards. Khair was auctioned at about Rs.400/- per annum.

Since 1940 extra felling were done to meet the urgent demand of war but the supplies were made chiefly from Khesra forests. The timber felled from the reserved forests for this purpose constituted a negligible portion. The advice of the Agency forest officer was followed in the management of the forest and as a result of which, the estate possessed a valuable property of 145 square miles of sal and bamboo forests. There was a progressive increase in the revenue since 1913 to 1944. The forest was worked under a working scheme drawn by Mr. Hart and Mr. Moony in their inspection notes.

1. The coppice-working circle (overlapping)
2. The bamboos working circle(part overlapping)

PRESCRIPTION OF COPPICE WORKING CIRCLE

Each felling series was divided into 40 annual coupes of approximately equal area where four felling series were constituted with 40 years rotation. Chitkikhadu, Rohini, Budulakhaman, Dheknapani and Singaribahal Blocks were allotted to this working circle.

RESULTS OF PRESCRIPTIONS

The constitution and working of the coppice coupes immediately provided a great financial gain. The clear felling of all tree growth gave a new life to the bamboo clumps through sudden admission of light and severe reduction of root competition. Bamboo growth increased at places and the growth of the coppice shoots was seriously impeded. In order to eliminate this evil, cleaning operations were prescribed in the next plan for 2 to 3 years successively after the clear felling. These operations involved

climber cutting and removal of bamboo clumps which were suppressing the valuable coppice shoots. But thinning was neglected. In order to increase the value of crop, the successional relationship between these two species should have been maintained. Manipulation of the canopy appears to be the only method for keeping the bamboos in the present sub-climax stage and this was not provided in this plan. The felling of clumps on thinning basis gave best results and resulted in the production of maximum number of new culms.

NAGARA AND HATIBARI AREA

Majority of the existing reserved forests were demarcated and reserved between1905 to 1910. Nothing was done to introduce systematic management until 1922 when two to three coupes were opened .Prior to that some felling were done but there is no record available to that effect. In1927, the first Working Plan was written. By that time there were hardly big trees over 16 feet d. b. h available throughout Nagara and Hatibari areas, which could be ascribed to two reasons. The first was destructive method of shifting cultivation practiced by the villagers owing to the fact that such lands were not assessed for rent and over exploitation of forests undertaken by the M/s Nagra Timber Trading Co. (subsequently Bengal Timber Trading Co. Ltd.) for sleeper supply. Not many restrictions were imposed on the company and probably no control was exercised by the estate. No attempt was made to regulate the yield or to restrict the size of trees, which were felled. The first lease of the company was in 1893 for seven years. The royalty for B.G. sleeper was six annas per sleeper during that period. The lease was extended up to 1920. The rate paid during these two decades being only eight annas per B.G. sleeper. From 1908-1917, sleepers were not converted but only dry logs were extracted. In 1917, and for two to three years afterwards, sleepers of Asan, Jamun, Kurum and Arjun were exported. When Dr. H. F. Mooney visited South Chirobeda forest in January, 1924, sleepers were still being extracted but the company work was stopped in that year or soon after.

WORKING PLAN BY DR. H.F. MOONEY

1927 PRESCRIPTION

In 1927 a simple Working Plan was prepared by Dr. H.F. Mooney which included the forests of Nagra area, but the forests of Hatibari area were not supervised at that time. The prescriptions were coppice with standard in 30 blocks constituting 22 felling series, improvement felling in South Chirobeda, closure in Bhainsamunda, Ergeda, Santoshpur and Bandomunda for the period of the plan and systematic working of bamboos in North and South Chirobeda Block on a three years cutting cycle. Other prescriptions were provided for thinning, control of grazing, fire protection and climber cutting. The prescriptions were simple as far as possible due to the shortage of trained staff those days.

RESULTS OF PRESCRIPTIONS

The condition of the forest improved. Regular coppice shoots, excellent standard young crop in coppice coupes due for thinning further improved their quality adding considerably to the annual yield. Due to improvement felling in South Chirobeda, whole of old over mature stock was removed which left the forest in a more healthy condition. Of course some over felling took place in that Block to meet the war demand which was paramount and almost all forests in the country suffered from that. The condition of crops was still immature when climber cutting was carried out satisfactorily in Bhainsamunda. During

war period trees of other species and not Sal were supplied to meet the heavy demand. The revenue increased due to more intensive method of working introduced in 1927. Remarkable price was obtained due to all round increase in price of all commodities during the war period. There was a steady increase in coppice coupes prices.

FIRE PROTECTION

Due to Kendu leaves trade, the forests were subjected to annual and repeated burning in dry seasons. Due to repeated fire, the establishment of seedling was retarded and the forest turned towards xerophytic condition usually due to production of more hardy species. In order to check this menace, regular fire fighting equipment with staff is required to be maintained.

PLANTATION

Under various schemes plantations had been raised both by the territorial and afforestation divisions. But the plantation had been raised by afforestation division outside the R.F. Afforestation division had done fencing and other cultural operations in certain areas.

5.1.5 WORKING PLANS BY SRI A.B. LAL (1945-46 to 1964-65)

Sri A.B. Lal prepared the first working plan for the period from 1945-46 to 1964-65. Five working circles were constituted the namely the selection Working Circle, the coppice Working Circle, the Bamboo Working Circle, the Nistar Working Circle and the Protection Working Circle.

5.1.6 WORKING PLAN OF SRI D.S. PATTNAIK (1979-80 TO 1998-99)

This plan expired during March 99 and it was extended up to 30.6.01. The following working circles were constituted in the said plan.

1. The Sal conversion working circle.
2. The Selection cum improvement working circle.
3. The Coppice with reserve working circle.
4. The Bamboo (overlapping) working circle.
5. The Soft wood (overlapping) working circle.
6. The Plantation working circle.
7. The Rehabilitation working circle.
8. The Re-creation working circle.

1. The Sal Conversion Working Circle

During the last plan period action was taken to bring more forest area under Sal forest cover. The protection offered by V.S.S. and trench fencing in some forest Blocks has promoted the growth of Sal crops.

2. The Selection cum improvement working circle

Selection coupes working of forest was done up to 1990. Improvement aspect was very much neglected and it created gaps at many places. The felling of trees was banned subsequently throughout the state.

3. The Coppice with Reserve Working Circle

Reserve trees were less in number in this working circle and less regeneration was coming up.

4. The Bamboo over lapping Working Circle

There was haphazard working of Bamboo coupes in the past. Silivicultural operation of Bamboo was not taken up properly. During 2001, the O.F.D.C. refused to work bamboo coupes due to non-availability of bamboo in forests.

5. The Softwood overlapping Working Circle

The O.F.D.C. Ltd. had worked Rai, Moi and Salai during coupe working.

6. The Plantation Working Circle

The list of plantation is given in annexure 12. There is much deviation in selection of site for plantation and in many cases exotic species have been given priority during plantation.

7. The Rehabilitation Working Circle

Gap plantation with trench fencing has been taken up in many forest blocks but all the forest blocks prescribed in the last plan have not been covered. In many cases trenches have not been renovated and purpose of trench fencing has become futile.

8. The Recreation Working Circle

This working circle was very much neglected. The number of carnivores as well as herbivores has gone down drastically. The construction of game tanks, salt licks, tourist huts and watch towers were not done in adequate numbers under works of improvement. The number of wild animals has reduced. The bamboo forests have been devastated by the local inhabitants inside forest and as a result of which elephants menace has increased.

5.1.6.1 Critical Analysis of D.S. Pattanaik's Plan:

Selection cum Improvement Working Circle: In the last working plan prepared by D.S.Pattanaik, 2no. felling series namely Kuarmunda and Rajgangpur was allotted for Selection cum Improvement Working Circle with two no. of coupes to be worked out every year. The two felling series were divided into equi-productive coupes to be worked out over a period of ten years. The Silvicultural system adopted was selection cum improvement felling; harvesting the trees above exploitable girth and preserving the trees of principal sp. under best condition to favour the recruits. But due to imposition of moratorium on tree felling vide Govt. of India letter no. 13-FCWP-OS-SMP dtd 22.10.1992, harvesting of trees were banned. The fund flow for silvicultural operation was also stopped. Added to this, heavy biotic interference like illicit felling, fire, grazing adversely affected the regeneration in the areas. So, entire working circle, instead of showing any improvement, the growing stock was deteriorated. Hence, in the new Working plan those areas are allotted to Rehabilitation WC. The details of coupe area worked out and royalty deposited against the coupe during the past working plan period is given in the following table.

Year	No. of coupes allotted	Total Area of the coupe allotted (acre)	No. of coupes worked	Area of the Coupe worked out (acre)	Royalty deposited against the Coupe
1979-80	2	459	1	380	19900
1980-81	2	510	0	0	0
1981-82	2	456	1	377	56800
1982-83	2	412	0	0	0

1983-84	2	407	1	324	55200
1984-85	2	366	1	284	15600
1985-86	2	368	1	293	78150
1986-87	2	377	1	297	326200
1987-88	2	483	1	402	105600
1988-89	2	448	1	365	62900
1989-90	2	452	1	421	54600
1990-91	2	471	1	383	108700
1991-92	2	358	ban on clear felling	ban on clear felling	ban on clear felling
1992-93	2	352			
1993-94	2	314			
1994-95	2	501			
1995-96	2	486			
1996-97	2	551			
1997-98	2	564			
1998-99	2	275			

Sal Conversion Working Circle: In Sal Conversion WC, different compartments of S. Chirobeda RF were allotted into three Periodic blocks (PB-I, PB-Inter and PB-Young). Each PB were divided into equiproductive coupes to be worked each year. The following table shows the detail area worked in each year along with the royalty deposited. The aim of this WC was conversion to uniform system with a view to obtain an even aged crop. This objective could not be achieved due to various constraints and adverse factors like increasing population pressure, uncontrolled fire hazards, excessive grazing, illicit removal of trees and continuous operation of large number of mining projects in these areas. Though the regeneration of the Sal crop was good, but this could not establish due to heavy grazing and fire. Status of pole crop which serves as future crop is also not satisfactory. So, these forests are now to be worked under selection system with the objective to take up suitable silvicultural operations including opening of the canopy in order to create favorable conditions for natural regeneration.

Year	**No. of coupes alloted**	**Total Area of the coupe allotted (acre)**	**No. of coupes worked**	**Area of the Coupe worked out (acre)**	**Royalty deposited against the Coupe**
1979-80	3	488	2	277	678000
1980-81	3	499	1	159	18100
1981-82	3	472	2	267	414200
1982-83	3	590	0	0	0
1983-	3	516	2	278	507000

84					
1984-85	3	491	2	268	636500
1985-86	3	516	1	148	165800
1986-87	3	518	2	277	442100
1987-88	3	645	2	272	480800
1988-89	3	663	2	284	362200
1989-90	3	636	2	278	457000
1990-91	3	604	2	280	346800
1991-92	3	628	ban on clear felling		
1992-93	3	592			
1993-94	3	555			
1994-95	3	571			
1995-96	3	549			
1996-97	3	561			
1997-98	3	545			
1998-99	3	575			

Coppice with Reserve WC: In coppice WC, 15 no. of Coppice coupes were allotted in different RF areas with an aim to meet the requirement of local population for small timber, poles for house building purpose. Silvicultural system adopted was coppice with reserve. As, mentioned in the Selection WC, the same happened in the Coppice WC too, resulting in loss of standards and poor regeneration of the principal sp. Due to this the area allotted to Coppice WC are now allotted to RWC .

Year	**No. of coupes allotted**	**Total Area of the coupe allotted (acre)**	**No. of coupes worked**	**Area of the Coupe worked out (acre)**	**Royalty deposited against the Coupe**
1979-80	15	1256	10	1126	249850
1980-81	15	1309	5	419	99700
1981-82	15	1235	9	1083	394400
1982-83	15	1187	0	0	0
1983-84	15	1148	6	621	174100
1984-85	15	1204	10	747	151500
1985-86	15	1107	7	597	256600
1986-87	15	1204	9	893	224700

1987-88	15	1181	8	863	392600
1988-89	15	1205	8	906	562000
1989-90	15	1292	8	986	401700
1990-91	15	1248	7	917	254400
1991-92	15	1207	ban on clear felling		
1992-93	15	1299			
1993-94	15	1243			
1994-95	15	1268			
1995-96	15	1286			
1996-97	15	1211			
1997-98	15	1235			
1998-99	15	1228			

Soft wood Working Circle: Two no. of coupes in Softwood WC was to be worked out each year. The area was overlapping with the selection cum improvement WC and Coppice with reserve WC . So, the result of selection-cum improvement WC was also influenced the Soft wood WC. Forest allotted in to this WC has been divided in to 2 felling series. Two coupe from each felling series has to be worked every year. But, all the coupes could not be worked out due to unavailability of trees above exploitable class. Besides this the increased demand of soft wood for industries resulted in illegal exploitation and thus poor growing stock. These areas now allotted to Rehabilitation WC. The detail of the coupe working in the division is given in the following table.

Year	**No. of coupes allotted**	**No. of coupes worked**	**Royalty deposited against the Coupe**
1979-80	2	0	0
1980-81	2	0	0
1981-82	2	0	0
1982-83	2	0	0
1983-84	2	0	0
1984-85	2	2	78300
1985-86	2	2	215600
1986-87	2	2	41000
1987-88	2	2	39300
1988-89	2	1	34200

5.2. EXPLOITATION OF MFP AND GRAZING The exploitation of M.F.P is very common by local people and they sell the same in market or consume for their own requirements. The grazing by goats, sheep and domestic cattle inside forest are very common in Rourkela Division.

Revenue obtained from people for timber, fire wood and grazing during last plan period

Year	Timber	F.W.	Grazing	M.F.P.	Total
88-89	5,389.50	10,155.70	9,551.10	-	25,096.30
89-90	4,470.40	5,241.50	3,967.25	-	13,679.15

90-91	1,939.70	3,070.60	6,579.60	-	11,589.90
91-92	1,907.95	2,939.90	3,573.00	-	8,420.85
92-93	1,366.05	896.35	5,528.15	-	7,790.55
93-94	975.40	509.65	6,756.10	-	8,341.15
94-95	2,530.31	1,585.19	3,409.85	-	7,526.34
95-96	1,828.30	971.20	2,944.00	-	5,843.50
96-97	1,082.25	398.75	3,442.20	-	4,923.20
97-98	80.00	17.00	669.00	-	766.00
98-99	88.50	1,026.50	289.00	-	3,788.15
99-00	138.50	13.50	185.00	-	337.00

The revenue figure shows declining trend and inhabitants were reluctant to pay revenue for collection of fire wood and grazing.

5.2.1 RESERVATION OF FOREST BLOCKS

The list of forest blocks shows that many D.P.Fs were declared as P.R.F. during last plan period and number of PRF increased to 6.

5.2.2 ROADS AND BUILDINGS

The list of roads and buildings is given in Para 20.2 and 20.3.

5.3 PAST REVENUE AND EXPENDITURE

The figure given below shows that expenditure was made in all heads and attempt was made to save forest and wildlife of the Division.

PAST REVENUE AND EXPOENDITURE FROM 79-80 TO DATE OF ROURKELA DIVISION

YEAR	REVENUE	EXPENDITURE	EXPENDITURE
		TOTAL FIELD ESTT.	2406 FORESTRY & WILD LIFE (N.P)
1979-80	34,55,640.09	-	17,46,760.14
1980-81	39,96,167.47	14,15,014.80	17,41,435.04
1981-82	59,34,901.71	17,53,770.20	21,88,823.67
1982-83	44,46,772.51	24,75,328.77	28,22,465.27
1983-84	55,14,736.16	25,28,619.70	38,32,797.36
1984-85	55,36,042.76	24,63,991.91	28,68,509.70
1985-86	77,66,562.57	28,43,358.27	33,56,358.27
1986-87	59,39,886.76	30,16,811.70	38,05,051.68
1987-88	58,62,876.75	36,16,288.93	43,43,383.89
1988-89	39,10,269.33	37,73,081.68	03,02,264.60
1989-90	48,52,470.42	44,92,848.50	51,93,013.02
1990-91	36,17,214.15	46,43,461.26	54,32,571.04
1991-92	72,58,139.67	55,40,765.63	64,64,368.14
1992-93	39,02,532.12	73,49,302.00	90,11,050.32
1993-94	20,21,190.38	79,03,638.90	86,86,937.40

1994-95	13,63,866.75	80,75,145.44	02,23,888.50
1995-96	48,27,740.00	86,41,329.03	04,34,331.60
1996-97	24,66,799.37	98,05,317.80	1,16,20,315.32
1997-98	24,28,588.40	1,03,96,058.00	1,20,96,979.42
1998-99	24,05,679.60	1,19,86,392.10	02,62,203.50
1999-00	27,63,195.00	1,55,78,558.70	03,05,550.60
2000-01	45,80,481.00	1,53,29,754.74	1,63,84,505.46
2001-02	28,63,601.00	1,41,20,360.00	03,40,852.00
2002-03	30,53,169.00	1,53,92,191.00	2,06,12,012.00
2003-04	5,24,531.00	45,96,755.00	31,94,014.00
2004-05	7,79,808.00	1,05,39,000.00	32,10,378.00
2005-06	12,03,115.00	1,07,41,000.00	11,49,946.00
2006-07	20,39,585.00	1,06,43,000.00	10,50,000.00
2007-08	55,79,34.00	94,81,000.00	34,10,000.00
2008-09	12,03,232.00	2,28,19,562.00	36,74,969.00
2009-10	29,79,645.00	2,58,85,450.00	35,54,654.00
2010-11	14,10,903.00	2,98,52,941.00	26,93,000.00
2011-12	61,72,114.00	2,86,95,655.00	23,03,000.00
2012-13	34,31,038.00	2,97,43,785.00	49,63,360.00
2013-14	29,70,722.00	3,20,95,037.00	279,43,260.00

5.4. Intervention carried out during 2003-04 to 2013-14(Plan Holiday)

The outgoing Working plan of Sri D.S. Pattanaik was over in 1998-99. It was given extension for two years, i.e.- up to 2000-01. Rourkela Division was reorganized from the Sundargarh Forest Division in 2003. Felling of trees was banned from 1991-92 to 2004-05.Though the Working Plan for the reorganized Rourkela Forest Division was not officially approved but, many departmental works like plantation, SMC, forest type improvement, WHS etc. have been done from the state target through various plan and non-plan scheme. Besides this 13788.5 ha area has been planted through different VSS under OFSDP . From 2009-10 different plantation and other developmental work were carried out under CAMPA fund. Various activities done in this Division since 2003in the draft working plan area is given below:

	Inside WP area of Rourkela			OWP	Banki Range (Bonai WP)		
Activities	**SWC**	**RWC**	**PWC**	**area**	**WP area**	**OWP area**	**Total**
Plantation	2357	10433	5381.13	1918.56	2971	1967.13	25027.79
SSO/SMC	530	1092	799.22	387.2	3760	80	6648.42
Weeding	130	443.2	221	0	105	100	999.2
Mgt. of old teak plant.	14.4	143.56	4.45	55.37			217.78

The detail list of plantation done in Rourkela Division since 2003, is given in annexure 27 A to 27 D (Page-113, Vol-II).

Though green felling was banned in the Division after 1991, salvage operation was carried out in different reserve forest areas. Since 2003, Total:- **462.3665** CUM of timber and **31324.1 Qtl** of fire wood has been salvaged in this division. Abstract of the salvage operation is given in the following table and the detail list detail list of Salvage since 2003 to 2013 is given in Annexure 27 E (Page-128, Vol-II).

Year	Timber salvaged in Cum.	Firewood (Qtl.)
2003-04	61.0396	11641.5
2004-05	136.2215	1629.6
2005-06	87.5482	4555
2006-07	16.253	2275
2007-08	27.056	2003
2008-09	16.8439	1600
2009-10	23.6855	655
2010-11	3.2315	1625
2011-12	8.4038	275
2012-13	1.8497	1250
2013-14	80.2338	3815
Total	**462.3665**	**31324.1**

PART-I
CHAPTER-VI

STATISTICS OF GROWTH AND YIELD

6.1 PAST STATISTICS

To ascertain growth and yield of forest species we have to go through experimental figures. This Division does not have any sample or experimental plot to ascertain the same. The systematic study of any important species has not been made in this Division. In the absence of all these we have referred to the following important literatures on growth and statistics for different species. Sal is the dominant species in this Division associated with Asan, Bija, Dhaura and Sisoo etc. The help of following literatures were taken up.

(1) General volume table for Sal by S. H. Harward published as Indian Forest Records (Silvicultural Series) volume-X (Part VI) 1924.

(2) Yield and Stand Table for Sal by A. L. Griffith and Bakshi Sant Ram published as Indian Forest Records (New series) Silvicultural volume- 4(A), No.4, 1943.

(3) Volume and out turn table for Sal by S. N. Harward published as Indian Forest Records (silvicultural Series) Vol. XII, Part- I, 1925.

(4) General standard and commercial volume table for Asan by A.L.Griffith and Baskhi Sant Ram published as Indian Forest records (New series) silvicultural volume 4 (A) No.5 (1947).

(5) General volume table for Bija based on data procured from Andhra Pradesh, Maharastra, Orissa and Bihar published as Indian Forest Records (New series) Silvicultural Vol. II, No.7, (1969).

(6) General standard volume table and commercial volume table based on data from Bihar, Orissa, Maharastra, Madhya Pradesh by S. M. Dabral published as Indian forest records (New series) Silvicultural Volume II, No.5 (1964).

(7) Standard volume table for Moi based on data from Andhra Pradesh, Maharastra, Bihar and Uttar Pradesh by S. N. Dabral and D.C.Sharma published as Indian forest records (New series) Silvicultural volume II, No.7 (1969).

The quality class of Sal as used in all India yield and volume table has been recognized and administered in this plan. The quality of Sal of each compartment has been recorded in the concerned compartment history. The criteria adopted for Sal quality classes are as follows:

Quality-I Area where the matured Sal crop attains height of 33 m. and above.

Quality-II Area where the matured Sal crop attains height between 27 to 33 m.

Quality-III Area where the matured Sal crop attains height between 21 to 27 m.

Quality-IV Area where the matured Sal crop attains height between 15 to 21 m.

Quality-V Area where the matured Sal crop attains height of less than 15m.

One percent enumeration has been carried out in strip sampling method over 10 RFs. and 3 PRF and twelve out of thirteen have been included in the Selection Working Circle of undivided

Sundargarh Division of which 2 RF has been included in Rourkela WP. Crop composition of each block has been reflected in the stock maps prepared on Topo sheet of 1:25,000 scale which have been attached to compartment histories of the concerned blocks.

6.2 Enumeration

One percent enumeration was taken up in ten R.F.s and 3 P.R.F.s of the combined Division. There was no tree of exploitable girth available in Lalma R.F. and it was excluded from Selection Working Cicrle. Rest twelve Forest blocks was included in Selection Working Circle of undivided Sundargarh Division of which 2 RF has been included in Rourkela WP.

6.3 Analysis of enumeration result

Enumeration results show that sal is the dominant species in all the forest blocks followed by Asan, Dhaura and Bija. Among other species Kendu and Char are available in plenty. Sal trees of exploitable girth are available in plenty and exploitation of sal trees will not effect the forest growth because regeneration is profuse in all the forest blocks.

6.4 Estimation of total population of the division species wise and girth class wise is given below.

ESTIMATED TOTAL UNITS SPECIES WISE AND GIRTH CLASS WISE

Number of trees (Girth class wise and species wise)

Total area of 13 blocks - 33, 084.01 ha. Area of enumeration 335 ha.

No.	Species	30-59 cm	60-89 cm	90-119 cm	120-149 cm	150 cm and above	Total
1	Sal	12,15,088.98	8,27,492.49	4,44,995.96	1,78,098.38	63,599.42	27,29,275.23
2	Asan	3,20,297,08	1,39,298.73	32,499.70	8,599.92	2,599.98	5,03,295.41
3	Bija	51,599.53	32,199.71	17,899.84	4,999.95	1,899.98	1,08,599.01
4	Dhaura	2,82,597.43	1,41,098.72	38,099.65	5,999.95	1,899.98	4,69,695.73
5	Bandhan	14,999.86	7,499.93	1,799.98	499.99	0	24,799.76
6	Mundi	10,699.90	3,499.97	2,199.97	1,699.98	499.99	18,599.82
7	Gambhar	3,399.97	1,799.98	99.99	199.98	0	5,499.94
8	Kurum	14,399.87	6,099.94	3,799.96	899.99	599.99	25,799.75
9	Sisoo	1,999.98	699.99	0	99.99	0	2,799.96
10	Kendu	4,81,195.62	1,86,798.30	59,499.46	13,099.88	4,299.96	7,44,893.22
11	Bahada	11,899.89	11,599.89	2,799.97	1,899.98	1,099.98	29,299.72
12	Harida	31,499.71	14,499.87	5,599.95	899.99	0	52,499.52
13	Char	5,51,994.97	77,799.29	6,499.94	199.99	0	6,36,494.19
14	Neem	0	0	0	0	0	0
15	Rai/Moi	1,40,798.72	60,999.44	14,899.86	3,699.97	899.99	2,21,297.98
16	Mahul	1,25,298.86	76,999.29	37,399.65	14,999.86	5,599.95	2,60,297.61
17	Kasi	21,599.80	12,999.88	3,499.97	1,299.98	399.99	39,799.63
18	Jamun	81,299.27	43,799.61	17,999.84	4,499.96	1,599.98	1,49,198.67
19	Sidha	1,02,599.08	29,599.73	7,999.93	1,499.99	1,099.99	1,24,798.72
20	Tentuli	16,099.86	8,199.93	2,799.98	799.99	399.99	28,299.76
21	Anla	33,499.96	6,899.94	799.99	0	0	41,199.89
22	Salai	9,799.91	14,599.87	12,799.88	5,199.95	1,899.98	44,299.59
23	Bela	7,699.93	1,299.98	299.99	0	0	9,299.91
24	Kusum	10,399.91	9,799.91	4,399.96	5,799.95	1,399.99	31,799.72
25	Amba	32,899.70	21,499.81	1,899.98	99.99	0	56,399.48
26	Kumbhi	32,899.70	21,499.81	1,899.98	99.99	0	56,399.48
27	Misc	6,49,994.15	1,75,698.42	44,499.59	10,799.90	2,999.97	8,83,992.03

	Total	**42,36,823.98**	**19,17,282.58**	**7,66,657.32**	**2,67,297.49**	**93,599.1**	**72,81,660.47**

6.5 ESTIMATION OF GROWING STOCK OF THE DIVISION

IN SITU CAPITAL VALUE OF GROWING STOCK

The total unit value of the enumerated forest blocks can be obtained by multiplying the unit value for each girth class with the estimated number of trees. The total units of timber available are presented here under.

ESTIMATED TOTAL UNITS SPECIES WISE AND GIRTH CLASS WISE

Total area of 13 Forest blocks: 33084.01 hactares Area of Enumeration: 335 ha.

No.	Species	30-59 cm	60-89 cm	90-119 cm	120-149 cm	150 cm & above	Total
1	Sal	303772	413746	444996	356197	254398	1773109
2	Asan	38436	34825	16250	8600	5200	103311
3	Bija	12900	16099	17900	9999	7600	64498
4	Dhaura	16956	16932	9525	3000	1900	48313
5	Bandhan	3750	3750	1800	1000	0	10300
6	Mundi	1284	875	1100	1700	1000	5959
7	Gambhar	850	900	100	400	0	2250
8	Kurum	3600	3050	3800	1800	2400	14650
9	Sissoo	500	350	0	200	0	1050
10	Kendu	57743	46700	29750	13100	17200	164493
11	Bahada	714	1392	700	950	1100	4856
12	Harida	1890	1740	1400	450	0	5480
13	Char	33120	9336	1625	100	0	44181
14	Neem	0	0	0	0	0	0
15	Rai/Moi	8448	7320	3725	1850	900	22243
16	Mahul	15036	18999	18700	15000	11200	78935
17	Kasi	2592	3250	1750	1300	800	9692
18	Jamun	9756	10950	9000	4500	3200	37406
19	Sidha	12312	7400	4000	1500	2200	27412
20	Tentora	1932	2050	1400	800	800	6982
21	Anla	2010	828	200	0	0	3038
22	Salai	588	1752	3200	2600	1900	10040
23	Bela	462	156	75	0	0	693
24	Kusum	624	1176	1100	2900	1400	7200
25	Amba	1572	1125	750	1400	1600	6447
26	Kumbhi	1974	2580	475	50	0	5079
27	Misc.	39000	21084	11125	5400	3000	84688
	TOTAL	**571821**	**625365**	**584446**	**434796**	**317798**	**2534226**

6.6 ESTIMATION OF VOLUME OF THE GROWING STOCK

The total in situ capital value of the growing stock is as under

(i) Total estimated units of growing stock = 2534226

(ii) Unit value = Rs.583/-

(iii) Total in situ value of the growing stock= Rs.1,47,74,53,758/-

The average out-turns of round timber per tree for different girth classes in cubic metres for some forest blocks is given below. These out-turn figures have been obtained from the conversion registers maintained by O.F.D.C.Ltd.

Abstract of 1% Enumeration																Area – 6126.75 Ha.
Range- Bisra		South Chirobeda														
Sl. No.	Species	Area of Enumeration - 62.02 ha.														
		30-59 Cm.		60-89 Cm.		90-119 Cm.		120-149 Cm.		150-179Cm.		180&Above		Total		G. Total
		S	U	S	U	S	U	S	U	S	U	S	U	S	U	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	Sal	1590	670	1202	390	745	172	302	55	73	13	36	4	3948	1304	5252
2	Asan	746	127	298	52	141	19	45	4	9	0	5	1	1244	203	1447
3	Bija	168	27	73	14	12	5	1	1	0	0	0	0	254	47	301
4	Dhaura	497	157	238	61	87	26	25	5	6	1	3	0	856	250	1106
5	Bandhan	43	27	44	11	11	2	2	3	0	0	0	0	100	43	143
6	Mundi	8	1	10	2	7	2	1	3	0	0	0	1	26	9	35
7	Gambhar	3	4	7	1	0	0	0	1	0	0	0	0	10	6	16
8	Kurum	41	17	16	5	10	2	1	0	0	0	0	0	68	24	92
9	Sisoo	4	0	4	0	0	0	1	0	0	0	0	0	9	0	9
10	Kendu	526	239	216	91	65	37	20	11	8	7	4	1	839	386	1225
11	Bahada	5	0	0	0	1	0	0	0	0	0	0	0	6	0	6
12	Harida	29	7	18	2	5	1	2	0	0	0	0	0	54	10	64
13	Char	550	100	118	10	8	2	1	0	0	0	0	0	677	112	789
14	Neem	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0
15	Rai/Moi	138	43	104	18	44	7	7	3	6	1	0	0	299	73	372
16	Mohul	94	19	61	28	46	17	24	12	4	1	3	0	232	77	309
17	Kasi	25	7	25	6	7	2	1	2	0	1	1	0	59	18	77
18	Jamu	107	32	65	22	18	7	5	3	2	2	3	0	200	64	264
19	Sidha	167	60	47	17	8	1	4	1	1	2	0	2	227	83	310
20	Tentala	17	9	6	6	6	0	0	0	2	0	0	0	31	15	46
21	Anla	1	5	4	1	0	0	0	0	0	0	0	0	5	6	11
22	Salai	2	0	2	1	2	1	2	0	0	2	1	0	9	4	13
23	Bel	7	1	3	1	0	1	0	0	0	0	0	0	10	3	13
24	Kusum	5	2	1	2	1	0	1	1	1	2	1	0	10	7	17
25	Amba	0	1	1	1	0	0	0	0	0	0	0	0	1	2	3
26	Kumbhi	4	4	1	1	0	0	0	0	0	0	0	0	5	5	10
27	Misc	948	346	307	106	82	26	25	7	2	3	7	0	1371	488	1859
	Total	**5725**	**1905**	**2871**	**867**	**1306**	**330**	**470**	**112**	**114**	**35**	**64**	**9**	**10550**	**3239**	**13789**

Range – BISRA		North Chirobeda												Total area of the block -3654.84 ha.
Sl No.	Species	Area of Enumeration -37.004 ha.												
		30-59 Cm		60-89 Cm		90-119 Cm		120-149 Cm		150 cm and above		Total		G.Total
		S	U	S	U	S	U	S	U	S	U	S	U	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	Sal	393	175	103	79	37	10	3	2	0	0	536	266	802
2	Asan	228	75	45	31	12	10	4	1	0	0	289	117	406
3	Bija	7	10	2	4	0	0	0	0	0	0	9	14	23
4	Dhaura	342	110	79	55	12	9	2	0	0	0	435	174	609
5	Bandhan	8	2	4	1	1	1	0	0	0	0	13	4	17
6	Mundi	2	1	0	0	0	0	0	0	0	0	2	1	3
7	Gambhar	6	1	3	1	0	1	0	0	0	0	9	3	12
8	Kurum	16	18	3	10	1	4	0	0	0	0	20	32	52

9	Sisoo	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Kendu	188	81	42	23	10	2	1	0	0	0	241	106	347
11	Bahada	1	1	1	0	1	0	0	0	0	0	3	1	4
12	Harida	5	2	2	0	1	1	0	1	0	0	8	4	12
13	Char	386	124	59	22	3	3	0	0	0	0	448	149	597
14	Neem	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Rai/Moi	60	53	30	31	9	18	0	1	11	0	100	103	203
16	Mohul	30	3	10	1	3	1	4	0	0	0	47	5	52
17	Kasi	23	5	7	6	0	0	0	1	0	0	30	12	42
18	Jamu	9	4	5	3	1	0	0	0	0	0	15	7	22
19	Sidha	120	110	12	12	4	2	0	0	0	0	136	124	260
20	Tentala	11	6	7	4	0	2	1	1	1	0	20	13	33
21	Anla	4	2	0	0	0	0	0	0	0	0	4	2	6
22	Salai	44	5	93	22	81	28	44	4	11	2	273	61	334
23	Bel	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Kusum	5	5	4	5	0	0	0	0	0	0	9	10	19
25	Amba	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Kumbhi	0	2	0	0	0	0	0	0	0	0	0	2	2
27	Misc	265	232	60	61	12	12	0	0	0	0	337	305	642
	Total	**2153**	**1027**	**571**	**371**	**188**	**104**	**59**	**11**	**23**	**2**	**2984**	**1515**	**4499**

PART-I
CHAPTER-VII
ESTIMATE OF CAPITAL VALUE OF FORESTS

7.1 Total area of 69 R.Fs in full and one in part, 6 P.R.Fs, 33 D.P.Fs and 19 Village forest covered under this plan is 54952.67ha. The forest types, crop composition, crop quality, crop density etc of the growing stock are not uniform throughout the Division rather vary from place to place. Even variations are noticed within the same block and compartment. To have a realistic estimate of the capital value of the standing crop, we must have a complete set of information /data on growing stock. Information have been collected through enumeration, stock mapping and compartment inspection etc., but due to factors like vastness of the forest area, heterogeneity of vegetation, relatively low intensity of enumeration etc, it is difficult to make proper estimate of the capital value of the growing stock of the Division. However attempt has been made to calculate capital value basing on the available data /information. For the purpose of estimation of the population, volume and capital value of the growing stock, following facts have been taken into consideration.

1. Out of 70 RFs, 6 PRFs and 33 DPFs, growing stock of 2 RFs of present Rourkela Division have been enumerated and included in Selection Working Circle.

2. The standing crop in rest of the forest blocks does not have sufficient growth for enumeration i.e. percentage of trees of higher girth class is very less for any effective enumeration. Hence, it is not possible to estimate the growing stock in these blocks.

3. Intensity of enumeration is one percent and it has been carried out by linear strip sampling method. The total enumerated area of 10 RF and 3 PRF blocks is 335.0 ha.

4. For growing stock of trees having 30 cm. girth at breast height and above trees have been enumerated and grouped into 27 different species. Other trees are grouped into miscellaneous category.

5. Stock mapping of growing stock has been carried out for the whole Undivided Sundargarh Division in 314 forest blocks and stock maps have been prepared.

6. Comparison with previous enumeration data is not feasible as no enumeration had been carried out during the preparation of the plan.

7. Local volume equations developed by Forest Survey of India based on forest inventory of some portions of Odisha have been used for estimating the volume of the growing stock.

7.2 The unit volume of timber has been calculated by the method prescribed by Memo No.12224 (4)/5F ST-20/81 dt.7.6.1982 and No.17544/5F.ST-20/83 dt.4.9.1987 of Principal Chief Conservator of Forests, Orissa, Bhubaneswar. As per these circulars, the ratio for conversion into units is presented in the following table. Ratio for conversion into 'UNITs'

Girth class (in cm.)	1st Class Species	2nd Class Species	3rd Class Species
Less than 60 cm.	0.25	0.12	0.06
60 - 89	0.50	0.25	0.12

90 - 119	1.00	0.50	0.25
120 to 149	2.00	1.00	0.50
150 to 179	4.00	2.00	1.00
180 and above	6.00	3.00	1.50

1st Class - Sal, Sissoo, Bandhan, Gambhar, Mundi,Bija

2nd Class - Kasi, Asan, Mango, Kendu, Jamu,Dhaura.

3rd Class - All other species except Teak and Sandal wood.

The unit value of timber is taken at Rs.583/- .This is obtained by taking average of the unit value of Selection coupes of Sundergarh Division operated last during 93-94.

7.3 IN SITU CAPITAL VALUE OF GROWING STOCK

The total unit value of the enumerated forest blocks can be obtained by multiplying the unit value for each girth class with the estimated number of trees. The total units of timber available are presented here under.

ESTIMATED TOTAL UNITS SPECIES WISE AND GIRTH CLASS WISE

Sl. No.	Species	30-59 cm	60-89 cm	90-119 cm	120-149 cm	150 cm and above	Total
1	Sal	303772	413746	444996	356197	254398	1773109
2	Asan	38436	34825	16250	8600	5200	103311
3	Bija	12900	16099	17900	9999	7600	64498
4	Dhaura	16956	16932	9525	3000	1900	48313
5	Bandhan	3750	3750	1800	1000	0	10300
6	Mundi	1284	875	1100	1700	1000	5959
7	Gambhar	850	900	100	400	0	2250
8	Kurum	3600	3050	3800	1800	2400	14650
9	Sissoo	500	350	0	200	0	1050
10	Kendu	57743	46700	29750	13100	17200	164493
11	Bahada	714	1392	700	950	1100	4856
12	Harida	1890	1740	1400	450	0	5480
13	Char	33120	9336	1625	100	0	44181
14	Neem	0	0	0	0	0	0
15	Rai/Moi	8448	7320	3725	1850	900	22243
16	Mahul	15036	18999	18700	15000	11200	78935
17	Kasi	2592	3250	1750	1300	800	9692
18	Jamun	9756	10950	9000	4500	3200	37406
19	Sidha	12312	7400	4000	1500	2200	27412

20	Tentora	1932	2050	1400	800	800	6982
21	Anla	2010	828	200	0	0	3038
22	Salai	588	1752	3200	2600	1900	10040
23	Bela	462	156	75	0	0	693
24	Kusum	624	1176	1100	2900	1400	7200
25	Amba	1572	1125	750	1400	1600	6447
26	Kumbhi	1974	2580	475	50	0	5079
27	Misc.	39000	21084	11125	5400	3000	84688
	TOTAL	**571821**	**625365**	**584446**	**434796**	**317798**	**2534226**

7.4 ESTIMATION OF POPULATION OF GROWING STOCK

As mentioned earlier 13 forest blocks have been enumerated with the linear strip sampling method with the enumeration intensity of about one percent and while carrying out enumeration exercise, the forest blocks have been taken as a unit. The population of different species in different girth classes has been computed block wise. For this purpose, following empirical formula has been used.

$$P = \frac{P_e \times A_t}{A_e}$$

Where P_e = Population of tree species 'S' in girth class 'x-y' in the forest block 'A'

A_t = Total area of forest block 'A'

A_e = Enumerated area of forest block 'A'

The growing stock of RF blocks of Chhatamb, Bhaisamunda and many others have not been enumerated. For above mentioned forest block, enumeration figures of the adjoining and nearby RF blocks having similar type of crops have been taken into account. The girth class wise population of different species in these forest blocks has been computed by using empirical formula applicable for enumerated forest blocks. Many RF and PRF blocks are having degraded forest vegetation and are to be managed under Rehabilitation Working Circle. Girth class wise total population of different species in these blocks has been computed using following empirical formula.

$$Pt = Pavg \times A \times Y$$

Where Pavg = Average per ha. population of species 'S' in girth class 'x-y' in enumerated forest blocks.

A = Area of remaining un-enumerated forest blocks.

Y = Numerical factor which varies with girth class and has been arrived on the basis of field observations.

The value of numerical factor 'Y' for different girth classes has been taken as given below:

Y = 0.40 for 30-59 cm. girth class.

Y = 0.30 for 60-89 cm. girth class.

Y = 0.25 for 90-119 cm. girth class.

Y = 0.15 for 120-149 cm. girth class.

Y = 0.05 for 150 cm. and above girth.

Using above cited empirical formula the total number of different species in different girth class in all the forest blocks have been computed which is furnished in the following table.

Sl. No.	Species	30-59 cm	60-89 cm	90-119 cm	120-149 cm	150 cm and above	Total
1	Sal	12,15,088.98	8,27,492.49	4,44,995.96	1,78,098.38	63,599.42	27,29,275.23
2	Asan	3,20,297,08	1,39,298.73	32,499.70	8,599.92	2,599.98	5,03,295.41
3	Bija	51,599.53	32,199.71	17,899.84	4,999.95	1,899.98	1,08,599.01
4	Dhaura	2,82,597.43	1,41,098.72	38,099.65	5,999.95	1,899.98	4,69,695.73
5	Bandhan	14,999.86	7,499.93	1,799.98	499.99	0	24,799.76
6	Mundi	10,699.90	3,499.97	2,199.97	1,699.98	499.99	18,599.82
7	Gambhar	3,399.97	1,799.98	99.99	199.98	0	5,499.94
8	Kurum	14,399.87	6,099.94	3,799.96	899.99	599.99	25,799.75
9	Sisoo	1,999.98	699.99	0	99.99	0	2,799.96
10	Kendu	4,81,195.62	1,86,798.30	59,499.46	13,099.88	4,299.96	7,44,893.22
11	Bahada	11,899.89	11,599.89	2,799.97	1,899.98	1,099.98	29,299.72
12	Harida	31,499.71	14,499.87	5,599.95	899.99	0	52,499.52
13	Char	5,51,994.97	77,799.29	6,499.94	199.99	0	6,36,494.19
14	Neem	0	0	0	0	0	0
15	Rai/Moi	1,40,798.72	60,999.44	14,899.86	3,699.97	899.99	2,21,297.98
16	Mahul	1,25,298.86	76,999.29	37,399.65	14,999.86	5,599.95	2,60,297.61
17	Kasi	21,599.80	12,999.88	3,499.97	1,299.98	399.99	39,799.63
18	Jamun	81,299.27	43,799.61	17,999.84	4,499.96	1,599.98	1,49,198.67
19	Sidha	1,02,599.08	29,599.73	7,999.93	1,499.99	1,099.99	1,24,798.72
20	Tentuli	16,099.86	8,199.93	2,799.98	799.99	399.99	28,299.76
21	Anla	33,499.96	6,899.94	799.99	0	0	41,199.89
22	Salai	9,799.91	14,599.87	12,799.88	5,199.95	1,899.98	44,299.59
23	Bela	7,699.93	1,299.98	299.99	0	0	9,299.91
24	Kusum	10,399.91	9,799.91	4,399.96	5,799.95	1,399.99	31,799.72
25	Amba	32,899.70	21,499.81	1,899.98	99.99	0	56,399.48
26	Kumbhi	32,899.70	21,499.81	1,899.98	99.99	0	56,399.48
27	Misc	6,49,994.15	1,75,698.42	44,499.59	10,799.90	2,999.97	8,83,992.03
	Total	**42,36,823.98**	**19,17,282.58**	**7,66,657.32**	**2,67,297.49**	**93,599.1**	**72,81,660.47**

7.5 VOLUME EQUATIONS

Volume equations have been used for computing the volume of growing stock. As mentioned earlier, these volume equations for some important species have been developed by Forest Survey of India, Dehradun (FSI). These local volume equations have been derived on the basis of forest inventory done by FSI in the forests of Sambalpur Division, Koraput Division and few other areas of Orissa. In a particular volume equation 'V' represents the under bark round timber volume of standing tree in cum

and 'D' is the over bark diameter at breast height in mts. The local volume equation gives the volume of the main stem upto the point where stem can not be differentiated from the branches. The following table gives local volume equations for different species.

Name of the Species	Local volume equations	Remarks
(1)	(2)	(3)
Sal	$\sqrt{V} = 0.19994 + 4.57179\ D - 1.56823\ \sqrt{D}$	Based on the forest inventory of Sambalpur
Bija	$\sqrt{V} = 0.16276 - 2.82002\ D + 0.04034\ D^2$	-do-
Asan	$V = 0.05061 - 1.11994\ D + 8.77839\ D^2$	-do-
Dhaura	$V = 0.13928 - 2.87067\ D + 20.22404\ D^2 - 13.80572\ D^3$	-do-
Kendu	$\sqrt{V} = 0.06728 + 4.06351\ D - 0.99816\ \sqrt{D}$	-do-
Kurum	$V = 0.08507 + 0.19669\ D + 7.16812 D^2$	-do-
Kasi	$\sqrt{V} = 0.1162 + 4.12711\ D - 1.08508\ \sqrt{D}$	-do-
Jamu	$\sqrt{V} = 0.30706 + 5.12731\ D - 2.0987\ \sqrt{D}$	-do-
Sidha	$V = 0.07199 - 1.25923\ D + 9.28416\ D^2$	-do-
Bandhan	$\sqrt{V} = 0.03456 + 3.81921\ D - 0.80884\ \sqrt{D}$	-do-
Bahada	$V = 0.14823 + 2.44138\ D - 6.86434\ D^2 + 18.05444\ D^3$	-do-
Moi	$V = 0.01071 - 0.66528\ D + 9.54478\ D^2 - 4.58876\ D^3$	-do-
Karda	$\sqrt{V} = 0.12956 + 3.7819\ D - 1.04671\ \sqrt{D}$	-do-
Salai	$V = 0.36432 - 1.32768\ D + 9.48471\ D^2$	-do-
Simul	$V = 0.02834 + 4.68381\ D^2$	-do-
Sissoo	$V = 0.00965 + 0.58546\ D + 2.5605 D^2 + 24.34215\ D^3$	-do-
Mundi	$V = 0.08444 - 1.26801\ D + 8.75274\ D^2$	Based on the forest inventory done by F.A.O.
Tentra	$V = 0.27 - 2.953\ D + 12.836\ D^2$	-do-
Kumbhi	$V = 0.003 - 0.848\ D + 7.342\ D^2$	-do-
Anla	$V = 0.406 + 3.54\ D - 3.231\ D^2$	-do-
Mahul	$V = 0.10423 - 1.38429\ D + 8.39379\ D^2$	Based on the forest inventory of Koraput
Misc.	$\sqrt{V} = 0.06063 + 3.43666\ D - 0.75571\ \sqrt{D}$	Based on the forest inventory of Sambalpur

For the tree species, e.g., Char, Harida, Rai, Dhubeni, Bheru, Sunari, Bel, Kusum, Amba, Kadamba and Teak volume equations are not available. Hence, for these species, volume equation applicable for miscellaneous species is used.

7.6 VOLUME OF GROWING STOCK

Using above local volume equations, girth class wise volume of growing stock has been computed. While computing the volume of a particular tree species in a particular girth class, diameter

corresponding to mid-girth class has been taken as a representative of that girth class. The value of 'D' for different girth classes has been taken as below:

D	=	0.14 m for girth class	30-59 cm.
D	=	0.24 m for girth class	60-89 cm.
D	=	0.33 m for girth class	90-119 cm.
D	=	0.43 m for girth class	120-149 cm.
D	=	0.53 m for girth class	150 cm and above

7.7 SELLING RATES OF ROUND TIMBER AT ROURKELA O.F.D.C. DEPOT

Following table gives girth class wise approximate selling rates for different species at Rourkela O.F.D.C.Depot. These rates have been deduced from the selling rate provided by O.F.D.C.Ltd and are approximate in nature. These rates are for the financial year 1996-97.

Species	30-59 cm.	60-89 cm.	90-119 cm.	120-149 cm.	150 cm. and above
(1)	(2)	(3)	(4)	(5)	(6)
Sal	2100.00	3800.00	5600.00	7200.00	7500.00
Asan	1250.00	2000.00	2300.00	2700.00	3000.00
Bija	2200.00	3900.00	5800.00	7500.00	9500.00
Dhaura	1400.00	2750.00	3700.00	4000.00	4500.00
Kendu	1150.00	2100.00	2300.00	2500.00	2800.00
Bandhan	1700.00	3550.00	3800.00	4200.00	5000.00
Kurum	1450.00	3100.00	4100.00	4800.00	6500.00
Mundi	1250.00	2050.00	2500.00	2600.00	3000.00
Gambhari	2450.00	4000.00	5800.00	8200.00	10500.00
Sissoo	5500.00	9200.00	11800.00	13800.00	15500.00
Char	1100.00	2000.00	2200.00	2400.00	2600.00
Bahada	1200.00	2000.00	2200.00	2400.00	2600.00
Harida	1200.00	2000.00	2200.00	2400.00	2600.00
Moi	700.00	1100.00	1200.00	1300.00	1450.00
Rai	700.00	1100.00	1200.00	1300.00	1450.00
Mahul	1200.00	2000.00	2200.00	2400.00	2600.00
Kasi	1700.00	3700.00	4400.00	5100.00	6700.00
Jamu	1400.00	2750.00	3700.00	4000.00	4500.00
Sidha	1200.00	2000.00	2200.00	2400.00	2600.00
Tentra	1400.00	3400.00	3700.00	5100.00	6100.00
Dhuben	1000.00	1800.00	2000.00	2200.00	2300.00
Bheru	750.00	950.00	1050.00	1100.00	1200.00
Anla	1200.00	2000.00	2200.00	2400.00	2600.00
Salai	700.00	1100.00	1200.00	1300.00	1450.00

Karada	1200.00	2000.00	2200.00	2400.00	2600.00
Sunari	750.00	950.00	1050.00	1100.00	1200.00
Bel	1000.00	1800.00	2000.00	2200.00	2400.00
Semul	700.00	1100.00	1200.00	1300.00	1450.00
Kusum	1200.00	2000.00	2200.00	2400.00	2600.00
Amba	900.00	1400.00	1700.00	2000.00	2200.00
Kadam	1400.00	2750.00	3700.00	4000.00	4500.00
Kumbhi	750.00	950.00	1050.00	1100.00	1200.00
Teak	5500.00	9200.00	11800.00	138000.00	15500.00
Misc.	1200.00	2100.00	2300.00	2500.00	2700.00

7.8 PRODUCTION COST OF ROUND TIMBER

It has been hypothetically assumed that all standing crop will be clear felled and converted into round timber, firewood and Bamboo sale units at the site by the O.F.D.C.Ltd. and then afterwards will be transported to their depot at Rourkela for selling purpose. All these process of felling, logging, conversion, transportation etc. involve huge amount of expenditure. For estimating the in situ capital value of standing crop (round timber) it is necessary to estimate the production cost of round timber which will be inclusive of expenditure incurred at the site, transportation cost and cost incurred at the depot.

Estimation of volume of the growing stock

The total in situ capital value of the growing stock is as under

(1) Total estimated units of growing stock = 2534226

(2) Unit value = Rs.583/-

(3) Total in situ value of the growing stock = Rs.1,47,74,53,758/-

7.9 ESTIMATION OF CAPITAL VALUE OF FIRE WOOD

The forest of this division is primarily of broad leave deciduous type. In this type of forest about 20% of total volume of tree constitutes the fire wood. Species-wise volume estimation of the round timber of growing stock of girth 30 cm. and above has been done and these figures have further been used for estimating the volume of fire wood portion of the standing crop empirical formula has been used.

$$V_f = 0.25 \text{ X } V_r$$

where V_r = Total volume of round timber of species 'S' in 314 nos. of forest blocks in girth class 30 cm. and above.

V_f = Total volume of firewood of species 'S' in 314 nos. of forest blocks in girth class 30 cm. and above.

Using above mentioned method, total fire wood volume of all the species have been roughly computed. The total fire wood volume of different species has been converted into equivalent weight by multiplying volume with specific gravity (at oven dry weight and green volume) selling rate of fire wood has been taken as Rs.200.00 per MT (at Rourkela).

PRODUCTION COST OF FIREWOOD

Estimated volume of firewood comes to Rupees fifty crores only. For estimating the insitu capital value of firewood portion of the standing crop, it is necessary to estimate the production cost of firewood. Production cost will be inclusive of expenditure incurred in conversion of lops and tops, stacking at site, transportation and cost incurred at depot. For the purpose of estimation of production cost of firewood, production cost norms for firewood as obtained from O.F.D.C.Ltd (applicable for Rourkela for the financial year 1996-97) has been taken into consideration. In situ capital value of growing stock of firewood comes to Rupees fifty crores approximately.

7.10 ESTIMATE OF CAPITAL VALUE OF BAMBOOS

Enumeration of bamboo in the bamboo bearing forest area of various RF and PRF blocks has also been done simultaneously alongwith the enumeration of tree species. While carrying out bamboo enumeration, only number of culms per clump has been counted and girth and length of each bamboo have not been measured.

Since the selling rate of bamboo culms varies as per length and girth class, so the average in situ capital value of each culm has been taken at Rs. 2.00 basing on above facts and assumptions, total insitu capital value of bamboo forest of the Division comes out to be Rs.5.00 crores. The O.F.D.C. Ltd has not worked bamboo coupes during 1999-2001 due to non-availability of bamboo in bamboo coupes. However, it is expected that bamboo production will improve after silvicultural operations are taken up.

7.11 TOTAL IN SITU CAPITAL VALUE OF GROWING STOCK

(Round timber, fire wood and bamboos)

(i)	Total insitu capital value of round timber	=	Rs. 147.74 crores
(ii)	Total insitu capital value of firewood	=	Rs. 50.00 crores
(iii)	Total insitu capital value of bamboos	=	Rs. 5.00 crores
So, the total in situ capital value of growing stock		=	Rs. 202.74 crores

7.12 ASSESSMENT OF ENVIRONMENTAL VALUE OF THE FOREST

Forest is a vast treasure of various valuable resources. It provided both tangible benefits to the living beings. Apart from providing- timber, firewood, fodder, fruits, seeds, resin, gums, tans, medicinal herbs and various others non-timber products, it also provides many other silent benefits. The immense bio-mass of the forest continuously improves the quality of the atmosphere by absorbing harmful gases like Carbon dioxide etc. and by releasing Oxygen to the environment. Forest is also a large reservoir of both surface and underground water retention capacity of the soil and prevents soil erosion. Forest improves the fertility of the soil by providing essential organic matter to the soil. Forest cover improves the landscape to a great extent and thus enhances the aesthetic value of surrounding environment. It is also a great source of recreation to the living beings.

Keeping in view the above cited tangible and intangible benefits as provided by the forest and environment, the norm for computting the environmental value of one hact of fully stocked forest having density 1.0 has been taken as Rs.126.74 lakhs to accrue over a period of 50 years. It improves water

retaining capacity, prevents soil erosion, improves fertility of soil and provides many other benefits. There is no perfect method to assess the environmental value of forests. The value of one hactare of fully stocked area having density 1.0 has been taken as Rs.126.74 lakhs to accrue over a period of 50 years. Basing on this the environmental value of this Division having average density of forest as 0.5 comes to Rs. 790 crores per year.

Environmental value of the forest is comprehensive in nature and is inclusive of so many tangible and intangible values. From the above computations, it is evident that the capital value of the forest of Sundargarh Division is below eight percent of the environment value. Though, the timber, firewood, bamboo etc. are apparently major forest produce from commercial point of view but their overall contribution in the welfare of the living beings is a small fraction of other benefits provided by the forest. Hence, we have to be very cautious regarding felling of the trees and should make all possible efforts to conserve and preserve this valuable natural resource in perpetuity.

PART-I

CHAPTER-VIII

WILDLIFE

8.1 GENERAL HISTORY

Orissa comes under the bio-geographical zone of Deccan peninsula. The central or core area of Indo–Malayan or Oriental realm containing tropical forests represent the richest bio-geographic area from biodiversity point of view. The wildlives existing in Orissa are classfied under the Indian Peninsular sub-region that forms a part of the Oriental Zoogeographical realm of the world.

8.2 WILDLIFE MANAGEMENT IN PREVIOUS PLANS

The forest of Sundergarh District was rich with diverse flora and fauna in the past. Massive hunting of tiger and regular poaching of other animals took place in the past by the Ex-rulers of Sundergarh and by poachers. The Ex-rulers of Sundargarh District took up unabated poaching of animals and specific control measures were not implemented. The tribals of Sundargarh forest, encroachers inside the forests and local people were very often indulging in 'Shikar' and that resulted in low population of animals, unbalanced prey-predator ratio, high rate of mortality, low birth rate of herbivores, migration of animals and destruction of habitat. There was tremendous decrease in population of wild animals, loss of cover and habitat due to destruction of forests. The density of forest in majority of forest blocks of Rajgangpur, Kuarmunda Ranges decreased considerably and that resulted in loss of cover for the animals.

The water sources, both annual and perennial decreased in the past due to diversion of stream near forest areas by the local inhabitants and encroachers for the purpose of cultivation. Diversion of streams, nallah and small water sources for agriculture purposes forced the animals to migrate to distant areas in search of water during pinch period. In the past severe damage was caused to wild animals' habitat due to large scale reclamation of forest area and resettlement of revenue villages inside the forests. The removal of timber by various agencies in the past, mining activities, human interference, new village settlements as encroachments inside forest areas, opening of new roads, illicit felling of trees and rapid urbanization and industrialization have shown adverse effects on the wild animals and their population has decreased considerably. The list of injury caused to human beings, crop damage, house damage and cattle damage along with compensation paid to the victims are given in Annexure 30 to 34 (Page-130 to 132, Vol-II).

8.3 PRESENT STATUS OF WILDLIFE

The general census report is given in annexure 28 and 29(Page -129, Vol-II). The herbivores and birds are thriving well in the forests of Rourkela Division but carnivores have become almost extinct from this Division according to census report. It shows that hidden poaching of carnivores is taking place. The encroachers and tribals, who want to save their domestic cattle from predation by carnivores, are killing the carnivores. The male, female and calves ratios are not maintained in all animals except elephants. Tiger (*Panthera tigris*) was available in Chhatam R.F., Haldipani R.F., north and south Chirobeda R.F. but due to increase in population their numbers have decreased throughout the division. Jungle cats are seen in almost all R.F. Sloth Bear is common in Chirobeda R.F., Sloth bear are very often attacking human beings due to fragmentation of habitat and non-availability of food.

The elephants are found roaming in all the six ranges of Rourkela Divisions. The elephant migrate from Jharkhand state and Chhatisgarh state through different routes and intermixing with elephants of Orissa is commonly available. In Bisra range, North Chirobeda R.F. and South Chirabeda R.F. provide shelter to elephants. These habitats are the original home of elephants and migration through corridors and intermixing with other elephants are very common. The migratory path of elephants sometimes changes and they keep moving in herd of 3 to 12 elephants through different forest blocks. Bison have become extinct from the division. Hyena, porcupine, barking deer, monkey, rhesus macaque, mongoose and hare are commonly available in almost all the bigger forest blocks of Rourkela division. The important migratory routes of elephants should be joined with corridors and human habitations in that area should be evicted. The man-elephant conflict takes place in the migratory routes because adequate food and water are not available in the area. The prey-predator ratio is highly imbalanced and association among wild animals has reduced.

8.4 SANCTUARY AND NATIONAL PARK

There is no Sanctuary and National Parks existing in this Division.

8.5 RIGHTS AND CONCESSIONS

After the enactment of Wild Life (Protection) Act, 1972 and its further amendments, the Ex-rulers of Sundargarh and the common citizens of Sundargarh have no rights regarding poaching, shooting and trade in wild animals and wild life articles.

8.6 COMMON INJURIES TO WILD LIFE

There are many factors responsible for causing damage to wild lives and destroying food, water, cover and instinctive needs of animals. They are discussed below.

8.6.1 Destruction of habitat

There has been massive destruction of habitat due to illicit felling of trees and encroachments inside forest areas, removal of trees, destruction of forests cover, collection of NTFP by local tribals, diversion of water course of nallah and stream for agricultural purposes, cultivation of agriculture crops inside encroached areas, infestation by weeds in blank areas, decrease in cover of wild animals due to removal of trees from forest area and interference by local habitants inside the forest. Major predators, i.e., tiger and leopard are not available in forest according to census report.

8.6.2 Lack of food

There is tremendous shortage of food for both predators and prey inside the forest. The bamboo is not available in sufficient quantity for elephants and as a result the elephants are migrating to different areas. Tall grasses, which were available in plenty in the past, have decreased and small grasslands have been converted into agricultural fields by encroachers. The ambush cover has decreased and ungulate population is unable to breed successfully. There is acute shortage of fruit bearing trees for herbivores including monkeys and elephants. Due to lack of grazing land, frequent forest fire, hunting, lack of water and lack of cover, the breeding among herbivores is not taking place properly. As a result, herbivores population has decreased tremendously. The number of prey has decreased and as a result of which the number of predators has also decreased.

8.6.3 Lack of Water

There are two major rivers flowing in this Division and there are many perennial streams inside the forest. The local encroachers have diverted most of the perennial streams for agricultural purposes. During summer, the animals are migrating to different places in search of water.

8.6.4 Lack of Cover

Due to massive destruction of forest, decrease in density of the forest, encroachment by human population, increase in number of domestic cattle, grazing and frequent fire, the cover of animals have decreased. As a result breeding among the animals, increase in population and development and growth of the animals is poor. The male-female ratio is not balanced and lack of cover is coming in way to breeding. There is definite loss of natural vegetal cover due to decrease in density of forests. Non-vegetal cover i.e. caves etc. are available. Refuge cover has decreased in Rajgangpur and Kuarmunda Range due to heavy destruction of forests. Ambush cover is available in almost all the Ranges. Loafing cover is available in Bisra Range. Breeding cover is available in all Ranges and it has decreased slightly in Sundargarh, Kuarmunda and Rajgangpur Ranges due to heavy industrialization. Roosting cover for birds is sufficient throughout the Division.

8.6.5 Departmental Working of Timber

In the past departmental working of timber was taken up without giving full consideration to wild lives and as a result the wild animals population has decreased. Snags are less and there are gaps created by local inhabitants between patches of forest area. The growth of bamboo is stagnated at many places and weeds have replaced the grasses and grassland. Continuous patch of forest is seen in Bisra, Rajgangpur Ranges. Weed eradication and silvicultural operation of bamboo clumps are immediately required.

8.6.6 Plantation Program

Massive plantations were taken up along with trench fencing in most of RFs, PRFs and DPFs. Common species, which have been planted, are Teak, Eucalyptus, Acacia, Chakunda and Gambhari etc. These commercial plantations have adversely affected the wild animals' habitat.

8.6.7 Encroachment

The number of wild animals is much below the carrying capacity of forest area because the number of local cattle inside the forest has increased tremendously. The encroachers and local inhabitants are keeping plenty of cows, buffaloes, goats and sheep. These domestic animals are grazing inside the forest, polluting water of streams, nalla and ponds and spreading diseases among wild animals. The wild animals, both herbivores and carnivores are migrating to different places in search of food and water.

8.6.8 Diseases

Common diseases observed are Anthrax, Foot and Mouth diseases etc. Vaccination of domestic cattle is essentially required throughout the Division.

8.6.9 Fire

Annual fires are reported throughout the Division in most of the forest blocks. Fire destroys the organic matter, burns grass and calfs of animals inside the grasses. The wild animals lose their cover due to frequent fire and are forced to migrate to different areas. Fire control measures are required to be adopted to save the habitat especially in Rutukupedi, Chhatam, South chirobeda, N. Chirobeda and Durgapur R.F.

8.6.10 Increasing demand of forest product

The demand of forest product, i.e., timber, fire wood, fodder, NTFP, bamboo and other forest products has increased due to pressure of industrialization and urbanization throughout the Division. It has adversely affected the ecological balance of the area.

8.6.11 Poaching

The local tribal and encroachers of the Division very often go for hunting of the animals. It needs to be checked by regular patrolling in the area and punishing the offenders by legal measures. The poaching cases have been detected and prosecutions have been sent to Court for trial. The details are given in annexure 30. The damage caused to houses by wild animals, cattle lifted, crop damaged, and compensations paid are mentioned in annexure 31. The compensation paid for human kills are given in annexure 32.

8.6.12 Method of hunting and shooting

The hunting and shooting of wild animals by common citizens, Ex-Rulers and poachers are stopped completely according to Wild Life (Protection)Act, 1972. For research work, scientific proposes and for animals, which are, causing threat to life and property of common citizens, special permission from Chief Wild Life Warden, Orissa, Bhubaneswar is required.

8.7 EXISTING SALT LICKS AND WATER HOLES

(A) Number of Game Tanks and their location

There are 41 water bodies created in this Division by the end of 2013-14 under different schemes, which are as follows:

	Name of Range					
Name of RF with no. of water body created	Bisra	Kuarmunda	Biramitrapur	Panposh	Rajgangpur	Grand total
	Bagdega-1 S. chirobeda-3 N.Chirobeda-3 Jharbeda-1 S.Sukuda-1 Lindidiri-1 Gainjor-1	Rutkupedi-4 Mudra-1 Kamarpahad-2 Brahmani-2 Bhaisamunda-1	Purnapani-1 Andhari-1 Dhumagada-1 Satbhaya-1 Mankadchua-1 Lassey-2	N.Chirobeda-3 Ergeda-1 Hatibandha-1	Chhatam-3 Haldipani-3	

	N.Sukuda-1 Kudahudang-1					
Total	**13**	**10**	**7**	**5**	**6**	**41**

(B) Number of Salt licks and their location:-NIL

(C) Number of watchtower and their location: Nil

8.8 WILD LIFE RULES

Prior to enactment of Wild Life (Protection) Act, 1972, the following legislations of the Ex-Rulers and State Government were in operation.

1. The Reserved Forests Shooting Rules.
2. The Elephant Preservation Act, 1879.
3. The Wild Birds and Animals Protection Act.

The rules and laws were comprehensive in nature but there was no provision for controlling trade, imposing penalties on poachers and enforcing wild life protection rules on offenders. The Wild Life (Protection) Act 1972 enacted by the Central Government and subsequent Wild life (Protection), Orissa Rules, 1974 has brought some changes. As a result, poaching and trade of wild animals have reduced. The Divisional Forest Officer, Rourkela (T) has been declared as Ex-officio Wild Life Warden in respect of Rourkela (T) Division.

PART-I

CHAPTER-IX

WATER SHED, HYDROLOGY AND SOIL EROSION

9.1 GENERAL There are several minor irrigation projects in this Division. Out of those, Mandira Dam and Pitamahal Dam is worth mentioning. The soil conservation works taken up by Forest Department are negligible although there is scope for check dams, water harvesting structures and mini-watersheds inside forest. A good chunk of geographical area is under forest cover with adequate forest growth. A good nos. of streams are flowing through this Division but most of them are non-perennial. Hence, from watershed point of view all the existing forest area need to be properly managed.

The Brahamani is the important river flowing through this Division. . This river is fed by several perennial and non-perennial streams as detailed in Chapter 1.

9.2 SOIL EROSION

Denudation of forest growth results in soil erosion and once it is started will continue till the complete devastation of the whole area. The importance of forest in changing the micro climate, increasing the number of rainy days, regulating the water in streams, reducing silt load in rivers and streams ultimately increases the longevity of multi-purpose river valley projects for power generation. Soil erosion is wide spread especially in Hatibari areas by the cultivators of marginal lands particularly in the areas where a dry nalla flows. Such nallas are blocked at various points and its banks are widened gradually for cultivation.

Mining operation involve extensive excavation of forest land and are causing considerable damage to forest crop and are responsible for soil erosion. Decrease in forest cover increases water run off and increases the risk of flood. No specific fund for watershed development, prevention of soil erosion has been allotted to this Division over the years. Due to paucity of funds no significant work has been taken up in this Division as regard to watershed development and soil conservation measures.

The maximum temperature experienced in this Division is 45.5^0 centigrade during the month of May and June where as the minimum temperature is 6 degree centigrade recorded in the month of January. The details of rain fall have already been furnished in Chapter 1 of Part I. The details of agricultural practices have been furnished in Chapter 3. Degraded forest areas requiring immediate rehabilitation measures have been dealt in Rehabilitation Working Circle and appropriate treatment measures for such areas have been dealt their in. A good number of Mining Projects are in operation through out this Division. These mining operations involve extensive as well as intensive excavation of the prime forest land and are thus causing considerable damage to the forest vegetation and are responsible for soil, water and noise pollution. Detailed treatment measures to these mining effected areas have been furnished in Part II of this plan under different working circles.

Though water harvesting structures have not been taken up by Forest Department in this Division, 641 nos. of water harvesting structures have been constructed by Soil Conservation Department in this Division which includes reservoirs, diversion weirs, D/bund barrages etc from the year 1970-71 to 2000-01. An amount of Rs.385 .1966 lakh have been spent on these operations. Moreover 384.8 hectares of Sisal plantation at 13 sites 63 hectares of miscellaneous plantation at 17 sites have been taken up by Soil Conservation Department in this Division. In the forest areas wind erosion is the most common type of erosion. The rate of run off of water in forest area is regulating information of gully especially in hilly area. Gully plugging and construction of check dams are required in most of RFs of Bisra Range, Kuarmunda Range and Rajgangpur Range.

9.3 RIVER SYSTEM AND CATCHMENTS

River Brahamani is main river flowing through this Division. Sankha and Koel, the two tributaries of river Brahamani unite at Vedavyash, 1 Km. from Panposh on the up stream side. This confluence place, Vedavyash, is considered as a sacred place and people from far and near come here to offer their prayer to deity Siva in the 'Mahasivaratri' every year and a grand mela for seven days is celebrated here with much pump & ceremony.

The river Sankha originating from Bihar enters this Division almost in the mid-north and traverses eastwards up to Vedavyash to meet with river Koel to form Brahamani. The feeder tributaries are Lurgi (Perennial), Naktijor and Badjor etc. Mandira reservoir has been constructed on this river near Jharbeda which provides water to Rourekela Steel Plant. Emerging from the Sate of Bihar, River South Koel enters from the Eastern corner of the Division at Jareikela and run up to Vedavyash to form river Brahamani after joining with river Sankha. The main tributaries are Deo nalla, Kalosihiria etc.

These rivers are perennial in nature and water flow continues during summer also. These rivers have to play major role in the forest management of this Division. The presence or Hirakud Dam on river Mahanadi, Rengali Dam on river Brahamani and Mandira Dam on river Sankha demands the up keep of the catchments areas belonging to this Division and necessitates proper management of the existing forest. The denuded forest land of Bihar and Madhya Pradesh in the catchments area of these rivers contributes to the irregular water flow besides soil erosion and requires proper management of the forest of this Division to get sustained water flow in these rivers.

9.4 WORKS OF IMPROVEMENT UNDERTAKEN

No works of improvement regarding Soil Conservation and Watershed have been taken up by Forest Department. The soil conservation works of Soil Conservation Department are included in Annexure 35 (Page-133 to 138, Vol-II).