सत्यमेव जयते

GOVERNMENT OF MAHARASHTRA

WORKING PLAN REPORT

FOR

THE FOREST

OF

BHAMARAGARH FOREST DIVISION

SOUTH CHANDRAPUR FOREST CIRCLE, CHANDRAPUR

FOR THE PERIOD 2007-08 TO 2016-17

BY

RAMJEE SINGH YADAV, IFS
CONSERVATOR OF FORESTS
WORKING PLAN
CHANDRAPUR-2

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VOLUME-I

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RAMJEE SINGH YADAV, IFS
CONSERVATOR OF FORESTS,
WORKING PLAN
CHANDRAPUR-2

FOREWORD

The Draft Working Plan for **Bhamaragarh Forest Division** for the period 2007-08 to 2016-17 by Shri Ramjee Singh Yadav, IFS, Conservator of Forests, Working Plan-2, Chandrapur was approved by the State Level Committee on 13th March 2007 and submitted for final approval to Government of India.

Working Plan of Bhamaragarh Forest Division has been approved with two modifications by the **Government of India, Ministry of Environment & Forests, Regional office, Western Region, Bhopal** vide letter No- **12-22/2006 (FOR)4452 dated 6.12.2007.** Condition No. 2 & 3 of above letter duly complied with and necessary modifications have been carried out in the Working Plan.

Modification No.1 :- The definition of malformed has been replaced as " A tree is malformed when it is defective or abnormal either in crown or bole, which includes condition like slag headedness, crookedness, gnarls, twist or constrictions by climber beyond recoupement etc." **in Place of** "A tree will be treated as malformed if it does not have a clean bole up to at least 2m above the breast height." Modified definition of malformed has been incorporated in Improvement working circle on page 133 section 2.13.3.4 (iv),(e).

Modification No.2 Teak Plantation Working Circle of Draft working plan has been deleted. Entire area 1511.404 ha. of Teak Plantation Working Circle **(overwood removal)** has been incorporated in the Selection-cum-Improvement Working Circle. Old Teak plantations raised during previous plans, have been merged with their original working circles i.e. SCI & IWC and have been prescribed thinning as well as other treatments, as per the schedule given in Vol.II of Appendix XIX. **The final areas in different working circles are as under.**

Sr.No.	Name of the Working Circle	Area as per Draft Plan	Area added/deleted	Area as per Approved W.P.
1	SCIWC	183423.862	(+) 1511.404 (+) 2850.640	**187785.906**
2	IWC	101366.594	(+) 1164.000	**102530.594**
3	PWC	26809.100	0.000	**26809.100**
4	TPWC 1. Old Teak Plantation 2. Overwood Removal	4014.640 1511.404	(-) 4014.640 (-) 1511.404	**0.000** **0.000**
5	**Grand Total of Division Area**	**317125.600**	**0.000**	**317125.600**

Accordingly necessary corrections have been made in the Working Plan.

(Ashok Sharma)
Chief Conservator of Forests
Working Plan, Nagpur.

Nagpur :
Dated : 03/01/2008

FOREWORD

RAMANUJ CHOUDHARY,IFS
CHIEF CONSERVATOR OF FORESTS
(WORKING PLAN), NAGPUR

The present Working Plan Report for Bhamaragarh Forest Division for the period 2007-08 to 2016-17 written by Mr.Ramjee Singh Yadav, IFS, Conservator of Forests on the basis of First Preliminary Working Plan Report written by Shri B.S.K. Reddy, IFS, Conservator of Forests, South Chandrapur Forest Circle, and 2nd Preliminary Working Plan Report written by Shri Ramjee Singh Yadav IFS, Conservator of Forests Working Plan Chandrapur-2, replaces the earlier Working Plan authored by Shri A.P.Deshmukh & Shri B.P. Singh.

This is the first Working Plan for the division which has been written after the issue of detailed guidelines through the National Working Plan Code, 2004 formulated by Government of India. Accordingly as per new guidelines, the author Shri Yadav has added 3 mandatory chapters which vividly focus on need for integrating the concepts like JFM with general approach for management in forestry as well as lay suitable emphasis on propagation, management and conservation of Wildlife & NTFP in the area.

Needless to say, that, successful protection measures with active involvement of local people is '*Sine quo non'* for the sustainable growth and maintenance of extremely valuable forestry resources in the tract. Keeping this in view, the mandatory chapters on JFM as well as for 'Protection' lay suitable emphasis on ensuring that protection of forests is carried out effectively and thwart any attempt for illicit cutting of valuable trees. However, it is very pertinent to mention here that entire division is presently in the grip of antisocial elements and because of that field works like complete enumeration could not be done. In view of this, it is futile to talk of effective protection measures and timely silvicultural operations in the tract till effective steps are taken to tackle naxalite activities in the tract and allow movement of field staff without fear or prejudice. Currently, there appears to be real threat to the life and body of staff and this threat to staff from antisocial elements from within the territory, as well as, across the border need to be undone on top priority basis. Unless effective measures are taken to ensure safety to staff, prescriptions given in the 'Plan' for the growth of the valuable forests would not materialise in real sense. It is, therefore, strongly desired that administration and management in the area be geared up well to take care of the protection and safety of the departmental staff as well as the forest as a matter of first priority.

In view of the fact that GOI has recently been considerate in allowing overwood removal in certain areas for encouraging growth of valuable species like teak, and thus lifting the ban on felling of trees imposed earlier, the present Working Plan also provides for introducing on pilot basis the activity related with raising of teak plantations in the area after almost a gap of about 20 years. Since the tract includes one of the best miscellaneous forest areas in the State, it is expected that this kind of initiative would be welcomed and

successful plantations of teak would be raised and protected to build healthy and sustainable growing stock for the posterity.

Despite constraints of staff and lack of resources, the maps of entire area have been digitized and SOI management maps integrated with geo referenced village maps. Whereas this has facilitated preparation of new management maps which contain all important features of forests and relate it suitably with village locations and related attributes. The digitized maps, if permitted by Survey of India as per Map Policy of India, 2006, would be provided to Dy.Conservator of Forests Bhamaragarh through CDs which would enable him to conveniently print and use of management maps on any scale as per need. The range, round and beat maps can be printed in colour with details and crop compositions and other features. The Geo-media viewer is being provided to the Dy.Conservator of Forests free of cost that can be useful for conveniently studying, monitoring and printing of maps as a whole or in part. However, for this territorial staff needs to be trained and motivated adequately for the said task. Further extensions in applications of GIS in the Department may provide opportunities for monitoring the trends of changes or growth in crop stocks in times to come through extensive use of GPS and satellite imageries of higher resolutions. I expect that the officer in charge of divisions and ranges would benefit immensely if they proceed to use the technology even for printing of treatment maps and estimation.

The provisions made under important miscellaneous regulations as well as the main chapters on Forest Protection, Wildlife, NTFP and SCI should be followed scrupulously to ensure success of the present plan endeavours. Mr. Yadav and his entire team have done very hard work and make special efforts to bring out this plan in the present form and I wish to thank them for their commendable work on this count.

Nagpur,
Dated, 22-02-2007.

(*Ramanuj Choudhary,IFS*)
Chief Conservator of Forests
(Working Plan), Nagpur.

INTRODUCTION

RAMJEE SINGH YADAV, IFS
CONSERVATOR OF FORESTS
WORKING PLAN
CHANDRAPUR-2

Bhamaragarh Forest Division is one of the largest Forest Divisions of Maharashtra. It comprises of areas spread over five territorial forest ranges viz. Bhamaragarh, Etapalli, Gatta, Kasansur and Tadgaon. The total forest area of this division is 367,731.681 hectare of which 324,825.204 ha is reserved forest, 42,784.140 ha is protected forest and 122.337 is Zudupi Land. It excludes forest area to the extent of 10,438.60 ha which has been taken away from this division to carve out as Bhamaragarh Wildlife Sanctuary and handed over to Allapalli Wildlife Division for intensive wildlife management. The present working plan for the division replaces the earlier working plan of Shri A.P.Deshmukh and Shri B.P. Singh for the period 1995-96 to 2004-2005 and extended upto 2006-07.

The 1st Preliminary Working Plan for Bhamaragarh Forest Division was prepared by Shri B.S.K. Reddy, IFS, Conservator of Forests, South Chandrapur Forest Circle, and Chandrapur. 1st PWPR was discussed by State Level Committee on 18th January, 2006 and same was accepted with some suggestions to be incorporated.

2nd Preliminary Working Plan Report was written by Shri Ramjee Singh Yadav, IFS Conservator of Forests, Working Plan Chandrapur-2. It was discussed by State Level Committee on 11th July, 2006 and was approved with some suggestions.

Draft Working Plan Report written by Shri Ramjee Singh Yadav was discussed by State Level Committee on 13th March, 2007 and approved with some minor suggestions.

Working Plan Report for the Bhamaragarh Forest Division has been written by Ramjee Singh Yadav IFS, Conservator of Forests, Working Plan Chandrapur-2. WPR is based on the 1st , 2nd Preliminary Plan Reports and Draft working Plan Report. Suggestions made by the Committee have been incorporated at appropriate places.

Previous Working Plan dealt with following working circles:

(1) Selection – cum- Improvement Working Circle.
(2) Old Teak Plantation Working Circle.
(3) Protection Working Circle.
(4) Improvement Working Circle.
(5) Bamboo (Overlapping) Working Circle.
(6) Non- Wood Forest Produce (Overlapping).
(7) Wild- life (Overlapping) Working Circle.

WPR prescribes mandatory chapters on Joint Forest Management, Ecotourism and Forest Protection as per National Working Plan Code, 2004 and as suggested by the Additional Principal Chief Conservator of Forests (Production and Management) and the Chief Conservator of Forests, Working Plan Nagpur during various stages of discussions with author. Overlapping Working Circles: Bamboo Overlapping Working Circle, Non Wood Forest Produce and Medicinal Plant, and Wild Life Management have been also

included. Thus present working plan envisages following working circles and mandatory chapters.

SrNo	Working Circles/ Chapters	Remarks
1	Selection Cum Improvement Working Circle	Working Circle
2	Improvement Working Circle	Working Circle
3	Teak Plantation Working Circle	Working Circle
4	Protection Working Circle	Working Circle
5	Bamboo (Overlapping) Working Circle	Overlapping working circle
6	Non Wood Forest Produce & Medicinal Plants	Overlapping working circle
7	Wildlife (Overlapping) Working Circle	Overlapping working circle
8	Joint Forest Management	Chapter
9	Eco Tourism	Chapter
10	Forest Protection	Chapter

The tract dealt with contains basically Miscellaneous and Teak-Miscellaneous Forest with large number of associate tree species. Miscellaneous species is represented by Ain *Terminalia latifolia and Bija (Pterocarpus marsupium)* . The All India Teak Site Quality varies from I to IV and major of areas conform to M II/III. Except near villages, the natural regeneration is satisfactory in most of areas. The biotic pressure is more near the thickly populated areas and villages otherwise free from it.

Stock mapping and Compartment History have been updated by the staff of SOFR and the territorial Division under supervision of Conservator of Forests Working Plan, Chandrapur-2 and Deputy Conservator of Forests, Bhamaragarh Forest Division. As suggested by 2nd State Level Committee, latest enumeration data available for the tract collected during 1990-93 and data of partial enumeration done by SOFR have been used as recent enumeration work was not completed due to persistent threat to life of SOFR personnel from Naxalites and no sign of let up in near future. Also the forests have been subject to fellings upto only 10% of estimated felling during previous plan period, the composition of crop has not deteriorated and improvement is visualized due to rest given to them. The satellite data procured for the tract have been analyzed for density classification and stocking. To manage the forests in future, Working Circles have been prescribed on the basis of the site quality, composition of the crop, and natural regeneration status of the forests.

It would be worthy to mention here that in the earlier Working Plan of Shri A.P.Deshmukh and Shri B.P. Singh for the division, the Teak Conversion Working Circle was discontinued due to restriction on clear felling by the Government of India. Potential site for Teak Plantation (about 100 ha/annum) has been proposed under Teak Plantation working Circle with overwood removal on pilot basis.

Author is extremely grateful to Shri J. N. Saxena, IFS, then Principal Chief Conservator of Forests Maharashtra State, Nagpur, Shri K Subramanian IFS, Ex- PCCF MS, Shri B Muzumdar IFS, Principal Chief Conservator of Forests (Wildlife) MS, Shri Jwala Prasad IFS, Principal Chief Conservator of Forests, MS, Shri Arvind Balkrushna Bhangare IFS , Additional Principal Chief Conservator of Forests (Production and Management) MS, and Shri Ramanuj Choudhary IFS, Chief Conservator of Forests, Working Plan Nagpur for their kind inspiration and valuable guidance in their respective

capacities in the preparation of Preliminary and Draft Working Plan Report for Bhamaragarh Forest Division from time to time. Author is also thankful to Shri B.S.K.Reddy IFS, ex-Conservator of Forests, South Chandrapur Circle, Chandrpur and Shri Anwar Ahamad IFS and Ravikiran Govekar IFS ex and present Deputy Conservator of Forests, Bhamaragarh Forest Division who have been kind enough to extend their cooperations and valuable helps for the preparation of this Working Plan Report for Bhamaragarh Forest Division.

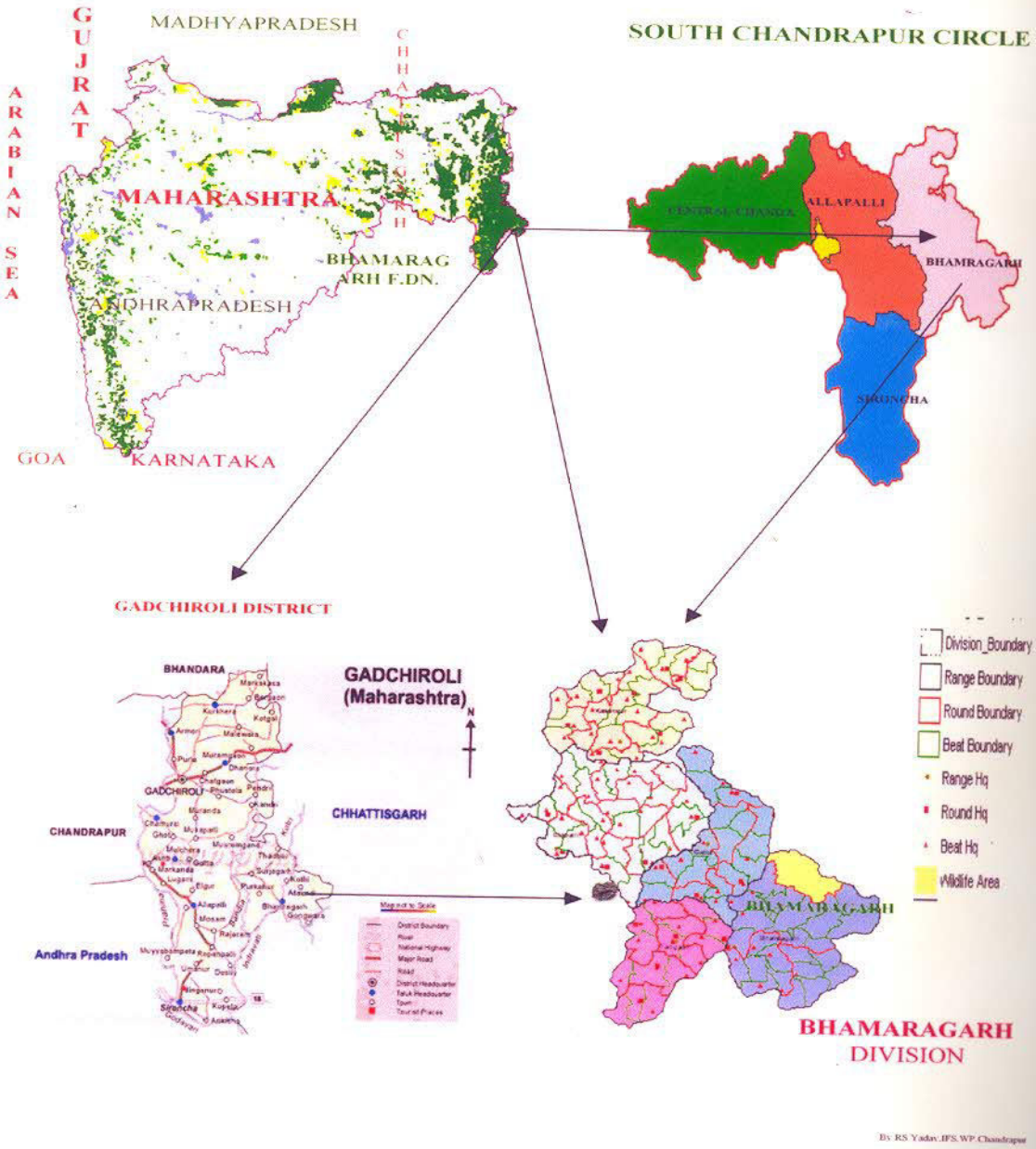
Author is thankful to Shri S B Meshram RFO, Shri M B Jawade, Shri M. T. Nandapurkar RFO and Shri B S Padawe RFOs of Working Plan Division, Chandrapur –2 for their services rendered in this regard. Author is thankful to the staff of Working Plan Chandrapur-2 S/Shri C.B. .Nerkar, Ranger Surveyor, S/Shri S.B. Waghmare, D.N. Badwe, G. G. Nannore, N. T. Satai, D.S. Landge Surveyors, and Shri Ramesh G Muraskar, Steno who have put in their dedicated and sincere efforts in the preparation of this plan for Bhamaragarh Forest Division.

Chandrapur.
Dated 21st March, 2007.

(Ramjee Singh Yadav, IFS)
Conservator of Forests,
Working Plan
Chandrapur-2.

MAP-1

LOCATION OF BHAMARAGARH FOREST DIVISION



By RS Yadav,IFS,WP,Chandrapur

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ABBREVIATIONS USED IN THE TEXT

SrNo	ABBREVIATIONS	
1	MSL	Above Mean Sea Level.
2	ACF	Assistant Conservator of Forests.
3	BH	Breast Height.
4	CAI	Current Annual Increment.
5	Cft	Cubic feet.
6	cm	Centimeter.
7	Cmt/m³	Cubic meter.
8	Comptt/CN	Compartment/ compartment number.
9	DBH(OB)	Diameter at Breast Height (Over Bark)
10	DyCF/DCF	Deputy Conservator of Forests.
11	Dn	Division.
12	DGF	Director General of Forests
13	FDCM Ltd	Forest Development Corporation of Maharashtra Limited.
14	FLCS	Forest Labourers Cooperative Society.
15	FRH	Forest Rest House.
16	FS	Felling Series.
17	FSO	Forest Settlement Officer.
18	FV	Forest Village.
19	FYM	Farm Yard Manure.
20	FYO	First Year Operation.
21	GBH	Girth at Breast Height.
22	GBH(OB)	Girth at Breast Height (Over Bark).
23	GBH(UB)	Girth at Breast Height (Under Bark).
24	ha	Hectare.
25	IGF	Inspector General of Forests.
26	IFA	Indian Forest Act, 1927.
27	km	Kilometer.
28	kg	Kilogram.
29	m	Meter.
30	mm	Milimeter.
31	MAI	Mean Annual Increment.
32	MVSS	Maharashtra Van Sanshodhan Sansthan.
33	PB	Periodic Block.
34	PPO/ PYO	Pre Planting Year Operation.
35	PWD	Public Works Department.
36	RF	Reserved Forests
37	RFO	Range Forest Officer.
38	Rs	Rupees.
39	SCI	Selection Cum Improvement.
40	sq	Square.
41	sqkm	Square kilometer.
42	Spp	Species.
43	SRP	State Reserve Police.
44	SYO	Second Year Operation.
45	SrNo/SN	Serial Number.
46	TYO	Third Year operation.
47	WC	Working Circle
48	WS	Working Series.
49	IVth YO	Fourth Year Operation.
50	Vth YO	Fifth Year Operation.

LOCAL AND BOTANICAL NAMES OF PLANTS OCCURING IN THE TRACT

A: TREES:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Achar/ Char/Charoli	*Buchanania lanzan*	Anacardiaceae
2	Amaltas/Bahava	*Cassia fistula*,Linn	Caesalpiniaceae
3	Amta	*Bauhinia malabarica*,Roxb	Caesalpiniaceae
4	Anjan	*Hardwickia binata*,Roxb	Caesalpiniaceae
5	Apta	*Bauhinia racemosa*,Lamk	Caesalpiniaceae
6	Aonla	*Emblica officinalis*	Euphorbiaceae
7	Arjun	*Terminalia arjuna*	Combretaceae
8	Babul	*Acacia nilotica Linn*	Mimosaceae
9	Bud/Wad	*Ficus bengalensis,Linn*	Moraceae
10	Beheda	*Terminalia bellirica,Gaertn*	Combretaceae
11	Bel	*Aegle marmelos(L)*	Rutaceae
12	Bhirra	*Chloroxylon swietenia*	Rutaceae
13	Biba/Bhilwa	*Semecarpus anacardium,Linn*	Anacardiaceae
14	Bija	*Pterocarpus marsupium,Roxb*	Fabaceae
15	Bistendu	*Diospyros montana, Roxb*	Ebenaceae
16	Bor/Ber	*Zizyphus mauritiana,Lamk*	Rhamnaceae
17	Chichwa	*Albizia odoratissima,Roxb*	Fabaceae
18	Dhaman	*Grewia tilifolia(vahl)*	Tiliaceae
19	Dhaoda	*Anogeissus latifolia*	Combretaceae
20	Dhoban/Satpuda	*Dalbergia peniculata, Roxb*	Fabaceae
21	Dikamali	*Gardenia resinifera, Roth*	Rubiaceae
22	Garari	*Cleistanathus collinus,Roxb*	Euphorbiaceae
23	Ghogar/Papda	*Gardenia latifolia Ait*	Rubiaceae
24	Ghoti/Ghot	*Zizyphus glaberrima(Sedgw)*	Rhamnceae
25	Gongal	Cochlospermum religiosum Linn	Cachlospermaceae
26	Haldu	*Haldina cordifolia*	Rubiaceae
27	Hingan	*Balanites aegyptica (L)Del*	Balanitaceae
28	Hiwar	*Acacia leucophloea Roxb Willd*	Mimosaceae
29	Hirda/Harra	*Terminalia chebula*	Combretaceae
30	Imli/Chinch	*Tamarind indica*	Caesalpiniaceae
31	Jambhul/Jamun	*Syzigium cumini Linn*	Myrtaceae
32	Kakad	*Garuga pinnata Roxb*	Burseraceae
33	Kala-umber	*Ficus hispida*	Moraceae
34	Kakai	*Flacourtia indica (Burmf)Mer*	Flacourtiaceae
35	Kamala	*Mallotus philippensis*	Euphorbiaceae
36	Karai	*Miliusa velutina HF& Thoms*	Anonaceae
37	Kalamb	*Mitragyna parviflora Roxb*	Rubiaceae
38	Karanj	*Pongamia pinnata(L)Pierre*	Fabaceae
39	Kateyen/Kasai	*Bridelia retusa Spreng*	Euphorbiaceae
40	Kawith	*Limonia acidissima Lorr*	Rutaceae
41	Khair	*Acacia catechu Willd*	Mimosaceae
42	Khirni	*Manilcora hexandra Roxb*	Sapotaceae
43	Kullu	*Sterculia urens Roxb*	Sterculiaceae
44	Kumbhi	*Careya arborea Roxb*	Lecythidaceae
45	Kusum	*Schleichera oleosa Lour Merr*	Sapotaceae
46	Lasora/Bhokar	*Cordia dichotoma Forstf*	Boraginaceae

47	Lendia/Sehna	*Lagerstroemia parviflora Roxb*	Lythraceau
48	Lokhandi	*Lxora arborea Roxb*	Rubiaceae
49	Mango/Aam	*Mangifera indica*	Anacardiaceae
50	Maida-Lakri	*Litsea glutinosa*	Lauraceae
51	Medshing	*Dolichandrone falcata Seem*	Bignoniaceae
52	Moha/Mahuwa	*Madhuca longifolia Koen*	Sapotaceae
53	Mokha	*Schrebera swietenoides Roxb*	Aristolochiaceae
54	Moyen/mowai	*Lannea coromandelica Hoult*	Anacardiaceae
55	Neem	*Azadirachta indica AJuss*	Meliaceae
56	Padar	*Stereospermum suaveolens DC*	Bignoniaceae
57	Pair	*Ficus rumphii*	Moraceae
58	Palas	*Butea monosperma Lamk Taub*	Fabaceae
59	Pangara	*Erythrina variegata Linn*	Fabaceae
60	Pipal	*Ficus religiosa*	Moraceae
61	Papra	*Holoptelea integrifolia*	Urticaceae
62	Rankela	*Dillenia pentagyna*	Magnoliaceae
63	Rohan	*Soymida febrifuga(AJuss*	Meliaceae
64	Sagwan/Sag/Sagaun	*Tectona grandis Linn*	Verbenceae
65	Saja/ain	*Terminalia alata Heyne*	Combretaceae
66	Salai	*Boswellia serrata Roxb*	Burseraceae
67	Semal	*Bombax ceiba L*	Malvaceae
68	Shisham	*Dalbergia latifolia Roxb*	Fabaceae
69	Shivan	*Gmelina arborea Linn*	Verbenaceae
70	Siras-black	*Albizia lebbek Lwilld*	Mimosaceae
71	Siras-white	*Albizia procera Roxb*	Mimosaceae
72	Sitaphal	*Annona squamosa L*	Annonaceae
73	Suriya	*Xylia xylocarpa Roxb*	Annonaceae
74	Tendu	*Diospyros melanoxylon Roxb*	Ebenaceae
75	Tiwas/Tinsa	*Ougenia oojeinensis Roxb*	Fabaceae
76	Umbar/Gular	*Ficus recemosa Linn*	Moreaceae
77	Warang/Baranga	*Kydia calycina Roxb*	Malvaceae

B: SHRUBS AND HERBS:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Aal	*Moringa citrifolia(Lin)*	Celeastraceae
2	Aghada	*Achyranthus aspera(Linn)*	Amarantaceae
3	Akola	*Alangium salvifolium(Thwaites)*	Cornaceae
4	Ban rahar	*Flemingia semialata(Roxb)*	Fabaceae
5	Baibirang	*Embelia ribes*	Myrsinaceae
6	Bankapas/Rankapas	*Thespesia lamps*	Malvaceae
7	Bharati	*Maytenus emarginata(Benth)*	Celastraceae
8	Chind/Sindhi	*Phoenix sylvestris Roxb*	Palmae
9	Chipti	*Desmodium pulchellum Benth*	Fabaceae
10	Dhawai/Jilbili	*Woodfordia fruticosa Kurz*	Lythraceae
11	Dikamali	*Gardenia resinifera Roth*	Rubiaceae
12	Gurmukhi/Gursukri	*Grewia hirsuta*	Tiliaceae
13	Gokhru	*Tribulus terrestris,Linn*	Zygophyllaceae
14	Harsingar/Kharsui	*Nyctanthus arbortristis*	Oleaceae
15	Jine	*Leea crispa*	Leeaceae
16	Ranbhendi	*Dodonea viscosa*	Sapindaceae
17	Koril	*Petalidium barlerioides nees*	Acanthaceae
18	Kasterua	*Hygrophila auriculata KSchum*	Acanthaceae

19	Kharoti	*Grewia hirsuta Vahl*	Tiliaceae
20	Kudursi	*Bridelia hamiltoniana Wall*	Euphorbiaceae
21	Kudmudi	*Gardenia gummifera Linn*	Rubiaceae
22	Kuda	*Holarrhena pubescens (Buch,Ham)*	Apocynaceae
23	Kala kuda	*Wrightia tinctoria*	Apocynaceae
24	Kuchala	*Strychnos nuxvomica*	Strychnaceae
25	Lokhandi	*Ixora arborea Roxb*	Rubiaceae
26	Morarphal	*Helicteres isora Linn*	Steculiaceae
27	Maruadona	*Carvia callosa Ness*	Acanthaceae
28	Nirmali	*Strychnos potatorum*	strychnaceae
29	Neel	*Indigofera tinctoria*	Papilionaceae
30	Phetra-safed	*Gardenia turgida Roxb*	Rubiaceas
31	Phetra-kala	*Tamilnadia uliginosa(Retz)*	Rubiaceas
32	Tarwad	*Cassia auriculata*	Caesalpiniaceae
33	Tarota	*Cassia tora Linn*	Caesalpiniaceae
34	Thuar	*Euphorbia tirucalli Linn*	Euphorbiaceae
35	Warangal	*Celastrus paniculata Willd*	Celastraceae

C: GRASSES AND BAMBOOS:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Ghonad	*Themeda triandra*	Gramineae
2	Bamboo-karka	*Dendrocalamus strictus(Roxb)*	Gramineae
3	Bamboo-katang	*Bambusa arundinacea(Willd)*	Gramineae
4	Bhurbhusi	*Eragrostis tenella(Roem & Schulf)*	Gramineae
5	Godhel	*Eragrostis interapta*	Gramineae
6	Katanbahari	*Aristida funiculata (TrinetRupa)*	Gramineae
7	Kunda/Sum	*Eulaliopsis binata(Retz)(Mark)*	Gramineae
8	Kusal/Speargrass	*Heteropogon contortus (Linn)Beau*	Gramineae
9	Marvel-Small	*Dicanthium annulatum(Forsek)*	Gramineae
10	Marvel-Big	*Dicanthium aristatum(poir)*	Gramineae
11	Mushan	*Iseilema laxum (Hack)*	Gramineae
12	Paonya	*Sehima sulcatum (Hack)Acamus*	Gramineae
13	Sheda	*Sehima nervosum (Staff)*	Gramineae
14	Tikhadi	*Cymbopogon martinii (Roxb)Watson*	Gramineae
15	Chir	*Imperata officinalis*	Gramineae

D: CLIMBERS:

Sr.№	**LOCAL NAME**	**BOTANICAL NAME**	**FAMILY**
1	Bandke	Dendropthoe falcata(Linn)t	Loranthaceae
2	Chilar	*Caesalpinia decapetala(Roxb)*	Caesalpiniaceae
3	Chilati	*Mimosa hamata(Willd)*	Mimosaceae
4	Chilati badi	*Acacia torta(W & A)*	Mimosaceae
5	Dhimarval	*Celastrus paniculata(Willd)*	Celastraceae
6	Dudhi/Nagvel	*Cryptolepis buchanani(Roem)*	Periplaceae
7	Eroni	*Zizyphus oenoplia(Linn)*	Rhamnaceae
8	Gunj	*Arbus precatorius(Linn)*	Fabaceae
9	Gulvel	*Tinospora cordifolia(Willd)*	Menispermaceae
10	Gurar, Nasvel	*Millotia extensa(Baker)*	Papilionaceae
11	Kajkuri	*Mucuna pruriens(L)*	Fabaceae
12	Khadyanag	*Gloriosa superba*	Liliaceae
13	Khobarvel	*Hemidesmus indicus(Linn)*	Asclepiadaceae

14	Kukuranji	*Calycopteris floribunda*	Combretaceae
15	Mahulvel	*Bauhinia vahlii(Wand A)*	Caesalpiniaceae
16	Musalikand	*Dioscorea pentaphylla(Linn)*	Dioscoraceae
17	Papri,Lalvel	*Ventilage denticulata(Willd)*	Rhamnaceae
18	Palasvel	*Butea superba(Roxb)*	Fabaceae
19	Piwarvel	*Combretum ovalifolium(Roxb)*	Combretaceae
20	Ramdaton	*Smilax macrophylla(Roxb)*	Liliaceae
21	Shataori	*Asparagus recemosus*	Liliaceae

E: PARASITES:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Amaravel	Cuscuta reflexa(Roxb)	Cuscutaceae

F: EPIPHYTES:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Vanda	Vanda cesellata(Roxb)	Orchidaceae

G: ENDEMIC/THREATENED PLANT SPECIES:

Sr.№	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Alichettu	Eonymus godaverensis	Celastraceae

LIST OF MEDICINAL PLANTS

Family/Botanical Name	Local Name	Uses
Acanthaceae :		
1 Andrographis paniculata	Koyekutta	Decoction as anti-malarial and anti-pyretic.
2 Adathoda zeylanica	*Urdus*	Decoction as anti-arthritis, anti-rheumatic; extract as expectorant.
3Barleria cristata	*Gattuguru*	Extract to stop gum bleeding
4 Hemigraphis latebrosa	Budilsi cettu	Extract to cure ear pain
5 Hygrophila auriculata	Untskatra	Decoction as anti-rheumatic, and extract as anti, helminthitic; root extract, anti-dysenteric.
6 *Justica betonica*	Tellaranthu	Anti-diassoad and anti-diabetic.
Amaranthaceae :		
7 *Achyranthus aspera*	Aghada, chirchita	Root applied externally as abortifacient.
8 *Amaranthus spinosus*	Kotikanta	Extract to cure constipation.
Amaryllidaceae :		
9 *Crinum defixum*	Gondali kanda	Edible as antidote for snake-bite.
Anacardiaceae :		
10. *Lannea grandis*	Mavai	Decoction as febrifuge.
11 *Semecarpus anacardium*	Jid cettu	Oil applied on warts,expectorant and ring worm infection.
Aristolochiaceae :		
12 *Aristolochia indica*	Sapsund	Decoction given to cure Jaundice
Apiaceae :		
13 *Centella asiatic*	Bramhi	Extract as blood purifier
Asclpiadaceae :		

14 *Holostemma annularis*	Dudhurli	Root used in diabetes, gonorrhoea
Apocynaceae :		
15*Holarrhena antidysenterica*	Kuda	Bark decoction to cure vene- ral disease and fruit as anti- dysentric
16 *Ichnocarpus frutescens*	Behouri	Root extract used in jaundice and diabetes.
Araceae :		
17Amorphophallus campanulatus	Suran	Tuber as anti-septic, carminative Useful in dysentery and Rheumatism, stomachic, tonic, restorative
Asclepidaceae		
18 Calatropis gigantea	Zilla cettu	Latex as anti-bacterial anti- Septic, anti-asthma, expectorant
19 Pergularia daemia	Utaran Vel	Extract as purgative and Expectorant
Bombacaceae :		
20 *Bombax ceiba*	Katesawar	Extract given to cure Leucorrhoea.
Burseraceae		
21 *Boswellia serrata*	Salai	Gum anti-diabetic.
Bignoniaceae :		
22 *Oroxylum indicum*	Tandri Cettu	Bark decoction anti-dysentric, Vermifuge and refrigerant
Barringtonaceae :		
23 *Barringtonia acutangula*	Piwar	Seeds expectorant
Caeselpiniaceae :		
24 Cassia tora	Cheorofa	Extract to cure skin infections
25 Cassia absus	Kantha Cettu	Seed extract in opthalmic disease
26 Cassia fistula	Rel	Extract to cure stomachache
Boraginaceae :		
27 *Heliotropium indicum*	Bhurundi	Extract as emmenagogue
Celastraceae :		
28 *Celastrlus paniculata*	Peng	Seed oil rubifacient and applied in eczema and ringworm infections.
Cleomaceae:		
29Gynandropsis pentaphylla	Ayanti Cettu	Extract to cure earpain, anti-bacterial and anti-septic.
Costaceae :		
30 Costus speciosus	Keyo Kanda	Rhizome mixed with roots of Nicotiana tabacum and given as anti- rheumatic and anti-arthritis
Cochlospermaceae :		
31Cochlospermum religiosum	Gumgum	Extract as anti-bacterial and anti-septic.
Cyperaceae :		
32 Cyperus rotundus	Motha	Rhizome astringent and diuretic.
33 Scirpus grossus	Khilyari kanda	Tuber edible as tonic and appetiser
Cassythaceae		
34 *Cassytha filiformis*	Uoorbela	Extract applied to cure baldness
Combretaceae :		
35 Anogeissus latifolia	Dhawda	Gum to cure amebic dysentry
36 Combretum decandrum	Rampi	Extract as anti-septic, seed oil to Cure

		eczema and ringworm
37 Terminalia chebula	Hirda	Fruit extract to cure toung ulcers and also as digestive, caraminative.
38 Terminalia bellerica	Beheda	Seeds anti-diarrhoeal digestive and Caraminative.
39 Calycopteris floribunda	Pandhri Zilbuti	Decoction as carminative and Diuretic
Convolvulaceae :		
40 Ipomoea pestigridis	Maryadvel	Root as diuretic and anti-inflammatory.
41 Rivea hypocrateriformis	Phangi	Root diuretic
Compositae (Asteraceae):		
42 Vicoa indica	Sankuli	Extract to induce anti-fertility in Man
43 Centipeda minima	Nanshikani	Extract vermifuge
44 Eclipta alba	Makka	Extract as anti- bacterial and anti-septic
45 Echinops echinatus		Root extract as purgative
46 Elephantophus scaber	Mattu	Root extract anti-inflammatory
47 Oligochaeta ramosa	Hitta Cettu	Extract as anti - helminthitic, Purgative
48 Spilanthus paniculata	Tarholi	Extract as tonic
49 Ageratum conyzoides	Dhanota	Decoction given internally as Anti-rheumatice.
Cucurbitaceae :		
50 *Citrullus colocynthis*	Indryan	Roots and fruits as purgative
Convolvulaceae :		
51 Merremia emargimata	Hadjodi	Poultice applied on bone fractures.
52 Rivea hypercratiformis	Pidma Za	Extract as anti – tumour.
Dioscoreaceae :		
53 *Dioscorea hispida*	Tikhoor Kanda	Tuber applied as anti-bacterial and anti-inflammatory.
Dilleniaceae :		
54 *Dillenia pentagyna*	Michud	Fruit appetiser.
Ebenaceae :		
55Diospyros melanoxylon	Tendu	Gum chewed with piper betal to Induce sterlity in females.
Euphorbiaceae		
56 *Macaranga tomentosa*	Zilla Marha	Seed oil as anti-septic, anti- biotic and purgative.
57 Kirganelia reticalata	Khareta	Branches as toothbrush.
58 Acalypha indica	Kappi Cettu	Extract given internally for dog bite.
59 Bridelia retusa	Jonna	Extract as diuretic and branches as Toothbrush.
60Euphorbia dracunculoides	Nijki Dudhi	Decoction given to cure veneral Diseases.
61Jatropa gossypifolia	Chandra jyoti	Juice applied on conjuctivitis.
62 Chrozophora plicata	Karsa	Juice and docoction as anti-fetility, Stimulant and refrigirant
63 Phyllanthus virgatus	Dudhi	Juice as galactogouge
64 Mallotus philippensis	Shendri	Fruit pubescence used to cure peptic ulcers
Ehretiaceae :		
65 *Ehretia laevis*	Datrang	Bark extract used in dropsy, Conjuctivitis and cataracts.
Flacourtiaceae :		

66 *Flacourtia ramontchi*		Fruit anti-jaundice.
Fabaceae :		
67 Abrus precatorius	Gurjool	Extract anti-inflammatory.
68 Mucuna pruriens	Kachkur	Root extract anthelminthitic.
69 Butea superba	Monthu fool	Bark as refrigerant and digestive.
70 Canvalia gladiata	Sem Bansim	Extract caraminative.
71 Desmodium velutinum	Dayampurka	Fumigation as anti-epileptic, extract as anti-pyretic and analgestic. .
72 Indigofera cordifolia	Kolyari	Extract analgesic anti-pyretic.
73 Pongamia pinnata	Goranji	Seed oil eczema, anti-pyretic.
74 Pterocarpus marsupium	Nameli Cettu	Wood extract anti-diabetic.
75 Rhyncosia minima	Jangli Ulva	Seed extract anti-pyretic if given With Piper longum .
76 Tephrosia purpurea	Tagres Fool	Decoction as appetiser and tonic.
Gentinaceae :		
77 *Centarium roxblurghii*	Chiryata	Used as bitter tonic and caraminative.
Hypoxidaceae :		
78 *Curculigo orchioides*	Kewarkanda	Decoction to cure spermatorrhoea
Lamiaceae :		
79 Leonotis nepetifolia	Bahikusjyar	Extract as anti-septic and anti-biotic; anti-tumour property also reported.
80Colebrookea oppositifolia	Lirka Marha	Extract as cardiac tonic.
81 Leucas aspera	Guma	Decoction to cure excess bile secretion.
82 Leucas montana	Guma	Decoction as anti-pyretic and anti-biotic.
83 Acrocephalus indicus	Cisri Cettu	Extract as oxytocic.
84 Ocimum basilicum	Bodulsa cettu	Seeds anti-dysentric.
85 Anisomeles malabaricum	Chikta	Root extract for insanity and mental disorder.
Lecythidaceae :		
86 *Litsa monopetala*	Gurpa Marha	Fruits are diuretic, anti-diarrhoeal .
Liliaceae		
87Chlorophytum tuberosum	Musli Gadda	Root as general tonic.
88 Gloriosa superba	Karkari	Root extract as abortifacient
89 Scilla hyacinthiana	Dhor kanda	Tuber extract for asthma and cough
Loranthaceae :		
90 Viscum orientale	Gongai	Extract used as vermifuge.
91 Dendropthoe falcata	Bandha	Decoction to regularise menstrual Cycle.
Martyniaceae :		
92 *Martynia annua*	Garadu mukku	Fruits applied on tonsils and Anti-inflammatory.
Malvlaceae		
93 Sida glutinosa	Foolagalm Cettu	Root extract anti-rheumatic.
94 Sida cordata	Panchgo Cettu	Fumigation anti-epileptic.
95 Urena lobata	Gokru	Root extract anti-helminthitic.
Menispermaceae :		
96 *Cocculus hirsutus*	Vasanbel	Juice used for biliolus dyspepsia.
Mimosaceae :		
97 Xylia xylocarpa	Surya	Bark extract applied on leucoderma and vitiligo.
98 Pithecellobium dulce	Vilayati Chinch	Seed extract applied to stop bleeding

Molluginaceae :		
99 *Mollugo pentaphylla*	Jaharsa	Extract as stomachic, caraminative and tonic.
Moraceae :		
100 Ficus cunia	Disak marha	Fruit extract given to cure male genital diseases.
101 Ficus lacour	Parad	Extract to cure veneral diseases and excess bile secretion.
Nyctaginaceae :		
102 *Boerhavia repens*	Punarwa	Root applied in vagina to induce abortion.
Orchidaceae :		
103 Vanda tassellata	Kekdi Bandha	Extract anti-rheumatic.
104 Elulophia nuda	Budbar	Tuber as anti-tumour.
105 Geodorum dilatatlum	Gadda	Tuber extract cure stomach ulcer.
106 Habenaria stenopetala	Kazri pinger	Extract applies to cure cataract.
Onagraceae :		
107 *Ludwegia parviflora*	Bijband	Seeds to cure spermatorrhoea.
Opiliaceae :		
108 *Cansjera rheddii*	Kusurtonda	Fruits applied to cure night Blindness.
Ochnaceae :		
109 *Ochna obtusata*	Pivla Champaca	Flowers edible and used to stop leucorrhoea.
Oxalidaceae :		
110 *Biophytam sensitivum*	Lajari	Leaves chewed to increase sexual desire.
Polygonaceae :		
111 *Polygonum hydropiper*	Mangalgota	Extractused to induce sterlity in females.
Papiloniaceae :		
112 *Erythrina variegata*	Pangara	Leaves dieuretic and emmenagogue, seeds extract cures leucorrhoea.
Plumbaginaceae :		
113 *Plumbago zeylanica*	Chifraka Malam	Root extract as anti-arthritis and Anti-rheumatic.
Poaceae :		
114 *Sacciolepis interupta*	Gadgawa	Extract given to cure piles .
Rubiaceae :		
115 Gardenia gummifera	Vidgu	Gum as anti-septic and anti helminthitic.
116 Gardenia resinifera	Dikamali	Gum as anti-septic, anti helminthitic and purgative.
117 Borreria hispida	Gatiya	Extract on leucoderma.
118 Oldenlandia corymbosa	Kaimul	Extract as expectorant
119 Randia brandsii	Fipra pungari	Extract applied on skin tumour and expectorant.
Rhamnaceae :		
120 *Zizyphus rugosus*	Pandhra Bor	Root extract used as oxytoxic and analgesic.
Sapindaceae :		
121Cardiospermum helicacabum	Kapalphodi	Root diuretic, diaphoretic, laxative and anti-rheumatic .
Samydaceae :		
122 *Casearia graveolens*	Recha	Fruit decoction for colic pain; leaves and root extract refrigerant .
Solanaceae :		
123 Solanum ferox	Mulkayari	Extract oxytonic and anti-pyretic.
124 Solanum nigrum	Kacchipurdu	Extract as diuretic, anti-inflammatory and cardiac tonic.
125 Physalis peruviana	Phopadi	Extract as caraminative and decoction as

		anti-pyretic.
Scrophulariaceae :		
126 Scoparia dulcis	Ghada Tulas	Decoction as anti-pyretic.
127 Celsia coromandelina	Kutaki	Extract applied as anti- arthritis and anti-rheumatic.
128 Sopubia delphinifolia	Dudhali	Juice as astringent; also used in leucoderma and vitiligo.

COMMON AND ZOOLOGICAL NAMES OF THE WILD ANIMALS AND BIRDS COMMONLY FOUND IN THE TRACT

A: MAMMALS

(Where: I/I/(8A) stands for Schedule/ Part/ Serial Number respectively in Wild Life Protection Act, 1972)

Sr.№	COMMON NAME	SCIENTIFIC NAME	STATUS
1	Aswal/Bhalu/Riksha/ Bear	*Melursus ursinus*	I/I/(31C)
2	Bandar/Monkey/Rhesus macaque	*Macaca mulatta*	II/I/(17A)
3	Bagh/Sher/Tiger	*Panthera tigris*	I/I/(39)
4	Bhekar/Barking Deer	*Muntiacus muntjak*	III/ (2)
5	Bibta/Panthe/Tendua	*Panthera pardus*	I/I/(16B)
6	Bison/ Gaur	*Bos gaurus*	I/I/(8E)
7	Chausingha	Tetraceros quadricornis	I/I/(8B)
8	Cheetal/Deer/Hiran	Axis axis	III/(5)
9	Civet	Vivera spp except Malabar Civet	II/II/(1A)
10	Common Langur/ Hanuman Bandar	*Presbytis entellus*	II/I/(4A)
11	Flying Squirrel	*Petaurista petaurista*	II/II/(1C)
12	Fox/Lomadi/Lomas	*Vulpes bengalensis*	II/II/(1B)
13	Hare/Shasha/Khargosh	*Lepus ruficaudatus*	IV/(4)
14	Hyaena/Tadas/Lakadbaggha	Hyaena hyaena	III/(12)
15	Jackal/Kolha/Siyar	*Canis aureus*	II/II/(2B)
16	Jungle Cat/Ran Majar	*Felis chaus*	II/II/(2C)
17	Mongoose/Nevala	*Herpestes spp*	II/II/(16)
18	Nilgai/Blue Bull	*Boselaphus tragocamelus*	III/(14)
19	Otter	*Luthra perspicillata*	II/II/(4)
20	Pangolin/ Ant Eater/ Khawlya Manjar	*Manis crassicaudata*	I/I/(28)
21	Porcupine/Shahi	*Hystrix indica*	IV/(4E)
22	Sambhar	*Cervus unicolor*	III/(16)
23	Wild boar/Ran Dukar/Jungali Suar	*Sus scorfa*	III/(19)
24	Wild dog/Ran Kutra/Jungli Kutta	*Cuon alpinus*	II/I/(22)
25	Wolf/Landaga/Bhendia	*Canis lupus pallipes*	I/I/(15)

B : BIRDS

Sr.№	COMMON NAME	SCIENTIFIC NAME	STATUS
1	Painted Sandgrouse	*Pterocles indicus*	IV/(60)
2	Common Sandgrouse	*Pterocles exustus*	IV/(60)
3	Pea Fowl/Mayur/Mor	*Pavo cristatus*	I/III/(11)
4	Grey Jungle Fowl/Jungli Murga	*Gallus sonneratii*	II/II/(17)
5	Painted Partridge	*Francolinus pondicerianus*	IV/(51)
6	Blackbreasted Quail	*Couturnix coromandelicus*	IV/(57)
7	Red Spour Fowl	*Galloperdix spadicea*	IV/(63)
8	Crane	*Grus antigone*	IV/(16)
9	Spotted Bill Duck	*Anas poecillorhyncha*	IV/(21)
10	Pigeon	*Treron phoenicoptera*	IV/(54)
11	Dove	*Streptopelia spp*	IV/(19)
12	Cotton Teal	*Nettapus coromandelienus*	IV/(70)
13	Vulture	*Gyps spp*	I/III/(24)
14	Whistling Teal	*Dendrocygna javanica*	IV/(70)
15	Woodpeckers	*Picidae spp*	IV/(79)

C : REPTILES

Sr.№	COMMON NAME	SCIENTIFIC NAME	STATUS
1	Crocodile/Magar	*Crocodilus palustris*	I/II/(1D)
2	Cobra	*Naza naza*	II/II/(11)
3	Krait	*Elapidae family*	IV/(12) (vi)
4	Viper	*Vipera ruselli*	II/II/(14)
5	Dhaman/ Rat Snake	*Pityas mucosus*	II/II/(9)
6	Ghorpad	Varanus griseus	I/II/(1)
7	Common Lizards	*Varanus spp*	II/II/(15)

D : ENDANGERE SPECIES

Sr.№	COMMON NAME	SCIENTIFIC NAME	STATUS
1	Bagh/Sher/Tiger	*Panthera tigris*	I/I/(39)
2	Bison/ Gaur	*Bos gaurus*	I/I/(8E)
3	Chausingha	Tetraceros quadricornis	I/I/(8B)
4	Dhanesh (Great Indian Hornbill)	*Buceros bicornis*	I/III/(4)
5	Otter	*Luthra perspicillata*	II/II/(4)
6	Vulture	*Gyps spp*	I/III/(24)

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CHAPTER I

THE TRACT DEALT WITH

SECTION: - 1.1: NAME AND SITUATION

1.1.1.1: This working plan deals with the entire forest areas of Bhamaragarh Forest Division in South Chandrapur Forest Circle, extending over Bhamaragarh, Etapalli, Gatta, Kasansur and Tadgaon forest ranges. It lies in Bhamaragarh and Etapalli (Part) Talukas in Gadchiroli District of Maharashtra.

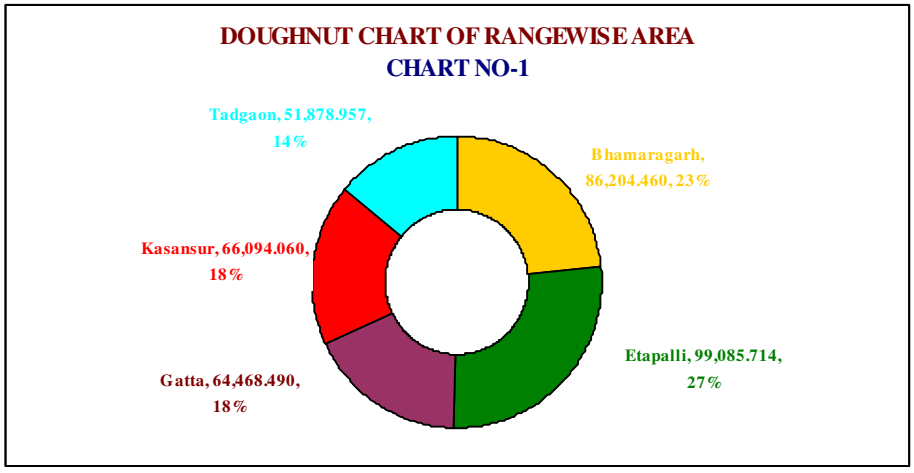
1.1.1.2: The forest areas of this division occur in the compact blocks and in some scattered patches. Forests of this division lay between the parallels of latitudes 19° 17´ to 20° 03´ North and between the meridians of longitudes 80° 08´ to 80° 57´ East.

1.1.1.3: As per the Form № 1 of Bhamaragarh Forest Division, the forest area is as given in Table No-1.

Table №-1

TABLE SHOWING RANGE WISE & CATEGORIES WISE FOREST AREA (in hectare)

SrNo	Range	Reserved Forest (ha)	Protected Forest(ha)	Zudupi Jungle(ha)	Total Area (ha)
1	Bhamaragarh	81,414.960	4,789.500	0.000	86,204.460
2	Etapalli	87,361.540	11,710.694	13.480	99,085.714
3	Gatta	56,676.344	7,788.799	3.347	64,468.490
4	Kasansur	58,232.454	7,861.606	0.000	66,094.060
5	Tadgaon	41,139.906	10,633.541	105.510	51,878.957
Division Area		324,825.204	42,784.140	122.337	367,731.681



1.1.1.4. BOUNDARIES OF THE TRACT: The boundaries of the tract dealt with are as follows

North: Boundaries of Gadchiroli Forest Division and Chhattisgarh State.
East: Boundary of Chhattisgarh State.
South: River Indravati along Chhattisgarh State Boundary and Sironcha Forest Division.
West: River Bandia, Dumme Nala along Allapalli and Gadchiroli Forest Divisions.

SECTION-1.2: CONFIGURATION OF THE GROUND

1.2.1.1: The major portion of the tract is undulating ground with hilly region. The hills are rugged and steep especially at the higher slopes. It has an elevation from 228 meter (at Bhamaragarh) to 697 meter (Near Moharli) above mean sea level. In Bhamaragarh, Tadgaon and Gatta ranges hilly portion is more than 2/3rd portion of geographical area. The hilly portion is the part of Abujmal Mountain Range and Surjagarh Hills.

1.2.2: DRAINAGE

1.2.2.1 The tract is extensively interspersed with numerous big and small nalas. These nalas drain into Zuri, Bandia, Pamalgautam, Laheri and Paralkota rivers and finally become part of Indravati River.

SECTION: 1.3: GEOLOGY, ROCK AND SOIL

1.3.1.1: As per the Geological information of Gadchiroli District of Maharashtra State obtained from the Geological Survey of India**,** the Geological successions of formations as noticed in this tract are given in the table no-2.

Table №-2
TABLE SHOWING GEOLOGICAL FORMATIONS

Sr №	Origin	Geological Formations	Rocks Presents
1	Recent	Alluvium	Alluvium soil, Laterite
2	Upper Gondwana	Kota Maleri beds	Sandstones, shales, clay
		Chikiala beds	Sandstones
3	Lower Gondwana	Kamti Series	Sandstones and shales
4	Upper Cuddapah	Pakhal series	Conglomerates, siliceous limestones, slates
5	Archaeans	Crystalline or metamorphic series	Gneisses, granites, schists

1.3.1.2: The tract comprises of the Archaeans series of rocks including unclassified granitic gneisses. Rocks are correlative to the Bengpal, Bailadila and Abujmal Groups of adjoining Bastar Division of Chhattisgarh State. The unclassified granitic gneisses occur in the west of the area. The classified crystalline include the rocks of Bengpal group and Bailadila group. Former includes granulites and quartzite and the later comprises of hornblende schist, talc sericite schist, talc chlorite schist, banded hematite and quartzite.

These are intruded by the basic dykes. In the east (east of Kotra River) the rocks correlate to Abujmal group of the Chhattisgarh State. These include conglomerates, sandstones, grits and thick piles of basalt and andesitic lava flows. Towards north, pink granites considered equivalent to the Dongargarh granites of Rajnandgaon District is noted. It is intruded by quartz and pegmatite veins. Laterite is developed at places covering the volcanic rocks of Abujmal group. Alluvium to recent is seen near the major streams and rivers as elongated strips marked by luxuriant vegetation.

1.3.1.3: The regional trend of foliation is NW-SE. The banded hematite, quartzite show a crescent shape. NW-SE strike in the Western Part which changes to NE-SW of Geda and East of Surjagarh. The dips and steep varying from 45º to vertical, generally towards South-West or South. The banded hematite quartzite shows a plugging synformal structure.

1.3.1.4: The Archaeans rocks are subjected to more than two orogenic episodes. The first one trends NWW-SSE whereas, second one trends to unending NNE-SSW. The Abujmal groups of rocks uncomfortably overlaying the older rocks are structurally less disturbed and gently dipping.

1.3.1.5: The western boundary of Abujmal group is represented by a major fault, approximately along which Kotra river flows. A number of other faults have also been identical in these areas. Normally four sets of joints have been found which N30E-S E-W/Verticals.

1.3.2.1: ECONOMIC MINERALS: Important minerals of economic scale found are as follows:

(a) IRON ORE: Iron ore reserve in Surjagarh hill range is of economic importance. Wurrea hill itself has an estimated 123.15 million tones of iron ore. Iron ore deposits in Bhamaragarh hill range are also reported. Main ore found are hematite and magnetite. Content of Fe_2O_3 varies from 63% to 66%.

(b) ALLUMINOUS LATERITE: In Abujmal Group of hill range aluminous laterite is found in the form of capping on the lava flow formation. In such ore the content of alumina Al_2O_3 is of the order of 40%.

(c) SANDSTONE: Sandstones are found near Darba village.

(d) GOLD: Gold particle are found in traces in Bhamaragarh Range.

1.3.3. SOILS:

1.3.3.1. SOIL ALONG RIVER BANKS: The soil along the river bank is loamy and it is grey to reddish in colour. Its depth varies from 30 centimeter to 60 centimeter according to the topography. It is moderately rich in humus content, well drained and is suitable for forest growth.

1.3.3.2. SOIL IN PLAIN AREA: The soil in plain area is generally sandy loam, except low lying areas, where it is clay loam. In eroded areas it is sand with pebbles. Its colour varies from whitish to brown depending upon the humus content. The soil is moderately deep and well drained.

1.3.3.3. SOIL IN FOOT HILLS: The soil in foot hills is clay loam, which is rich in humus content and fairly deep and black in colour. The drainage is poor.

1.3.3.4. SOIL ON HILL SLOPES AND TOPS: It is sandy loam, light black in colour and moderately rich in humus content. Some slopes in Bhamaragarh range are covered with lateritic soil. On hill tops soil depth is moderate. In South-Eastern portion of Surjagarh Block between Titoda and Puskoti nala and North Western corner of Ghotsur Block near village Wadsa are having typical soil formation with thin layer of brown clay mixed with grey murrum and sand bearing poor forest.

SECTION1.4: CLIMATE

1.4.1.1: Climate of Bhamaragarh areas is hot and dry and is of tropical type. Broadly speaking, there are four seasons, namely: The cold season, the hot season, monsoon season and post monsoon season. The cold season starts from November and continues up to mid – February. The cold is mild and the weather is extremely pleasant. It is followed by hot season from the middle of February till onset of monsoon in the middle of the June. During April and May, the heat of the day is unbearable, in spite of the dryness. The monsoon season is from the middle of June to September end. October and November are post monsoon month. The climate is humid and hot.

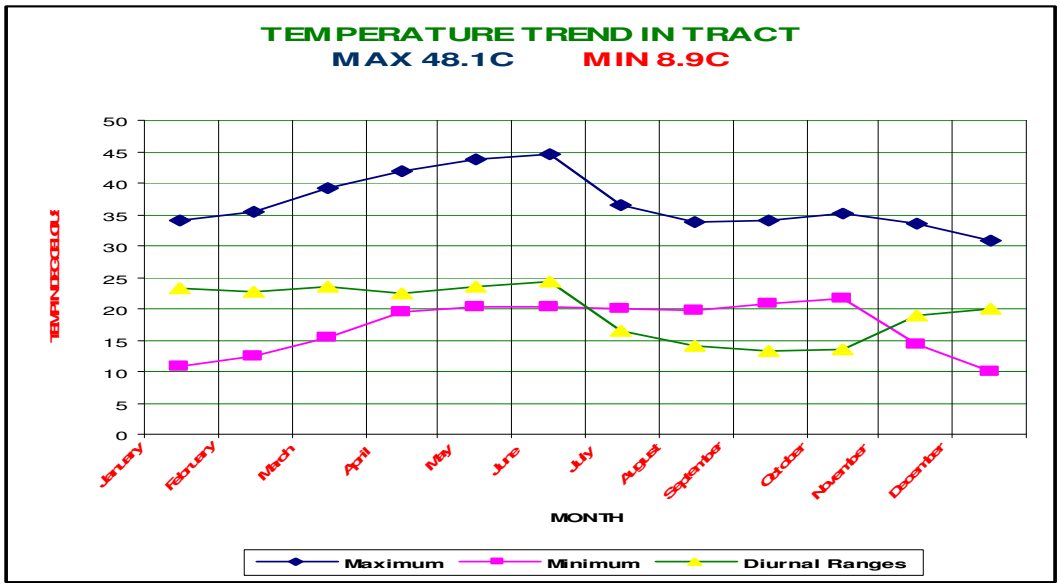
1.4.1.2: TEMPERATURE: The average maximum and minimum temperatures and the diurnal range during the different months of the year are given in the following table.

Table №-3

TABLE SHOWING MAXIMUM AND MINIMUM TEMPERATURES
(Temperature in degree Celsius)

Month	Maximum	Minimum	Diurnal Ranges
January	34.05	10.88	23.17
February	35.30	12.56	22.74
March	39.08	15.48	23.60
April	41.90	19.48	22.42
May	43.73	20.14	23.59
June	44.66	20.23	24.43
July	36.43	19.90	16.53
August	33.90	19.80	14.10
September	34.14	20.80	13.34
October	35.24	21.75	13.49
November	33.42	14.38	19.04
December	30.94	9.93	20.01

GRAPH № 2
GRAPH SHOWING DIURNAL TEMPERATURE BEHAVIOUR



Diurnal range of temperature is largest during March and shortest in rainy season. High temperature in summer adversely affects the vegetation owing to the exposure. The recorded Maximum and Minimum temperatures are 48.1º Celsius on May, 1956 and 8.9º Celsius on January, 1956 respectively

1.4.1.2: RAINFALL: Some rainfall in the form of pre monsoon showers occurs in May. But the main rainy season is from July to October. Averages for this tract indicate that the rainfall during the month of June to October is about 95% of the annual rainfall. July and August are the months when maximum downpour is experienced. About 5% rainfall is received in post monsoon months. Since the rainfall data at Bhamaragarh are not available and Bhamaragarh was the part of Sironcha Tahsil earlier, the data available at Sironcha had been used in the past.

Table №-4

RECORDS SHOWING RAINFALL DATA (in mm) FROM 1991 to 1999

AT SIRONCHA STATION

Year	June		July		August		September	
	NRD	RF	NRD	RF	NRD	RF	NRD	RF
1991	11	177.00	22	517.00	22	310.00	9	55.00
1992	09	270.00	13	358.00	21	418.00	9	172.20
1993	08	120.80	17	561.00	16	259.80	11	224.40
1994	12	190.20	23	461.80	14	40.80	10	82.00
1995	05	241.00	18	251.50	16	224.50	9	125.00
1996	11	175.60	21	318.80	27	460.40	12	310.00
1997	09	57.30	19	292.10	18	433.40	12	127.00
1998	NA	NA	NA	NA.	NA	NA	NA	NA
1999	15	262.70	24	331.60	21	370.50	18	204.50
TOTAL	80	1494.60	157	3091.80	155	2517.40	90	1300.10
AVERAGE	**10**	**186.83**	**20**	**386.48**	**19**	**314.68**	**11**	**162.51**

Table №-4 Contd

October		**November**		**December**		**Total**		**Average**	
NRD	RF	NRD	RF	NRD	RF	NRD	RF	NRD	RF
4	47.00	--	--	--	--	68	1106.00	136.0	221.20
1	13.20	--	--	--	--	53	1231.40	106.0	246.28
5	69.00	--	--	--	--	57	1235.00	114.0	27.40
2	48.00	--	--	--	--	61	1190.00	122.0	23.80
10	271.20	--	--	--	--	58	1113.20	116.0	222.64
4	21.20	--	--	--	--	75	1287.00	150.0	257.40
2	72.00	--	--	--	--	60	981.80	120.0	196.36
--	--	--	--	--	--	--	--	--	--
3	85.00	--	--	--	--	85	1336.60	121.4	190.94
31	626.60	--	--	--	--	477	9481	985.4	
4	**78.32**					**59.6**	**1185.13**	**123.2**	**1819.82**

Where: NRD= Number of rainy days.
RF= Rain fall in millimeter (mm)

Table №5

RECORDS SHOWING RAINFALL DATA (in mm) FROM 1991 to 1999 AT AHERI STATION

Year	**June**		**July**		**August**		**September**	
	NRD	RF	NRD	RF	NRD	RF	NRD	RF
1991	14	56.10	21	368.70	21	414.80	10	48.50
1992	11	335.10	16	305.70	23	665.40	10	244.50
1993	13	250.00	20	516.50	13	262.70	15	228.30
1994	20	305.60	27	448.60	25	457.20	8	91.40
1995	9	180.30	20	485.50	12	329.70	9	162.90
1996	11	196.00	17	245.80	27	542.60	9	16.30
1997	11	236.50	18	239.20	17	355.10	12	12.10
1998	--	--	--	--	--	--	--	--
1999	11	394.00	18	195.00	15	289.10	16	214.90
TOTAL	100	2105.10	157	1395.00	153	3316.60	89	1274.50
Average	**12.5**	**263.13**	**19.62**	**399.57**	**19.12**	**414.57**	**11.12**	**159.31**

Continued:

October		**November**		**December**		**Total**		**Average**	
NRD	RF	NRD	RF	NRD	RF	NRD	RF	NRD	RF
2	22.00	--	--	--	--	68	1110.10	136	222.02
2	47.20	--	--	--	--	62	1597.90	124	319.58
9	31.90	--	--	--	--	70	1240.90	140	248.18
6	62.70	--	--	--	--	86	1765.50	172	353.10
14	23.59	--	--	--	--	64	1394.30	128	278.86
4	43.20	--	--	--	--	68	1190.60	136	238.12
4	66.90	--	--	--	--	62	1008.70	124	201.74
--	--	--	--	--	--	--	--	--	--
2	44.00	--	--	--	--	64	1157.00	128	165.28
43	509.80	-	-	-	-	544	10465	1874	2026.88
5.37	**63.72**	**--**	**--**	**--**	**--**	**68**	**1380**	**136**	**2027**

1.4.1.3: HUMIDITY: The average monthly relative humidity percentage for the period from 1978 to 2004 at Gatta is given below:-

Table №-6

TABLE SHOWING HUMIDITY AT Gatta (%)

SrNo	Month	830 Hrs	1730 Hrs	Average
1	January	76.4	43.2	59.80
2	February	63.2	53.3	49.25
3	March	43.1	23.6	33.35
4	April	32.6	18.1	25.35
5	May	40.3	21.7	31.00
6	June	63.6	43.6	53.60
7	July	83.1	69.0	76.05
8	August	88.3	79.1	83.70
9	September	91.2	81.3	86.25
10	October	72.4	62.2	67.30
11	November	66.1	51.0	58.55
12	December	73.0	48.3	60.65

Above table indicates that the relative humidity is maximum in the month of September and then it gradually decreases till April while it suddenly increases in June

1.4.1.4: FROST: The phenomenon of frost in the tract does not occur.

1.4.1.5: DROUGHT: Though the rainfall figures do not show marked difference in the annual precipitation. Droughts are occasional. But its pronounced effect on the vegetation is noticeable. Established crop is not much affected due to drought. But the unestablished seedlings suffer a lot. The effect of drought on plantations is very acute. The erratic nature of monsoon in recent past has its severe impact on establishment of regenerations natural or artificial.

1.4.1.6: STORMS AND WINDS: The prevailing winds are North-Easterly from October to March and South-Westerly from April to September. The incidence of storm and wind is uncommon. Winds are generally moderate. Occasional storms in premonsoon period regularly occur leading to uprooting of old trees.

1.4.2.1:- HEALTH CONDITIONS: Owing to the climatic conditions and luxuriance of the vegetation, the tract shows unhealthy conditions. Malaria used to be very common. It is now in control due to malaria eradication programmes. For want of clear, potable drinking water at many places, the diseases like diarrhea, dysentery, cholera and many other skin diseases are common. The existing medical facilities are inadequate. Due to insufficient land holding and dependence on monsoon for agricultural production, general public health is at lower rung. Main reason is the paucity of food grains, dependence on forests for fruits and other products and medicinal practices and inadequate employment level.

SECTION: 1.5: WATER SUPPLY

1.5.1.1: There is an acute scarcity of water throughout the tract during the summer. Perennial rivers flow along the boundary of the tract dealt with. Rain water drains off quickly. Most of the inland nala go dry from December onwards and water is confined to pools only. There are no small or medium dams or inland water courses.

1.5.1.2: A few anicuts, vantalis and tanks have been constructed in the past with very small capacity to retain water.

1.5.1.3: The ground water is mostly tapped by dug wells and bore wells. The dug wells range in depth from 12 to 15 m and their yield varies from 45000 – 50000 liters a day. Most of the wells go dry in March. Bore wells range in depth from 50 to 60 m and their yield varies from 18000 – 25000 liters per day only.

SECTION-1.6: DISTRIBUTION OF AREA

1.6.1.1: As per different notifications and Form No-1 of Bhamaragarh Forest Division and communicated to Working Plan Officer, for forest area, distribution of forest areas in the tract dealt with is given as follows:

Table No-7a

TABLE SHOWING THE BLOCKWISE AND RANGEWISE NUMBER OF UNSURVEYED VILLAGES AND NOTIFIED FOREST AREA

Range	Block	No of village	Notified area (in ha)		Total
			RF	PF	
Bhamaragarh	Nibra	8	18,095.200	333.450	18,428.650
	Dubbagudam	1	955.020	27.540	982.560
	Kuwakodi	11	25,424.720	242.000	25,666.720
	Nelgunda	25	37,184.080	1,167.510	38,351.590
Bhamaragarh Range		45	81,659.020	1,770.500	83,429.520
Etapalli Range		30	64,851.826	4,319.126	69,170.952
Gatta	Parli(P)	1	362.924	0.000	362.924
Gatta	Gatta	1	3,945.080	0.000	3,945.080
	Nargunda(P)	21	41,263.990	776.679	42,040.669
Gatta Range		23	45,571.994	776.679	46,348.673
Kasansur Range		19	25,621.544	1,031.596	26,653.140
	Kudkeli	3	3,910.850	233.910	4,144.760
	Nargunda(P)	13	16,650.240	437.581	17,087.821
Tadgaon	Parli(P)	2	1,600.456	143.260	1,743.716
	Visamundi	2	1,683.960	80.530	1,764.490
	Wateli	2	3,631.740	79.310	3,711.050
Tadgaon Range		22	27,477.246	974.591	28,451.837
Grand Total of Division		139	245,181.630	8,872.492	254,054.122

Table No-7b

TABLE SHOWING THE BLOCKWISE AND RANGEWISE NUMBER OF UNSURVEYED VILLAGES AND NOTIFIED FOREST AREA

SrNo	Range	Reserved Forest (ha)	Protected Forest(ha)	Zudupi Jungle(ha)	Total Area (ha)
1	Bhamaragarh	81,659.020	1,770.500		83,429.520
2	Etapalli	64,851.830	4,319.126		69,170.956
3	Gatta	45,571.990	776.679		46,348.669
4	Kasansur	25,621.540	1,031.596		26,653.136
5	Tadgaon	27,477.250	974.591		28,451.841
Division Area		**245,181.630**	**8,872.492**	**0.000**	**254,054.122**

Table No- 8a

TABLE SHOWING THE RANGEWISE NUMBER OF SURVEYED VILLAGES AND NOTIFIED FOREST AREA

Sr No	Range	No of Village	Notified area (ha)		
			RF	PF	Total
1	Bhamaragarh	18	10,194.540	3,019.000	13,213.540
2	Kasansur	50	32,610.910	6,830.010	39,440.920
3	Etapalli	32	22,509.710	7,391.568	29,901.278
4	Gatta	20	11,104.350	7,012.120	18,116.470
5	Tadgaon	24	13,662.660	9,658.950	23,321.610
Grand Total of Division		144	90,082.160	33,911.648	123,993.808

Table No- 8b

TABLE SHOWING THE RANGEWISE Zudupi Jungle handed over to Forest Department

SrNo	Range	Zudupi Jungle(ha)
1	Bhamaragarh	0.000
2	Etapalli	13.480
3	Gatta	3.347
4	Kasansur	0.000
5	Tadgaon	105.510
Division Area		**122.337**

Out of above forest area, 10,438.600 ha of forest area have been transferred from Bhamaragarh Range to Allapalli Wildlife Division after declaring as Bhamaragarh Wild Life Sanctuary.

Table No- 8c

TABLE SHOWING THE RANGEWISE NET AREA

SrNo	Range	No of villages	Reserved Forest (ha)	Protected Forest(ha)	Zudupi Jungle(ha)	Total Area (ha)
1	Bhamaragarh	63	81,414.960	4,789.500	0.000	86,204.460
2	Etapalli	62	87,361.540	11,710.694	13.480	99,085.714
3	Gatta	43	56,676.344	7,788.799	3.347	64,468.490
4	Kasansur	69	58,232.454	7,861.606	0.000	66,094.060
5	Tadgaon	46	41,139.906	10,633.541	105.510	51,878.957
Division Area		283	324,825.204	42,784.140	122.337	367,731.681

SECTION-1.7. STATE OF BOUNDARIES

1.7.1.1. Total length of external boundary of the forest area of the division is 688.559 km. Out of which 196.790 form permanent natural features i.e. rivers. Whereas artificial boundaries of 491.769 km is covered by 12 - 15 m wide clear lines. The boundary is demarcated at some places, by cairns at suitable intervals and putting numbers on them. The state of internal boundary is very poor. The boundary between revenue villages and forest is either absent or in an extremely poor state. Encroachment around villages is commonly seen.

1.7.1.2: Though notification for Reserved Forests has been issued in 1992, the Reserved Forests and Protected Forests have not been delineated.

SECTION: 1.8. LEGAL POSITION

1.8.1.1. RESERVED FORESTS: Reserved Forests have been declared RF on 5th May, 1992. The extent of RF is 324,825.204 ha.

1.8.1.2. PROTECTED FORESTS: Forests in the tract dealt with were declared Protected Forests under sec 29 of IFA1927 and notified under Ex MP Gazette Notification No FLD-4669 II-8316-E, dated June 15, 1955 also in 1959 and 1960. Out of these PF, RF has been declared as per the provisions of IFA, 1927. Remaining PF to the extent of 42,784.140ha has been left to meet the local requirements under right and concessions.

1.8.1.3. ZUDUPI JUNGLE: 122.337 ha of Zudupi Jungle under Revenue Department have been transferred to Forest Division in the tract.

1.8.1.4. Following are the various Government notifications under which the notifications for reserved forests and protected forests have been issued:
(1) Govt Notification No 2105-10-50-XI dated 4/6/1955.
(2) Bombay Govt Gazette Notification No. FLD/4659-3313-E, dated 23-4-1959.
(3) No. FLD-125-II/3314, DT 15-6-1959.
(4) No FLD/3685/9316/CR-42/F-3, dated May 5, 1992 under section 20 of IFA, 1927.

SECTION: 1.9. RIGHTS AND CONCESSIONS

1.9.1.1. RIGHTS AND CONCESSIONS IN RESERVED FORESTS: These forests are not burdened with any adverse rights, privileges or concessions. Existing concessions cannot be claimed as rights or privileges and are terminable at the will of the State Government. The concession are (1) Grazing of cattle free or at concessional rates, (2) removal of certain kinds of forests produce for bonafide, domestic use by the forests villagers free, (3) enjoyment of commutation system. The rights which are destructive to the conservation and development of the forest are commuted by the Forest Settlement Officer.

1.9.2.1: RIGHTS AND CONCESSIONS IN PROTECTED FORESTS: - Most of such Forests were declared Protected Forests in 1955 and later on in 1959 and 1960. These areas were earlier with erstwhile Landlords and were annexed to Government under the provisions of the Madhya Pradesh Abolition of proprietory rights (Estates, Mahalas, Alienated Lands) Act, 1950 (I of 1951). To keep the interest of local people over these lands, provision of Nistar was made in then Land Revenue Code of C.P. The Nistar Patrak (Wazib-Ul-Haq) deals exclusively with the management and use of Government land while the Wazib-Ul-Arz deals with community and customs of uses over private land.

1.9.2.2: The nistar inquiry had been conducted during the period 1954-56 and all the villages included in the tract have been covered under it. The nistar officers have formed grazing and nistar zone by clubbing together surplus villages with deficit villages while self sufficient villages have been treated as individual zones. Villages assigned to particular zone can exercise their nistar rights within that zone. After notification of the reservation in 1992, the rights and concession exist in the Protected Forests set aside for a village or group of villages.

1.9.3.1. GRAZING: - Grazing rules were made applicable vide Government of Maharashtra Revenue and Forest Department Resolution No MFP-1371/237035-Z, dated 3rd November, 1973. The basis for forming grazing zones was that each head of cattle in Cotton-Juar tract should have 0.2 hectare grazing area and that in other tracts it should have 0.4 ha. Villages in which the grazing lands are less than the above requirements were clubbed with the neighbouring village area which exceeds the above standard.

1.9.3.2. The Grazing Settlement has not been done so far in this division as per the provision of the above G.R. and so the number of grazing units has not been formed. The grazing settlement is usually done by a Revenue officer. The grazing is free of cost to all cattle of aboriginal tribals. The grazing of sheep and goats is not permitted.

1.9.3.3. The Government of Maharashtra vides its resolution No FCT/15 64/22-23-Y dated January 15, 1968 has granted the following concessions for villagers other than tribals:

(a) For villagers having land holding less than 20 acre, 4 cattle units are free for grazing.
(b) For villagers having land holding more than 20 acre, 8 cattle units are free for grazing.
(c) A family having more than the above cattle unit will have to take the grazing permit at the rates decided by the Conservator of Forests, South Chandrapur Circle Chandrapur.

1.9.3.4. The latest rates sanctioned by the Conservator of Forests, South Chandrapur Circle vide letter No G-2(3)12648, dated November 16, 1977 are as follows:

a) He and She buffalo	Rs 2/- each.
b) Cow and Bullock	Rs 1/- each.
c) Calf of buffalo more than 6 months but less than 3 years	Rs 1/- each.
c) Calf of cow more than 6 months but less than 3 years	Rs 0.50 each.

1.9.4.1: OCCUPATIONAL NISTAR: In nistar patraks, occupational rights of communities have been recorded and recognized in several villages and entries are found in the Wazib-Ul-Haq for each village. The nistar is required by the villagers for bonafide and agricultural purposes, forest nistar generally includes timber of certain species and sizes for agricultural implements, houses and cattle sheds, fire wood, bamboos, thatching and fodder grasses, fencing material bark, fiber, minor minerals and paidawar i.e. edible fruits, flowers and roots, honey, wax etc. The rights and concessions are governed as per the provisions made in the nistar Patrak for each village, according to which, agriculturalists and agricultural Labourers are entitled to following kinds of forests produce for their nistar either free of charge or at concessional rates fixed by the competent authority, from their nistar zones only.

1.9.4.2. Small Timber & Poles : According to the zonal arrangement made by the nistar officers, the villagers are entitled to obtain their nistar requirements of small timber and poles from the available material either from the forests included in a particular zone or on payment upto a certain quantum fixed by the competent authority. In order to meet the demand of the cultivators of the villages which were not included in the zone, the nistar officers have described that in the event of supply being in excess, in a particular zone after meeting the demands of zones on payment at the rates fixed by the competent authority of the District.

1.9.4.3: Supply of salai wood in marriage ceremonies: Several communities use green *salai* poles as *kham*, a*d*am and *thuni* in marriage ceremonies. The villagers are permitted to remove their requirements upto the maximum limit of 2 trees on permits.

1.9.4.4. Fuel Wood. Free removal of fuel wood from Khasara numbers set aside for nistar is permitted as per rights recorded in nistar Patrakas to the prescribed extent for bonafide use of the villagers. In Khasara numbers which are in excess, no such right is allowed.

1.9.4.5. Dry bamboos are allowed to be removed free from the ex-proprietary forests for bonafide nistar. Green bamboos are given on concessional rate fixed by Collector at nistar depots.

1.9.4.6. Where thorns are not available brush wood such as the lops and tops of the felled trees and of bamboos are permitted to be removed Where removal of thorns and brush wood is allowed either free or at nominal rates, the existing practice continues.

1.9.4.7. Barks, fibers and roots are allowed to be removed where it is customary to allow their removal for bonafide use and removal is non destructive.

1.9.4.8. *Moha, achar, tendu* or other edible fruits, flowers and roots are allowed to be removed free of cost from all over the forests for domestic consumption The removal however, is permitted by head loads only

1.9.4.9. As regards occupational nistar, ghont fruit and dhaora leaves are allowed to be removed by the charmakers free of charge. They are also allowed to remove *bakkal*, and *kahu* bark on nominal payment from trees marked for felling.

1.9.4.10. The then Government of Madhya Pradesh, under whose control these forests vested, issued detailed instructions regarding administration of nistar supply of timber etc to villages vide Government letter No 2396/2389-XXVII, dated October 16, 1956. These instructions which listed details about areas from where nistar was to be made available, extent of nistar to different categories, management of nistar and other forests; extraction and distribution of nistar material by the Gram Panchayats; Gram Sabhas or Nistar Panchayats, envisaged that forests would be managed on scientific basis by the Forest Department and communicated to the Village bodies which would then regulate the supply of nistar as per rules. The quantum of nistar was to be regulated as per the Government order No336/1606-XXVIII, dated June, 1953, which listed the following categories of forest produce and the nistar over the same.

1.9.4.11. GRAZING: Cultivators: Two Plough cattle per plough plus four other including one she buffalo.

1.9.4.12. Agriculturists: Four cattle and four sheep or goats/house hold, artisans, Labourers etc.

1.9.4.13. TIMBER:

AGRICULTURAL IMPLEMENTS: Eight poles upto 45 cm girth and timber actually needed for implements.

MACHAN: Four poles upto 45 cm girth at every third year.

REPAIRS TO HOUSES: Up to ten poles of satkatha (MiscTree species) upto 60 cm girth, if needed.

FOR NEW CONSTRUCTION: As required but on payment and also subject to availability.

1.9.4.14. BAMBOO:

a) **AGRICULTURIST**: 50 bamboos. (For repairs)
b) **NON – AGRICULTURIST:** 25 bamboos (subject to availability)

1.9.4.15. GRASS FOR THATCHING:

(a) **AGRICULTURIST**: Four cartloads.
(b) **NON-AGRICULTURIST:** Four cartloads.

1.9.4.16. MISCELLANEOUS:

i) **FUELWOOD:** Hundred head loads or five cartloads.
ii) THORNS AND BRUSH WOOD :
a) **AGRICULTURIST** : Five cartloads
b) **NON-AGRICULTURIST** : Two cartloads
iii) LEAVES (excluding tendu) : No limit
iv) BAKKAL ROOTS : No limit
(v) PALAS ROOTS : One head load

(**vi**) **FRUITS** & **FLOWERS** : No limit

(vii) KARAI AND **KARKA BAMBOOS**:

a) **AGRICULTURIST** : Two cartloads
b) **NON AGRICULTURIST** : One cartload

1.9.4.17. Nistar is not the right. It is to be met as per the availability of forest produce and People`s cooperation in forest protection from fire, grazing and illicit removal of produce. It is equally pertinent that forest produce will be available only when the forests are intact and not encroached upon for the other forestry operations. Some of the nistar areas have been encroached upon and are not left as forest. Hence there will be no fulfillment of nistar right in those areas.

1.9.5.1. CURRENT STATUS OF NISTAR: A committee was constituted to review and finalize the Nistar in Gadchiroli and Chandrapur districts under the Chairmanship of Conservator of Forests during 1999. Accordingly, the committee has submitted its report**.** Final decision is still awaited.

1.9.5.2. Under Panchayat Raj Extension to Scheduled Areas Act [An Amendment to Indian Constitution], ownership on Minor Forest Produce is to Gram Sabhas. As the tract dealt with is entirely under Scheduled Area, the owner of MFP is Gram Sabhas. Role of Forest Department is Regulatory so that Destructive Harvesting of such produce does not occur.

1.9.5.3. As per Indian Forest Policy 1988, the first charge on forest produce will be that of local forest dwellers. But that will be limited to carrying capacity of the forests concerned.

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CHAPTER-II

FLORA AND FAUNA

CHAPTER IIA

FOREST FLORA

SECTION-2A.1: COMPOSITION AND CONDITION OF THE CROP

2A.1.1.1 The forests of Bhamaragarh Forest Division come under the two sub groups of revised classification of the forest types of India on the basis of ecological grouping as classified by Sir H.G. Champion and Shri S.K. Seth. These groups are

i) **3B** : **South Indian Moist Deciduous Forests.**
ii) **5A: Southern Tropical Dry Deciduous Forests**.

2A.1.1.2 Considerable variations in floristic compositions are noticed due to edaphic and topographical factors. As there is no prominent altitudinal variation, altitudinal variance in species distribution in the tract is not of the significance value. As per the type and depth of the soil, the composition and quality of forests vary. Forests of the tract can be classified as follows in tabular form.

Table N0-9
TABLE SHOWING FOREST CLASSIFICATION

FOREST TYPES	**CHAMPION & SETH`S CLASSIFICATION**
(1) Sub Group – 3B	South Indian Moist Deciduous Forest
(2) Sub Group – 5A	South Indian Tropical Dry Deciduous Forest
	CLIMAX TYPES
(i) 3B/Cic	Slightly Moist Teak Forests.(Teak Type)
(ii) 3B/C_2	Southern Moist Mixed Deciduous Forest.
	Ain-Bija-Dhaoda Type.
(iii) 5A/C_3	Southern Tropical Dry Mixed Deciduous Forests
	Ain-Tendu-Dhaoda Type
	Rohan-Bhirra Type

2A.1.1.3. 3B/South Indian Moist Deciduous Forests are further classified into: a) Moist Teak Forest and b) Moist Mixed Deciduous Forests.

2A.1.1.4. 5A-Southern Tropical Dry Deciduous Forests – The sub types in this category are: (1) Dry Teak Forests – 5A/Cib and (2) Southern Dry Mixed Deciduous Forests – 5A/C3.

2A.1.2. 3B/ SOUTH INDIAN MOIST DECIDUOUS FOREST

2A.1.2.1. 3B/C1c – SOUTH INDIAN SLIGHTLY MOIST TEAK FORESTS- This type of forests are found in patches. These cover about 2% of the total area of the tract dealt with. Major

areas found are in Etapalli range whereas in other ranges very small patches are found. These forests are restricted to the depression, slopes and banks of the rivers and nalas.

These are occasionally seen in eastern half portion of Gatta Block, Southern most part between rivers Jumme and Bandia in Surjagarh Block, along the Zuri river in Paidy Block and on slopes and along Bandia and Zuri rivers in Ghotsur Block. These forests are seldom found in Etapalli and Bandia Blocks. In Compartment No-144, teak percentage is more than 70%. Whereas, in compartment No E101 and E103, it is about 40% in Ghotsur Block. In Surjagarh Block, crop near Reknar and Gundapure, consists of teak to the extent of 30% to 40%. In nature nowhere teak consists of pure crop. The age of crop is uneven consisting of mainly middle aged trees interspersed with some matured trees. Density varies from 0.6 to 0.8. Sometimes nearing to 1.0. Site Quality varies from II to IV. In some patches it is even I. Regeneration is profuse in the midst of forests but sparse near habitation due to comparatively more biotic pressure. Bamboo is found in almost entire tract.

2A.1.2.2 FLORISTIC:

(I) TOP STOREY: Following tree species commonly forms the top storey of these forests:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Ain	*Terminalia latifolia*	*Anjanwak*	*Hardwickia pinnata*
Beheda	*Terminalia bellerica*	*Bija*	*Pterocarpus marsupium*
Dhaora	*Anogeissus latifolia*	*Haldu*	*Haldina cordifolia*
Hirda	*Terminalia chebula*	*Kakad*	*Garuga pinnata*
Kulu	*Sterculia urens*	*Kusum*	*Schleichera oleosa*
Mowai	*Lannea coromandelica*	*Salai*	*Boswellia serrata*
Semal	*Bombax ceiba*	*Shisham*	*Dalbergia latifolia*
Sag/Teak	*Tectona grandis*		

(II)MIDDLE STOREY : Middle storey commonly comprises of following species:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Achar	*Buchanania lanzan*	*Amaltas*	*Cassia fistula*
Aonla	*Emblica officinalis*	*Dhaman*	*Grewia tilifolia*
Garari	*Cleistanthus collinus*	*Ghot*	*Zizyphus glaberrima*
Kumbhi	*Careya arborea*	*Phetra*	*Gardenia turgida*
Tendu	*Diospyros melanoxylon*	*Tiwas*	*Ougenia oojeinensis*

(IIa) BAMBOO: Major species of Bamboo found in the tract is *Karka*. The rarely found species along the banks of nala is Katang (Bambusa arundinacea).

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Karka	*Dendrocalamus strictus*	*Katang*	*Bambusa arundinacea*

(III) SHRUBS: Main species of shrubs found in the tract are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Dikamali	*Gardenia resinifera*	*Kuda*	Holarrhena pubescens

Lokhandi	*Isora arborea*	*Murarphali*	*Helicteres isora*
Rankapas	*Thespesia lampas*		

(**IVa) HERBS:** Prominent herbaceous plants found in these forests are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Bhuichind	*Phoenix acaulis*	*Gursukri*	*Grewia hirsuta*
Neel	*Indigofera cassioide*		

(IVb) GRASSES: Common grasses are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Bhurbhusi	Eragrostis tenella	*Chir*	Imperata officinalis
Kusal	Heteropogon contortus	*Mushan*	Iseilema laxum

(V) CLIMBERS: Climbers are prominent which encircle the trees species for their support and growth.

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Chilati	*Mimossa hamata*	*Lalbel*	*Ventilago denticulata*
Palasbel	*Butea superba*	*Ramdataon*	*Smilax xylanica*

2A.1.2.2. Successful teak plantations have been raised in these areas. The list of such plantation will be given Volume II of Final Draft Plan.

2A.1.2.3. 3B/C_2: SOUTH INDIAN MOIST MIXED DECIDUOUS FOREST- This sub type covers approximately 25% area of the total area of the division. It occurs along hill slopes and in valleys. It is confined mainly to Surjagarh, Ghotsur, Paidy and Gatta Blocks of North and South Etapalli ranges where soil is deep and fertile alluvial sandy loam. The quality of the crop is II to III and density 0.5 to 0.8. Ain and bija are the main species, and at places they constitute about 60% of the crop. Teak is found upto 5% of the crop. Other associates are *dhaoda, semal, haldu and lendia.* Second story consists of *garari, kuda, ghont, murarphali, chipti, and triumpheta* species. Climbers are mainly *Palasbel, kukuranji, and iruni*. Grasses are medium. C*hirgrass* occurs occasionally. *Bhurbhusi* and *kusal* are common.

2A.1.2.4. On drier areas where soil is shallow and eroded, the forest is of low quality. Density varies from 0.3 to 0.6. Teak is practically absent. *Anjan* is common. Second storey is of *bhirra, rohan, khirni, dikamali, alichetu* etc.

2A.1.2.5 FLORISTIC:

(I) TOP STOREY: Following tree species commonly forms the top storey of these forests:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Ain	*Terminalia latifolia*	*Arjun*	*Terminalia arjuna*
Beheda	*Terminalia bellerica*	*Bija*	*Pterocarpus marsupium*
Bhirra	*Chloroxylon swietenia*	*Dhaora*	*Anogeissus latifolia*
Haldu	*Haldina cordifolia*	*Hirda*	*Terminalia chebula*

Kakad	*Garuga pinnata*	*Kalamb*	*Mitragyna parviflora*
Kulu	*Sterculia urens*	*Kusum*	*Schleichera oleosa*
Lendia	*Lagerstroemia parviflora*	*Mahua*	*Madhuca indica*
Mowai	*Lannea coromandelica*	*Rankela*	*Dillenia pentagyna*
Semal	*Bombax ceiba*	*Shisham*	*Dalbergia latifolia*
Sag	*Tectona grandis*		

(II)MIDDLE STOREY : Middle storey commonly comprises of following species:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Achar	*Buchanania lanzan*	*Alichettu*	*Euonymus davaransis*
Amaltas	*Cassia fistula*	*Aonla*	*Emblica officinalis*
Bel	*Aegle marmelos*	*Biba*	*Semecarpus anacardium*
Dhaman	*Grewia tilifolia*	*Garari*	*Cleistanthus collinus*
Khair	*Acacia catechu*	*Kulu*	*Sterculia viscosa*
Kumbhi	*Careya arborea*	*Ranmendhi*	*Dodonea viscosa*
Rohan	*Soymida febrifuga*	*Surya*	*Xylia xylocarpa*
Tendu	*Diospyros melanoxylon*	*Tiwas*	*Ougenia oojeinensis*

(IIa) BAMBOO: Major species of Bamboo found in the tract is Karka. The rarely found species along the banks of nala is Katang (Bambusa arundinacea).

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Karka	*Dendrocalamus strictus*	Katang	*Bambusa arundinacea*

(III) SHRUBS: Main species of shrubs found in the tract are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Harsingar	*Nycanthus arbortristis*	*Kuda*	Holarrhena pubescens
Lokhandi	*Isora arborea*	*Murarphali*	*Helicteres isora*

(**IVa) HERBS:** Prominent herbaceous plants found in these forests are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Bhuichind	*Phoenix acaulis*	*Gursukri*	*Grewia hirsuta*
Neel	*Indigofera tinctoria*		

(IVb) GRASSES: Common grasses are:

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Bhurbhusi	Eragrostis tenella	*Chir*	Imperata officinalis
Kusal	Heteropogon contortus	*Mushan*	Iseilema laxum
Speargrass	*Heteropogon contortus*	*Tikhadi*	*Cymbopogon martini*

(V) CLIMBERS: Climbers are prominent which encircle the trees species for their support and growth.

Local Name	**Scientific Name**	**Local Name**	**Scientific Name**
Chilati	*Mimosa hamata*	*Iruni*	*Zizyphus oenoplia*
Kukuranji	*Calycopteris floribunda*	*Mahulbel*	*Bauhinia vahlii*
Nagbel	*Cryptolepis buchanani*	*Palasbel*	*Butea superba*

2A.1.3: 5A SOUTHERN TROPICAL DRY DECIDUOUS FOREST

2A.1.3.1: **5A/C3 SOUTHERN TROPICAL DRY MIXED DECIDUOUS FORESTS-** This type of forests cover approximately 72% of forest area of the division. Most of the areas under this type are having great varieties of species. The quality of the crop varies between II to IV. Under this type, on slopes and areas with comparatively better soil, local sub type – Ain-Tendu-Dhaoda is seen. Lower slopes show poorer soil and Rohan-Bhirra sub type takes the place in over wood

2A.1.3.2: The crop is sound, well formed and middle to matured aged. Teak comprises upto 60% of the crop at places. Density varies from 0.4 to 0.9. Other associates are *ain*, *bija, haldu* and *semal*. Under storey of *garari, khair, medsing, baranga* is common. On the poorer soils *medsing, garari, dikamali, lokhandi, anjan* stand out. Above sub group can be further sub divided into following local sub types:

(i) Ain-Bija-Dhaoda sub type.

(ii) Ain-Tendu-Dhaoda sub type.

(iii) Ain-Garari sub type.

(iv) Salai-Bhirra-Khair sub type.

(v) Rohan-Bija-Dhaoda sub type.

(i) AIN-BIJA-DHAODA SUB TYPE

2A.1.3.3. Under this sub type approximate percentage of ain, bija and dhaora is 30 to 35%, 25 to 40% and 20 to 25% respectively. Arjun and jamun are localized to moist places. The crop is young to middle aged. Natural regeneration is profuse. Establishment is also adequate except near to habitation. The Site Quality is generally III. Density varies from 0.4 to 0.7. Bamboo is confined to hilly area and nala banks with quality between I and II.

FLORISTIC

(I) TOP STOREY: Following tree species commonly forms the top storey of these forests:

Local Name	Scientific Name	Local Name	Scientific Name
Ain	*Terminalia latifolia*	*Arjun*	*Terminalia tomentosa*
Baranga	*Kydia calycina*	*Bija*	*Pterocarpus marsupium*
Dhaora	*Anogeissus latifolia*	*Haldu*	*Haldina cordifolia*
Hirda	*Terminalia chebula*	*Jamun*	*Syzygium cumini*
Kulu	*Sterculia urens*	*Kusum*	*Schleichera oleosa*
Moha	*Madhuca indica*	*Mowai*	*Lannea coromandelica*
Papara	*Holoptelea Integrifolia*	*Salai*	*Boswellia serrata*
Semal	*Bombax ceiba*	*Shisham*	*Dalbergia latifolia*

(II)MIDDLE STOREY: Middle storey commonly comprises of following species:

Local Name	Scientific Name	Local Name	Scientific Name
Achar	*Buchanania lanzan*	*Amaltas*	*Cassia fistula*
Aonla	*Emblica officinalis*	*Dhaoda*	*Anogeissus latifolia*
Garari	*Cleistanthus collinus*	*Ghot*	*Zizyphus glaberrima*
Kumbhi	*Careya arborea*	*Kasai*	*Bridelia retusa*
Karai	*Miliusa velutina*	*Surya*	*Xylia xylocarpa*

(IIa) BAMBOO: Major species of Bamboo found in the tract is Karka. The rarely found species along the banks of nala is Katang (Bambusa arundinacea).

Local Name	Scientific Name	Local Name	Scientific Name
Karka	*Dendrocalamus strictus*	*Katang*	*Bambusa arundinacea*

(III) SHRUBS: Main species of shrubs found in the tract are:

Local Name	Scientific Name	Local Name	Scientific Name
Dikamali	*Gardenia resinifera*	*Jilbili*	*Woodfordia fruticosa*
Kuda	Holarrhena pubescens	*Murarphali*	*Helicteres isora*

(**IVa) HERBS:** Prominent herbaceous plants found in these forests are:

Local Name	Scientific Name	Local Name	Scientific Name
Bhuichind	*Phoenix acaulis*	Gursukri	*Grewia hirsuta*
Neel	*Indigofera cassioide*		

(IVb) GRASSES: Common grasses are:

Local Name	Scientific Name	Local Name	Scientific Name
Bhurbhusi	Eragrostis tenella	Chir	Imperata officinalis
Kusal	Heteropogon contortus	Mushan	Iseilema laxum

(V) CLIMBERS: Climbers are prominent which encircle the trees species for their support and growth.

Local Name	Scientific Name	Local Name	Scientific Name
Gung	*Abrus precatorius*	Lalbel	*Ventilago denticulata*
Palasbel	*Butea superba*	Shataori	*Asparagus racemosa*

(ii) AIN-TENDU-DHAODA SUB TYPE

2A.1.3.4. This sub type consists of ain, dhaoda, tendu, lendia, bija, salai trees with varying proportion. This type generally occurs on slopes and in areas with loamy soils. The occurrence of garari and tendu in second story is common feature throughout the area. The crop is young to middle aged with density 0.4 to 0.6, besides Understocked patches here and there. Bamboo is also found in the part of the area. Paidy Block area boasts with

Katang bamboo. Natural regeneration of ain, bija, tendu and dhaoda is satisfactory. Khair regeneration in patches is also noticed.

FLORISTIC

(I) TOP & MIDDLE STOREY

Ain (Terminalia latifolia), dhaora (Anogeissus latifolia), lendia (Lagerstroemia parviflora), hiwar (Acacia leucophloea), anjan (Hardwickia binnata), bija (Pterocarpus marsupium), rohan (Soymida febrifuga) chichwa, (Albizia odoratissima), harra (Terminalia chebula), bahera (Terminalia bellerica), semal (Bombax ceiba), jamun (Syzygium cumini), kulu (Sterculia urens) haldu (Haldina cordifolia), Moha (Madhuca indica), teak (Tectona grandis), mowai (Lannea coromandelica), karam (Mitragyna parviflora), Garari (Cleistanthus collinus) aonla (Emblica officinalis), apta (Bauhinia recemosa), khair (Acacia catechu), ghont (Zizyphus glaberrima), kakai (Flacourtia indica) khirni (Mimusops hexandra) medsing (Dolichandrone falcata), kalaphendra (Randia uliginosa), lokhandi (Ixora parviflora), palas (Butea monosperma), gugal (Gardenia latifolia), achar (Buchanania lanzan), kusum (Schleichera oleosa), kumbhi (Careya arborea), dhaman (Grewia tilifolia), bell (Aegle marmelos), kuda (Holarrhena pubescens), amaltas (Cassia fistula)

(IIa) BAMBOO

Dendrocalamus strictus (in sheltered pockets)

(III) SHRUBS

Neel (Indigofera cassicide), gursukri (Grewia hirsuta)

(IVa) HERBS

Dhawai (Woodfordia fruiticosa), bhuichind (Phoenix acanuis)

(IVb) GRASSES

Mushan (Iscilema laxum), bhurbhusi (Eragrostis tenella), kusal (Heteropogon contortus), ghonad (Themeda triandra),

(V) CLIMBERS

Gunj (Abrus precatorius), chilati (Mimosa hamata), Palasbel (Butea superba), chilati (Mimosa hamata), Nagbel (Cryptolepis buchananii), kukranji (Calcopteris floribunda), lalbel (Ventilago denticulata)

(iii) AIN –GARARI SUB TYPE

2A.1.3.5. This sub type consists of mainly ain, garari, and dhaoda species in varying proportion. It generally occurs over clayey soils and eroded patches of sandy loam. The Site quality varies from III to IV. Density varies from 0.4 to 0.6. This type is common in Paidy, Surjagarh and Gatta Blocks. Regeneration is satisfactory.

(I) TOP STOREY: Ain, dhaoda, tendu, mowai, mahua, kalamb, rohan etc,

(II) SECOND STOREY: Garari, apta (Bauhinia racemosa), achar, phetra, aonla, and lokhandi.

(III) SHRUBS: Kuda, Jilbili, bhuichind.

(IVa) GRASSES: Kusal, Mushan.

(IVb) CLIMBERS: Palasbel, Mahulbel, chilati etc.

(iv) SALAI-BHIRRA-KHAIR SUB TYPE:

2A.1.3.6. This type of forest occurs on hill slopes, ridges and spurs. Soil is very shallow, strewn with boulders. At many places parent rock is exposed. Salai with bhirra, dhaoda, kulu mowai, and under storey of achar, khair are prominent. Bamboo is of poor quality. Grasses are abundant. Regeneration of many species is scanty.

Floristics

Salai (Boswellia serrata), *Lendia (Lagerstroemia parviflora),*
Kulu (Sterculia urens) *Mowai (Lannea coromandlica),*
Dhaora (Anogeissus latifolia) *Gongal (Chchlospermum religiosum),*
Tendu (Diospyros melanoxylon), *Ain (Terminalia latifolia),*
Rohan (Soymida febrifuga) *Teak (Tectona grandis),*
Karachi (Nyctanthus arbortristis), *Achar (Buchanania lanzan),*
Apta (Bauhinia recemosa), *Khair (Acacia catechu)*
Aonla (Phyllanthus emblica) *Chilati (Mimosa hamata),*
Ironi (Zizyphus oenoplia). *Bhirra (Chloroxylon swietenia)*
Practically no shrubs occur. High dense growth of grass is seen,

(v) ROHAN-BHIRRA SUB TYPE

2A.1.3.7. This type occurs on shallow gravelly or clayey soils i.e. on the abondoned cultivation. Surface soil has become hard and impervious. Stocking is poor. Crop is stunted. Underwood is in differentiable from the overwood. Under growth is scanty.

Floristics

Anjan (Hardwickia binnata), *Ain (Terminalia alata)*
Mowai (Lannea coromandelica), *Dhaoda (Anogeissus latifolia)*
Lendia (Lagerstroemia parviflora) *Tendu (Diospyros melanoxylon)*
Khair (Acacia catechu), *Garari (Cleistanthus collinus)*
Ghont (Zizyphus glaberrima), *Palas (Butea monosperma)*
Dikamali (Gardenia resinifera)
III/Ivb: Very thin and patchy growth of dhawai (Woodfordia fruticosa), bhuichind (Phoenix acaulis), and gursukri (Grewia hirstuta) coarse grasses is common.

2A.1.3.8: SPECIES IN NEED OF CONSERVATION: The following species are in need of conservation measures. *Doroxylum indicum, Radermachera xylocarba, Eriolaena hookeriana, Spondias mangifera, Careya arborea, Ehretia laevis, Hymenodictyon Excelsum, Litsea gluginose, Mallots phillipensis, Pterocarpus marsupium, Trema politoria, Ficus cunia, Yaesa indica.*

2A.1.3.9: MEDICINAL PLANTS: The important medicinal plants are found in this division e.g. *Asparagus racemosa, Chlorophytum tuberosum, Equisetum sp, Hygrophila*

auriculata, *Bauhinia diffusa*, *Terminalia bellerica*, *Terminalia chebula*, *Emblica officinalis*, *Soymida febrifuga*, *Solanum violaceum*, *Glorisa superba*, *Pueraria tuberosa*, *Plumbago zexlamica*, *Iplengenia indica*, *Cassia absus*, *Holarrhena antidysenterica.* *Hemidesmus indicus*, *Helicteres isora*, *Evolculus alsinoides*, *Vernonia cineria* etc. List of important medicinal plants found in the tract and their parts used has been given on page number vi to xi. Non destructive harvesting measures have been discussed on page no-179-181.

SECTION-2A.2: INJURIES TO WHICH THE CROP IS LIABLE: The forests are liable to the following injuries

2A.2.1.1: FIRE: Dry season from February to June is very long and during which the forests are susceptible to fires. Fires taking place by the end of winter and at the beginning of summer are not severe. Late fires in coupes closed to grazing are very damaging. The damage is serious when the freshly felled material is lying in the coupe and when it is regenerated. The young regeneration suffers a lot and crop like teak gets killed in the form of die back. Severe fires cause scorching heat leading to unsound and hollow stems. Which further render them to fungus and insect attack? Fires cause soil erosion indirectly, by destroying vegetal soil cover. Occasionally, fires are set by people with an interest to collect flowers, fruits, good tendu flush and grass. Recorded fire damage is negligible.

A VIEW OF STUMP OF ILLICITLY FELLED TEAK TREE

2A.2.1.2: ILLICIT FELLING OF TREES- Illicit felling for timber, firewood, and poles is not a very common practice. Now a day's local's people presume it is their right to cut any tree in the forest. Mostly it is aimed at encroachment for cultivation, an activity to support household a recreational means like passing time while axing a tree and so on. Large scale illicit cuttings are for the benefit of land grab movement. Reported figure of illicit felling is given below.

Table-10

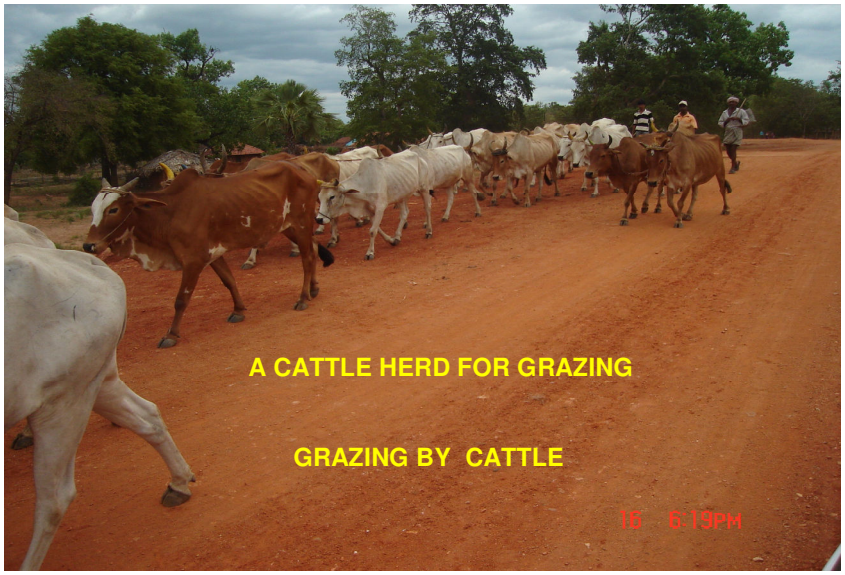
REPORTED DATA OF ILLICIT FELLING OF TREES						
			Seized materials			
Period	No of trees	Value in Rs	No of pieces	Cmt	Value in Rs	% recovery
1998	4614	31,94,000			32,.66,000	102%
1999	4307	37,48,000			37,51,000	100%
2000	2639	17,44,000			18,00,000	103%
2001	2619	16,77,493	2944	374.272	15,48,546	92%
2002	2949	18,48,019	3067	380.443	15,89,438	86%
2003	6251	57,83,092	5464	1144.191	48,73,812	84%
2004	4181	24,16,000		497.414	22,77,000	94%

2A.2.1.3: ENCROACHMENT ON FOREST LAND- Encroachment is common. Support of Naxalites is now a day considered a deterrent in detection and booking of these offences and has become a problem for local authorities. Large scale encroachment is seen mainly for the purpose of cultivation. The unsurveyed new reserved forests and protected forests need immediate surveying and demarcation to protect these forests from the menace of encroachment and dealing the culprit in the court of law.

Table-11

TABLE SHOWING EXTENT OF ENCROACHMENT

SrNo	Range	AREA	PERIOD	No OF ENCROACHERS	ENCROACHED AREA (ha)
1	Bhamaragarh	86,204.460	POST 1/4/1978	248	301.49
2	Etapalli	99,085.714	POST 1/4/1978	500	643.91
3	Gatta	64,468.490	POST 1/4/1978	392	423.30
4	Kasansur	66,094.060	POST 1/4/1978	594	656.96
5	Tadgaon	51,878.957	POST 1/4/1978	261	291.93
	Total Division	367,731.681	POST 1/4/1978	1995	2317.59



2A.2.1.4: GRAZING BY CATTLE- The incidence of grazing is low in the tract. But forests near villages bear the pressure of grazing. Protected forests are burdened with nistar right of grazing. Such forests are vulnerable for grazing. Grazing affects the establishment of young recruitments. Some of areas are affected by trampling. Movement of cattle in sandy area enhances the soil erosion. The carrying capacity of the forests of division is 3,33,000 cattle units. Whereas cattle unit present in the tract is 1,25,000 cattle units. Thus the grazing pressure is low.

2A.2.1.5: GRAZING BY WILD ANIMALS- The tract is almost devoid of herbivore**.** Hence the pressure of wild animals on young regeneration is almost negligible.

2A.2.1.6: INSECTS AND FUNGII The attack of teak-skeletonizer (Hapalia machaeralis) and teak-defoliator (Hyblaea puera*)* are common in teak patches and occur almost every year during that period. Termites are found to attack the young seedling at the base of the collar especially in the degraded areas. Termites also attack the young pole crop of Dhaoda (Anogeissus latifolia) and Aonla (Emblica officinalis) by girdling them at the base. Dhaora (Anogeissus latifolia) is attacked by bark eating caterpillars, Indarbela quadrinotata. It also has a tendency to become hallow which subsequently is colonized by a white insect. Acacia leucopholoea is attacked by Hapalophraginium ponderosum causing woody galls. They should not be looked upon as the damaging agents. Rather they are sanitation agents. They thrive on mostly on succulent leaves or dead wood. In both ways they control the sanitation of the forests.

2A.2.1.7: CLIMBERS AND WEEDS- These are common and infesting almost all the areas. Common amongst them are *Mahul (Bauhinia vahlii), Palasbel (Butea superba), Nagbel (Cryptolepis buchanani), Gorari (Milletia auriculata), Chilati (Acacia pinnata), Banda (Clematis triloba), Malkangni (Celastrus paniculata), Rhet bel (Combretum ovalifolium), Kharbel (Ventilago madraspatane), Kumbera (Vitex auriculata) and gorbel (Pueraria tuberosa).* They are not causing any damage to forests in large extent. They are helping in biodiversity. Most of them are of medicinal values to humane beings and wild animals. They need proper protection so that they would not be annihilated from the forests.

2A.2.1.8: PARASITES AND EPIPHYTES- The following are the important epiphytic species present in this division *Visum articultatum, Cusenta specious, Crinum species, Gloriosa superba, Nictetiana splumbaginifolia, Waltheria indica , Smithia bigemna* The loss caused by them is not substantial. Their role is to have sanitation in forests.

2A.2.1.9: FROST- The phenomenon of frost seldom occurs in the tract. Hence damage caused by frost is not known to the tract.

2A.2.1.10: WINDS AND STORMS- The damage done by them is significant in the tract. Every year some trees or broken or uprooted due to wind or storms. Particularly during rainy season the wind velocity used to be high leading to breaking or uprooting of the trees.

2A.2.1.11: DROUGHT- Drought in real sense is not common in the tract. But untimely rains or scanty rains or long dry spell are common. It affects the regeneration and establishment of crop. It also hampers the growing stock in some extent.

SECTION: 2A.3: SOIL EROSION

2A.3.1.1: Soil erosion is eminent along the long tract of Bandia, Zuri, Pamalgautam, Paralkota and Indravati Rivers and their tributaries small rivers or nala. Sheet erosion is common in entire tract. Gully erosion is common along river banks. Recent formations, metamorphic formation and sedimentary rocks easily eroded. Due to removal of vegetal covers in some areas the outcrop rock is seen. Even the erosion is not alarming in the forest tract as the most of the tract is under vegetal covers.

SECTION: 2A.4. SHIFTING CULTIVATION:

2A.4.1.1. Shifting cultivation is done mainly by hill Madias. Practice of shifting cultivation started before 1951 because of the fact that the ex-proprietors permitted people to fell trees any where in the forests for their domestic purpose. Same habits still persist in them. A number of legal and persuading efforts were made to stop that practice but still it is continuing. The probable reason for the persistence of this practice might be due to the backwardness, illiteracy, remoteness of the areas and communication gap due to language problem. Besides, they are generally shy, suspicious and superstitious by nature. These areas become inapproachable during rains. They do not have adequate basic facilities for sustenance of life.

2A.4.1.2. The Madia are supposed to be one of the sects of Dravidian aboriginal group which migrated from the South India and settled in the tract dealt with which is presently the home of Madias. The Madias in the eastern hills differ from the Madias in the plains in their way of life etc. The hill Madias are engaged mainly on shifting cultivation. As per 2001 census, population of Scheduled Tribes in the tract is 85,601. Category wise population has not been given. But, Collector Gadchiroli has communicated the figure of Bada Madia in Bhamaragarh to the Honourable High Court as 640 in 6 villages.

2A.4.1.3. The main occupation of Madia people is agriculture. The people are backward and illiterate. Their farming methods are primitive. They do not have improved seeds, implements and fertilizers. The yield is generally poor. Their agriculture solely depends upon seasonal rains. The crop is insufficient to sustain them throughout the year. The diet is supplemented by wild fruits, roots, tubers extracted from forests, hunting and fishing. They also collect Minor Forest Produce and sell them in weekly markets.

2A.4.1.4. The Madias are nomadic in nature. They do not have affinity for their lands and huts. They are ready to surrender their lands, property and even village sites and settle anywhere at any time. They encroach upon the forest area, clear fell and burn the felled material and then start cultivation. They cultivate Kosari and hill millets on hills. They prefer to choose the site for shifting cultivation within a radius of 8 to 15 kilometer from village site. Normally they cultivate at one site continuously for three years and thereafter they shift to other site. In this way shifting continues. The area which is left fallow after cultivation is covered by coppice and natural regeneration of miscellaneous species and carpet of bamboo. In such areas young crop is seen.

2A.4.1.5. Gradually with the change in nomadic nature the extent of shifting cultivation is decreasing as they are gradually settling by encroaching upon the forest areas. The population of tribals who survive on the shifting cultivation is less. Therefore, frequency of clear felling on the same area is very less and period is very long. A list of some villages and families, in remote areas of Bhamaragarh Range, engaged in the practice of shifting cultivation is as follows:

Name of the Villages	Total Number of Families practicing Shifting Cultivation
1. Fodewada	8
2. Korparsi	9
3. Timeli	7
4. Dhamanmarka	2
5. Pirmalbhatti	15
6. Binagunda	20
7. Turemarka	25
8. Kuakodi	14

This is not the exhaustive list. The information collected by the field staff of working plan has been given. The territorial division does not have any record with reference to the shifting cultivation. Therefore, the actual extent of area under shifting cultivation has not been given.

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CHAPTER-II

FLORA AND FAUNA
CHAPTER IIB
THE FOREST FAUNA

SECTION 2B:1: HISTORY OF WILDLIFE PROTECTION

2B.11.1 The tract dealt with has been an ideal natural habitat for the wildlife. The forests are mainly of miscellaneous species and are dense and rich so far as varieties of species are concerned. As per discussion with local people, good varieties of wild animals inhabited the tract. But today the tract is very poor in wildlife in number of species and their population distribution.

2B.2: DISTRIBUTION OF WILDLIFE:

2B.2.1.1 The faunas are widely distributed in areas adjoining rivers. The wild animals commonly found in the tract are as follows:

2B.2.1.2: – CARNIVORE: A few numbers of carnivores are found in the tract.

(1) **Tiger (Panthera tigris)** Tiger is seldom found in small number. Reported figure as per 2006 Estimation, is 1. The author of this working plan report had not a single opportunity to have a sight of tiger in the tract. The data of tiger population in last two decades is not promising one. Estimated number of tigers in previous estimates is given in the following table.

Table No-12

Year	Tiger Hunted	Panther Hunted	Year	Tiger Estimated	Year	Tiger	Panther
1966-67		1	1971	6	1989	0	0
1967-68	1		1972	7	1993	0	0
1968-69	1		1973	3	1997	0	0
1969-70	1	1	1974	0	2001	0	0
1970-71	1		1975	0	2005	1	0

Reported figure of tiger and panther from 1974 to 2004 is nil. As the tract was part of Aheri jamindari up to 1952, it was game block for Jamindars and their guests. Hence big game were almost wiped out during that period itself.

(2) **Panther (*Panthera pardus*)** Panther is not reported in the tract dealt with.

(3) Hyena (*Hyena hyena*) This species is commonly seen in the tract. Almost entire tract experiences its presence.

(4) Wild Dog (*Cuon alpinus*). Wild dog has been reported in the tract. The tract dealt with has estimated wild dog population to 43 during 2005 count.

(5) Wolf (*Canis lupus*). It is reported to be present in the tract.

(6) Jackal (*Canis aureus*) Jackals are found everywhere in the tract.

(7) Fox (*Vulpes bengalensis*). Just like jackals foxes are found in the tract.

(8) Jungle Cat (*Felis chaus*) Jungle cats are common in the tract.

2B.2.1.2: HERBIVORE- A large number of herbivore is found in the tract forming the prey base to carnivore. The species commonly found are: Sambhar (Cervus unicolour), Cheetal (Axis axis), Nilgai (Boselaphus tragocamelus), Wild Boar (Sus scorfa), Barking Deer (*Muntiacus mujtjak*), Langur (*Presbytis entellus*), Monkey (*Rhesus macaque*), Hares (*Lepus nigricollers),* H*are, (Lepus reficaudatus).* The main species of concern is Langur**.**
Langur- langur is mercilessly hunted by the tribals. They are hunted by felling the trees in group or by traping. It is by tradition. No impact is on the mind of people for their protection.
OMNIVORE: Sloth Bear (Melursus ursinus).
2B.2.1.3: – RODENTS- There are so many rodents found in tract. It is difficult to enlist them. Main rodents are:
Flying Squirrel (*Petaurista petaurista),* Porcupine (*Hystrix indica*), mouse deer, rats, mice etc.
2B.2.1.4: WILD BIRDS- Jungles of the tract are full of avi fauna. The list has been given earlier. Even river tract attracts many avi fauna both native and migratory. Common amongst them are: Painted Sand Grouse (*Pterocles indicus*), Common Sand Grouse (*Pterocles exustus*), Pea Fowl (*Pavo cristatus*), Grey Jungle Fowl (*Gallus sonneratii*), Painted Partridge *(Francolinus pictus*), Grey Partridge (*Francolinus pondicerianus*), Black Breasted Quail (*Coturnix coromandelicus*), Red Spur Fowl (*Galloperdix spadicea*), Crane (Grusantigone), Spotted Bill Duck (Anas poecilorhyncha), Pigeon (Treron phoenicaptera), Dove (Streptopelia *spp*), Cotton Teal (Nettapus coromandelianus), Whistling Teal (*Dendrocygna javanica*) Cuckoo (*Cuculus varius*), Snipe (*Capella galliachges*) etc. Great Indian Hornbill group was also seen by the author in Nelgunda Forests during April, 2005.

2B.2.1.5: Reptiles- The tract is full of reptiles. Many types of lizards including monitor lizards are found. Snakes of various types are found. Even crocodiles (Magar) are found in the course of Indravati River.

Table No-13
TABLE SHOWING THE ESTIMATED POPULATION OF WILDLIFE DURING ESTIMATED PERIOD

SPECIES	*1989*	*1993*	*1997*	*2001*	*2005*
Barking deer	---	---	4	23	88
Bat	---	---	0	10	0
Chital	---	---	54	42	49
Chausingha	---	---	0	4	1
Crested hawk eagle	---	---	0	3	0
Crested serpent eagle	---	---	0	0	4
Crocodile	---	---	0	3	3
Flying Squirrel	---	---	0	5	6
Hyena	---	---	0	2	4
Hare	---	---	0	112	0
Indian Fox	---	---	15	10	194

Jungle cat	---	---	4	3	29
Langoor	---	---	0	5	110
Mongoose	---	---	0	5	17
Nilgai	---	---	1	7	5
Owl	---	---	0	10	0
Pangolin/ Anteater	---	---	0	1	2
Porcupine	---	---	0	2	11
Peacock	---	---	0	95	0
Sambhar	---	---	4	10	28
Sloth bear	---	---	10	4	112
Small Indian Civet	---	---	0	2	4
Wild dog	---	---	0	0	43
Wild boar	---	---	244	96	226
Wolf	---	---	4	7	0
Giant squirrel			0	0	18
Palm civet			0	0	133

SECTION-2B.3: INJURIES TO WHICH THE WILDLIFE IS LIABLE

2B.3.1.1. The wildlife is liable to the following injuries:

2B.3.1.2. SHIKAR/POACHING- The tract is entirely covered with forests and residents are mainly aborigin. They are fond of shikar i.e. hunting. They usually hunt in group and at special occasions like festival or to please their deities. During Jamindari Raj, Shikari was sent by the jamindars. Earlier Shooting Blocks were meant for official shikar upto early seventies of last century. Now a day's shikar is totally prohibited. Poaching of tiger or panther was main cause of depletion of carnivore.

2B.3.1.3. FIRE : The tract is not so prone to fire. Some areas might be exception to it but the remote areas, which are the ideal habitat, are not affected by fire. The forest fire damages the natural habitat and drives animals towards human habitation to take shelter and thereby they become easy prey to poachers and local villagers.

2B.3.1.4.WATER : Most of the streams, except a few big rivers, become dry during summer. Therefore, animals had to visit only a few waterholes. This fact makes the villagers and poachers easy to kill the wild animals.

2B.3.1.5. DISEASES- Wildlife is prone to diseases both of domestic animals and diseases confined to wild animals. No much study has been done for diseases pertaining to wild animals. But wild animals use common resource that shared by domestic animals. Hence they are vulnerable to diseases pertaining to cattle. In past Foot and Mouth Disease of cattle spread over wild animals during late seventies of previous century and particularly bison and wild buffalo and almost these species were wiped out from the tract.

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CHAPTER – III

UTILIZATION OF FOREST PRODUCE

SECTION– 3.1: AGRICULTURAL CUSTOMS AND ERQUIREMENTS OF THE POPULATION

3.1.1.1. The tract dealt is situated in Etapalli (part) and Bhamaragarh Tahsils of Gadchiroli District. The tract is sparsely populated. It is inhabited by *Gond, Madia*, *Scheduled Castes*, *Navboudhas, (New Buddhists*), *Komti, Dhiwar, Madgi, Muslim, Chamar, Bengali* etc who have settled in the villages.

3.1.1.2. Socio-Economic Report of tract is as follows: The tract dealt with is the remotest tracts of the Maharashtra State. It is on the border of Maharashtra and Chhattisgarh states in South-East corner and bordering to Bastar area of Chhattisgarh which is considered to be most backward region of the Country. Bhamaragarh and Etapalli (part) tahsils are the revenue units. Population dynamics on the basis of Socio Economic Survey published by Economic and Statistical Directorate for Gadchiroli District and pertaining to talukas of tract dealt with is as follows:

Geographical area of district = 12,504 km^2
Geographical area of the tract = 3,782 km^2
Forest area percentage is to the extent of 92% in the tract
Education rate is 60.3%. (That of State is 77%)
Geographical area of the tract = 3,782 km^2

Table No-14
Table showing population(Census 2001)

Tahsil	Geographical Area km^2	No of Villages	No of Rith villages	Population	SC	ST
Bhamaragarh	449.77	110	18	31,664	1,390	26,435
Ettapalli (Full)	3954.70	188	09	70,641	2,627	59,166
Total	4404.47	298	27	102,305	4,017	85,601
					3.93 %	83.67 %

Where:
Rith: - Village as recorded in Revenue Record with geographical area but no human population.
ST: - Scheduled Tribes.
SC: - Scheduled Castes.
It is obvious that 87.6% population belong to Scheduled Castes and Scheduled Tribes.

Table No-15

Table showing occupation wise population in tract

(Population in 100)

Types of population	Etapalli	Bhamaragarh	Division	% with respect to division
Agriculturists	197	98	295	41.9 %
Agricultural Labourer	33	16	49	6.3%
Engaged in cottage industries	1	1	2	0.26%
Other workers	23	8	31	4.01%
Marginal workers	62	17	79	10.21%
Non workers	225	93	318	41.1%
Total	**541**	**233**	**774**	

Table No-16

Table showing cattle population in tract

ANIMAL HUSBANDRY (1997 CENSUS OF ANIMALS): Bhamaragarh & Etapalli Tahsils

CATGORIES	ETAPALLI	BHAMRAGARH	TOTAL	CATTLE UNIT	REMARKS
Hybrid bull	0	0	0	0	
Hybrid cow	0	4	4	4	
Hybrid calf	2	12	14	7	
Bull	24,720	11,607	36,327	26,327	
cow	19,999	8,618	28,617	28,617	
calf	27,009	10,291	37,400	18,700	
He buffalo	16,271	8,099	24,370	48740	
She buffalo	312	24	336	672	
Buffalo calf	1061	73	1,134	1,134	
TOTAL	**89,374**	**38,728**	**128,202**	**124,201**	
Sheep	0	0	0		Cattle unit present in
Goat	36,632	14,234	50,866		the tract is only
Horse/Mule	2	0	2		124,202 say 125,000.
Other animal	16,284	6,528	22,812		Goats are not allowed
Cock	84,164	22,514	106,678		to graze in forests

Table No-17

Table Showing Maximum admissible cattle units of forests for grazing.

Type of Forests	Area in ha	Ha/cattle units	Admissible Cattle Units
Tree Forest	240,195.387	1.2	200,163
Minor Forest	100,782.694	0.8	125,978
Protection Forest	26,753.600	4.1	6,525
Miscellaneous Forest			332,666
Maximum admissible cattle units			332,666 say 333,000

Thus the cattle unit present in the tract is 124,201 say 125,000. Maximum admissible cattle units to have grazing facility if entire area is open for grazing will be as below in table is 332,666 say 333,000 cattle units. Thus overall grazing pressure in the tract is not acute. But near human habitation the grazing is experienced due to concentration of cattle there.

3.1.1.2. *Adiwasis* like *Madias*, *Pradhan* Oraon and *Gonds* practice cultivation of primitive type. They still stick to their ancestral methods of cultivation during agricultural season. They depend mainly on forest labour. Their hardiness earns for them a considerable remuneration through forestry works. Their living condition in recent years has improved substantially, though more efforts are needed to improve their socio-economic status. Electrification of all villages has not been undertaken in interior villages. Due to which most of the villages in interior are without electricity. Wherever power is available it is utilised for lift irrigation. Even diesel pumps are used for lift irrigation. But the shortage of petro fuel enhances their misery of lives. In entire tract there is only one Petrol Pump at Etapalli. Paddy is the main crop and once it is harvested, the fields are left fallow for the remaining period of the year. Department of Agriculture has introduced some improved methods of cultivation, use of better quality seeds, manure etc. In this area, most of the people live in the thatched roof-huts built from stout posts of *ain, garari* or miscellaneous species and plastered with mud and *cow dung*. Modern housing patterns are coming fast as people are being provided with housing facilities under so many developmental schemes undertaken by the government.

3.1.1.3:- Main requirements for which the people depend on the forests are as under:-

(1) Small timber: Poles of *ain, dhaora, garari, dhaman, tendu, shiwan* etc are extensively used for construction of huts and agricultural implements. Even teak is used by people for their bonafide needs by hook or crook. As they are getting indirect protection in the name of naxalism.

(2) Fire wood: The demand for firewood is considerable, as it is used for providing light as well as warmth in the hut. Firewood is essential for cooking purpose. Fire is kept burning in and around the hut throughout the night, as a practice to keep the hut warm and keep away the wild animals.

(3) Bamboos: These are used for preparation of mats, baskets and construction of huts and other materials for local use and for sale to other areas for earning livelihood.

(4) Thatching Grass: This is commonly used for thatching the roofs of the huts.

(5) Grazing: Cattle from the village resort to daily grazing in the adjoining forest. Grazing incidence is light in eastern part which is thinly populated. Incidence is moderately heavy in the forest bordering the thickly populated villages.

(6) Fruits, Flowers and Leaves: – Majority of the inhabitants being poor, they resort to collection of flowers and fruits of *mahua*, fruits of *tendu, khirni* and *achar* for their bonafide consumption. *Palas* and *Mahua* leaves are used for preparation of *patrawalies* (leaf plates) and *drona* (Cups) either for bonafide uses for their religious and customary functions or for sale to earn their livelihood. Tendu leaves provide earning during season.

(7) Fibers: *Palas* roots are dug and cured to obtain fiber for making ropes. Twining climbers and their bark are also put to similar use.

(8) Other Products: Edible tubers and roots are obtained by *Adiwasis* for consumption *Tendu* leaves are used for preparing *chutta* or *bidi* for local use. *Tendu* leaves are plucked by the villagers and given to licensee to pluck and processing of *tendu* leaves

every year. It is the main bone of contention in Naxalites, Police and Forest Officials. And people of the tract are facing peculiar problem not getting the coveted employment of plucking *tendu* leaves during 2003 season (full) and 2004 and 2005 season (parts).

(9) Medicinal Products: The tract dealt is very rich in medicinal plants found naturally. They are utilised by local *Vaidyas* or local people through their traditional knowledge. But the value added processes are seldom done in the tract. That leads to exploitation of people through middle men. Locals get meager remuneration for collection and extraction of medicinal products.

SECTION: 3. 2: MARKET AND MARKETABLE PRODUCTS

3. 2.1.1: MARKET: Local demand for various forest products is limited. Main market for the forest products particularly timber is at Allapalli in Gadchiroli District and Ballarshah in Chandrapur District, which are out side the tract dealt with. Earlier the main market for timber used to be Ballarshah which is 170 km from Bhamaragarh and 100 km from Allapalli. Even today the better quality timber is transported to Ballarshah and inferior one to Allapalli. The timber at these Depots is sold through open auction. Purchasers from various parts of Country participate here. The tract is devoid of any Railways Line. A network of roads has been undertaken by Border Road Organisation (BRO) to link the entire tract for rapid development of tract. But due to Naxalites interference and opposition to road, most of the tract remains cut off from the rest of Maharashtra. There are still a large number of villages which are not connected to fair weather roads. Hence they are cut off any market facility.

3.2.1.2: The forest produces in demand in these areas are as under:-

Teak – *Teak* timber is in great demand in all sizes.

Semal – Demand exists for timber over 120 cm in girth.

Ain, bija, haldu, shisham – Demand exists for timber over 121 cm in girth and length above 2 m.

Firewood – Firewood is in demand for various purposes. Small sizes are demanded for Particle Board manufacture. Medium sizes are needed by small carpenters for carpentry purposes. There is a great demand of firewood for charcoal manufacturing. Charcoal is manufactured at site near to Forest Depot duly sanctioned by competent authority and sent to consumption centers directly or Chandrapur and Ballarshah for further disposal.

Tendu leaves – There is a keen demand of *Tendu* leaves for bidi manufacture. But the bidi manufacturing centers are out side the tract and people of the tract are devoided of the employment so generated.

Other Products – Gum, honey, wax are collected for trade. Barks, roots, medicinal plants are extracted either for local consumption or for minor trade. Mahua flowers and fruits of *tendu*, khirni, achar are collected for bonafide consumption or for sale.

SECTION – 3.3: LINES OF EXPORT:-

3.3.1.1:- Timber extracted, at present is dragged to jungle depot, conveniently located along road side and then directly sent to Allapalli or Ballarshah. There is no Saw Mill operating in the tract. Mode of transport is by truck. Transport of timber and other forest produce of the department are carried out by the government trucks of Transport and Marketing Division and trucks of other divisions and even sometimes by private haulage. Some of the important roads and cart tracks in these forests are noted below:-

Table No-18

TABLE SHOWING THE ROADS IN TRACT DEALT WITH

Sr №	Name of the Roads	Length in km	Remarks
1	Etapalli-Halewara	22	Fair weather
2	Halewara-Burgi	12	Fear weather
3	Parsalgondi-Hodri	8	Fair weather
4	Halewara-Ghudranur	25	Fair weather
5	Mangar-Gundapuri	12	Fair weather
6	Gundapuri-Puskoti	10	Fair weather
7	Etapalli-Parsalgondi	25	Fair-weather
8	Halewara-Jarawandi	40	Fair weather
9	Kasansur-Ghotsur	20	Fair weather
10	Kasansur-Kothi	15	Fair weather
11	Kasansur-Sewari	9	Fair weather
12	Jarawandi-Pendhari	8	Fair weather
13	Gatta-Allapalli	80	Fair weather
14	Kothi-Allapalli	65	Fair weather
15	Laheri-Allapalli	112	Fair weather
16	Bhamaragarh-Allapalli	60	All weather

SECTION –3.4:- METHODS OF EXPLOITATION AND THEIR COST

3.4.1.1: Agency of exploitation: - Timber and fuel is extracted departmentally and through Forest Labour Cooperative Societies (FLCS). Felling and logging is done with cross cut saw. In some hilly portion the dragging is done by men, bullocks and buffaloes. In the interior areas, which are not served by good roads, timber is transported by bullock-carts. At places, Government trucks extract timber from forests to Ballarshah and Allapalli. Firewood is stacked in or out of the coupe or in depot in stacks of size 2m x 1.2m (where billet length is 1.2 m) and its multiples. Bamboo felling is done through BILT. For Nistar provision, Bamboo is also worked in some Nistar Felling Series departmentally.

3.4.1.2: Maintenance of registers in depots: Various Registers are maintained at Jungle depot and Main depot as per Bombay Forest Manual to maintain the timber intake, outward and disposal.

(i)The rules regarding the carting of timber: The material is transported by the truck carrying three copies of carting challans (Form No9 –(A)-122) The carting challan carries the details like felling series, coupe number, species, measurement of logs, its volume, the truck number and name of the driver. In case of poles, only the number of poles and species, its girth class is written. The driver carrying the three copies of carting challan (Second, third and fourth) will hand over them to the depot officer. The depot officer then verifies the receiving material and acknowledges the receipt in all three copies. The depot officer then returns the fourth copy, while he retains the second and the third. The depot officer then makes the relevant entries in his register. The logs are remeasured in the depot and its entries are recorded against the old entries. Any discrepancy is reported to the field officer.

(ii)The rules regarding the maintenance of register: - The following registers are maintained in the depot:-

Daily receipt register: - It contains details of daily receipt. It contains the entries as stated in the carting challan.
Depot measurement register: - This contains the entry of the measurement of lots done in the depot.
Lot register: - The lot register contains details about the lots. The logs with same specification like grade, length class, girth class, species etc are put in the same lot.
Sale register: - This register contains details about the sale at the depot it contains the details like the name of purchaser, earnest money deposited, and the balance to be paid.
Dispatch register: - It contains the daily entry of the material being dispatched outside the depot.
Daily balance register: - This register records the daily balance of the material in the depot.

The register for departmental supply: - The register contains the following details:-

(i) Supply to government agency.
(ii) Supply to co-operative society.
(iii) Supply to government saw mills.
(iv) Supply to Forest based industries.

3.4.1.3:-The unified sale condition: - The sale at the depot and in situ are governed by the unified sale conditions. Standard Institution

3.4.2.1: *TENDU*:-*Tendu*** leaf trade is nationalized since 1969. Now the leaves are collected and disposed of through the licensee fixed by the government through sealed tender method There are separate rules for sale of *tendu* leaves disposal.

3.4.4.1:-Cost of exploitation:- Cost of exploitation is fixed by the committee headed by Conservator of Forests, South Chandrapur Forest Circle, Chandrapur as per the existing norms and minimum wage sanctioned by Government from time to time. It is revised every year. The average cost of exploitation, thus, depends upon the prevailing minimum wage. From July, 2003 the minimum wage for various works are being linked with dearness allowance. Dearness Allowance for the labourer is being revised half yearly, once in January and other in July. Accordingly minimum wage is revised. Details of wage Board rates for 2006-07 has been given in appendix no-VI(c) in Volume II of this draft plan report.

Table No-19
Table showing current rate of wage given for forestry works

Sr. No.	Type of work	Minimum wage as Per 2-7-2003 GR		D.A. for 1-7-06 to 31-12-06	Daily Wage for 1-7-06 to 31-12-06
		Rs/month	Rs/day	Rs/Month	Rs/day
1	Skilled	2,100	80.77	249	90.35
2	Semiskilled	1,900	73.08	249	82.65
3	Unskilled	1,700	65.38	249	74.96

SECTION –3.5: PAST AND CURRENT PRICES

3.5.1.1: Market conditions- For all kinds of forest produce there is great demand. Wide gap between supply and demand results into keen competition amongst the purchasers. All the timber species are in good demand and their rates are increasing day by day, same

is the case with charcoal and other forest products. The details of past and current prices have been given in appendix no-VI(a) in Volume II of this Draft Plan Report.

Table No-20

Table showing current price rate of teak & non teak timber, fuel beat & bamboo

Sr. No.	Items	Grade	Girth Class (cm)	Length Class (m)	Rs/m^3	Remarks
1	Teak	I to VI	U15 to 211& Up	U2 to 8&Up	12,800 to 48,300	Details given in appendix no- VI(a)
2	Non Teak	I to VI	U15 to 211& Up	U2 to 8&Up	2,200 to 33,800	
3	Bamboo	I & II	12cm to 18&Up	3 to 8	3.50 to 20 / bamboo	
4	Bamboo Bundle				13.50 / bundle	Length upto 2m
5	Teak Beat		U30 to 31-45 cm		850 to 1700 / beat	> 45 cm is taken as timber
6	Non-Teak Beat		U30 to 90 & up cm		600 to 2500 / beat	Details given in appendix no- VI(a)
7	Chock Teak Timber		15-30 to >90 cm		1700 to 8000	
8	Chock Non Teak Timber		15-30 to >90 cm		300 to 5000	

On comparing the past price of teak timber, for girth class 121-130 in 1982 as Rs 4659/ m^3 to that of girth class 121-130 in 2005 as Rs 43,000/ m^3 , we have 9.23 times raise in price. Collection charges given through Tribal Development Corporation Limited, Maharashtra for various forest produce under monopolistic collection of these produce are as follows

Table No-21

TABLE SHOWING COLLECTION CHARGES PAID FOR MFP

Items / Year	Moha Flower Rs/kg	Gum Rs/kg	Hirda Rs/kg	Mohatodi Rs/kg	Beheda	Tendu Leaves (By Licensee) Rs Per Std Bag
1994-95	3.80	17.00		5.10		820
1995-96	4.25	39.22				830
1996-97	4.70	26.47	3.71	6.38		840
1997-98	4.65	33.94	5.88	5.85	2.23	850
1998-99	5.60		3.20	6.50	0.90	860
1999-00	5.95	43.34	3.93	5.95	0.90	870
2000-01						880
2001-02	4.70		3.00			890
2002-03	4.99	27.60				900
2003-04	4.85					910

Above quoted charges are average of collection of respective items and quality.

BHAMARAGARH FOREST DIVISION

LONELY HOUSE: DAVANMARKA

RICE MAKING IN HOUSE

LAHIRI VILLAGE: HOUSE WITH GORGA TREE

C.N. B739

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CHAPTER IV

IMPACT OF ACTIVITIES BY FOREST DEVELOPMENT CORPORATION OF MAHARASHTRA LIMITED (FDCM), IN THE TRACT

SECTION:4.1: CONSTITUTION OF FOREST DEVELOPMENT CORPORATION OF MAHARASHTRA LIMITED

4.1.1.1. No forest area is under Forest Development Corporation in the tract dealt. Hence the question of impact of activities of Forest Development Corporation in the tract does not arise at all.

BHAMRAGARH FOREST DIVISION

C.N. B758 XYLIA XYLOCARPA FOREST

C.N.B740

LAHIRI GUNDEJUR NALA

C.N.B739

VIEW OF FORESTS
PHOTO BY R.S.YADAV,IFS,CFWP

CHAPTER V

IMPACT OF FIVE YEAR PLANS

SECTION: 5.1. IMPACT OF FIVE YEAR PLANS ON ATTAINMENT OF MANAGEMENT OBJECTIVES

5.1.1.1: Till 42nd Amendment to Constitution of India in 1976, Forest was a Subject of State List. State used to look upon forests as resources generating revenue to its exchequer. Maharashtra Government worked in that perspective. This division was one of the revenue generating division of the State. Parts of forests were worked before independence on non-scientific basis by then owner Zamindar. Emphasis was to maximize the revenue to Zamindari. After independence, ex-proprietary forests were brought under the gambit of management. Wildlife was treated as source of recreation. Till late seventies of last century no plan fund was siphoned to forestry sector in the tract. Total forest area in the tract dealt with is to the tune of 92% of total geographical area and has presence of very dense forests. For meeting the requirements of locals for forest produce, the activities taken for social forestry is almost nil. Silvicultural operations in the tract were always at the top priority. Earlier forestry sector was the only sector providing the employment to the people. From early eighties of last century, Special Action Plan was initiated under Tribal Sub Plan. But the share for forestry development was still decimal. Being the remotest tract of the district, even plan was not prepared for development of forest from such component. Forestry remained the revenue generating machine. Only fuelling of machinery through Non Plan expenditure was done with meager plan resources. Even today percentage of Plan expenditure for forestry sector in the District is less than 5%. Forest Department shares its 7% revenue to Zilha Parishad for development of Forests through Zilha Parishad. But the development through Z.P. has been seldom done except construction of some roads and raising few plantations.

5.1.1.2: FIRST FIVE YEAR PLAN (1951 to 1956) - First Five Year Plan aimed at rehabilitation of degraded forests, introduction of economic species, survey and demarcation. Bhamaragarh Forest Division was not separate unit in that period. Also most of the reserved forests and protected forests were not with the forest department; rather they were directly under then Aheri Jamindars. Aheri Jamindari Forests were brought to State under Indian Forest Act, 1927 and declared as Protected Forests under section-30. The impact of that Plan was not noticeable as flow of funding was never made available to the tract for requisite achievement.

5.1.1.3: SECOND FIVE YEAR PLAN (1956-1961) - Just like 1st five year plan, 2nd five year plan aimed at rehabilitation of degraded forests, introduction of economic species, survey and demarcation. During that period the tract dealt was not having separate identity. Protected forests were annexed to forest department during that period and intention of State to constitute Protected Forests to Reserved Forests were notified in 1959. Part of Gatta and Bandia Blocks were brought under working as per the scheme prepared by Shri S.C. Agrawal for the period 1956-57 to 1975-76.

5.1.1.4: THIRD FIVE YEAR PLAN (1961-1966): Third Five Year Plan aimed at increasing productivity of forests through fast growing species plantation, scientific assessments and modern logging. During those period schemes for Gatta and Bandia Blocks as per S.C. Agrawal scheme and J.R. Desai and M.V. Khisti's scheme for

Surjagarh and Ghotsur (period 1961-62 to 1977-78) under protected forests were in operations in the tract. The process of reservation of protected forests to reserved forests was initiated. Forests lands were allowed to be given to villager for cultivation for getting agricultural crop. But fortunately the population being low no major impact of disforestation was felt there. Silvicultural operations were the main concern of management and due to that forest got improved. No plan expenditure was incurred. Operations were revenue oriented. The existence of Bhamaragarh Forest Division came into its earlier form i.e. in the name of South Chanda Forest Division.

5.1.1.5: POST THIRD FIVE YEAR PLAN (1966-1969): S.C. Agrawal and M.V. Khisti `s schemes(1961-62 to 1969-70) for protected forests were in operations. The tract was under severe drought condition and people were reeling under deep poverty and the major concern was to provide work and civil amenities to the people. Foresters were compelled to follow the dictum of nature vis-à-vis people demand.

5.1.1.5: FOURTH FIVE YEAR PLAN (1969-1974)- Just like 3rd Five Year Plan, 4th Five Year Plan aimed at increasing productivity of forests through fast growing species plantation, scientific assessments and modern logging. For protected forests different schemes were in operations covering the different blocks. Many successful plantations were raised during that period. No direct funding was made available from plan component.

5.1.1.6: FIFTH FIVE YEAR PLAN (1974 - 1979)- 5th Five Year Plan aimed at large scale plantation, social forestry and forest conservation. During that period forestry works were carried out as per V.B.Joshi`s Scheme (1970-71 to 1979-80) and V.R.Singh`s Scheme(1977-78 to 1786-87) for protected forests. Forest Department took various development activities for development of forests and raised successful plantations in conversion areas. No plan fund was made available.

5.1.1.7: ANNUAL PLAN (1979 – 1980) AND SIXTH FIVE YEAR PLAN (1980 – 85): The aim of 6th Five Year Plan was Social Forestry and fuelwood reserves to save natural forests. The tract is having 92% of total geographical area under very good forest cover. Hence, there was no dearth of fuel wood. Also there was no scope for Social Forestry in community land. The tract experienced the emergence of naxalism due to decision of State Government to regularise the encroachments upon forest land for the encroachers of encroachment for period from 1/4/1972 to 31/3/1978. That had created an atmosphere that encroachment on forest land is bound to be regularised in due course of time. It got tacit support of Naxalites. V.R.Singh`s scheme for protected forests were implemented. Due to naxalism forestry works got affected from time to time. Tract used to get direct funding from Tribal Sub Plan. But forestry sector did not get its due upto its potential. Not even 1% of total allocation of District was given to Forest. Present Bhamaragarh Forest Division was carved out during that period in 1983.

5.1.1.8: SEVENTH FIVE YEAR PLAN (1985-90): The basic aim of 7th Five Year Plan was forest conservation, massive afforestation and wasteland development. Tribal Sub Plan was providing funds to various developmental activities in the tract. Forestry sector share was dismal. V.R.Singh`s scheme was in operation. Due to ban on tree felling, conversion activities got affected and discontinued. Working Plan was not in operation for most of the period. Some plantations were taken in various plan schemes. But these were not so successful. Forests got some rest and that lead to boosting of natural regeneration.

5.1.1.9: EIGHTH FIVE YEAR PLAN (1992--1997): 8th Five Year Plan aimed at preservation of biological and genetic diversity (both flora and fauna), protection of forest against biotic interference, utilisation of wastelands, and promotion of people's participation through Joint Forest Management (JFM). During that period concept of Participatory Forest Protection through people participation started with Government resolution regarding that. World Bank Funded Forestry Projects were implemented to boost the infrastructures and enhance the productivity of forests. The consolidated Working Plan for period 1995-96 to 2004-05 extended to 2006-07 for entire forest areas of the tract was under operation. Naxalism started to show its ugly impact on the implementations of plan schemes. Even forestry activities were not allowed to be run smoothly. The real impact on the over all development was not achieved to the fullest extent due to unruly conditions and terror created by anti social elements.

5.1.1.10: NINTH FIVE YEAR PLAN (1997 - 2002): Just like 8th FYP, 9th FYP aimed at preservation of biological and genetic diversity (both flora and fauna), protection of forest against biotic interference, utilisation of wastelands, and promotion of people's participation through Joint Forest Management (JFM).State government had started various schemes in consonance with central government schemes. World Bank Funding ended with plan period. Tract received little fund from plan source to achieve the objectives of plan. Forestry sector augmented through World Bank added Forestry Project. The consolidated Working Plan for the tract for period 1995-96 to 2004-05 extended to 2006-07 was in operation.

5.1.1.11: TENTH FIVE YEAR PLAN (2002-2007): Present Five Year Plan operations are on. The wave of Joint Forest Management in its various incarnations is now getting momentum in the tract. Though Forest Development Agency, a Central Government Added Project had been sanctioned, people are reluctant in Naxalite affected villages to come forward. Some people think that they will be forced to come out from their encroachment on forest land. Even they will be bound not to encroach upon forest land in future and they would be assisting the forests for no extra gains. They are already enjoying the benefit of forests without such activities. They do not feel any shortage of forest produce or compulsion to have forest protection. They appear to be getting full support from naxalites for not participating in JFM. Assaulting of forest personnel, particularly, beat guards by the Naxalites is common. Thus the tract is experiencing a peculiar development which is against the long term objective of development. Even implementation of existing working plan or project prescriptions are not being allowed to be carried out in some areas by naxalites. The consolidated Working Plan for the tract for period 1995-96 to 2004-05 extended to 2006-07 is in operation.

5.1.1.12. Basic purpose of National Forestry Action Programmes is to establish direct linkage between the national forest policy and the national five year plans. In the past there has not been a comprehensive and constant programme structure for forestry. Every plan has had its own programme structure, so it was difficult to get linkages and establish trends. The percentage share of forestry sector outlay changed from 0.32 percent of the total outlay in First FYP to 0.94 percent in Eighth FYP. The highest allocation was in the Seventh FYP (1.09%). For the sustainable development of the sector, allocation to the forestry sector should be raised to about 4 to 5 percent of the total outlay of the country. Similarly, in the tract also, the plan allocation must be in conformity with national perspective to achieve objectives of the nation and forest as the forest area is to the extent of 56% of total geographical area of the District. Even in the tract dealt with forest consists

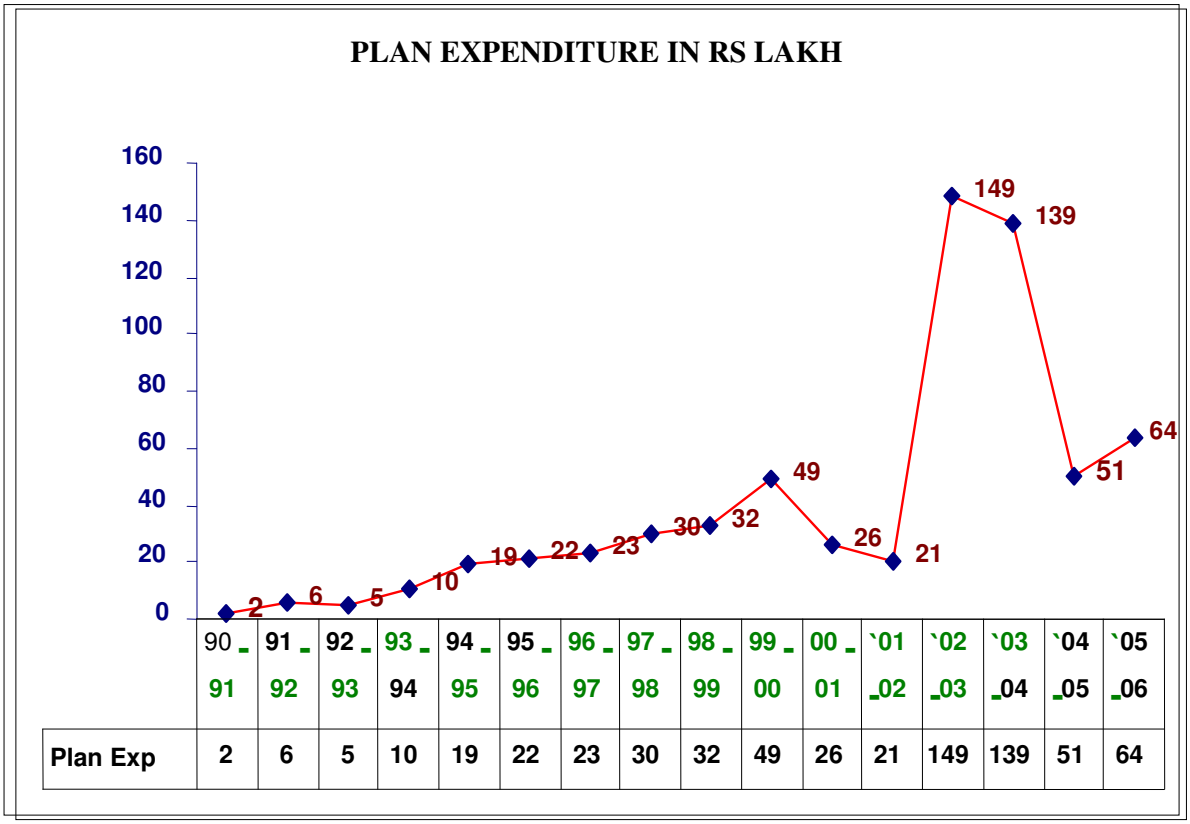
of 92% of geographical area. Hence forestry sector here needs even more allocation of resources to develop the tract and people.

5.1.1.13. As per Socio-Economic Survey of Gadchiroli District for 2003-2004, published by Economics and Statistics Department Maharashtra State, Plan and EGS Allocation for Forest Department of Gadchiroli District are as below:

Item	District	Forest Department	% allocation
Plan	1,880.48 lakh	50 lakh	2.66%
EGS	11,490.94 lakh	619.94 lakh	5.04%

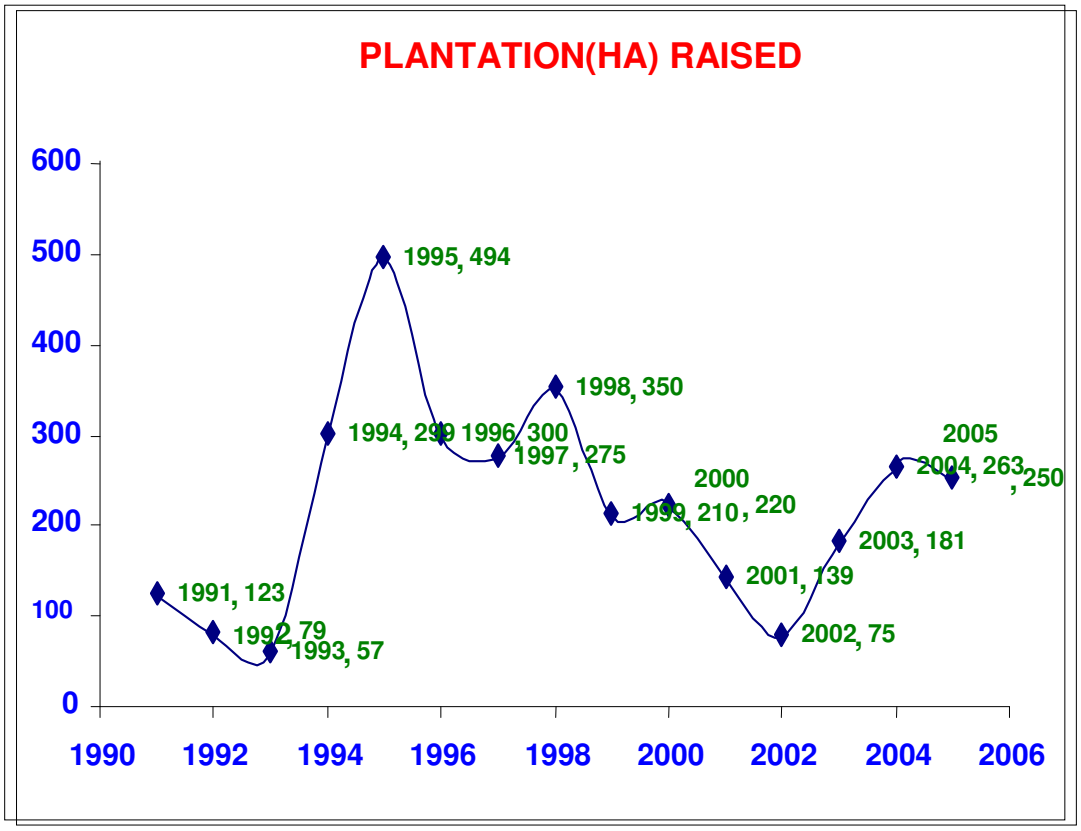
Even for EGS works, out of 417 proposed works, sanction was given to 32 works and financial allocation of 150 lakh was made for five Forest Divisions in the District.

GRAPH -3



	90 - 91	91 - 92	92 - 93	93 - 94	94 - 95	95 - 96	96 - 97	97 - 98	98 - 99	99 - 00	00 - 01	`01 - 02	`02 - 03	`03 - 04	`04 - 05	`05 - 06
Plan Exp	2	6	5	10	19	22	23	30	32	49	26	21	149	139	51	64

GRAPH -4



We observe that the flow of plan fund for development of tract is not as per the extent of forests and needs of forest dwellers. Except one year, the fund flow is inadequate with steady low pace.

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CHAPTER – VI

STAFF AND LABOUR SUPPLY

SECTION – 6.1: STAFF

6.1.1.1. Bhamaragarh Forest Division at Allapalli was created in 1966 when the then Chanda Forest Circle was reorganised. Administrative set of Bhamaragarh Forest Division at Allapalli is as follows:

Name of Division:	Bhamaragarh Forest Division at Allapalli.		
Forest Circle :	South Chandrapur Forest Circle at Chandrapur.		
Name of Forest Ranges:	1. Bhamaragarh	at Bhamaragarh	Tahsil: Bhamaragarh.
	2. Etapalli	at Etapalli	Etapalli
	3. Gatta	at Gatta	Etapalli
	4. Kasansur	at Kasansur	Etapalli
	5. Tadgaon	at Tadgaon	Bhamaragarh & Etapalli

6.1.1.2: The sanctioned and existing posts of officers/staffs in Bhamaragarh Forest Division at Allapalli on 31-03-2006, is given in the following table.

Table No-22
TABLE SHOWING THE NUMBER OF POSTS AND THEIR POSITION

Sr №	**Name of Posts**	Permanent	Temporary	Total	Filled As on 31-03-06	Vacant
1	Deputy Conservator of Forests	1	0	1	0	1
2	Assistant Conservator of Forests	3	0	3	3	0
3	Range Forest Officers	8	2	10	6	4
4	Foresters	23	32	55	41	14
5	Forest Guards	107	54	161	129	32
6	Chief Accountant	1	0	1	0	1
7	Surveyor	1	0	1	1	0
8	Clerk cum Typist	9	6	15	14	1
9	Driver	2	14	16	8	8
10	Daftari	1	0	1	1	0
11	Peon	5	1	6	6	0
12	Cleaner	0	5	5	3	2
13	Choukidar	1	0	1	1	0
14	Water Woman	1	0	1	1	0
Total		**163**	**114**	**277**	**214**	**63**

In addition to these personnel, division has following Van Majoors on establishment as supernumerary staffs and Temporary Van Majoors as daily paid Labourers.

1. Permanent Van Majoors: **36**.
2. Temporary Van Majoors: **19.**

6.1.1.3: The list of Divisional Forest Officers/Deputy Conservator of Forests who have held the charge of Bhamaragarh Forest Division has been given in the **Appendix No-VII in the Volume II in DPR.**

SECTION –6.2 : LABOUR

6.2.1.1:- All developmental activities including important forestry operations depend on labour supply in adequate numbers and in time, so as to make the project in hand a success. Without adequate and timely supply of labour, forestry activities will be jeopardized to a great extent and especially in important areas like Bhamaragarh Forest Division. There are two major sources of labour at present. Internal source is from the villages in the Bhamaragarh Forest Division and external source is from outside the tract.

6.2.1.2:INTERNAL LABOUR: In the earlier days, around 1895 onwards, forestry operations were few and simple and were restricted over a small part of the year and were unable to support the labour all around the year. Therefore, the labour was supplied with land for cultivation as an incentive for them to stay at site (villages) and as a measure of additional economic support. Further, the artificial regeneration operations coincide with the agricultural operations and dearth of labour is felt for planting. Carting season comes in conflict with the crop harvesting season of the local villages. But the population of the tract has increased many folds and the tract is under the grip of naxal activities. People are forced, sometimes, not to go on forestry works. It is reported that the villagers have to beg or bargain before naxalites for attending the forestry and other works.

6.2.1.3: EXTERNAL LABOUR: During non-agricultural season, labour for forest works are available in adequate quantity. Acute shortage is however, felt for planting and weeding when the labour from villages gets locally employed for for paddy transplanting, weeding and other agricultural operations. The tract is sparsely populated. *Gonds, Oraon* and *Madias* form bulk of the unskilled labour in this tract.

6.3.1.1:REMUNERATION TO LABOURS: There are 36 permanent Van Majoors who are getting facilities of permanency. Present minimum daily wage is linked with minimum wage and dearness allowances declared on six monthly basis by the State Government. Casual workers are paid either on daily wage or job basis as decided by Wage Board.

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CHAPTER-VII

PAST SYSTEMS OF MANAGEMENT

SECTION: 7.1: GENERAL HISTORY OF FORESTS

7.1.1.1. The tract dealt with under the present working plan remained under Zamindari rights till the year 1951. The Zamindari rights were abolished in the year 1951 under the provision of Madhya Pradesh Abolition of Proprietary Rights Act, 1951. Therefore, the past history of forests is described separately for both the periods before and after 1951.

SECTION: 7.2: PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS
SYSTEM OF MANAGEMENT DURING ZAMINDARI PERIOD

7.2.1.1. During Zamindari period, the forests were managed without any systematic working system. Selection felling and shifting cultivation were carried out till the year 1902. During this period extravagant felling, annual fires and shifting cultivation were common. These resulted in considerable damage to the forests. In the year 1902, the Aheri Zamindari Estate was kept under the control of the Court of Wards and the shifting cultivation was stopped. Due to the poor financial conditions of the Zamindari Estate, haphazard and heavy exploitation continued till 1916.

ANTHONY'S PLAN (1916 to 1954-55)

7.2.1.2. In the year 1916, Anthony prepared the first working plan for the systematic working of the forests. This plan covered 18,825 acres of valuable forests of Gatta Block. This plan could not even cover the total area of the Gatta Block. Rest of the area of the tract dealt with remained unattended. The whole area taken under the scheme was put under Improvement Working Circle. The prescriptions given were improvement fellings with a felling cycle of 20 years. Under Improvement felling, the removal of sound trees of all species above the fixed minimum girth, when salable and not required for seed and protection to soil, was prescribed. Removal of dead and dying trees, cutting back of malformed teak, shisham, bija and removal of inferior species; weeds and grasses interfering with the proper development of seedlings and young growth of teak, shisham and bija were also prescribed.

7.2.1.3. The main objective of the plan was to bring about an improvement in the quality, composition and density of the growing stock, especially in respect of teak, shisham and bija over a period of 20 years, as well as to fetch revenue by removing sound trees of exploitable girth, which were salable and were not required to be retained on silvicultural grounds.

7.2.1.4. The first felling cycle was over in the year 1936-37. The working in the second felling cycle continued till 1950-51. When the Estate was vested in the State Government, under the provision of Abolition of Proprietary Rights Act, 1951, the working was discontinued on account of the dispute under trial in the court of law. The working was again taken up in 1954-55 after the decision of the case. Thereafter, S.C.Agrawal's working scheme was started.

7.2.1.5. The exploitable girths of teak and other species, prescribed in Anthony's plan were as follows:

(a)	*Teak, bija, anjan, haldu, ain and kalam*	5'
(b)	*Shisham*	4½'
(c)	*Tiwas*	2'

7.2.1.6. During the operation of these plan only mature trees, particularly teak, was exploited from the worked coupes and all other prescriptions could not be attended to. Most of the unsound and unmarketable trees remained unharvested. Besides, Anthony did not prescribe any subsidiary silvicultural operations after the working of the coupes. Consequently, the natural regeneration and reproduction of all species suffered considerably unlike under systematic and proper working. Thus it is evident that Anthony proposed very light felling of selected species of harvestable girth and working prescribed was conservative. Besides, implementation was also poor.

7.2.1.7. There was no systematic management in other blocks of the tract dealt with. The selective felling of *ain, bija*, and *teak* was carried out. Prior to the Abolition of Proprietary Rights, Zamindari used to lease out the whole area to the Ballarshah Timber Syndicate(Ltd), Ballarshah for removal of hard wood species, such as ain, bija, teak, haldu etc over 3 feet gbh on payment of royalty at the rate of Rs.¼ per cubic feet on lease till 30.9.1959.

7.2.1.8. The right for collection of tendu leaves over the whole Zamindari area was used to lease out to M/s Sawakar of Chanda. The leased period continued till 1959. There was no restriction on collection of firewood, bamboo, minor forest produce by the local villagers. Shifting cultivation was going on in large areas throughout the tract. The system of working was totally unscientific and unsystematic. The exploitation of forest was carried out of replenishing the finance of Zamindari. This resulted in the over exploitation in accessible areas and stagnation of mature crop in comparatively remote areas. The practice of shifting cultivation destroyed the forests and reduced the soil fertility to the greatest extent.

SYSTEMS OF WORKING IN POST ZAMINDARI PERIOD

7.2.2.1. The forests of the tract dealt with were declared as P.F. in the years 1955 and 1959 under Section 29 of IFA, 1927. A nistar enquiry was conducted in the year 1956 and area for nistar right in each village was specified. The state did not frame the rules under section 30 and 32 of IFA, 1927 but the list of tree species for reservation was notified in 1956.

7.2.2.2. The tract dealt with is divided into eleven working blocks. These are 1.Ghotsur, 2.Paidy, 3.Etapalli, 4.Surjagarh, 5.Gatta, 6.Garewara, 7.Tadgaon, 8.Bandia, 9.Bhamragarh, 10.Laheri, and 11.Kuwakodi. S.C. Agrawal prepared the first working scheme for systematic management of Ex-Aheri Zamindari forests of South and East Chanda Forest Divisions, for the period from 1956-57 to 1975-76. The forest areas dealt with under this scheme were comprised of the Gatta, Aheri, Edranga, Umanoor and Bandia Blocks. Out of these blocks Gatta and Bandia Blocks lie within the tract dealt with under this working plan. The remaining blocks have been reallocated to other divisions.

7.2.2.3. J.R.Desai and M.V.Khisti prepared the first working scheme for the forests of Surjagarh and Ghotsur Blocks of the tract dealt with for the period from 1961-62 to 1969-70.

7.2.2.4. V.R.Singh prepared the working scheme for the forests on North and South Etapalli Ranges. The Scheme included five blocks, namely Etapalli, Surjagarh, Gatta Ghotsur and Paidy. The period of the working scheme was from 1977-78 to 1986-87.

7.2.2.5. V.B.Joshi prepared the first working scheme for the systematic management of Garewada, Tadgaon, Bhamragarh, Kuwakodi and Laheri Blocks. The period of that working scheme was from 1970 –71 to 1979-80.

7.2.2.6. A.P. Deshmukh and B.P.Singh prepared consolidated working plan for the entire forest area of the tract for the period 1995-96 to 2004-05 extended upto 2006-07.

7.2.2.7. In this way the entire area of the tract dealt with under this working schemes/plan was brought under systematic working under the aforesaid working schemes/plan. The details of which are summarized as follows:

Table No-23

TABLE SHOWING SCHEMES/PLAN, PERIOD & BLOCKS INCLUDED

SrNo	Schemes of	Period	Blocks Included
1	S.C.Agrawal	1956- to 1975-76	Bandia, Gatta
2	M.V.Khisti& J.R.Desai	1961-62 to 1969-70	Surjagarh, Ghotsur
3	V.B.Joshi	1970-71 to 1979-80	Garewada,Tadgaon,Bha,ragarh,Laheri & Kuakodi
4	V.R.Singh	1977-78 to 1986-87	Gatta.Surjagarh, Etapalli, Paidy and Ghotsur
5	A.P.Deshmukh & B.P.Singh	1995-96 to 2004-05 extended upto 2006-07.	Entire tract

7.2.2.7. S.C.AGRAWAL'S SCHEME (1956-57 to 1975-76): It was the first attempt by S.C. Agrawal to bring a part of the forests of the tract dealt with under scientific management. The scheme included Gatta and Bandia Blocks of the tract dealt with in that working plan. Under that scheme only a part of 'Gatta` 'Block was given treatment. Out of total area of 246 km^2, treatment was given only to 133 km^2 and rest of the area was left unallotted, whereas the Bandia Block was covered totally.

7.2.2.8. OBJECTS OF MANAGEMENT OF S.C.AGRAWAL'S SCHEME:

(i) To bring maximum, possible area of Ex-proprietary Forests under systematic management before introducing regular working plan for these areas and thereby making improvement in the quality, composition and density of the growing stock, especially in respect of teak, shisham, and bija.

(ii) To go over the whole area within the shortest possible period, so as to remove the unsound stock and to improve the conditions of stocking and reproduction.

7.2.2.9. During this scheme the tract dealt with was stock mapped on 2″ = 1 mile Scale, obtained by reducing Patwari`s, maps on 16″ = 1 mile scale. The total area was divided into two working circles, namely:

(i) Selection-Cum Improvement working Circle and
(ii) Bamboo Overlapping Working Circle.

7.2.2.9. SELECTION-CUM IMPROVEMENT WORKING CIRCLE OF S.C.AGRAWAL'S SCHEME: Better quality *teak* and miscellaneous forests having goods stocking and mature crop were included in this working circle. Total area of the working circle was divided into 4 felling series with felling cycle of 20 years.

SILVICULTURAL SYSTEM:

7.2.2.10. SELECTION FELLING: Felling of trees of prescribed girth if silviculturally available, subject to prescribed limitation in the interest of future yields.

7.2.2.11. IMPROVEMENT FELLING: The guiding principle under this felling was that nothing would be felled unless it directly benefited or improved the crop. This was intended for removal of dead and diseased trees, inferior growth in favour of development of valuable species. The method of regeneration adopted was entirely natural from seedlings or seedling coppice. The harvestable girths decided for important species were as follows. :

Table No – 24

TABLE SHOWING SELECTION GIRTH IN S.C.AGRAWAL`S SCHEME

SrNo	Species	Gatta Block gbh(ob) (In feet)	Bandia Block gbh(ob) (In feet)
1	*Teak,Bija,Salai & Anjan*	5.0	4.0
2	*Semal*	4.5	4.0
3	*Shisham,Shivan,Haldu&Kalam*	4.0	4.0
4	*Garari*	1.5	1.5

7.2.2.12. The working rules were aimed at to bring and maintain a miscellaneous forest with teak and other important miscellaneous species in the proportion of 60:40. Teak was given the top priority and the other important species to be favoured of for these areas were *ain,bija, shisham, haldu, tiwas, shivan, dhaoda, lendia, bhirra and garari* in order of priority. Species, suitable for plywood industries, match wood industries and edible fruit bearing trees favoured by the local villagers, were given preferential treatment. Areas under erosion, vulnerable to erosion, areas of density below 0.4 and two chain width areas along rivers and streams were excluded from the working. *Semal* and *khair* trees were reserved from felling. The harvestable, marketable and silviculturally available trees were removed to the extent of one in every two. Besides, the best and the soundest stems were preferred for retention in such a way that the retention was uniformly distributed throughout the area as far as possible. Removal of dead, dying and malformed trees were also prescribed so as not to create a permanent gap. Inferior species and *bamboo* interfering with reproduction of the valuable species were also prescribed to be removed. In order to introduce *teak* in the mixed forests for increasing the value of the growing

stock, planting of teak to an extent of 4 to 8 hectares in suitable areas of site quality III in current coupes was recommended.

7.2.2.13. Subsidiary silvicultural operations in the year following the year of completion of main felling in each coupe were prescribed. These included:

(i) Operations prescribed under the felling rules but not carried out by the contractors.
(ii) Cutting of bamboo interfering with valuable tree species.
(iii) Cutting back of all valuable growth damaged during the main felling.

7.2.2.14. BAMBOO OVERLAPPING WORKING CIRCLE OF S.C.AGRAWAL'S SCHEME: This Working Circle overlapped with Selection Cum Improvement Working Circle in which only compartments of Gatta Block, carrying bamboos in harvestable proportion, were included. Only one commercial felling series was formed with cutting cycle of 4 years.

7.2.2.15. The local demand was very much limited as well as the remoteness of the tract and underdeveloped communication, the immediate harvesting on commercial scale was precluded. But keeping in view of the establishment of straw board and paper mill at Ballarpur, the possibilities of having a commercial demand of bamboo was guessed and accordingly one provisional bamboo felling series was formed. The working in these areas was left at the discretion of the D.F.O. after obtaining the previous sanction of the Conservator of forests.

7.2.2.16. FELLLING RULES: The felling rules prescribed retention of all culms less than one year of age. Minimum number of mature culms to be retained in each clump was prescribed to be 8. The felling was restricted from 16th September to 30th June. Digging of rhizomes was prohibited. Removal of dead, dying and deformed culms was prescribed. Felling at a height 6″to 18″ from ground was prescribed.

7.2.3. J.R.DESAI AND M.V.KHISTY'S WORKING SCHEME (1961-62 to 1969-70)

7.2.3.1. The first working scheme for the scientific management of the forests in Surjagarh and Ghotsur Blocks was prepared by J.R.Desai and M.V.Khisti for the period form 1961-62 to 1969-70 and was brought into force in the year 1961-62. The total area included was 889 km^2.

7.2.3.2. During Jamindari period forests suffered severe damage due to ill-treatment by way of selective and reckless harvesting of valuable trees, severe forest fires, uncontrolled shifting cultivation etc. No attempts were made to supplement the regeneration by any known methods. In order to improve these forests and to observe the various aspects of scientific management, following objects of management in the scheme were decided:

(i) To bring the maximum, possible areas under scientific management within shortest possible period before the regular plan is introduced.
(ii) To derive maximum yield to commensurate with economic exploitation of produce with de realization to remoteness of the areas.
(iii) To regulate and meet the nistar requirement of the local population.
(iv) To enhance the proportion of valuable species by introducing *teak*.
(v) To prescribe preventive measures against soil erosion.

7.2.3.3. During this scheme the tract dealt with was stock mapped on 4"=1 mile scale, obtained by enlarging toposheets in scale of 1" = 1 mile. Forests were classified into (i) *Teak* Forest (ii) Mixed Forest and (iii) Mixed Miscellaneous Forest on the basis of percentage of teak in the crop.

7.2.3.4. WORKING CIRCLES: Taking into account the depleted condition of the crop, it was necessary to prescribe light working along with the crop improvement measures, such as removal of mature, over mature and unsound trees. Accordingly, the entire areas of the tract dealt with under the scheme were divided into two working circles to meet the various requirements of the management. Working circles created were as follows:

(i) Selection-Cum Improvement Working Circle and
(ii) Bamboo Overlapping Working Circle.

7.2.3.5. S.C.I.WORKING CIRCLE OF J.R.DESAI AND M.V.KHISTY'S WORKING SCHEME: The working circle included the better quality forests bearing *teak* and valuable miscellaneous species. The total area under this working circle was divided into 4 felling series, two in each block with felling cycle of 20 years.

7.2.3.6. SILVICULTURAL SYSTE M: The silvicultural system adopted was selection felling and improvement felling.

(a) SELECTION FELLING: Felling of trees of prescribed girth, if silviculturally available subject to prescribed limitations in the interest of future yield.

(b) IMPROVEMENT FELLING: The guiding principle under this Improvement felling was that nothing would be felled unless it directly benefited the improvement of the crop. This was intended for removal of inferior growth in favour of development of valuable species and freeing of reproduction.

7.2.3.7. The method of regeneration adopted was entirely from natural seedlings or coppices.

7.2.3.8. The harvestable girths prescribed for different species in each block were as follows.

Table No – 25

TABLE SHOWING SELECTION GIRTH IN J.R.DSAI AND M.V.KHISTY`S SCHEME

SrNo	Species	Surjagarh Block	Ghotsur Block
1	*Teak, Bija, Saja/Ain, Haldu*	150cm	120cm
2	*Semal*	135cm	120cm
3	*Shisham, Shivan, Kalam*	120cm	120cm
4	*Tiwas*	90cm	90cm

7.2.3.9. Extraction of semal was prescribed one year in advance of main felling subject to its demand. Keeping in view the condition of the crop 50% harvestable trees were prescribed for retention as future safeguard.

7.2.3.10. Various measures were prescribed to supplement natural regeneration by way of clear felling of advance growth, planting *teak* in annual coupes and dibbling of teak seeds in 4 hectare patches. Subsidiary silvicultural operations, like (i) Cutting of bamboo and inferior growth and (ii) Cutting back of damaged valuable species were prescribed. Provision was made to favour the marketable species by removing inferior growth in case the latter was found to or likely to interfere with the former.

7.2.3.11. BAMBOO OVERLAPPING WORKING CIRCLE OF J.R.DESAI AND M.V.KHISTY'S WORKING SCHEME: The bamboo areas of Surjagarh and Ghotsur Blocks, bearing bamboos in harvestable proportion, were included in this working circle. Two categories of felling series, namely: (i) Commercial bamboo felling series and (ii) Nistar bamboo felling series were constituted. Under first category, 6 felling series were constituted on provisional basis to harvest bamboos for commercial purpose. Similarly under second category, 6 felling series were formed to meet the demand of the local villagers. Cutting cycle was initially kept as 4 years. However, considering the maturity and other factors the same was revised to 3 years with effect from 1967. In this scheme, it was prescribed that commercial bamboo coupes should be disposed of through auctions but the same were allotted to Ballarpur Paper and Straw Mills for manufacture of paper pulp. A major part of the areas under commercial bamboo felling series was tapped but the interior part remained unworked. So, the area remained potential to provide additional supply of bamboos.

7.2.3.12. Though the scheme was aimed at the general improvement of the growing stock and to harvest safely available quantity of timber and other forest produce, but the scheme was made applicable only to the limited part of the forests which were easily accessible. The interior areas were left unattended. Out of total area of 889 km^2 only 223 km^2 was put under the working and remaining 666 km^2 was left unattended. This was done mainly due to remoteness and under developed communication systems.

7.2.4. V.B.JOSHI'S WORKING SCHEME (1970-71 TO 1979-80)

7.2.4.1. V.B.Joshi prepared the first working scheme for the forest areas included in this scheme for scientific and systematic management. The scheme included forest areas in Bhamragarh, Gatta, and Tadgaon (part) ranges. Blocks included were Garewada, Tadgaon, Bhamragarh, Kuakodi and Laheri with total area of 148,572.10 ha distributed in 455 compartments.

7.2.4.2. Before the inception of the scheme 22 bamboo felling series were existing, which were formed in the year 1964 and same were allotted to Ballarpur Paper Mill. The Mill worked in all 22 coupes during the year 1964-65 and1965-66. But the Mill did not work the coupes of old Fodewada Bamboo Felling Series. Besides, attempts had been made since 1956 to replenish the growing stock by planting *teak* stump of suitable size which resulted in most successful and promising plantations. Plantation area was completely closed to grazing for a period of 7 years. Fire protection measures were prescribed. The area was closed under section 30 of I.F.A and nistar rights were not allowed. For raising *teak* stumps bed nurseries at Tadgaon, Bhamragarh and Gatta were prescribed to be established.

7.2.4.3. The scheme included 44 surveyed and 80 unsurveyed villages. Compartments lay down by V.B.Joshi, included village area as well. The range wise distribution of compartments so formed and included in this scheme is as follows:

Table No – 26

TABLE SHOWING COMPARTMENT DISTRIBUTION IN V.B.JOSHI`S SCHEME

SrNo	Range	Compartment No
1	Gatta	1 to 149
2	Tadgaon	150 to 203
3	Bhamaragarh	204 to 455

7.2.4.4. OBJECTS OF MANAGEMENT: The forest areas included in this scheme was unscientifically harvested in the past, resulting in over harvesting in easily accessible areas and congestion in remote and inaccessible areas. The over mature, malformed and badly grown tree species in remote areas were not harvested resulting in degradation of the crop. For meeting the nistar rights, forests around the villages were harvested ruthlessly. Taking into account these important factors, objects decided for the management were as follows:

(i) To set apart and manage the forest areas to the extent as laid in Ex-M.P.Land Reforms Department Memo No.1336/1608-XXVIII, dated 19.6.1953 to meet the bonafide nistar requirements.
(ii) To introduce systematic management at the earliest so as to remove unsound stock and improve the crop as well as utilize all silviculturally available mature and over mature trees.
(iii) To enhance the economic value of the crop by introducing teak in the suitable areas.
(iv) To conserve and preserve moisture with a view to improve water supply and prevent soil erosion and retention of suitable vegetative cover over the soil.
(v) To harvest bamboo on sustained yield basis.
(vi) To harvest all minor forest produce to the extent possible.
(vii) To open up the inapproachable areas by construction roads and bridges.
(viii) To organize the distribution of the staff on the basis of intensity of work and extent of forest areas.

7.2.4.5. The area was stock mapped on 4″=1 mile scale. The maps were not very accurate due to inherent drawbacks. Maps of these areas were prepared by reducing village maps on 16″=1 mile scale to 4″=1 mile and then were superimposed on the enlarged topographical maps. Enlarging from 1″=1 mile scale to 4″=1 mile scale by a pantograph. 149, 54 and 81 compartments in Gatta, Tadgaon and Bhamragarh Ranges respectively were stock mapped in detail. The rest 137 compartments in Bhamragarh Range being inaccessible were grouped in 14 groups (each of 8 to 15 Compartments) for the purpose of stock mapping within teak type and mixed type forests. Five quality classes e.g. I, II, III, IVa and IVb were distinguished. The forest areas having *teak* more than 20% of the growing stock were classified as *teak* forest and the other forest areas classified as mixed miscellaneous forest. Bamboo areas having bamboo of height more than 30 feet was taken as quality I, and height below 30 feet was taken as quality II. It was desirable to get the area properly surveyed by the survey of India on 4″=1 mile scale of 1:15000 R.F. in metric scale as early as possible. Three sets of maps showing the management details were

prepared. Total area of the scheme was divided into five working circles for the management purpose. These working circles are as follows:

(i) Protection Working Circle.
(ii) S.C.I. Working Circle.
(iii) Minor Forest Working Circle
(iv) Teak Plantation Working Circle and
(v) Bamboo Overlapping Working Circle.

7.2.4.6. PROTECTION WORKING CIRCLE: Total area included in this working circle was 92,767.2 acre (37,541.587 ha). Forest areas on very steep slopes (25° and above), along river banks and depleted forests due to maltreatment in which harvesting may cause soil erosion and adversely affect the productivity of the agricultural lands in the lower region were included in this working circle. Such forests are mainly in Bhamragarh Range in a compact block of 37,541.587 ha. In protection working circler, the compact block of protection forests in Bhamragarh, Kuakodi and Laheri Blocks of Bhamragarh Range are covered under 135 compartments. The other areas of protection forest, scattered in small patches in Gatta, Tadgaon & Bhamragarh Ranges, were not included in protection working circle. These were treated as unfit area for working in respective various working circles.

7.2.4.7. Areas included in this working circle were badly affected from shifting cultivation. Due to shifting cultivation the area was having young to middle aged coppice growth of miscellaneous species such as *garari, tendu, lendia, dhaoda, ain* etc. Nala banks and plains which were unsuitable for shifting cultivation were having mature crop. *Teak* was scattered and rare in occurrence. The under story of bamboo was very thick. The site quality was varying from IVa to III and density from 0.5 to 0.7. The coppice regeneration of miscellaneous species as stated above was adequate.

7.2.4.8. OBJECTS OF MANAGEMENT OF PROTECTION WORKING CIRCLE:

Following were the objects of management of that scheme:

(i) Owing to the long lead, remoteness and inaccessibility of theses areas it was not economically advisable to extract a sparsely available miscellaneous timber from such areas.

(ii) From silvicultural point of view such areas were in need of adequate rest for recouping soil fertility and site quality.

(iii) The area being very sparsely populated, villagers being migratory in nature and scheme in progress to resettle these people in large plain areas by the Tribal Welfare Department, areas setting aside for nistar could not arise.

Therefore, taking into account all above points no working, except for removal of bamboo, was proposed in these areas till the development of the communication system.

7.2.4.9. SELECTION-CUM IMPROVERMENT WORKING CIRCLE: The total area of this working circle was 204,357.8 Acres (82,000.74 hectares) spread over all five blocks and in 319 compartments. The forest areas included were hilly to gently sloping in topography. The soil is deep and fertile. Teak forests occur in patches along ridges, nalas and river banks. The quality varies from I to III along river banks and from III to IV on hill slopes and ridges. *Teak* regeneration was very poor in such areas. By and large the

area was fairly dense with density varying from 0.6 to 0.8. Area included was out of the areas classified as tree forests under functional classification. The area included was affected from shifting cultivation to a great extent.

7.2.4.10. OBJECTS OF MANAGEMENT OF SELECTION-CUM IMPROVERMENT WORKING CIRCLE OF:

The special objects of management were as follows:

(i) To improve the condition of the growing stock.
(ii) To extract mature and over mature marketable trees and
(iii) To conserve soil and moisture in hilly and other areas which are liable to erosion.

7.2.4.11. Silvicultural system, prescribed was Selection Cum Improvement Felling with natural regeneration. Total area included in this working circle was divided into eleven felling series. The harvestable girths prescribed were as follows:

(a) FOR REGULAR FELLING SERIES:

Species	girth (ob)
Teak	120 cm
Miscellaneous	135 cm.

(b) PROVISIONAL FELLING SERIES (inaccessible and difficult areas for extraction):

Species	girth (ob)
Teak	120 cm
Miscellaneous	135 cm.

Only *teak, ain, haldu, bija* and *shisham* were to be harvested as per the prescriptions. The rotation for teak *was* prescribed as 120 years.

7.2.4.11. FELLING RULE: In order to remove mature stock and to give silvicultural treatment to the other stock as quickly as possible, the felling cycle of 25 years was adopted. The yield was regulated by area. Areas having slope 25° and above, blanks and under stocked (area with density below 0.4) eroded areas and areas prone to erosion, areas in 20 meter wide strips along either bank of main water courses and nalas and areas in 10 meter wide strips along tank were excluded from working. Trees required for protection to soil, for seed production and other silvicultural consideration; healthy trees of local economic importance such as *moha, semal, tendu, aonla* etc. were reserved from felling. Out of harvestable trees only 50% were prescribed to be removed. The best and soundest stems were preferred for retention. All dead, dying and unsound trees were prescribed to be removed. Light crown thinning in favour of *teak, bija ain semal, shisham, haldu, dhaoda, tendu and tiwas* in order of priority was prescribed. Silvicultural operations, like C.B.O. & cleaning were prescribed.

7.2.4.12. MINOR FOREST WORKING CIRCLE: This working circle was having total area of 60,617 acre. This included forest around villages. Areas were distributed in Gatta, Tadgaon and Bhamragarh Ranges, covered under 264 compartments. This working circle was aimed at meeting the nistar requirements. A village was considered as self sufficient if the tree clad areas in that village was more than half the occupied area of that village as

per the Ex.M.P.Land Reforms Memo No. 1336, dated 19.6.1953. Accordingly nistar zones were formed and delineated from other part of the forests.

7.2.4.13. Forests included in this working circle were in plain. The site quality was varying from III to IV and moderately dense with density varying from 0.4 to 0.6. The density, quality and composition were not uniform and were changing from place to place. *Teak* was scattered in the crop and occurring in greater proportion near Bhamragarh and Allewara villages. Other timber species were *ain, tendu, dhaoda, garari, lendia* etc. The crop in the vicinity of the villages were hacked and pollarded. The ill treatment by villagers, uncontrolled grazing and frequent fire damaged the crop considerably in the past.

7.2.4.14. OBJECTS OF MANAGEMENT OF MINOR FOREST WORKING CIRCLE: Following were the special objects of management of this working circle:

(i) To provide nistar material to the local villagers.
(ii) To observe the directives of the Govt. Land Reforms Department's Memo No.235-6-239-XXVIII dated 16-10-66.
(iii) To prevent the indiscriminate felling of trees for nistar all over the forest areas and to minimize the damage to these forests by prescribing simple felling rules for the removal of small timber and fuel for nistar.

7.2.4.15. SILVICULTURAL SYSTEM: Coppice With Reserve silvicultural system was adopted to meet the bonafide need for small size timber and fuel to the local population.

7.2.4.16. FELLINGF SERIES AND ROTATION: The working circle was divided into 109 felling series, each nistar zone constituting a felling series. The rotation was fixed to 20 years. The yield was regulated by area. All trees below 9″ (g.b.h.o.b) were prescribed to be reserved. Unworkable area was completely excluded from harvesting, except removal of dead, diseased and dying trees, provided their retention was not necessary for silvicultural reasons. In adequately stocked teak and mixed forests, improvement felling consisting of removal of dead, diseased & dying trees was prescribed. In dense patches, C/D thinning was prescribed. Trees likely to create permanent gaps and trees yielding edible fruits and flowers were retained. Subsidiary silvicultural operations, such as C.B.O. cleaning and thinning were prescribed.

7.2.4.17. TEAK PLANTATION WORKING CIRCLE OF V.B.JOSHI'S WORKING SCHEME: 9,390 acre forest areas were included in this working circle. As per the prescriptions, every year in each range, teak was to be planted in 100 acre of suitable areas. Therefore, the forest area included in this working circle was distributed in all the three Gatta, Tadgaon, and Bhamragarh Ranges. Mixed forest areas with density 0.7 to 0.8 and site quality III to II were included. Areas are well drained with gently slopes. The above areas are covered under 24 compartments of Gatta, Tadgaon and Bhamragarh Ranges.

7.2.4.18. OBJECTS OF MANAGEMENT: The ill treatment and selective felling of t*e*ak in the past made the areas deficient of teak. The plantation taken in the past is very successful. On this back ground the objects of this working circle was to convert mixed forests into teak forest to the maximum possible extent and thereby increase the value of the growing stock.

7.2.4.19. Clear felling with artificial regeneration (Planting of teak) was adopted Silviculture system. Annual coupes were not formed in this working circle. Each range Forest Officer was authorized to select a compartment, (included in this working circle), in their respective ranges and to demarcate 100 acre suitable area for teak plantation. It was made clear that the treatment map should be prepared by the R.F.O. only and on treatment map suitable and unsuitable areas for clear felling and planting were required to be shown. Every year the same procedure was to be followed. The area selected in a particular year had to be contiguous to the area planted in there previous year. This was to be repeated till the total area of the working circle was planted. Planting of *teak* stumps at an interval of 6 ft x 6 ft was prescribed. Weeding in the planted area for the first three years was prescribed. Cleaning in 2^{nd}, 3rd and 4^{th} year was prescribed.

7.2.4.20. THINNINGS: First thinning in the 7^{th} year and 2^{nd} thinning in the 15^{th} year of planting were prescribed. Subsequent thinning of 10 year interval was prescribed. The area in which the first thinning was mechanical, the second thinning was also prescribed to be mechanical. Subsequent thinning was prescribed to be ordinary C/D grade. The approximate spacing to be aimed at was decided on the basis of the following formula:

$$D = (d + 3) \times 3/2$$

Where,
D = Distance in the feet between two stems and
d = Average diameter in inches of the two stems.

7.2.4.21. Prescription for closure of plantation area to grazing for a period of 7 years was given. Fire protection measures were prescribed. The area was closed under section 30 of IFA, 1927 and nistar rights were not allowed. For raising *teak* stumps bed nurseries at Tadgaon, Bhamragarh and Gatta were prescribed to be established.

7**.2.4.22. BAMBOO OVERLAPPING WORKING CIRCLE**: The total area of the scheme was taken under this working circle. Dendrocalamus strictus was the main species. Bambusa arundinacea species was also found on alluvial soil along river banks in scattered clumps. The growth of Dendrocalamus strictus was very dense on hill slopes and sparse on plains in the vicinity of villages due to heavy indiscriminate felling and unsystematic working. Initially 17 tentative bamboo felling series were formed in dense bamboo areas. Each felling series was divided into 4 coupes and these coupes were successively allotted to the Ballarpur Paper Mills. The Paper Mill worked coupe A of eleven felling series in the year 1964-65. 'C' coupes were worked by the Mill in the year 1966-67. In the year 67-68 D coupes were allotted. The paper Mill harvested bamboo only from accessible and nearer areas.

7.2.4.23. SPECIAL OBJECTS OF MANAGEMENT: Special objects of management were as follows:
(i) To harvest bamboo from all the areas on scientific lines.
(ii) To meet the nistar demand of local population and commercial demand of bamboo based artisan and industries.
(iii) To meet the growing demands of paper and straw board Industries.

7.2.4.24. The total area of the working circle was divided into 48 nistar and 9 commercial bamboo felling series. Felling cycle of 3 years was divided and accordingly each felling

series was divided into three coupes. Demarcation one year in advance was prescribed and to have control over the felling, felling in one Compartment at a time was prescribed.

7.2.4.25. FELLING RULES: Felling rules prescribed were as follows:

(i) The cutting would be done from 1st October to 14th June.
(ii) Dead, dry, twisted, bent, unsound and malformed culms would be removed.
(iii) A clump having more than 8 mature culms would be regarded as a mature (more than two season's old) for harvesting.
(iv) In a mature clump, the following types of culms will be retained:
  (a) All current season's i.e. less than 1 year old and one year old, i.e. more than one season and less than two seasons old culms.
  (b) From the rest culms equal in number of the current season's (Less than one year old) culms or eight whichever was more.
(v) The remaining culms would be considered available for harvesting.
(vi) Culms on the periphery of the clumps would be excluded from the cutting.
(vii) Cutting between 1st and 2nd internodes would be done.
(viii) The working of flowering clumps would be deferred till the completion of seeding.
(ix) Digging of rhizomes, cutting of peripheral culms, cutting of tops of bamboos for fodder, cutting below 6" and above 18" height above ground and using tender bamboos for bundling would be strictly prohibited.
(x) Sharp instrument for cutting and removal of all inflammable material would be used.

7.2.5. V.R.SINGH'S WORKING SCHEME (1977-78 to 1986-87)

7.2.5.1. This scheme included five blocks, out of which three blocks, namely Gatta, Surjagarh and Ghotsur were already under the regular schemes. The remaining two blocks, namely *Etapalli* and Paidy were taken up for the first time for systematic and scientific management. The working scheme for the Gatta Block of S.C. Agrawal` scheme was to expire in the year 1975-76 and that for Surjagarh and Ghotsur Blocks by J.R.Desai and M.V.Khisti expired on 68-69. The revision of these schemes was under taken in this scheme. The scheme was prepared for period form 1977-78 to 86-8. The scheme of J.R.Desai and M.V.Khisti was already expired, however, the same remained operational in which the sequence of felling for the period beyond the period of the scheme was laid down and the harvesting of these forests did not suffer. Similarly, the working in Gatta Block remained operational under the Agrawal scheme on getting extension till the enforcement of Singh's Scheme. On revision of Agrawal and Desai and Khisti's schemes, large tract of forest areas of Gatta, Surjagarh and Ghotsur Blocks, which were unallotted on account of poor accessibility in above schemes were brought under working by allotting them into different working circles in this working scheme. Besides, the area of Etapalli and Paidy Blocks were brought under regular scheme for the first time. The total area under this scheme was 148,962.01 ha.

7.2.5.2. OBJECTS OF MANAGEMENT: The main objects of the scheme were as follows:
(i) To bring the entire area of the tract being dealt with under systematic management.

(ii) To preserve and improve "Tree Forests" for the production of large sized timber, especially of *teak* to the maximum possible extent and to aim at progressively increasing annual yield of the same.
(iii) To preserve and improve` Minor Forests' to obtain progressively increasing annual yield of small size timber, poles and firewood and to meet the ever increasing local demand of the same.
(iv) To raise large concentrated plantation of *teak* and other industrial wood to meet the likely demand of the forest based industries and to tend the plantations undertaken during last 20 years.
(v) To aim at sustained supply of bamboo as raw material for manufacture of paper pulp.
(vi) To aim at creation of Normal Forests with all that it implies and
(vi) Consistent with above objects, to derive the maximum revenue for the state for all times to come.

7.2.5.3. The total area of the tract dealt with under this scheme was 148,962.01 ha which were allotted to three different non-overlapping working circles. Besides, there were three other overlapping working circles in this scheme. The following working circles were formed:

Table No-26

SrNo	Working Circles	Area allotted in ha
1	Conversion Working Circle	24,646.95
2	S.C.I. Working Circle	86,275.82
3	Miscellaneous Working Circle	38,039.24
4	Bamboo Overlapping Working Circle	85,717.07
5	Khair Overlapping Working Circle	148,962.01
6	Wildlife Overlapping Working Circle	148,962.01

7.2.5.4. CONVERSION WORKING CIRCLE: The main object was to convert uneven-aged non teak forests to even-aged teak forests. Areas included are of Gatta, Paidy and Ghotsur Blocks. All these areas are generally plain, except the undulating foot hill of Surjagarh hills in Gatta Block and are generally suitable for clear felling and raising teak plantation. The area allotted to this working circle was mixed forests of Gatta Block and high quality mixed forests of Paidy and Ghotsur Blocks. The site quality of the area is generally III and in Ghotsur and Paidy Blocks over a small patches quality is II. The density varies from 0.5 to 0.7. The valuable trees taken together formed a very low percentage in the crop and so the emphasis was given to increase the percentage of teak through artificial regeneration. Conversion period and rotation was fixed 100 years. Five P.B's were formed. 4 felling series in P.B.I; 4 felling series in P.B.II and III, and 4 felling series in P.B.IV and V were formed.

7.2.5.5. SILVICULTURAL SYSTEM: The inadequacy of the natural regeneration of teak in these areas forced to resort to clear felling and planting in order to achieve the objects. Therefore, conversion to uniform system through clear felling and planting *teak* was prescribed. Besides, retention of existing advance growth of *teak* in patches as future crop was also prescribed. In patches, unsuitable for *teak*, planting of miscellaneous spp., like *sissoo, siras, khair* and *tendu* was prescribed.

7.2.5.6. PERIODIC BLOCKS: Five periodic blocks, each of 20 years cycle corresponding to rotation of 100 years were formed. The areas to be planted in next 20 years were allotted to P.B.I. The remaining areas were divided into two groups -one to include P.B. II and P.B. III and another to include P.B.IV and V. The grouping of P.B's was made with an object of giving specialized treatment to these areas instead of reducing them to common level.

7.2.5.7. **METHODS OF TREATMENT**: **P.B.I.:** It was proposed to regenerate P.B.I. areas artificially in 20 years period and so areas were divided into 20 annual coupes of equal extent. The areas not suitable for teak planting was prescribed for planting of miscellaneous species with a view to improve site condition and were subjected to improvement fellings. Felling, in narrow strips along nalas and areas vulnerable to erosion and under stocked patches, was not prescribed. For artificial regeneration, Teak was taken the main species and in unsuitable patches for *teak*, seed sowing of miscellaneous species like *shisham, khair, ain, bija, haldu* and shivan was prescribed. Cultural and tending operations at proper intervals in plantations were prescribed.

7.2.5.8.P.B. II and III: Improvement felling with a cycle of 20 years was prescribed for forest areas included ion these P.B's. Trees post middle age and trees nearing maturity were favoured so that the most promising trees retained could put on the maximum volume and volume increment till due for clear felling. Selection felling maximum volume and volume increment till due for clear felling was confined to mature and over mature trees if their retention was not desirable on silvicultural grounds. Permanent gaps in the canopy were avoided. Badly malformed and unsound trees not required either for silvicultural reasons or for soil protection were prescribed to be removed. Areas with density less than 0.4 and vulnerable to erosion were excluded from felling. *Teak* as a principal species was favoured in carrying out silvicultural works. Other species such as *bija, ain, haldu, bhirra* and *dhaoda* were favoured in the order of priority. All edible fruit bearing trees were reserved. All class I and class II trees were reserved from felling. For congested stems and patches of advance growth, thinning was prescribed.

7.2.5.9. P.B.IV and V: Selection –Cum Improvement Felling on 20 year cycle with preferential treatment in favour of young trees and trees approaching middle age was prescribed for forests included in these P.B's. Thinning to benefit the young age classes and selection felling of silviculturally available trees to enable utilization of legitimate yield were prescribed. Permanent gaps were avoided. Thinning of congested poles was prescribed. Areas of low quality, under stocked, a strip along nalas vulnerable to erosion were excluded from felling.

7.2.5.10. All edible fruit and flower yielding trees were reserved. All class I and class II trees were reserved from felling. The yield was regularised by area. Subsidiary silvicultural operations were prescribed.

7.2.5.11. SELECTION-CUM IMPROVEMENT WORKING CIRCLE: This working circle included forests of Etapalli and Paidy Blocks, which were brought under systematic management for first time in this scheme and also included unallotted areas of Surjagarh and Ghotsur Blocks under Khisti and Desai's scheme and Gatta Block of Agrawal`s scheme. The forests are mostly of quality III improving to II places. Major part comprised of miscellaneous forests, with few scattered patches of mixed forests. In areas bearing mixed forests, the percentage of teak is varying from 5 to 15. However, in some

compartments of Gatta Block, it is fairly high. The density of crop varies from 0.4 to 0.7. The crop is highly irregular in nature due to great variance in quality, quantity and density. Under stocked patches are found occasionally. The basic objective was to improve the condition of growing stock by encouraging valuable species by giving preferential treatment and diminishing percentage of inferior species gradually. The total area of the working circle was divided into 16 felling series.

7.2.5.12. SILVICULTURAL SYSTEM: These areas were included for systematic management for the first time with the object of improvement and so, selection felling was prescribed. Only those trees were prescribed for felling whose retention was not necessary either for production of seeds or soil protection. Under improvement felling, removal of all dead, dying and unsound trees and thinning in congested patches in favour of teak and superior Injali species, like *ain, haldu, dhaoda, shisham, lendia, kusum*, were prescribed. Removal of inferior tree growth interfering with natural regeneration of teak and other valuable species was also prescribed. The harvestable girths decided for different species were as follows:

SrNo	Species	Selection girth (ob) in cm
1.	*Teak, ain, bija, haldu, kalam, Shisham and other valuable species.*	120
2.	*Tiwas, khair, garari.*	45

7.2.5.13. Teak attains 120 cm gbh (o.b.) at the age of 100 years and there after if tends to become hollow and therefore, rotation was fixed 100 years. Felling cycle of 20 years was adopted and accordingly 20 annual coupes in each felling series were formed. Yield was regulated by area. In due coupe, out of mature and over mature harvestable trees, 25% were reserved as the future safeguard.

7.2.5.14. Subsidiary silvicultural operations such as cut back operation, cleaning and thinning were prescribed.

7.2.5.15. MISCELLANEOUS WORKING CIRCLE: Degraded forests of these blocks were put to this working circle.

7.2.5.16. OBJECTS OF MANAGEMENT: The objects of management were as follows:
(i) To prevent nistar material to the local villagers as per the nistar rules.
(ii) To prevent indiscriminate exercise of the nistar rights by local villagers all over the forests which resulted in large scale destruction of the forests in the past.
(iii) To harvest silviculturally large sized timber other than the nistar material and thereby preventing further deterioration of timber and deriving maximum benefits.

7.2.5.17. SILVICULTUIRAL SYSTEM: Selection felling was prescribed. Creation of permanent gaps was avoided. For regeneration sufficient seed bearers, suitably distributed all over the areas, were retained. Thus silvicultural system adopted was selection felling with natural regeneration. The harvestable girths for different species were fixed as follows:

SrNo	Species	Selection girth (ob) in cm
1.	*Teak, ain, bija, haldu, semal, Shisham.*	120
2.	*Tiwas, khair, garari.*	60

7.2.5.18. BAMBOO OVERLAPPING WORKING CIRCLE: This working circle was overlapping with all three i.e. C.W.C., S.C.I. and Miscellaneous Working Circles. All compartments bearing bamboo were included in this working circle. The quality and growth of bamboo varies vastly in areas due to variation in soil, drainage and past treatment. Good quality dense bamboos were confined to hill slope and moist areas like nala banks and well drained soils. Quality I and II bamboos with dense stocking were occurring in Gatta, Paidy, Surjagarh and Part of Ghotsur Blocks. Two categories of felling series were formed, namely Nistar and Commercial felling series to cater the need of nistar and commercial demand.

7.2.5.19. NISTAR FELLING SERIES: There were six nistar felling series already existing in Surjagarh and Ghotsur Blocks in the previous schemes. One new nistar bamboo felling series was formed out of bamboo areas of Paidy Block which was brought under systematic management for the first time in this scheme only.

7.2.5.20. COMMERCLAL BAMBOO FELLING SERIES: Commercial bamboo felling series were already constituted in Agrawal and Desai and Khisti's Schemes, which were leased out to the Ballarpur Paper Mills, Ballarpur. Four additional commercial bamboo felling series were formed in this scheme. Decision of working in this felling series was left on the discretion of the Conservator of Forests.

7.2.5.21. Each felling series was divided into three coupes, with cutting cycle of 3 years. The cuttings were restricted from 16th September to 15th June. Culms, 2 years of age or below, culms from under developed clumps (clumps having less than ten culms) were prescribed not to be felled. Dead, crooked, twisted malformed bamboos were prescribed to be felled. Felling at height between 15 cm to 45 cm from the ground was prescribed. Per clump at least eight mature well grown culms were prescribed to be retained.

7.2.5.22. KHAIR OVERLAPPING WORKING CIRCLE: The entire area of the division was included in this working circle. The khair occurs sporadically in shallow and dry soils. However, it is profusely found in *khair-bhirra-rohan*-subtype forests. The bulk of khair crop is distributed all over in Etapalli, central and western part of Surjagarh and eastern part of Paidy Blocks. The occurrence of *khair* in other subtype is insignificant. This was the first scheme in which this working circle was formed for the scientific and systematic management of *khair*. Only one felling series was formed.

7.2.5.23. The main object of this working circle was to harvest mature marketable trees of *khair* to cater the needs for raw material of *Katha* Industries. Vidarbha and Manikgarh Katha Industries were already in existence and other similar factories were likely to come up in the region.

7.2.5.24. SILVICULTURAL SYSTEM: The sivivicutltural system adopted was selective felling with natural and coppice regeneration. The felling cycle of 20 years and harvestable girth as 60 cm (o.b.) was fixed. The regulation of yield was done by area.

7.2.5.25. WILDLFE OVERLAPPING WORKING CIRCLE: The forest areas of Etapalli and Kasansur Ranges in a compact block were included in this working circle. This working circle was constituted to ensure maintenance of viable population of wildlife and to create ideal growth conditions of for further development of wild animals.

7.2.5.26. The area dealt with offers an ideal flora and terrain for the wildlife. The perennial rivers, namely Bandia and Zuri traversing through these forests offer adequate water supply which is one of the main ingredients for maintaining the wildlife population. The animals commonly found were *tiger, panther wild dog, jungle cat, hyenas, sloth bear bison Sambhar, barking deer cheetal blue bull, wild boar, monkey, peacock, jungle hen, rabbits* etc. Restriction on felling in a radius of 20 meter from perennial water holes, felling of fruit trees, felling of evergreen bushes found in patches were prescribed. Development of salt lick, shelters and hiding places for wildlife was prescribed. Issue of permit for hunting in a shooting block was recommended subject to the lifting of ban on shooting. Endangered species were excluded from shooting. Besides a strict and effective fire protection, vigilant watch over poachers by erecting checking gates at strategic points, constant vigilance over waterholes during summer, rewarding informers of illicit shooting, displaying publicity boards at important places and construction of bunds on nalas at suitable places, to provide permanent waterholes to wildlife etc were prescribed.

7.2.6. A.P. Deshmukh & B.P.Singh`s Plan for period 1995-96 to 2004-05 extended upto 2006-07.

7.2.6.1. Shri A.P. Deshmukh and Shri B.P. Singh, for the first time, prepared consolidated Working Plan for Bhamaragarh Forest Division for period 1995-96 to 2004-05 extended to 2006-07. He prepared the density maps on 4″ = 1 mile scale from remote sensing data by visual interpretation technique and verified with ground truthing the result. That result was used to prepare stock maps on Survey Of India Sheet of 1: 50,000 scale. He carved out following working circles:

Table No – 27

TABLE SHOWING WORKING CIRCLE AND AREA IN B.P. SINGH`S WORKING PLAN (PLANIMETTED AREA)

SrNo	Working Circles	Area (ha)
1	Selection Cum Improvement Working Circle	187,190.58
2	Old Teak Plantation Working Circle	3,988.14
3	Protection Working Circle	37,341.86
4	Improvement Working Circle	77,149.00
5	Bamboo Overlapping Working Circle	197,393.36
6	Non-Wood Forest Produce Overlapping Working Circle	305,669.68
7	Wildlife Overlapping Working Circle	305,669.68

7.2.6.2. SELECTION CUM IMPROVEMENT WORKING CIRCLE: In this working circle, area included areas of SCIWC under V.R. Singh, V.B. Joshi and S.C. Agrawal`s scheme excluding Teak plantation area, areas of conversion working circle of V.R. Singh's scheme excluding PB I area and unworked areas of plantation working circle of V.B.Joshi`s scheme. 187,190.58 ha area was brought under this working circle.

7.2.6.3. SPECIAL OBJECTS OF MANAGEMENT: Following are the objects of management:

(i) To bring normalcy in the forest.
(ii) To increase the proportion of valuable tree species in the composition of the crop by giving preferential treatment to the naturally regenerated seedlings and by planting timber species, mainly teak in the gap as well as where the natural regeneration is not sufficient. By doing so, the value and productivity of the area will be increased.
(iii) To produce large sized timber.
(iv) To take under planting of bamboo wherever possible to increase the yield of bamboo.
(v) Consistent with above to derive optimum sustained yield of timber, firewood and bamboo.

7**.2.6.4. SILVICULTURE SYSTEM**: Silvicultural system proposed to have selection thinning in each girth class to get the normal stand in due course of time and natural regeneration to be supplemented with artificial regeneration to have preferential treatment to species preferred.

7.2.6.5. FELLING CYCLE: Felling cycle was fixed as 15 years. 60 Felling Series each containing 15 coupes were carved out.

7.2.6.6. YIELD REGULATION: K.P. Sagreiya`s modification of Smythie`s formula has been used for yield calculation. Annual average yield for first felling cycle arrived at 0.3812 cubic meter per hectare per year amounting to annual yield of 71,357 m^3 per year.

7.2.6.7. METHOD OF TREATMENT: After demarcation of coupes, treatment map of the coupe would be prepared. Coupe area to be classified as (i) Type A- Protection area- Slope ≥25° and 20 meter around water bodies, (ii) Type B- Understocked area with density < 0.4, (iii) Type C- Group of young poles and (iv) Type D- Well stocked areas- density ≥ 0.4. In Type A, area no working proposed. In Type B area only improvement works to be taken as removal of dead dying and malformed trees and replenishing the area with artificial planting in gaps. In Type C areas thinning of young poles was proposed to have thinned stand spacing to 1/3 rd of the average height of the crop. In Type D area selection felling of surplus trees than normal stand table prepared for that site quality, in each girth class was proposed. Natural regeneration are to be treated as par with the seedling plantations and gaps to be filled with artificial planting of choice species preferably teak and other superior timber species.

Ultimate girth class had been fixed as per Site Quality as given below.

SrNo	Site Quality	Ultimate Girth (ob) in cm
1.	I	165-180
2.	II	150-165
3.	III	135-150
4.	IVa	120-135
5.	IVb	105-120

7.2.6.8. OLD TEAK PLANTATION WORKING CIRCLE: Teak plantations taken during previous schemes in operations have been taken in this working circle. Area is 3988 ha.

7.2.6.9. OBJECTS OF MANAGEMENT: Following are the special objects of this working circle:

(i) To carry out thinning as per the yield table on the basis of age and site quality.
(ii) To improve the crop doing required silvicultural operations so as to achieve growth parameters comparable to those in yield table.
(iii) To cover thinning in all overdue plantations in the shortest possible time and to ensure thinning and other silvicultural operations in other plantations when they are due.

7.2.6.10. SILVICULTURAL SYSTEM: Silvicultural system is to have thinning of plantations taken as per their requirement.

SECTION: 7.3: ANALYSIS OF RESULTS OF PAST SYSTEMS OF MANAGEMENT:

7.3.1.1. Analysis of B.P.Singh plan is discussed here as per working circle involving area treatment.

7.3.2 SELECTION CUM IMPROVEMENT WORKING CIRCLE:

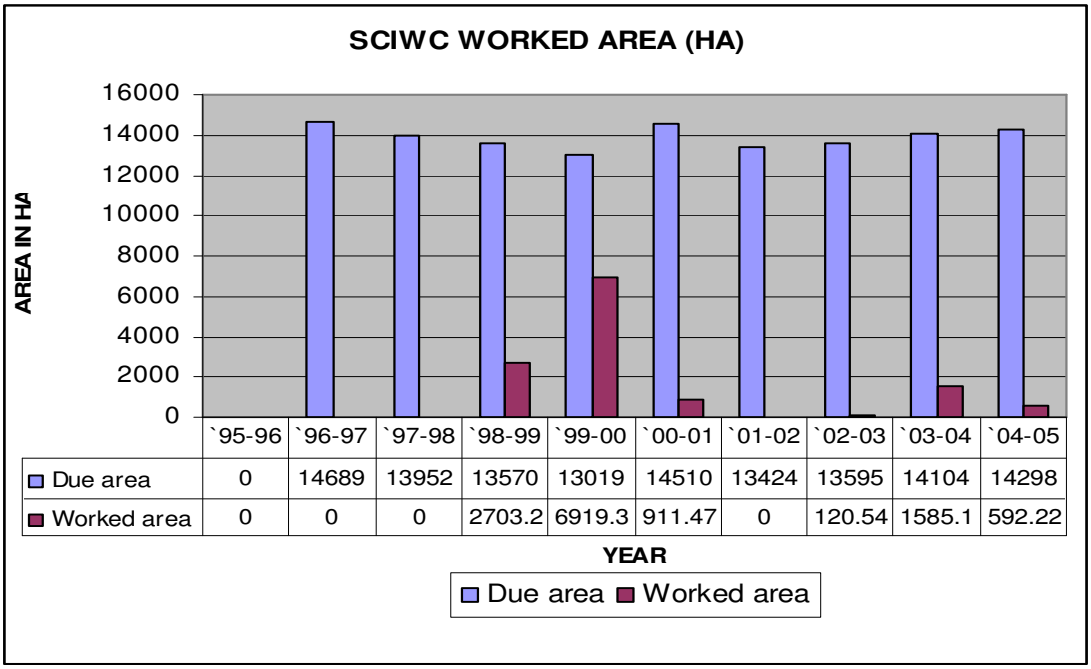
7.3.2.1. Since the Working Plan came into force in 1995-96, Coupe No. I was to be marked in 1995-96 and felled in the subsequent year i.e. 1996-97 and this sequence was to be followed throughout the working plan period. The statement of actual working of S.C.I. coupes during the working plan period is given in the following Table.

Table No – 28 & Chart -5

TABLE SHOWING ACTUAL WORKING IN SCIWC DURING B.P. SINGH`S WORKING PLAN PERIOD

(Total Number of coupes due for working = 66 each year. Estimated average annual yield of 71,357 m^3.)

Year of Dem	Due for main felling		Actually worked			Production	
	Coupe No	Area(ha)	Worked Coupe	Area(ha)	% of working	Timber in m^3	Fire Wood in beats
`95-96	0	0	0	0	0	0	0
`96-97	I	14689.03	0	0	0	0	0
`97-98	II	13952.38	0	0	0	0	0
`98-99	III	13569.54	18	2703.15	20	2460	9989
`99-00	IV	13019.00	41	6919.276	53	11122	25100
`00-01	V	14509.58	21	911.467	6	93	236
`01-02	VI	13423.86	0	0	0	0	0
`02-03	VII	13594.53	1	120.54	1	102	500
`03-04	VIII	14104.08	9	1585.09	11	1332	4640
`04-05	IX	14298.38	9	592.22	4	544	1680
Total : Plan period		**125160.38**	**99**	**12831.743**	**10.25%**	**15653**	**42145**



	`95-96	`96-97	`97-98	`98-99	`99-00	`00-01	`01-02	`02-03	`03-04	`04-05
Due area	0	14689	13952	13570	13019	14510	13424	13595	14104	14298
Worked area	0	0	0	2703.2	6919.3	911.47	0	120.54	1585.1	592.22

7.3.2.2. Out of 66 x 9 = 594 coupes due for selection felling, only 99 coupes were worked during entire plan period. It means only 16.7% coupes were worked and out of these coupes many coupes were not worked fully. Area wise 125,160.38 ha was due for working. But worked area is 12,831.74 ha. Percentage of area worked is 10.2%.

7.3.2.3. In 1995-95 coupes were not due for main felling as only marking of coupes were prescribed. But main fellings were not executed in coupes no I & II due in 1996-97 and 1997-98 respectively for reasons not recorded. In 2001-02 GOI permission for working of coupe no VI was not accorded hence no felling was executed. Presence of Naxalite Activists and their abrupt interference in working of forestry activities affects the working of silvicultural activities. Naxalites have intensified their activities in recent past. They are assaulting the forest personnel engaged in silvicultural operations and resort to damage the forest property including burning of buildings, vehicles, forest produces etc. They are threatening to liquidate forest personnel. Also their several calls for bands(Closers) at regular intervals are affecting the normal movement of forest personnel hindering their normal duties. This is the main reason for coupes not having been worked regularly in recent years.

7.3.2.4. Another point worth mentioning here is that the prescription of the working plan was to carry out cleaning in the 6th year after the coupe main felling is not allowed to be worked.

7.3.2.5. TECHNICAL PROBLEMS FACED: One of the major technical problems faced while carrying out the prescriptions of prescribed selection cum improvement working circle was that the marking rules were too complicated for the field level staff to understand and practice in the field. In fact to this day the Lower level Forest Personnel who do the marking are unsure of the marking rules. In selection system, selection girth is

fixed on the basis of site quality after stem analysis of important species during revision of plan. The prescriptions given in SCI Working Circle in the previous plan provides ultimate girth class and field staff is required to collect data regarding distribution of trees in each girth class. Felling is expected in each girth class if there is surplus in each girth class. On top of that they have to consider preferred choice of species. Present position of staff, their I.Q. (Intelligence Quotient), complicated marking rules, the vastness of the area and naxalite problems do not allow the marking to be done correctly.

7.3.2.6. RESULTS: In the limited area that has been worked and C.B.O. works carried out in this working circle, the regeneration status of miscellaneous species like *Ain, Dhaoda, Garadi, Lendia, Tendu* etc. is satisfactory. The regeneration of *teak* is very poor. Coppice regeneration of Garadi & Lendia is very good and these species have become part of middle storey in the coupes that have been worked.

7.3.3. OLD TEAK PLANTATION WORKING CIRCLE

7.3.3.1. Old Teak Plantation Working Circle comprised of 3988.14 ha of teak plantations raised during previous plan periods**.** The main objects of this working circle were to carry out thinning in the old teak plantations to have growth parameters comparable to those in the yield table and to ensure other silvicultural operations so as to enhance growth of these plantations. Two basic prescriptions were made-(i) Thinning and (ii) Cleaning.

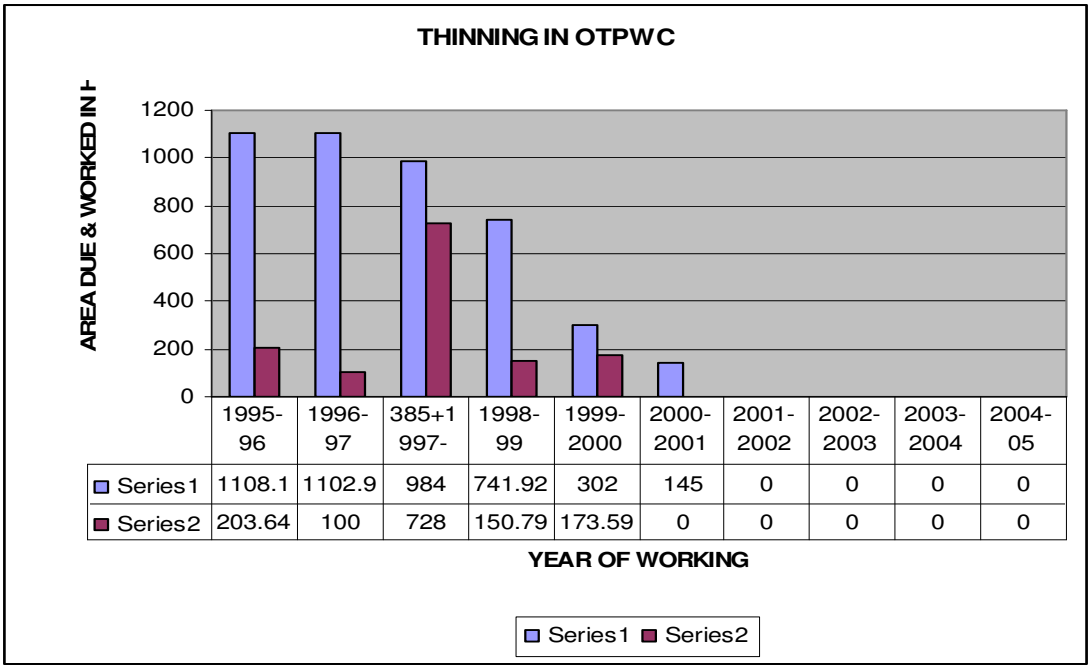
7.3.3.2. ANALYSIS OF WORKING IN OLD TEAK PLANTATION WORKING CIRCLE:

The details of work done under this working circle are given in Table below.

Table No – 29 & Chart -6

TABLE SHOWING ACTUAL WORKING IN OLD TEAK PLANTATION WORKING CIRCLE DURING B.P. SINGH`S WORKING PLAN PERIOD

Year of working	Thinning		Cleaning	
	Area to be worked (ha)	Area actually worked (ha)	Area to be worked (ha)	Area actually worked (ha)
1995-1996	1108.10	203.64	4807.23	315.80
1996-1997	1102.90	100.00	574.02	112.61
1997-1998	984.00	728.00	1991.12	1394.40
1998-1999	741.92	150.79	2134.72	1499.32
1999-2000	302.00	173.59	2859.32	2858.34
2000-2001	145.00	0	569.92	549.92
2001-2002	0	0	3401.32	3311.74
2002-2003	0	0	243.92	243.00
2003-2004	0	0	1714.52	1714.43
2004-2005	0	0	2083.30	891.54
Total-	**4383.92**	**1356.02**	**20379.39**	**12891.10**
% working		**30%**		



7.3.4. PROTECTION WORKING CIRCLE

7.3.4.1. The area under this working circle included the hilly and undulating areas having steep slopes. The entire area of 37,180.76 ha allotted to this working circle falls in one Range – Bhamragarh. The aim of including these areas to this working circle was to preserve and improve the existing growing stock for protecting soil and conserving moisture. The whole area was divided into 6 felling series each containing 10 coupes of 10 years working cycle**.**

7.3.4.2. ANALYSIS:-Though the working plan prescribed soil and moisture conservation works each year as per the coupes laid, work could be carried out only in 2003-04 & 2004-05. As the area is sparsely populated and covered no significant change has occurred.

Table No – 30

TABLE SHOWING ACTUAL WORKING IN PROTECTION WC DURING B.P. SINGH`S WORKING PLAN PERIOD

PWC working schedule and actual working executed during plan period
Total number of coupes due for working = 6 each year

	Area due for working		Area actually worked		
Year	**Coupe No**	**Area**	**Worked Coupe**	**Area**	**% of working**
`95-96	I	3545.33			
`96-97	II	4039.32			0
`97-98	III	3944.53			0
`98-99	IV	4142.7			0
`99-00	V	4048.73			0
`00-01	VI	3580.78			0
`01-02	VII	3615.44			0

`02-03	VIII	3543.03			0
`03-04	IX	3415.26	6	2017.30	59
`04-05	X	3379.12	4	2485.34	74
TOTAL		37254.24	10/60 = 16.7%	4502.64	12.1%

7.3.5. IMPROVEMENT WORKING CIRCLE

7.3.5.1. The forests allotted to improvement working circle vary considerably in composition, density & growth. These are inferior in both quality and composition, having degraded because of their nearness to human habitation. The aim of bringing these areas under this working circle was to improve the crop and to check soil & moisture conservation. The total area allotted to this working circle was 54,308.70 ha. divided into 35 felling series. Each felling series contained 10 annual coupes. Choice of species was *Teak, Bija, Shisham, Haldu, Ain, Kalam, Tiwas, Rohan, Dhaoda, Garadi & Lendia.* In the under storey bamboo and dikamali were to be preferred. Edible fruit trees were to be reserved everywhere.

7.3.5.2. ANALYSIS OF WORKING IWC: The details of works done in the working circle over last 10 years are tabulated below.

Table No – 31

TABLE SHOWING ACTUAL WORKING IN IWC DURING B.P. SINGH`S WORKING PLAN PERIOD

Total number of coupes due for working = 35 each year

	Due for Working		Actual Working		
Year of Dem	Coupe No	Area	Worked Coupe	Area	% of working
`95-96	0	0	0	0	0
`96-97	I	5454.72	0	0	0
`97-98	II	5607.97	0	0	0
`98-99	III	4610.73	18	2133.73	46
`99-00	IV	4549.00	29	3355.966	74
`00-01	V	4877.21	7	863.162	18
`01-02	VI	4863.58	0	0	0
`02-03	VII	4857.41	0	0	0
`03-04	VIII	4817.04	0	0	0
`04-05	IX	4730.99	6	556.83	12
	Total	**44368.65**	**60**	**6909.88**	**16%**

7.3.5.3. The table indicates that out of 315 coupes due for working only 60 coupes were worked i.e. only 19% coupes were worked. Area wise out of 44368.65 ha 16. % area i.e. 6,909.688 ha was worked. The reason for non working of these areas as mentioned earlier is Naxalite activities.

7.3.5.4. Regeneration – As most the area is around villages, the regeneration status is not satisfactory whereas the area away from the villages, it is satisfactory.

7.3.6. BAMBOO OVERLAPPING WORKING CIRCLE

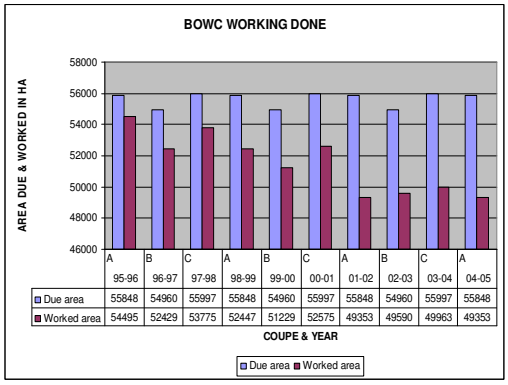
7.3.6.1. The total area allotted to this Working Circle in the previous Working Plan was 234,871.26 ha spread over all 5 ranges of the division. The area was divided into 75

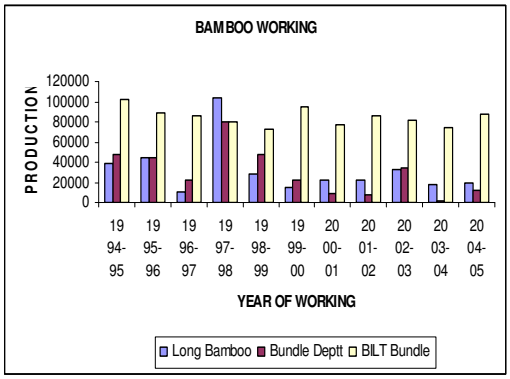
cutting series - out of which 19 were included in Commercial Bamboo Felling Series and the remaining 56 in Nistar Bamboo Felling Series. Harvesting of bamboos was prescribed on a cutting cycle of 3 years. Each cutting series was divided into 3 coupes viz. A, B, & C and one of the coupes from each cutting series was to be worked annually. Felling of bamboo is given below in table.

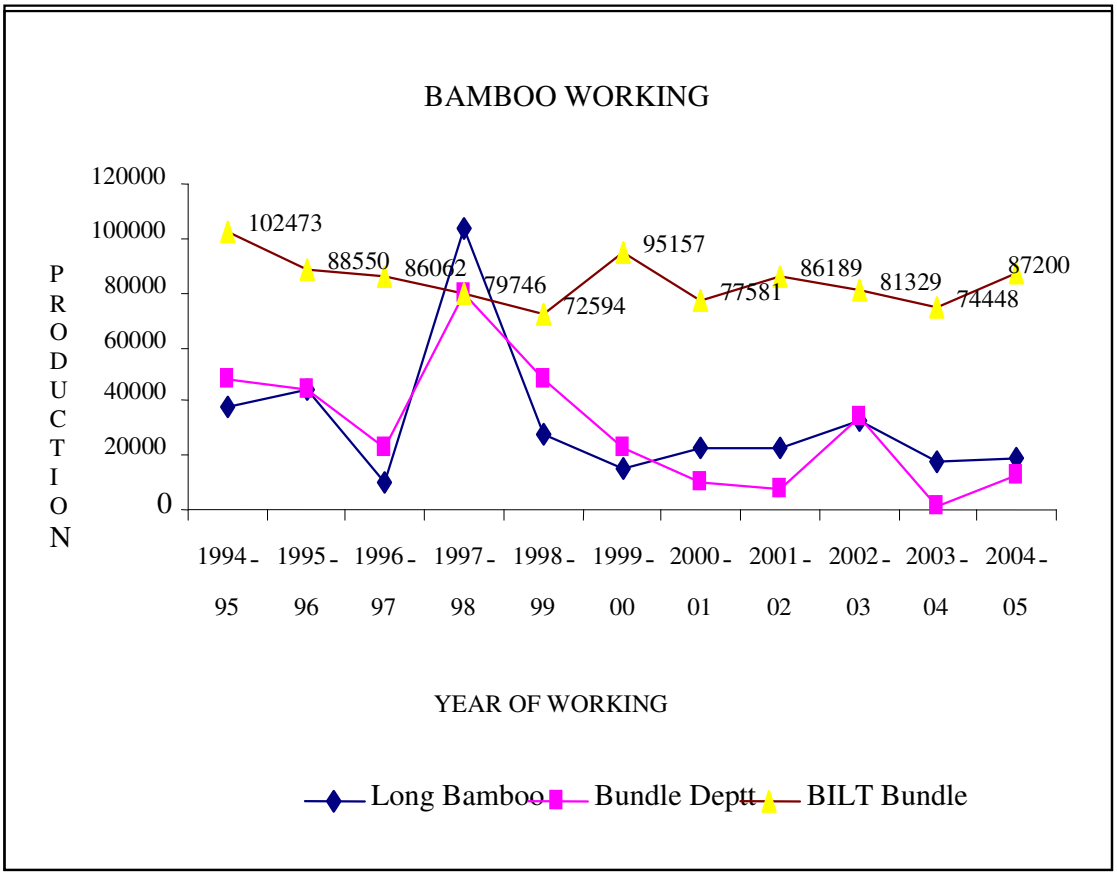
Table No-32 & Chart No-7a,7b,7c.

Total number of coupes due for working = 75 each year

	Due for harvesting		Actual harvesting		
Year of Demarcation	Coupe No	Area	Worked Coupe	Area	% of working
95-96	A	55,848	A	54,495.48	97.57
96-97	B	54,960	B	52,429.00	95.39
97-98	C	55,997	C	53,774.52	96.03
98-99	A	55,848	A	52,446.92	93.91
99-00	B	54,960	B	51,229.00	93.21
00-01	C	55,997	C	52,574.52	93.88
01-02	A	55,848	A	49,353.48	88.37
02-03	B	54,960	B	49,590.34	90.22
03-04	C	55,997	C	49,962.90	89.22
04-05	A	55,848	A	49,353.48	88.37







Note: Long Bamboo figure is reduced by 10 times to bring the scale parity.

7.3.6.2. ANALYSIS OF WORKING

(i) Looking into the magnitude of the work and subsequent to an agreement of lease between the Government of Maharashtra and M/S BILT Ltd. 19 CBFS and 30 NBFS were allotted for working to Ballarpur Industries Limited at Ballarshah. The rest of 24 NBFS coupes are being worked departmentally for catering to the Nistar and local needs.
(ii) Out of the 75 Felling series, 2 series namely Karka and South Ghotsur later became unproductive.
(iii) Out of the departmentally worked 24 NBFS coupes, 16 felling series have become non-productive.

7.3.7. NON TIMBER FOREST PRODUCE OVERLAPPING WORKING CIRCLE

7.3.7.1. Non Timber Overlapping Working Circle covered the entire tract. The Working Circle aimed at managing Minor Forest Produce in a scientific manner and to get a sustained yield. The Working Plan provided for methods of treatment for the following minor forest produce.

1. Moha fruit & flowers
2. Gums
3. Tendu

4. Myrobalon, dikamali & nirmali
5. Broom grass
6. Sabai grass
7. Khair

7.3.7.2. ANALYSIS OF WORKING: Excepting for the collection of Tendu leaves which is not an MFP; none of the minor forest produce has been collected to its full potential as seen from following table.

Table No-33

TABLE SHOWING THE REPORTED COLLECTION OF MFP DURING PREVIOUS PLAN PERIOD

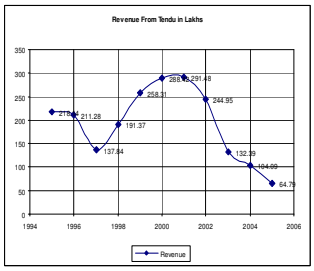
Production in Quintal.	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05
Gum	46.44	56.38	87.29	55.3	62.42	66.38	28.04	21.81	60.29	26.28
Moha	0	911.77	0	364.84	555.03	0	60.52	0	0	0
Harra	0	700.95	60.03	718.73	1800.17	2270.78	147.26	233.23	77.79	177.07
Mohatoli	0	1621.83	0	42.21	26.56	0	24.6	0	1.87	0
Biba	0	0	26.5	1.08	0	0	0	0	0	0
Chinch	0	0	38.94	0	5.19	0	1.74	0	0	3.06
Aonla	0	0	9.74	171.68	2.37	0	0	.80	0.78	115.18
Amaltas	0	0	7.25	0	0	0	0	0	0	0
Shenga										
Beheda		0	16.91	0	8.32	0	0	0	0	0
Chinch seed	0	0	29.67	0	2.97	0	0	0	0	0.48
Tendu leaves (Std Bags)	46791	47858	37378	47919	50490	53496	51188	57887	45423	34479

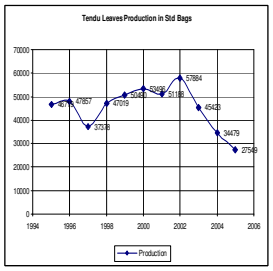
7.3.7.2 TENDU LEAVES COLLECTION: Total Units/ groups of units are 28. The following table shows the collection and revenue from tendu collection in previous plan period.

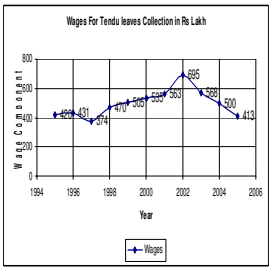
Table No-34
Chart No-8a, 8b,8c.

TABLE SHOWING THE REPORTED COLLECTION OF TENDU LEAVES DURING PREVIOUS PLAN PERIOD

SrNo.	Season	Total Sold Units/ Groups of units	Actual Production (Standard Bags)	Revenue (Rs.in Lakhs)
1	1995	28	46719	218.14
2	1996	28	47857	211.28
3	1997	21	37378	137.84
4	1998	26	47019	191.37
5	1999	28	50490	258.31
6	2000	28	53496	288.42
7	2001	28	51188	291.48
8	2002	28	57884	244.95
9	2003	23	45423	132.39
10	2004	18	34479	104.09
11	2005	13	27549	64.79







7.3.7.3. The collection of Tendu leaves is done by tendering the units/ groups of units to licensees where as the onus of collecting, other Minor Forest Produce used to be given to Tribal Development Corporation of Maharashtra Limited an Undertaking of Maharashtra State. Collection of Minor Forest Produce has not been done meticulously by the T.D.C. and most of the collected MFP is illegally traded, resulting into loss of Revenue to the Government as well as exploitation of the locals.

7.3.7.4. HONEY COLLECTION, PROCESSING & MARKETING: Taking advantage of the scheme National Afforestation Programme initiated by the Government of India, Bhamragarh division has taken steps to provide the benefits of MFP to the local villages. Under the N.A.P. scheme, Honey collection, processing and marketing unit has been set up at Etapalli which has proved to be a grand success. So far 10 MT. of raw honey has been collected, out of which 7 MT. have been processed and packed. Out of this 6 MT of processed honey has been sold resulting into a net profit of Rs 4 Lakh to the Forest Protection Committee Jiwangatta. Estimates show that the potential of honey production in this division is to the extent of nearly 30 M.T. per annum. Government is providing assistance to JFM Committee to set up mechanized unit for processing, packing and marketing the product for which Quality Certificate under AGMARK has been given. The product is being marketed under BHAMARAGARH NECTAR Trade Mark.

7.3.7.5.LAC CULTIVATION: The entire area of this division consists of healthy *Palas* and *Kusum* trees which are conducive to lac cultivation. The only effort required is to seed the Plants with brood lac, and the production of lac can be sustained for years together resulting into revenue generation. Such experimentation has already been carried out in three villages at Ettapalli Tahsil namely Bhapda, Dindvi and Sarkheda

7.3.8. TAPPING OF GUM & HARVESTING OF MEDICINAL PLANTS

7.3.8.1. As stated earlier the area consists of very good Miscellaneous Forests, a number of species like *Salai, Mowai, Ain, Dhawda, Kulu, Khair*, etc., are capable of yielding gum. Gums are easy to tap and fetch good market price if marketed properly. Under the Entry Point Activity of Bhamragarh Forest Development Agency nearly 8000 trees of different species have been inoculated with Ethephon. These trees have started yielding gum. About 5 quintal gum has already been collected in 2005 season.

7.3.8.2. Besides the above experimentation carried out, there are innumerable NTFP including medicinal plants which can be harvested indestructive way and the benefits be diverted towards the development of tribals.

7.3.9. WILDLIFE OVERLAPPING WORKING CIRCLE

7.3.9.1. Wild Life population in the tract is very poor. The details of animals found in the division as per previous estimates have been given in Chapter IIB in Table Nos 9 & 10.
7.3.9.2. In past no concrete steps have been taken to take care of wildlife which resulted in depletion of their number and even species depletion. To form the corridor for movement of wild animals from Chhattisgarh State to the tract and to have specific management to them, Bhamaragarh Wildlife Sanctuary has been carved out encompassing 10,438.60 ha and duly constituted Sanctuary as per the provisions of Wildlife Protection Act, 1972 and is placed under Allapalli Wildlife Division for management in 1997.

7.3.10. OVER ALL IMPACT OF THE B.P. SINGH`S PLAN IMPLIMENTATION

7.3.10.1. Felling has been prescribed only in the SCIWC, IWC and Bamboo Overlapping Working Circles in the previous working plan. Regular workings have been carried out in the BOWC over the plan period but very little working could be done under SCI and IWC. During the 10 years of SCIWC coupes those were to be worked, constituting 125,160.38 ha. only 12,831.743 ha. (10.25%) have been worked. As regards IWC out of 44,368.65 ha prescribed for working only 6909.88 (15%) could be worked. In Old Teak Plantation Working Circle thinning of stand was done just to the tune of 30% of total area due.

7.3.10.2. OBSERVATIONS: Following are the broad observations made on impact of the previous plan implementation.
(i) Because the area is not much affected by grazing, illicit felling etc., the crop composition remains almost the same as at the inception of the working plan.
(ii) In areas allotted to SCIWC & IWC, where fellings have been carried out, regeneration is satisfactory.
(ii) As regard to bamboo the crop has shown gradual deterioration in some areas nearer to habitation.
(iv) In old teak plantations, thinning to the extent of only 30 % of the prescribed area has been taken up during the plan period. This has resulted in congestion of the crop condition.

SECTION: 7. 4. PAST YIELD

7.4.1.1. Estimated yield and actual yield of forest produce during previous plan operation period are as follows:

Table No-33

YEAR	Estimated Yield of Timber in m^3	Actual Yield of Timber in m^3	Achievement in %	Remarks
1994-95	71,400	2,379.343	3.3%	Windfall material collection and coupe working to the extent of 10% overall due coupes.
1995-96	71,400	5,990.95	8.4%	
1996-97	71,400	2,226.496	3.1%	
1997-98	71,400	4,366.552	6.1%	
1998-99	71,400	9,187.538	12.9%	
1999-00	71,400	11,989.777	16.8%	
2000-01	71,400	4,158.229	5.8%	
2001-02	71,400	318.994	0.4%	

2002-03	71,400	2,369.27	3.3%
2003-04	71,400	2,253.914	3.2%
2004-05	71,400	2,127.483	3.0%

Table No-34

YEAR	Estimated Yield of Fuel Beats in m^3	Actual Yield of Fuel Beats in m^3	Achievement in %	Remarks
1994-95	21,400	19,995	93.4%	Windfall material collection and coupe working to the extent of 10% overall due coupes.
1995-96	21,400	2,805	13.1%	
1996-97	21,400	7,287	34.1%	
1997-98	21,400	2,485	11.6%	
1998-99	21,400	23,917	111.8%	
1999-00	21,400	20,382	95.2%	
2000-01	21,400	20,918	97.7%	
2001-02	21,400	295	1.4%	
2002-03	21,400	2135	10.3%	
2003-04	21,400	7,841	36.6%	
2004-05	21,400	2,484	11.6%	

Table No-35

YEAR	Estimated Tendu Leaves Std Bags	Actual Tendu Leaves Std Bags Collected	Estimated Bamboo Bundle in ADMT	Actual Bamboo Bundle in ADMT	Actual Bundle Deptt working	Actual Long Bamboo Deptt working
1994-95	45,000	46,719	80,000	102,473	47,384	383,300
1995-96	45,000	47,857	80,000	88,550	44,468	443,100
1996-97	45,000	37,378	80,000	86,062	22,135	96,589
1997-98	45,000	47,019	80,000	79,746	80,066	1,034,698
1998-99	45,000	50,490	80,000	72,594	47,737	279,689
1999-00	45,000	53,496	80,000	95,157	22,248	147,830
2000-01	45,000	51,188	80,000	77,581	9,615	225,768
2001-02	45,000	57,884	80,000	86,189	7,000	225,404
2002-03	45,000	45,423	80,000	81,329	33,622	326,695
2003-04	45,000	34,479	80,000	74,448	1,879	180,029
2004-05	45,000	27,549	80,000	87,200	12,511	187,018

7.4.1.2. Production of various MFP/NTFP as reported during previous plan period is given in the following table.

Table No-36

Production in Qntl.	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05
Gum	46.44	56.38	87.29	55.3	62.42	66.38	28.04	21.81	60.29	26.28
Moha	0	911.77	0	364.84	555.03	0	60.52	0	0	0
Harra	0	700.95	60.03	718.73	1800.17	2270.78	147.26	233.23	77.79	177.07
Mohatoli	0	1621.83	0	42.21	26.56	0	24.6	0	1.87	0
Biba	0	0	26.5	1.08	0	0	0	0	0	0
Chinch	0	0	38.94	0	5.19	0	1.74	0	0	3.06
Aonla	0	0	9.74	171.68	2.37	0	0	.80	0.78	115.18
Amaltas Shenga	0	0	7.25	0	0	0	0	0	0	0
Beheda		0	16.91	0	8.32	0	0	0	0	0
Chinch seed	0	0	29.67	0	2.97	0	0	0	0	0.48

SECTTION: 7.5. PASTREVENUE AND EXPENDITURE:

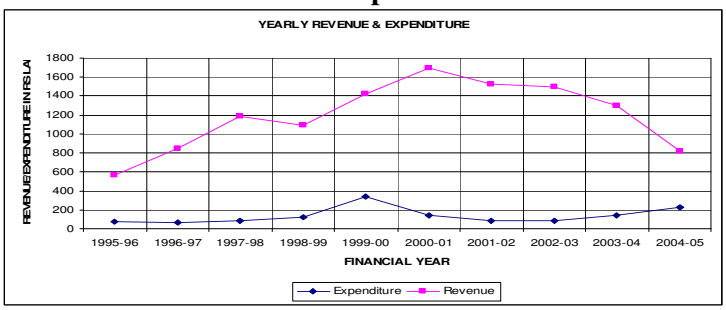
7.5.1.1. Estimated revenue from execution of plan operations of previous plan is given below in the table below.

Table No-37

YEAR	Estimated Revenue of Timber in Rs Lakhs	Actual Revenue of Timber,FW, Bamboo etc in Rs Lakhs	Estimated Revenue from BILT Rs Lakhs	Actual Revenue from BILT in Rs Lakhs	Estimated Revenue from Tendu Rs Lakhs	Actual Revenue from Tendu in Rs Lakhs	Actual Total Revenue in Rs Lakhs
1995-96	3,220		400	518.85	180	211.28	565.47
1996-97	3,220	151.95	440	554.41	180	137.84	844.20
1997-98	3,220	427.24	484	565.09	180	191.37	1,183.70
1998-99	3,220	266.43	532	565.85	180	258.31	1,090.59
1999-00	3,220	320.10	586	815.91	180	288.42	1,424.43
2000-01	3,220	674.84	644	731.73	180	291.48	1,698.05
2001-02	3,220	383.84	709	894.21	180	244.95	1,523.00
2002-03	3,220	436.99	779	928.17	180	132.39	1,497.55
2003-04	3,220	261.45	857	934.46	180	104.09	1,300.00
2004-05	3,220	185.31	480	566.90	180	64.79	8,17.00

7.5.1.2. The Graphs showing revenue accrued during execution plan operations of previous plan prescriptions is given below in chart no-10.

Graph-9



As execution of prescriptions of previous plan was seldom done in full extent, the estimated revenue was also not generated during that period.

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CHAPTER VIII

STATISTICS OF GROWTH AND YIELD

SECTION: 8.1: STATISTICS OF RATE OF GROWTH OF TEAK AND MISCELLANEOUS SPECIES

8.1.1.1. During preparation of previous working plans of the tract, no study had been conducted with regard to the growth either of teak or miscellaneous species. Statistics of growth of teak other species pertaining to other forest divisions had been reproduced in those documents. Conservator of Forests Working Plan Chandrapur -2 and his team have carried out stem analysis of *Teak i.e.Sag* (Tectona grandis), *Bija* (Pterocarpus marsupium) and *Ain* (Terminalia latifolia). Results of stem analysis have been given in appendix no-III in volume II of this draft plan report. Abstract is given below in following tables.

Table No-38

Table showing the result of stem analysis: Teak i.e. Sag (Tectona grandis)

SITE QUALITY TII

SrNo	Age (year)	DBH(OB) cm	Height m	Volume m^3	cai m^3	mai m^3
1	3	0.0	0.0	0.000	0	0
2	13	16.0	4.9	0.080	0.00615	0.00800
3	23	25.7	10.5	0.312	0.01355	0.02316
4	33	33.6	19.0	0.660	0.02000	0.03485
5	43	39.6	24.2	1.030	0.02395	0.03698
6	53	44.6	26.3	1.420	0.02679	0.03902
7	63	49.5	27.3	1.840	0.02921	0.04200
8	73	53.8	28.3	2.260	0.03096	0.04200
9	83	57.0	29.2	2.650	0.03193	0.03900
10	93	59.5	30.0	3.020	0.03247	0.03700
11	103	61.8	30.6	3.320	0.03223	0.03000
12	113	63.0	31.0	3.500	0.03097	0.01800

Table No-39

GRAPH-10

AGE-HEIGHT CURVE FOR TEAK S.Q. TII

Age	Height
0	0
10	4.9
20	10.5
30	19
40	24.2
50	26.3
60	27.3
70	28.3
80	29.2
90	30
100	30.5

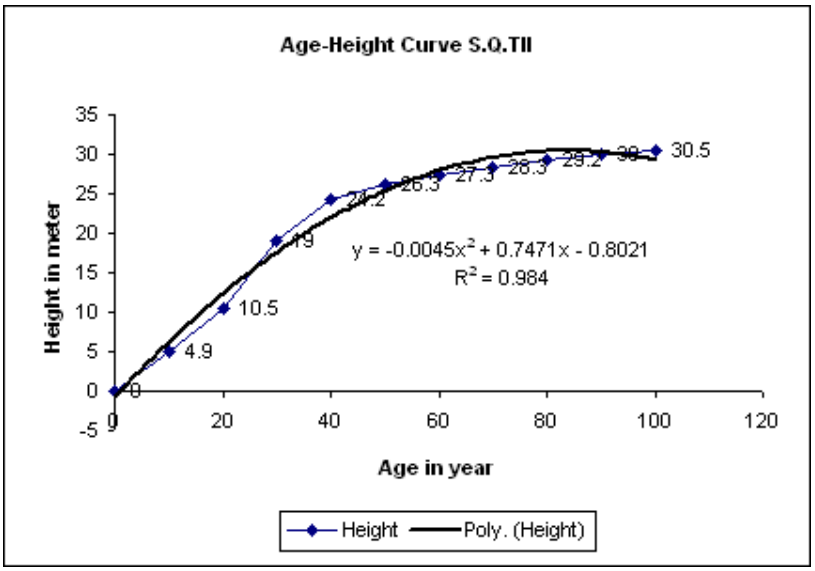


Table No-40

GRAPH -11

Table showing the result of stem analysis- age -volume: Teak i.e Sag(Tectona grandis)/

SITE QUALITY TII

Age in year	Volume in cubic meter	Remarks
3	0.000	
13	0.080	
23	0.312	
33	0.660	
43	1.030	
53	1.420	
63	1.840	
73	2.260	
83	2.650	
93	3.020	Extrapolated
103	3.320	Extrapolated
113	3.500	Extrapolated

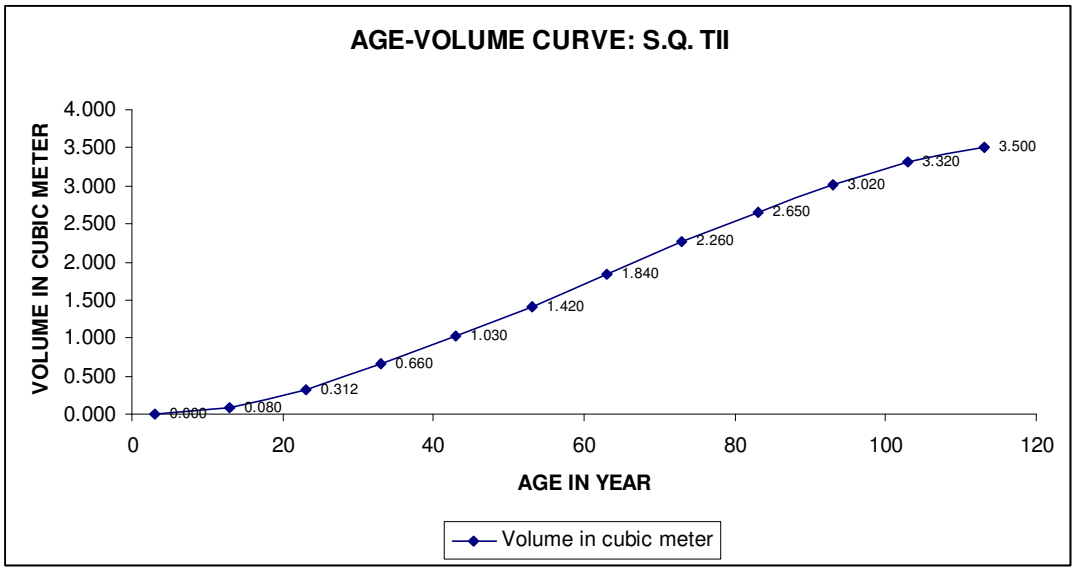


Table No-41

GRAPH -12

AGE-GBH(OB) FOR TEAK S.Q. TII

Age (year)	GBH(OB) cm
3	0
13	50.2
23	80.7
33	105.5
43	124.3
53	140
63	155.4
73	168.9
83	179
93	186.8
103	193.5
113	198.2

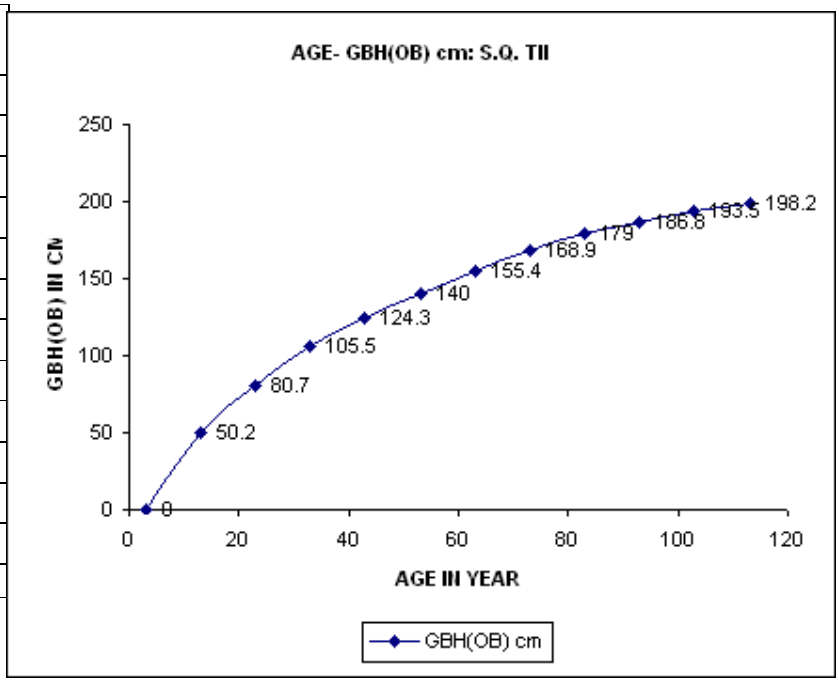
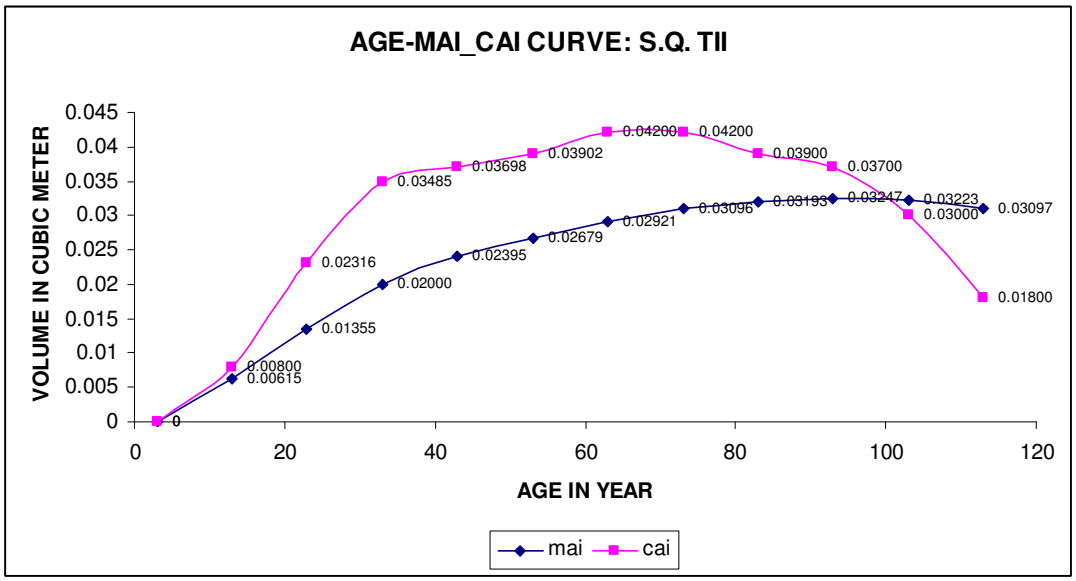


Table No-42

GRAPH NO-13

Table showing the result of stem analysis cai-mai: Teak i.e Sag(Tectona grandis)

Age in year	mai	cai	Remarks
3	0	0	
13	0.00615	0.00800	
23	0.01355	0.02316	
33	0.02000	0.03485	
43	0.02395	0.03698	
53	0.02679	0.03902	
63	0.02921	0.04200	
73	0.03096	0.04200	
83	0.03193	0.03900	
93	0.03247	0.03700	
103	0.03223	0.03000	
113	0.03097	0.01800	



cai and mai meet each other at 103 years corresponds to dbh 61.8 cm(gbh = 194 cm) and cai =mai = 0.03025 m^3/tree.

Table No-43

Table showing result of stem analysis: Teak (Tectona grandis). S.Q. TIII

SrNo	Age in year	Volume m^3	cai m^3	mai m^3
1	0	0	0.00000	0.00000
2	14	0.016	0.00160	0.00092
3	24	0.048	0.00320	0.00200
4	34	0.096	0.00480	0.00284

5	44	0.216	0.01200	0.00492
6	54	0.32	0.01040	0.00592
7	64	0.48	0.01600	0.00752
8	74	0.752	0.02700	0.01012
9	84	1.2	0.04500	0.01228
10	94	1.48	0.02800	0.01276
11	104	1.52	0.00400	0.01460

Table No-44

GRAPH NO-14

Table showing result of stem analysis-age-height: Teak (Tectona grandis). S.Q. TIII

Age	Height
4	1.37
15	4.24
22	7.24
28	10.24
34	13.24
41	16.24
48	19.24
62	22.24
90	25.24

Table No-45

GRAPH NO-15

Age-GBH(OB) curve for SQ TIII

Age	GBH(OB)
4	0.0
14	29.8
24	44.0
34	49.6
44	59.0
54	71.0
64	88.5
74	112.2
84	121.5
94	137.8

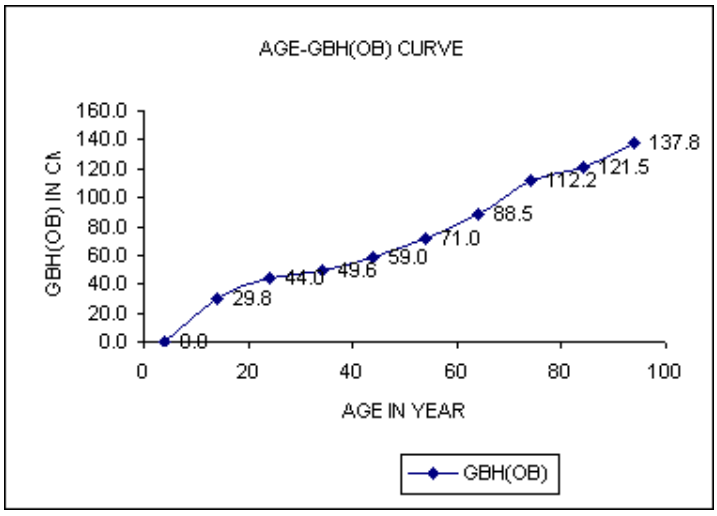


Table No-46
GRAPH NO-16
Age -Volume for Teak Site Quality III

Age in year	Volume m³
0	0
14	0.016
24	0.048
34	0.096
44	0.216
54	0.32
64	0.48
74	0.752
84	1.2
94	1.48
104	1.52

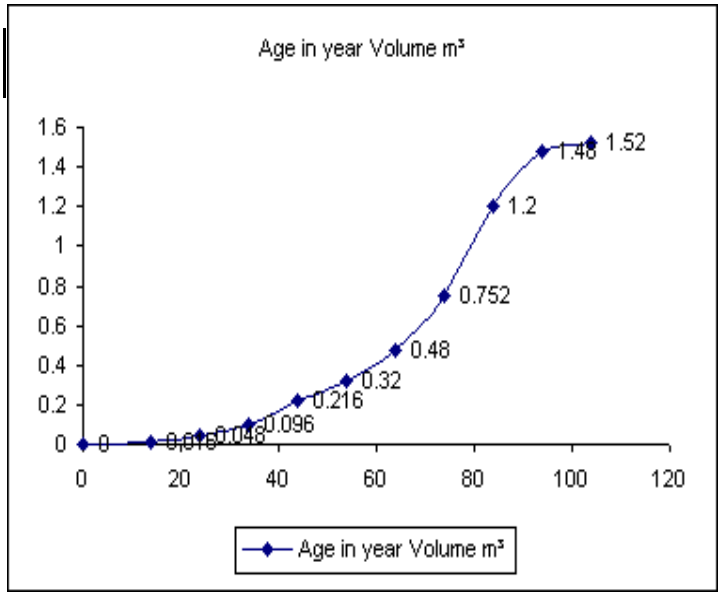
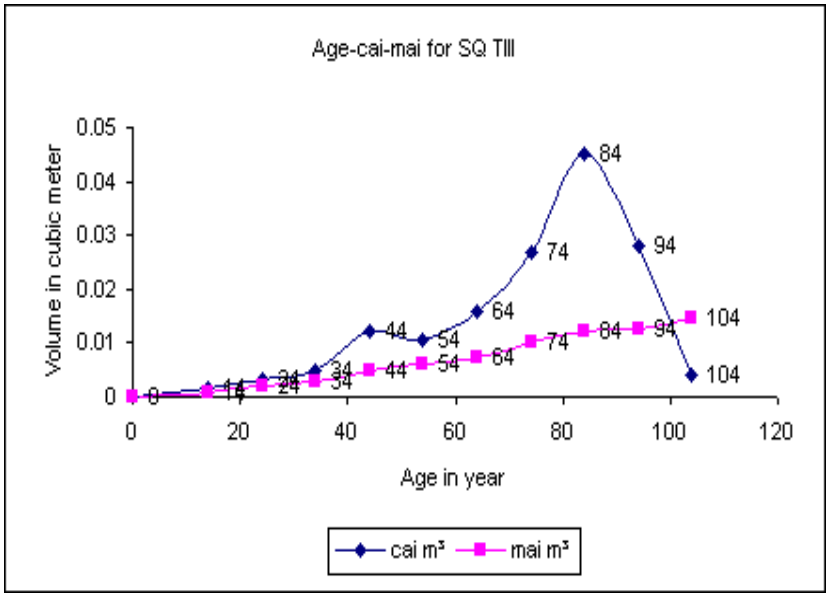


Table No-47
GRAPH NO-17
cai –mai for Teak Site Quality III

Age in year	**cai m³**	**mai m³**
0	0	0
14	0.0016	0.00092
24	0.0032	0.00200
34	0.0048	0.00284
44	0.0120	0.00492
54	0.0104	0.00592
64	0.0160	0.00752
74	0.0270	0.01012
84	0.0450	0.01228
94	0.0280	0.01276
104	0.0040	0.01460



CAI & MAI meet each other at the age of 97 years corresponds to GBH(OB) 135 cms

8.1.1.2. Details of results of Bija and ain have been given in appendix III of Volume II.

8.1.1.3. The results of stump analysis of bhirra, dhaoda and tendu carried out by Kartar Singh during preparation of working plan for earstwhile East Chanda Forest Division are reproduced as below:

Table No-48
GRAPH NO-18

Table showing result of stump analysis: *Bhirra (Chloroxylon swietenia)*

Age in year	GBH(OB) cm	DBH(OB) cm
12	15	4.8
24	30	9.5
33	45	14.3
43	60	19.1
55	75	23.9
67	90	28.6
79	105	3.4
92	120	38.2
108	135	43.0
124	150	47.

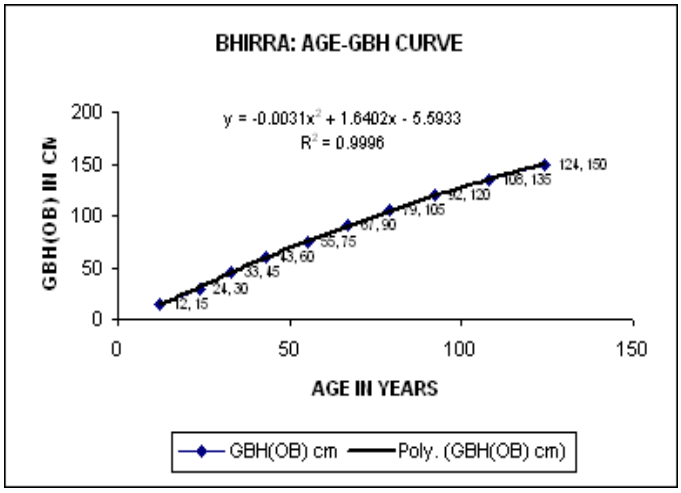


Table No-49
GRAPH NO-19
Table showing result of stump analysis: *Dhaoda (Anogeissus latifolia)*

AGE IN YEAR	GBH(OB) IN CM	DBH(OB) IN CM
16	15	4.8
28	30	9.5
40	45	14.3
52	60	19.1
66	75	23.9
80	90	28.6
93	105	3.4
107	120	38.2
123	135	43
142	150	47.7

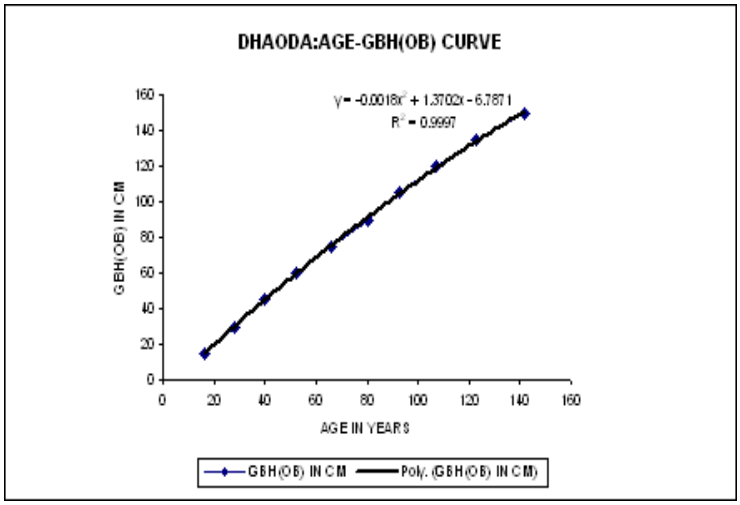
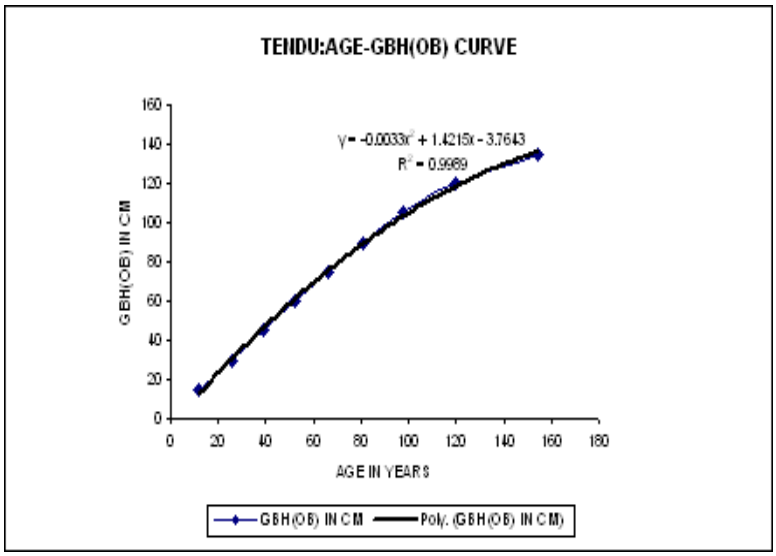


Table No-50
GRAPH NO-20

Table showing result of stump analysis: *Tendu (Diospyros melanoxylon)*

AGE IN YEAR	GBH(OB) IN CM	DBH(OB) IN CM
12	15	4.8
26	30	9.5
39	45	14.3
52	60	19.1
66	75	23.9
81	90	28.6
98	105	3.4
120	120	38.2
154	135	43



SECTION: 8.2: ENUMERATION RESULT

8.2.1.1. TREE ENUMERATION: 1% systematic line plot sampling method was adopted for enumeration of growing stock of the tract dealt with during 2005-06-2006-07. Due to interference from naxalites, stipulated enumeration work could not be completed. Enumeration parties were prevented from doing works. During discussion on II PWPR, it was suggested to use latest available data. Working Plan Office at Chandrapur-2 tried to conduct the enumeration works as and when opportunities available. Data were compiled from some compartments and analyzed. Comparative studies were done for respective available data of previous enumeration of 1990-93 and present data for respective compartments and given in appendix no-III in volume II. The result is produced as follows for respective ranges.

8.2.1.2. Range: Bhamaragarh, Tadgaon & Etapalli.
Year of Enumeration: 2006-07
No of Compartments covered : 35, mostly near to habitations.
Regeneration: on average profuse due to less biotic interference.
(Girth Class in centimeter, Number of tree/ha and Basal Area and Growing Stock are in square meter and cubic meter per hectare respectively.)

Table No-51

SrNo	GROUP	Species	15-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136& up	Total	Regn
1	A	Ain	16.0	10.1	9.7	5.9	6.3	5.6	5.9	2.8	5.2	67.4	75.0
2	A	Bija	0.0	0.7	1.0	2.8	3.8	3.8	3.5	2.4	3.8	21.9	41.7
3	A	Haldu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	A	Kalamb	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.0
5	A	Shisham	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

6	A	Shivan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	A	Teak	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.1
8	A	Tiwas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	**GROUP A TOTAL**		16.7	12.2	11.1	8.7	10.1	9.4	9.4	5.2	9.4	92.0	110.8
10	B	Garari	41.3	24.7	13.2	11.5	6.6	1.0	0.3	0.0	0.0	98.6	126.4
11	B	Lendia	14.9	9.0	4.5	3.5	1.0	1.4	0.0	0.0	0.0	34.4	28.8
12	**GROUP B TOTAL**		56.3	33.7	17.7	14.9	7.6	2.4	0.3	0.0	0.0	133.0	155.2
13	C	Khair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	**GROUP C TOTAL**		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	D	Amaltas	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
16	D	Aonla	1.4	1.0	0.3	0.7	0.3	0.3	0.0	0.0	0.3	4.5	0.0
17	D	Beheda	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
18	D	Bherra	3.5	1.4	1.0	0.0	0.7	1.0	0.0	0.0	0.0	7.6	0.0
19	D	Biba	0.3	0.3	0.3	1.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0
20	D	Char	5.9	7.3	1.7	1.7	0.0	0.0	0.0	0.0	0.0	16.7	9.7
21	D	Dhaman	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	D	Dhaoda	9.4	3.8	4.2	4.5	2.8	2.1	0.7	1.0	1.0	29.5	30.6
23	D	Dhoban	1.7	0.3	1.7	1.0	1.4	0.3	0.3	0.0	0.3	7.3	0.0
24	D	Ghoti	0.3	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	2.4	0.0
25	D	Hirda	0.0	0.0	0.3	0.3	0.0	0.7	0.0	0.0	0.0	1.4	2.4
26	D	Kasai	1.7	2.4	1.0	0.0	1.0	0.0	0.0	0.0	0.0	6.3	0.0
27	D	Kateain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	D	Kumbhi	1.4	3.8	1.4	0.7	0.7	0.3	0.3	0.3	0.0	9.0	0.0
29	D	Kusum	0.7	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
30	D	Moha	3.5	3.1	1.0	0.7	1.0	2.4	1.0	1.4	1.0	15.3	7.6
31	D	Mowai	1.0	0.0	0.3	0.7	0.3	0.0	0.0	0.0	0.0	2.4	1.0
32	D	Rohan	2.1	1.0	0.7	0.3	0.3	0.0	0.0	0.0	0.0	4.5	10.4
33	D	Salai	1.0	0.0	0.3	0.7	0.0	0.0	0.3	0.0	0.0	2.4	0.7
34	D	Semal	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0
35	D	Sehara	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	D	Surya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	D	Tendu	17.7	6.9	6.3	3.5	3.1	2.4	2.4	0.7	2.1	45.1	84.0
38	D	Other	0.0	1.0	0.7	0.7	0.3	0.3	0.3	0.0	0.0	3.5	2.8
39	**GROUP D TOTAL**		52.1	36.1	22.6	17.7	12.2	10.1	5.6	3.5	4.9	164.6	150.0
40	**GRAND TOTAL**		125.0	81.9	51.4	41.3	29.9	21.9	15.3	8.7	14.2	389.6	416.0
41	Basal Area/ha		0.526	0.942	1.149	1.521	1.638	1.673	1.553	1.132	2.318	**12.453**	
42	Volume/ha		1.750	2.294	3.597	7.024	7.615	7.438	6.951	5.469	11.175	**53.314**	

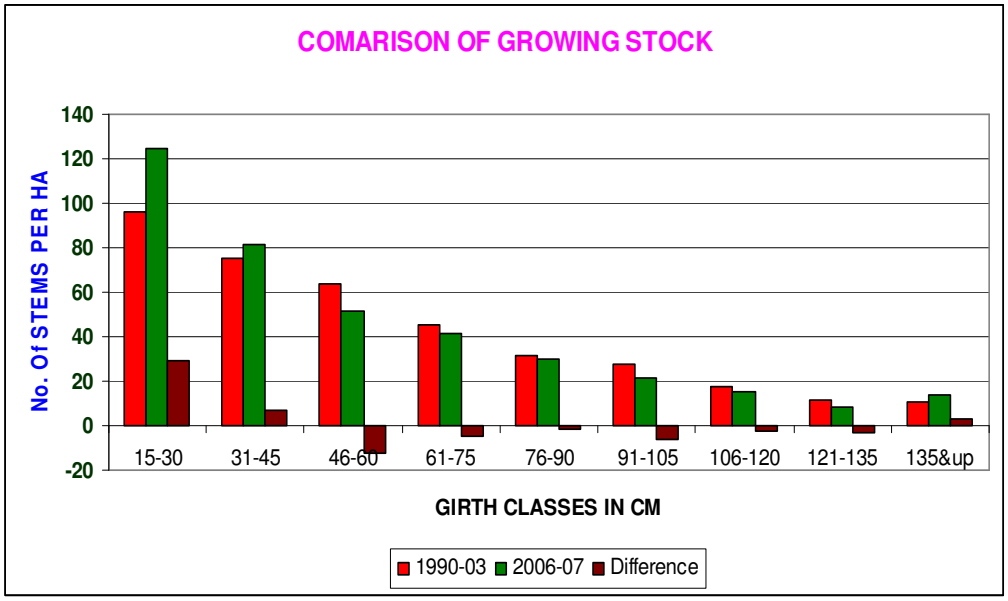
Table No-52

TABLE SHOWING GROWING STOCKS OF RESPECTIVE AREAS DURING 1990-93

Girth Class	1990-03	2006-07	Difference
15-30	95.9	125.0	29.1
31-45	75.3	81.9	6.6
46-60	63.6	51.4	-12.2
61-75	45.6	41.3	-4.3
76-90	31.3	29.9	-1.4
91-105	27.8	21.9	-5.9
106-120	17.9	15.3	-2.6
121-135	11.5	8.7	-2.8
135&up	10.8	14.2	3.4
Total	379.8	389.6	9.8
Regeneration	137.5	416.0	278.5

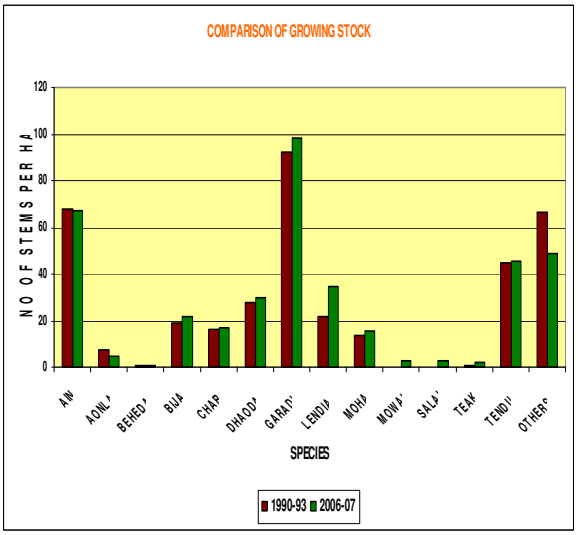
GRAPH - 21

GRAPH SHOWING THE TREND OF VEGETATION GROWTH



GRAPH-22

IMPORTANT SPECIES IN THE ENUMERATION AREA



SPECIES	1990-93	2006-07
AIN	67.9	67.4
AONLA	7.2	4.5
BEHEDA	1.0	0.7
BIJA	19.1	21.9
CHAR	16.3	16.7
DHAODA	28.0	29.5
GARADI	92.5	98.6
LENDIA	21.8	34.4
MOHA	13.4	15.3
MOWAI	0.1	2.4
SALAI	0.3	2.4
TEAK	0.9	2.1
TENDU	44.9	45.1
OTHERS	66.4	48.6
TOTAL	379.8	389.6

8.2.1.5. RESULT OF ENUMERATIONS: Random sampling of growing stock and compartmentwise results of respective compartments were studies for 1993-90 enumeration data and those of 2005-06 and 2006-07 data analyzed. Results show that there is increase in growing stock. Regeneration has been induced due to rest given to the tract as only 10% area were worked during the previous plan period. Biotic interference is comparatively less in the tract except in Tadgaon Range. In Tadgaon Range, the growing stock of middle age suffers small reduction due to local consumption for house hold and

local agriculture practices. Overall, pattern is in increase in growing stock in regeneration, basal area, Growing stock, species diversity.

SECTION: 8.3: STOCK MAPPING & G.I.S. APPLICATION:

8.3.1.1. Stock mapping was not done during previous plan preparation. With the help of data analysis of satellite imageries, NDVI (Normalized Differential Vegetation Index) was used to prepare the crown density classes.

8.3.1.2. During the course of revision of the plan, stock mapping have been carried out and data have been given in appendix no-II in volume II of this draft plan report.

8.3.1.3. With help of G.I.S. compatible Software entire data pertaining to drainage, contour, watershed, road, range, round, beat, division boundaries, stock mapping, important features like village, tank, rest houses, headquarters of range, round beats, Tahsils, etc have been digitized and digital data have been analyzed to get the extent of area and other features to arrive at the fixation of different working circles.

8.3.1.4. Satellite Data have been procured and analyzed at G.I.S. Cell in the Office of Chief Conservator of Forests Working Plan Nagpur. Stocking as per Satellite data of 1989 analyzed and reported in previous working plan and Satellite data of 2004 analyzed were compared for respective areas and data have been given in appendix no-II of Volume II of this draft plan report. Ground Truthing have been ascertained by conducting Ground Truthing during preparation of Draft Plan Report. On that basis management maps have been prepared. If Survey of India permits the use of MAPs by Forest Department as previously Forest Department was using 1:50,000 MAPs, and resources are made available at the disposal of CCF WP Nagpur, user officers will also be provided digital data to arrive at certain decisions with the help of Supportive Software.

TABLE NO-53

STOCK MAPPING RESULT OF DIVISION AREA

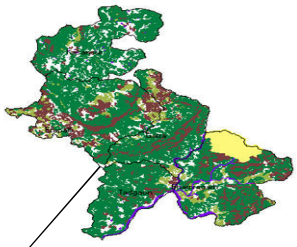
Sr.No.	Site QualityType	Area in Division (ha)	% w.r.t. Division Area
1	Miscellaneous I	3,121	0.8%
2	Miscellaneous II	58,615	19.9%
3	Miscellaneous III	183,947	50.0%
4	Miscellaneous IVa	20,670	5.6%
5	Miscellaneous IVb	10,501	2.9%
6	Miscellaneous Total	276,853	75.5%
7	Teak T I	0	0.0%
8	Teak II	411	0.1%
9	Teak III	1,124	0.3%
10	Teak IVa	282	0.1%
11	Teak IVb	2,645	0.7%
12	Teak Total	4,461	1.2%
13	Plantation	4,266	1.2%
14	Blank	31,546	8.6%
15	Miscellaneous area	50,606	13.8%
16	Grand Total	367,732	100%

MAP NO-1

STOCK MAPPING & ANALYSIS OF SATELLITE DATA

STOCK MAPPING RESULT

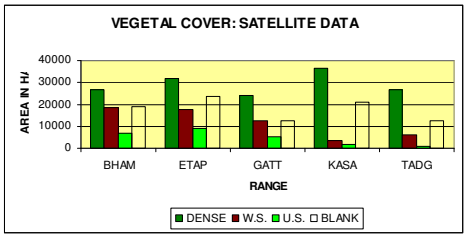
STOCKING IN TRACT



- 1:50,000 SHEETS: 13
- DRAINGE
- CONTOUR
- COMPARTMENTS
- STOCKMAPS
- DIVISION BOUNDARY
- RANGE BOUNDARIES
- ROUND BOUNDARIES
- BEAT BOUNDARIES
- ROADS
- TANKS
- IMPORTANT PLACES: TALUKA, RANGE, ROUND, BEAT HQRS, VILLAGES
- ANALYSIS OF SATELLITE IMAGERIES DATA
- WORKING CIRCLES
- FELLING SERIES
- COUPES

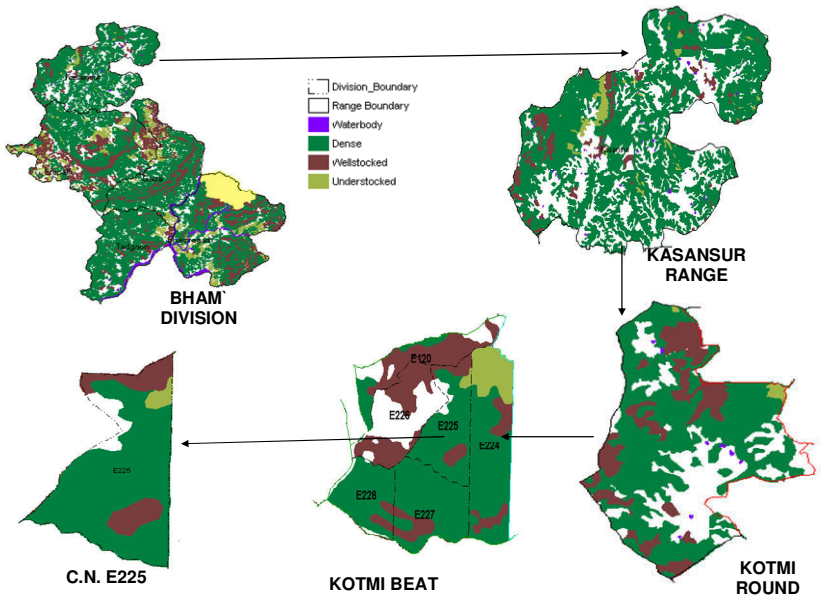
VEGETATION ANALYSIS

RANGE	DENSE	W.S.	U.S.	Blank/ Cultivation
BHAM	26678	18691	6937	18725
ETAP	32018	17483	9050	23658
GATT	24271	12654	5003	12306
KASA	36633	3652	1847	21228
TADG	26715	5940	1019	12659
DIVN	146315	58420	23857	88574
AREA SHORT	50606			

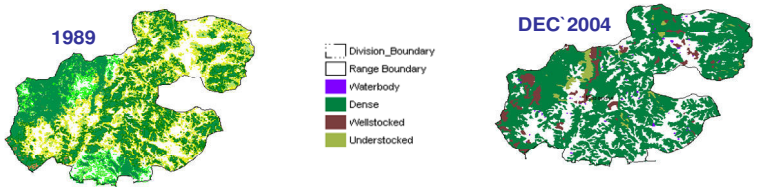


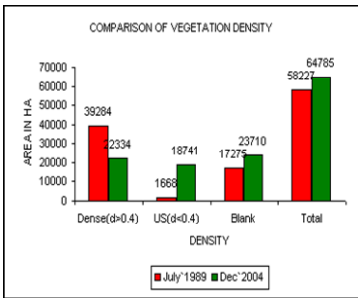
8.3.1.5. SATELLITE DATA ANALYSIS:

STOCKING IN THE TRACT: SATELLITE DATA ANALYSIS



Satellite Data Analysis Comparison: 1989 to 2004 for Kasansur Range





Density	1989	Dec`2004	Change
Dense(d>0.4)	39284.3	22333.6	16950.7
US(d<0.4)	1667.8	18740.9	17073.1
Blank	17274.8	23710.4	6435.7
Total	58226.8	64784.9	6558.1

ANALYSIS OF SATELLITE IMAGERIES DATA OF C.N. G424 :1989-2004

C.N. G424: 1989

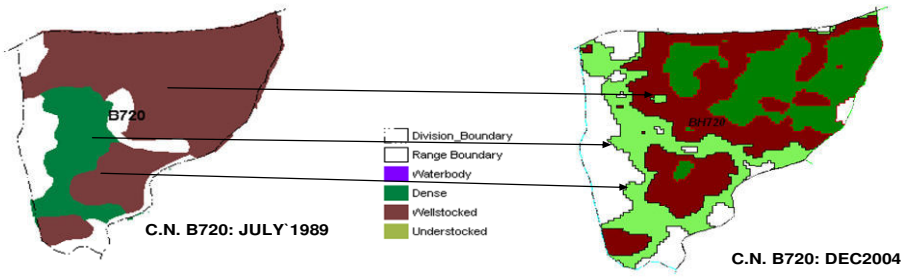
C.N. G424: DEC2004

COMPARISION OF VEGETAL COVERS

PERIOD	COMP AREA	DENSE	W.S.	U.S.	BL
1989	232.6	46.6	185.9	0.0	0.0
DEC` 2004	232.6	170.9	54.0	3.1	4.5
DIFF	0.0	+124.3	-131.9	+3.1	+4.5

AREA IS IN HECTARE
DENSE d> 0.6
W.S. WELL STOCKED 0.4<d< 0.6
U.S. UNDER STOCKED 0.1<d<0.4
BL BLANK d< 0.1

ANALYSIS OF SATELLITE IMAGERIES DATA OF C.N. B720 :1989-2004



PERIOD	COMP AREA	DENSE	W.S.	U.S.	BL
JULY` 1989	336.8	55.4	221.8	0.0	0.0
DEC` 2004	336.8	82.2	124.0	73.4	57.5
DIFF	0.0	+26.8	-97.8	+73.4	+57.5

AREA IS IN HECTARE
DENSE d> 0.6
W.S. WELL STOCKED 0.4<d< 0.6
U.S. UNDER STOCKED 0.1<d<0.4
BL BLANK d< 0.1

Note: Blank area consists of non forest area and encroached area. Difference in area is due to inclusion of non forest.

SECTION: 8.4. FORM FACTOR

8.1.1.1. Commercial Form Factor used in the past and prepared on the basis of actual trees felled and volume calculated for the tract dealt with is reproduced below.

Table No-58

GIRTH CLASS IN CM	TIMBER IN CMT	FIREWOOD IN SOLID VOLUME CMT	TOTAL VOLUME IN CMT
15-30	0.014	-	0.014
31-45	0.028	-	0.028
46-60	0.070	-	0.070
61-75	0.110	0.060	0.170
76-90	0.165	0.090	0.255
90-105	0.220	0.120	0.340
106-120	0.310	0.175	0.485
121-135	0.400	0.230	0.630
135-150	0.485	0.330	0.785
151 & ABOVE	0.570	0.430	1.000

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CHAPTER –IX

ESTIMATE OF CAPITAL VALUE OF FORESTS

SECTION 9.1. VALUE OF THE ECOSYSTEM

9.1.1.1. Forests are part and parcel of ecosystem. Ecological systems render services which are critical to the functioning of Earth's life-support system. They contribute to welfare of mankind both directly and indirectly. Hence forests represent part of economic value of State.

9.1.1.2. Forests ecosystems provide a variety of economic values for society. These values are associated with the direct use of ecosystem products, indirect use of ecosystem services, and non use of species and habitats.

(a) Direct Use: Direct use of ecosystem outputs are extraction of timber, fuelwood, flowers, fruits and other parts of trees, shrubs, herbs, grasses, climbers, epiphytes etc; recreation and water withdrawal.

(b) Indirect Use: It is derived in the form of appropriation of ecosystem services that serve as inputs for, and often make possible at all, human production of goods and services. Services performed by ecosystems include maintenance of hydrological and nutrient cycles, soil formation and erosion control, pollination, habitat provision, nursery for fish and game species, provision for food and water for humans and livestock, climate regulation, disturbance regulation, waste management and biological control.

(c) Non Use Value: It includes existence, stewardship, bequest and optional values, which individuals attach to knowing that particular species and habitats exist and passed on to posterity, even though they may never come into contact with the species or habitats. Direct use, indirect use, and non use values together make up the total economic value of these systems.

Thus Total Economic Value of forests is given by:

Total Economic Value (TEV) = Use Value (UV) + Non Use Value (NUV)

UV = Direct Use Value (DUV) + Indirect Use Value (IUV) + Optional Value (OV).

NUV = Existence Value (EV) + Bequest Value (BV).

Therefore: TEV = (DUV + IUV + OV) + (EV + BV)

9.1.1.3. Robert Costanza, Ralph d`Arge, Rudolph de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert V. O`Neill, Jose Paruelo, Robert G. Raskin, Paul Sutton and Marjan van den Belt have studies the ecosystem and valuated the services of ecosystem and given values to natural capital. Their studies is for all kind of eco systems.

9.1.1.4. Our discussion is confined to Forest Ecosystem. Regarding Forest Ecosystems they have categorised them into Tropical Forests and Temperate Forests. As the tract dealt with comes under Tropical Forests Ecosystems we will confine our valuation to this system only. They arrived at Total Value of Services of Tropical Forests System is 2,007 $ ha^{-1} yr^{-1} at the price level of 1994. Accordingly, Total Value of Services of Forests of the tract is 7.39 x 10^8 US$ yr^{-1} say Rs 3.69 x 10^{10} yr^{-1}. Total Value of Services of Forests of the tract for the plan period of 10 year is arrived at 7.39 x 10^9 US$ or **Rs 36,900 Crores.** (For 367,731.681 ha). Values of goods and services rendered by Tropical Forest Ecosystem have been given in following table.

TABLE NO-54

SrNo	Ecosystem services	Biome Forests Type: Tropical Forests.	For area of the tract Type: Tropical Forests. Area : 367,731.681ha
1	Gas regulation		7.38 x 10^8 yr^{-1} Or Rs 3.69 x 10^{10} yr^{-1} For the plan period of 10 year: 7.38 x 10^9 $ Or **Rs 36,900 Crores.**
2	Climate regulation	223	
3	Disturbance regulation	5	
4	Water regulation	6	
5	Water supply	8	
6	Erosion control and sediment retention	245	
7	Soil formation	10	
8	Nutrient cycling	922	
9	Waste treatment	87	
10	Pollination		
11	Biological control		
12	Refugia		
13	Food production	32	
14	Raw material	315	
15	Genetic resources	41	
16	Recreation	112	
17	Cultural	2	
18	Total Value	2,007 $ ha^{-1} yr^{-1}	

Open cells indicate lack of available information.

9.1.1.5. Thus the tract dealt with provides services to the tune of Rs 3.69 x 10^{10} yr^{-1} i.e. Rs 36,900 crores per annum. If it is incorporated into Gross Domestic Product (GDP) of the State, then the contribution of forestry sector will be more than that of any other sector. Thus forestry sector needs special attention. Accordingly, it needs fair contribution in fund flow for development.

SECTION 9.2. CURRENT VIEW ON INTANGIBLE BENEFITS OF FORESTS

9.2.1.1. At present**,** taking account of intangible benefits of forests is established. Even Honourable Supreme Court of India in its ruling in October 2002, has taken cognizance of intangible value of forests. In addition to the usual payment for the loss of trees, the SC decreed, those who cut forests must pay for the loss of the intangible benefits as well. A one time payment of Rs. 5.8 to 9.2 lakh per hectare has been set by the Supreme Court as the "Net Present Value" i.e. NPV of forest land according on the quality and density of forest.

9.2.1.2. Taking account of site quality and density of forests of Bhamaragarh Forest Division, NPV of the forest land will be as follow.

Table No-55

Type of Forest	**Area in ha**	**NPV/ha**	**Gross NPV**
Tree Forests	240,753.60	Rs. 9.2 Lakh	Rs 2,214,924 Lakh
Minor forests	100,782.694	Rs. 5.8 Lakh	Rs 584,540 Lakh
Protection Forest	26,753.600	Rs. 9.2 Lakh	Rs.246,133 Lakh
Gross Total for division	367,731.600		Rs. 3,044,004 Lakh **Say Rs. 30,440 Crores**

9.2.1.2. On comparing two values arrived at we have even conservative value of our discussed forests as Rs **30,440** Crores is of equally of great value in comparison of International trend of valuation to the tune of Rs **36,900** Crores/ year.

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CHAPTER – X

WILDLIFE PRESERVATION

SECTION: 10.1. HISTORY AND WILDLEFE PROTECTION

10.1.1.1. The tract dealt with has been an ideal natural habitat for the wildlife. The forests are mainly of miscellaneous species and are dense and rich so far as varieties of species are concerned. Good varieties of wild animals inhabited the tract in the past. But due to indiscriminate shooting, poaching and shikar by the local tribals mainly Madias and outsiders, the wild animals in most part of this tract have almost become absent despite having beautiful natural vegetation as an ideal habitat.

SECTION: 10.2. DISTRIBUTION OF WILDLIFE

10.2.1.1. The fauna were widely distributed in areas adjoining rivers. The wild animals commonly found in the past and rarely at present in this tract are as follows:

10.2.1.2. CARNIVORA: Tiger (Panthera tigris), Panther (Panthera pardus), Hyaena (Hyaena hyaena), Wild Dog (Cuon alpinus), Wolf (Canis lupus), Jackal (Canis aureus), Fox (Vulpes bengalensis), Jungle Cat (Felis chaus) etc.

10.2.1.3. OMNIVORA: Sloth Bear (Melursus ursinus).

10.2.1.4. HERBIVORA : Bison (Bos gaurus), Sambhar (Cervus unicolor), Cheetal (Axis axis), Nilgai (Boselaphus tragocamelus), Wild Boar (Sus scorfa), Barking Deer (Muntiacus muntjak), Langur (Presbytis entellus).

10.2.1.5. RODENTS & **REPTILES:** Mongoose, Rats, Mice, Snakes of many varieties like Cobra, Karait, Dhaman, Viper, Python etc and Crocodile (*Magar*).

10.2.1.6. AVI FAUNA: Painted Sand Grouse (Pterocles indicus), Common Sand Grouse (Pterocles exustus), Pea Fowl (Pavo cristatus), Grey Jungle Fowl (Gallus sonneratii), Painted Partridge (Francolinus pictus), Grey Partridge (Francolinus pondicerianus), Black Breasted Quail (Coturnix coromandelicus), Red Spur Fowl (Galloperdix spadicea), Crane (Grusantigone spp), Spotted Bill Duck (Anas poecilorhyncha), Pigeon (Treon phoenicaptera), Dove (Streptopelia spp), Cotton Teal (Nettapus coromandelianus), Whistling Teal (Dendrocygna javanica), Cuckoo (Cuculus varius), Snipe (Capella galliachges) etc.

10.2.1.7. The tract dealt with is situated in the interior most parts of the district and away from town. Due to this the wildlife was having least disturbances. Besides, with the existence of perennial water courses in the form of three main rivers and stagnant pools formed the area highly capable for supporting a variety of wild animals and birds. But due to opening of the tract to the outsiders through development of roads and other amenities, the area became easily accessible and wildlife were exposed to them. Which led to shikar and poaching of wildlife causing depletion of their number.

SECTION: 10.3. CONCENTRATION OF WILD ANIMALS

10.3.1.1. Areas known for the concentration of the wild animals in the past and as recorded in previous plan are follows: Babulai hills, Kumarguda nala, near 1964 teak plantation in Tadgaon Range; Khandi, Kunjemarka, Kothi, Moncandi, Padhur, Hikker and Rekabatad villages in Gatta Range; near Pamalgautam River, near Bhamragarh village, and near villages Pirmalbhatti and Bhatpar.

10.3.2. SHOOTING AND GAMES

10.3.2.1. The wild animals were classified for the purpose of shooting into three categories viz (i) Very big game, (ii) Big game and (iii) Small game. The details of which are as follows:

10.3.2.2. VERY BIG GAME

Bison (Bos gaurus) : They were occurring in small herds in the hilly region. During summer they were frequently seen in the plain forests along the main rivers and the main water courses. Stray herds were noticed occasionally. Main cause of disappearance is told that Foot and Mouth Disease broke out in the tract during late seventies in previous centuary and almost wiped out this magnificent spp. Migratory herds from adjoining Chhattisgarh frequently visit the tract. Bhamaragarh Wildlife Sanctuary has been carved out for their protection.

10.3.2.3.BIG GAME

(a) Tiger (Panthera tigris) : Tiger (Sher) was occurring in moderate number. During summer they usually remained confined to the water courses. A few migratory ones, occasionally used to enter into this tract from Bastar Division of Chhattisgarh. Presently, Tigers are confined to only a part of the tract. Tiger is sighted in Gatta and Bhamragarh Ranges.

(b) Panther (Panthera pardus) : They were less common in this tract . They were seen frequently only around the villages. Sometimes they used to enter into villages and do considerable damage to the cattle.

(c) Sambhar (Cervus unicolor), **Cheetal** (Axis axis), **and Blue Bull** (Boselaphus tragocamelus) : They were confined in the foothills only.

(d)Barking Deer (Muntiacus muntjak) : They were found all over the tract.

(e) Sloth Bear (Melursus ursinus): The people are very much afraid of this animal as it attacks unprovoked. Therefore, they are still available in this tract in good number.

(f) Wild Boar (Sus scorfa) : They are very common all over the area.

(g) Wild Dog (Cuon alpinus) : They move over in pack and do considerable damage to the wild animals. These packs are seen moving in the forests. However, the exact location can not be given.

10.3.2.4.SMALL GAME

The Malabar squirrel (Scrinus spp), Flying Squirrel, Jackal (Canis aureus), Hyaena (Hyaena hyaena), Porcupine (Hystrix indica), Langur Monkey (Presbytis entellus) were common all over the tract.

10.3.2.5. BIRDS

Pea fowl (Pavo cristatus), Grey Jungle Fowl (Gallus sonneratii) pondicerianis), Bater (Coturnix coromandelicus), Saras Crane (Antigone antigone) are common in the tract.

10.3.2.6. The people (mainly Madia) eat rats, lizards, red ants and any animals which are not poisonous. Village Patels used to do shikar and distribute the meat to the villagers in the past.

SECTION: 10.4. SHOOTING BLOCKS

10.4.1.1. Following shooting blocks were identified in which shooting was permitted on licenses.

Table No-55

TABLE SHOWING SHOOTING BLOCKS IN PAST

Block	Range	Taluka	Area in sq. miles
Bhamragarh	Bhamragarh	Bhamragarh	374.21
Gatta	Gatta	Etapalli	437.70
Ghotsur	Kasansur	Etapalli	612.48
Surjagarh	Etapalli	Etapalli	483.61
Etapalli	Etapalli	Etapalli	539.00

SECTION :10.5. PAST BMANAGEMENT OF WILDLIFE AND ITS RESULTS

10.5.1.1. During Zamindari period, these forests were managed by Jamindars. Accordingly, no rule of the land was applicable to them. There existed no rules for the regulation of hunting in these forests and the killing of animals for pleasure as well as for the sport by the Jamindars was common in tract.

10.5.1.2. After Zamindari period, tract was part of C.P. & Berar State. Regulation of wildlife was per the rules framed under C.P. & Berar Games Act, 1935 and the Game Block Rules.

10.5.1.3. Rules framed under Bombay Wild Animals and Wild Birds Protection Act of 1951 was made applicable to the Vidarbha region after formation of Maharashtra State in 1960. Wildlife (Protection) Act, 1972 is applicable after its inception. Hunting of animals has been completely banned.

10.5.1.4. Though the hunting of wild animals is completely banned, the number of wild animals in the tract is precariously less. The main attribute to the cause of depletion is indiscriminate hunting by the local in the past and outsiders as well.

SECTION :10.6. LEGAL POSITION

10.6.1.1. In past the tract was not the part of British Crown. Hence the Acts and Rules formed for protection of the wildlife were not applicable to the tract before independence.

10.6.1.2. In post independence era all Acts and Rules of the land were applicable to the tract due to annexation of the tract to main stream of National Administration. Provisions of Indian Forest Acts, 1927 and Wildlife Protection Act 1972 and the amendments made from time to time and rules framed accordingly are in enforcement to the tract.

SECTION: 10.7. RIGHTS AND CONCESSIONS

10.7.1.1. No rights and/or privilege are granted to any person over wildlife. As per section 17-A of Wildlife Protection Act, 1972 picking, uprooting, etc of specified plant is prohibited, provided, "a member of schedule tribes can subject to the provisions of chapter IV of Wildlife Protection Act, pick, collect or possess in the district he resides any specified plants or plant derivative thereof for this bonafide personal use." As per section 17-B- The Chief Wildlife Warden may, with the previous permission of the State Government, grant to any person to pick, uproot, acquire or collect from a forest land …. Any specified plant for the purpose of (a) education; (b) scientific research; (c) collection, preservation and display in a herbarium of any scientific institution; or (d) propagation by a person or an institution approved by the Central government in this regard.

SECTION: 10. 8: OTHER MEASURES ADOPTED FOR PROTECTING WILDLIFE:

10.8.1.1: Besides the legal provisions under the Wildlife (Protection) Act, 1972, amended from time to time and the various rules made there under, following measures have been taken to protect the wildlife.

10.8.1.2:Compensation is paid to the owner whose cattle are killed by a tiger in the forest areas as per the provisions contained in Government Resolution No WLP/1570/224482-X-II, dated September 30, 1971, No MSC-1075/113554/F-1, dated March 25, 1977 and No WLP/1579/6200/4/F-1, dated May 29, 1979 This provision was extended to the cattle killed by panther also and the killing by tiger or panther outside the forest areas also was included vide Government Resolution No WLP/1581/116974/F-5, dated August 22, 1984 and amended from time to time.

10.8.1.3: Provision has been made for compensation in case of death or injuries to human life by wild animals vide Government Resolution No WLP/1002/Pr.Kr. 258/F-1 dated, January17, 2003. The maximum amount of compensation in case of death is Rs 200,000/- , in case of serious injury Rs 50,000/- and for minor injuries Rs 7,500/-. As per Government Resolution issued from time to time in case of cattle killing the amount of compensation is upto Rs 9000/- vide above GR.

10.8.1.4: In 1972, with a view to check illicit shooting of wild animals, the State Government sanctioned the grant of reward to the informants in respect of unlicensed shooting provided that the information is found to be valid and leads to the conviction of the offender. In addition, the State Government has decided to sanction the rewards

equal to 50% of the compensation actually recovered from the offender for illicit shooting to the Gram Panchayat or its office bearers or individuals who render cooperation in detecting such illicit shooting. Besides, the above mentioned legal provisions for protection of wildlife, public awareness for protection and preservation of wildlife is created through the celebration of wildlife week from October 2, every year since 1951. Under the purview of the aforesaid Act, Rules, and Government Resolutions the efforts made for registering offences have been given in this plan. The details of cattle lifting, injuring or killing of human being in the tract will be given in the Volume II of Draft Plan Report.

SECTION: 10.9: INJURIES TO WILDLIFE: The following agents are mainly responsible for the destruction of wildlife in Bhamaragarh Forest Division:

10.9.1.1: SHIKAR: Shikar by tribals, though not recorded, is the most important reasons for destruction and depletion of the wild animals in the tract. The local tribal, particularly Madia is very fond of meat. They go for shikar resulting into the fact that not even a langoor is seen in most part of this tract now. Presently, the threat to the wild animals is not only from local Madia and other tribals of the tract but also from the anti social elements taking cover under naxalite activities.

10.9.1.2: FIRE: The forest of the tract is prone to recurring fires annually. Sometimes remotest areas caught fire causing serious damage to wildlife and its habitat. This leads to exposure of wild animals to human habitation and thus provides opportunity to be hunted. Fire not only burns the tract vegetation but also changes the vegetal cover and its quality which is detrimental for survival of wildlife in its perpetuity. More often than not, fire is caused by local tribal hunters and outsiders to ensure clear ground for trapping and chasing animals through domesticated and trained dogs.

10.9.1.3: WATER: Most of the streams, except a few big rivers, become dry during summer. Therefore, animals have to visit only a few water bodies. This fact makes the villagers and poachers easy to kill the wild animals. But long stretch of perennial rivers along the boundaries of tract serves as heaven for wildlife. That is why; still wildlife is abundant in some parts of the tract.

SECTION: 10.10: GENERAL MEASURES SUGGESTED FOR THE PROTECTION, CONSERVATION AND DEVELOPMENMT OF WILDLIFE

10.10.1.1. The general measures suggested are as follows:

(i) The area should be strictly and effectively protected from fire.
(ii) To keep vigilant watch on poachers/villagers.
(iii) Water pools, which provide water to wild animals during summer, should be kept under constant watch.
(iv) Informers should be promptly rewarded.
(v) Salt licks should be developed.
(vi) Shelter and hiding places should be developed at the required places.
(vii) Construction of bunds, anicuts, forest tanks etc. on nalas at suitable places should be carried out for providing permanent water holes to the wild animals.

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CHAPTER – I

BASIS OF PROPOSALS

SECTION – 1.1.1: NATIONAL FOREST POLICY

1.1.1.1: National Forest Policies for India were enunciated in the years 1894, 1952 and 1988. The changes in the policy were brought about according to prevailing national needs and public requirements both local and general.

1.1.1.2: FOREST POLICY 1894 FOR INDIA: The objectives of the Forest Policy of 1894 were as follows:

(1) To preserve climate and physical conditions of the country.
(2) To preserve minimum amount of forest necessary for the general well being of the country.

1.1.1.3 Other priorities of 1894 forest policy were:

(1) Priority to cultivation over forestry.
(2) To meet the local public demand from forest, free or at concessional rates, prior to the revenue consideration.
(3) Realization of revenue to the greatest possible extent after meeting the local demand.

1.1.1.4: NATIONAL FOREST POLICY OF 1952: Deteriorating environmental conditions in the country changed the view point of the policy makers while enunciating the forest policy. World Wars, dependence of defence and reconstruction schemes on forestry were basic turning factors in making the forest policy. The following needs were identified

(1) The need for evolving a system of balanced and complementary land use, under which each type of land is allotted to that form of use under which it would produce maximum and deteriorate the least.
(2) The need for checking:
    (a) Denudation in mountainous region.
    (b) Erosion along the treeless banks of great rivers and on vast undulating wastelands.
(3) The need for establishing tree lands, to ameliorate physical climatic conditions for general well being of the people.
(4) The need for progressively increasing demand for grazing, small wood for agricultural implements, firewood etc and to release the cattle dung for manure to step up food production.
(5) The need for the realisation of revenue in perpetuity.

1.1.1.5: The Forest Policy of 1952 stated that the discretion of the State Government to regulate the details of forest administration in their respective territories is left unfettered to enable them to frame their policies and legislation for conserving and utilising the forest resources, provided that those policies of the State do not impinge

adversely upon the general economy and physical balance of an adjoining State and in general the Forest Policy of the Central Government.

1.1.1.6: NATIONAL FOREST POLICY OF 1988: With 42nd amendment to Constitution of India, Forest has been brought to Concurrent List from State List. The Central Government exercises more authority in forestry matters now. Which is clearly reflected in the National Forest Policy of 1988. The reasons for such changes were the increasing demand for timber, fuelwood and fodder, inadequacy of protection measures, diversion of forest lands to non forestry uses and tendency to maximum revenue realisation. The present policy is based upon the realisation of basic facts that forests are to be managed primarily for preservation, maintenance, sustainable utilization, restoration and enhancement of natural environments.

1.1.1.7: Basic objectives that should govern the National Forest Policy, 1988 are the following:

(1) Maintenance of environmental stability through preservation and restoration of ecological balance that has been adversely disturbed by serious depletion of the forest of the country.
(2) Conserving the national heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna which represent the remarkable biological diversity and genetic resources of the country.
(3) Checking soil erosion and denudation in the catchment areas of the rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs.
(4) Increasing substantially the forests/tree cover in the country through massive afforestation and Social Forestry Programmes, especially on all denuded, degraded and unproductive lands.
(5) Meeting the requirements of fuelwood, fodder, minor forests produce and small timber of the rural and tribal population.
(6) Increasing the productivity of forests to meet essential national needs.
(7) Encouraging efficient utilization of the forest produce and maximum substitution of wood.
(8) Creating a massive people's movement with the involvement of all women, for achieving these objects and to minimize pressure on existing forests.

1.1.1.8: The principal aim of the Forest Policy, 1988 is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium, which is vital for sustenance of the life forms: human, animal and plant. The derivation of direct economic benefit must be subordinate to this principal aim.

1.1.1.9: The basic emphasis of the policy is on the management of the existing forests and forestland keeping in view the protection, improving their productivity and conservation of total biological diversity by strengthening the network of National Parks, Sanctuaries, Biosphere Reserves and other Protected Areas, providing sufficient fodder, fuel and pasture in areas adjoining forest to prevent their depletion and protecting, improving and enhancing the production of minor forest produce which provides the sustenance to tribal population. Based upon these objectives the salient features of Forest Policy, 1988 are as follows

(1) Severe restrictions on schemes and projects, which interfere with forests, that clothe steep slopes, catchment of rivers, lakes and reservoirs.
(2) No working of forests without the Central Government having approved the Management Plan.
(3) Non-introduction of exotic species without long term scientific trials for species.
(4) The rights and concessions including grazing always remain related to the carrying capacity of forests.
(5) Rights and concessions enjoyed by the tribal should be protected. Their domestic requirement of fuelwood, fodder, minor forests produce and timber for construction should be the first charge.
(6) Forest management plans to take special care of the needs of wildlife Conservation.
(7) Effective action should be taken to prevent encroachments on forest land and the existing encroachment should not be regularised.
(8) Forest based industries should raise the raw material needed by themselves in arrangement with the private cultivators.
(9) Survey of forest resources to be completed on scientific lines for updating information.

SECTION-1.2: NATIONAL WILDLIFE ACTION PLAN (2002-2016)

1.2.1: PREAMBLE

1.2.1.1: BACKGROUND: The first National Wildlife Action Plan (NWAP) was adopted in 1983, based upon the decision taken in the XV meeting of the Indian Board for Wildlife held in 1982. The plan had outlined the strategies and action points for wildlife conservation which are still relevant. In the meanwhile, however, some problems have become more acute and new concerns have become apparent, requiring a change in priorities. Increase commercial use of natural resources, continued growth of human and livestock populations and changes in consumption patterns are causing greater demographic impacts. Biodiversity conservation has thus becomes a focus of interest. The National Forest Policy was also formulated in 1988, giving primacy to conservation. Hence, this new National Wildlife Action Plan.

1**.2.1.2**: **OVERVIEW**:

(i) Wildlife encompasses all uncultivated flora and undomesticated fauna. Every species has right to live and every threatened species must be protected to prevent its extinction.

(ii) Water, wilderness and wildlife are irrevocably interlinked. With mounting agricultural, industrial and demographic pressures, wilderness areas, which are the richest repositories of wildlife and biodiversity have either shrunk or disappeared. Their continued existence is crucial for the long-term survival of biodiversity and the ecosystems supporting them.

(iii) Effective ecosystem conservation is the fundamental of long-term ecological and economic stability. Natural processes, forests and wildlife habitats recharge aquifers, maintain water regimes and moderate the impact of floods, droughts and cyclones. Thereby they ensure food security and regulate climate change. They are also

a source of food, fodder, fuel and other products supplementing the sustenance of local communities.

(iv) India ranks sixth among the 12 mega biodiversity countries of the world. Conservation of biodiversity is directly linked with conservation of ecosystems and thus with water and food security. These together constitute a major plank of Indian economy.

(v) National planning has not taken into account the adverse ecological consequences of shrinkage and degradation of wilderness from the pressures of population and commercialization. As a result, we have witnessed the alarming erosion of our natural heritage which comprises rivers, aquifers, forests, grasslands, mountains, wetlands, coastal and marine habitats, arid lands and deserts. This has also affected natural phenomena such as breeding, ranging and migration of wildlife and geomorphologic features.

(vi) The increased frequency and intensity of natural disasters, the plummeting fertility of our soils and the accelerated degradation of our fresh water resources have imposed a crippling financial burden on the nation. This underscores the realign development priorities to take into account ecological imperatives including the protection of wild species, which sustain and enhance natural habitats, even as they depend on such areas for their survival.

(vii) Rural development for communities inhabiting forest lands and other wilderness regions suffers both from inadequate resources and inappropriate measures. It has failed to address their strong dependence upon natural biomass resources vis-à-vis the shrinking and degrading resource base. Farm productivity has also declined due to lack of proper support, causing impoverishment and enhanced pressures upon natural areas. Resource impoverished communities have therefore begun to place even greater pressure on the biomass of our forests and have led to widespread alienation of people from the goals of nature conservation efforts.

(viii) Habitats loss caused by development projects such as dams, mines etc. compound the problems of wildlife conservation.

(ix) The constraining impact of habitats loss has been compounded by illegal trade fuelled by a rising demand of wildlife products and their lucrative prices in the international markets.

1.2.2: POLICY IMPERATIVES

1.2.2.1: Ecological Security: To protect the long-term ecological security of India, the national development agenda must recognize the imperative of identifying and protecting natural ecosystems from over-exploitation, contamination and degradation. Short term economic gains must not be permitted to undermine the ecological security.

1.2.2.2: Priority to Conservation: Assigning conservation a high priority both at the level of central and state governments is an imperative. Its integration in all development programmes, evolving appropriate funding mechanism, enhancement of financial allocations and provision of adequate personnel with requisite expertise has to

be ensured, to arrest the ongoing trend of degradation and to restore wildlife and its habitats.

1.2.2.3: National Land Use Policy: The NWAP cannot be implemented in isolation. Wildlife cannot be restricted to national parks and sanctuaries. Areas outside the protected area network are often vital ecological corridor links and must be protected to prevent isolation of fragments of biodiversity, which will not survive in the long run. Land and water use policies will need to accept the imperative of strictly protecting ecologically fragile habitats and regulating use elsewhere.

1.2.2.4: Primacy for Water and Sustenance: Water must be recognized as a prime product of natural forests. Forests must be managed to optimize and protect hydrological systems. The National Forest Policy of 1988 which emphasizes conserving our natural heritage in the form of natural forests, flora and fauna, is in consonance with this imperative. A critical imperative is also to recognize forests, wetlands and other natural habitats as a source of survival for millions of people, in particular as a source of NTFP and aquatic resources.

1.2.2.5: In Situ Conservation: Primacy must be accorded to in situ conservation, the sheer anchor of wildlife conservation. Ex situ measures in zoological parks and gene banks may supplement these objectives, without depleting scarce wild resources.

1.2.2.6: People`s Support for Wildlife: Local communities traditionally depend on natural biomass and they must, therefore, have the first lien on such resources. Such benefits must be subject to assumption of a basic responsibility to protect and conserve these resources by suitably modifying unsustainable activities. Conservation programmes must attempt to reconcile livelihood security with wildlife protection through creative zonation and by adding new Protected Area (PA) categories in consultation with local communities, such as an inviolative core, conservation buffer, community buffer and multiple use areas.

1.2.2.7: Man-Animal Conflict: While increasing man-animal conflict is an outcome of shrinkage, fragmentation and deterioration of habitats, it has caused destruction of wildlife and generated animosity against wild animals and protected areas. This is a crucial management issue, which needs to be addressed through innovative approaches.

1.2.3.1: STRATEGY FOR ACTION: Adopting and implementing strategies and needs outlined above will call for action covering the following parameters:

I. Strengthening and enhancing the Protected Area Network.
II. Effective Management of Protected Areas.
III. Conservation of Wild and Endangered Species and Their Habitats.
IV. Restoration of Degraded Habitats outside Protected Areas.
V. Control Poaching, Taxidermy and Illegal Trade in Wild Animal and Plant Species.
VI. Monitoring and Research.
VII. Human Resource Development and Personnel Planning.
VIII. Ensuring People`s Participation in Wildlife Conservation.
IX. Conservation Awareness and Education.
X. Wildlife Tourism.

XI. Domestic Legislation and International Conventions.
XII. Enhancing Financial Allocation for Ensuring Fund Flow to the Wildlife Sector.
XIII. Integration of National Wildlife Action Plan with Other sectoral Programmes.

SECTION-1.3: NATIONAL FORESTRY ACTION PROGRAMME

1.3.1.1: To reverse the process of degradation and for sustainable development of forests, the Government of India have prepared National Forestry Action Plan (NFAP), a comprehensive strategic plan to address the issues underlying the major problems of the forestry sector. The objective of the NFAP is to enhance the contribution of forestry and tree resources to ecological stability and people centered development through qualitative and quantitative improvement in the forest resources.

1.3.2.1: Identified issues in forestry sector: The objective of NFAP is to evolve issue based programmes in the line of provisions of the National Forestry Policy, 1988. It is to integrate the forestry development programmes in the country within the framework of National Five Year Plans. Five inter-related basic issues have also been identified and these are the basis of the following programmes structure.

I. Protect existing forest resources.
II. Improve forest productivity.
III. Reduce total demand.
IV. Strengthen policy and institutional framework.
V. Expand forest area.

Programmes:

1.3.2.2: Protect Existing Forest Resources: It has three main sub-programmes of (1) forest protection, (2) soil and water conservation, and (3) protected areas and biodiversity conservation. These include the works of forest survey, demarcation and mapping, inventory, biodiversity conservation, protected area management, protection against poaching, encroachment and fire etc. and other related issues.

1.3.2.3: Improve Forest Productivity: It has four main sub-programmes of (1) rehabilitation of degraded forests, (2) research and technology development, (3) development of NWFPs, and (4) assisting private initiatives with community participation. These involve mainly research, improvement in technology, enrichment planting, soil and water conservation, regeneration, rehabilitation and afforestation mainly in existing forests.

1.3.2.4: Reduce Total Demand: It has three main sub-programmes for the efficient uses of (1) fuelwood and fodder, (2) timber, and (3) NWFPs. This includes the programmes for reduction of demand placed on forests through the technology of reservation, seasoning, substitutions, and other measures or the efficient utilization of forest products and also through extensive biomass plantations.

1.3.2.5: Strengthen Policy and Institutional Framework: It has three main sub-programmes of strengthening of (1) central forestry administration, (2) central forestry institutions, and (3) State forestry administration and institutions. These include the development of infrastructures like building, communications, etc. and strengthening of

staff including HRD. This issue also covers all aspects of capacity building, forest policy and legislation, public forest administration and organizational structure, research, planning and budgeting etc.

1.3.2.6: Expand Forest Area: It has two main sub-programmes of (1) tree plantation on forest and non-forest lands, and (2) people's participation in plantations and its protection. This issue includes the extension of forestry programmes in all kind of wastelands and marginal farm lands. It also includes the programmes of creation of plantation forests through wasteland reclamation, afforestation and promotion of agro forestry.

1.3.3.1: Objectives of NFAP: Following are the objectives of the National Forestry Action Programmes:

(1) For sustainability of forests, productivity of forest plantations to be increased at least 3 to 5 m^3 ha^{-1} per yr^{-1} by promoting regeneration and enrichment plantations.
(2) Hygiene of forests to be improved through suitable silvicultural practices.
(3) Efforts to be made to bring one-third geographic area of the country under forest and tree cover by plantations on all categories of wastelands and agro forestry.
(4) Protected area network to be expanded and managed for biodiversity conservation.
(5) Plantations on non-forest wastelands to be done mostly with fuelwood species as 70% of the wood produce from forests are used as fuelwood. Species of pulpwood and other industrial wood may be encouraged in farm forestry.
(6) Institution for the people's participation in protection and development of degraded and fringe forests to be strengthened.
(7) NWFP species to be developed and value addition may be promoted at village level.
(8) Grazing in forests to be regulated as per carrying capacity and silvicultural needs.
(9) Infrastructure for forest inventory, research and development to be strengthened. HRD should also be improved.
(10) Investment for the sustainable development of forests should be rational and in proportionate to the total production.

SECTION-1.4: NATIONAL ENVIRONMENT POLICY 2006

1.4.1.1. The "Environment" comprises all entities, natural or manmade, external to oneself, and their interrelationships, which provide value, now or perhaps in the future, to humankind. Environmental concerns relate to their degradation through actions of humans. [National Environment Policy, 2006]

1.4.1.2. The National Environment Policy 2006 is intended to be a guide to action: in regulatory reform, programmes and protects for environmental conservation; and review and enactment of legislation by agencies of the Central, State and Local Governments. The main theme of this policy is that while conservation of environmental resources is necessary to secure livelihoods and well being of all, the most secure basis of conservation is to ensure that people dependent on particular

resources obtain better livelihoods from the fact of conservation, than from degradation of the resource. The policy also seeks to stimulate partnerships of different stakeholders, i.e. public agencies, local communities, academic and scientific institutions, the investment community, and international development partners, in harnessing their respective resources and strengths for environmental managements.

1.4.1.3. Objectives of the National Environment Policy, 2006:

(i) Conservation of Critical Environmental Resources.
(ii) Intra-generational Equity: Livelihood Security for the poor.
(iii) Inter generational Equity.
(iv) Integration of Environmental Concerns in Economic and Social Development.
(v) Efficiency in Environmental Resource Use.
(vi) Environmental Governance.
(vii) Enhancement of Resources for Environmental Conservation.

SECTION – 1.5: OTHER EXISTING COURT ORDERS, RULES OF THE LAND AND NATIONAL WORKING PLAN CODE

1.5.1.1. Forests are to be managed as per the guidelines issued from the apex Court of Country i.e. The Supreme Court of India and other Courts. The management of forests shall be in consonance to existing rules of the Land. Also the management of Forests will be in line to the National Working Plan Code and State Working Plan Code.

SECTION – 1.6: FACTORS INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT

1.6.1.1: The main factors influencing the object of management are listed below:

(i) Due to naxalite movement hindering the forestry activities and budgetary constraints, large tracts of forest that were not managed as per prescriptions laid down under scientific management during previous plans and schemes. These forests are getting unhealthy due to lack of management input. These forests will be managed as per scientific prescriptions for treatment of forests, attending to soil and moisture conservation measures, controlling grazing and protecting the forests from fire, illicit felling of trees and encroachment.

(ii) The increasing demand by local population for fire wood, small timber and fodder grass around populated areas have affected forests. Adequate provisions have to be made in the plan for meeting the demands and alternatives provided for demand beyond carrying capacity.

(iii) The state of natural regeneration of teak and miscellaneous is satisfactory in interior areas of the tract, where as it is unsatisfactory in plains, and nearby human habitations. New recruits are not established due to frequent fires, soil compactness and excessive biotic pressure. Provisions will have to be made in the plan for soil working and tending and protection of young natural regeneration which would help them to establish.

(iv) The forest tract around populated area are opened, under stocked and degraded which need improvement in their stocking by tending natural regeneration supplemented by artificial regeneration.

(v) The forest areas of steep slopes, undulating areas and along water courses are liable for soil erosion hence provisions to be made in the plan to check the same.

(vi) There is increasing demand for the timber of teak and other important species in the market.
(vii) Owing to possession of cattle by villagers to meet their agriculture need, the demand for fodder and grazing has increased around these villages.
(viii) Restoration of degraded environment as a national object.
(ix) The tract is experiencing threat to staff and grabbing of forest land under the cover of naxalism. The Government and the management must give adequate protection to forest, the staff as well as forest land to maintain its ecological and social fabric intact.
(x) To improve the habitat and hygiene of wildlife.

SECTON: 1.7. SPECIAL OBJECTS OF MANAGEMENT

1.7.1.1: Important factors which influence the general objects of management is the rapid depletion of growing stock around the populated villages due to various causes as enlisted in paragraph 1.6.1.1. In consonance with National Forest Policy 1988, Wildlife Action Plan, National Forestry Action Plan, Environmental Action Plan, Law of the Land, provisions of State and National working Plan Codes, the special objects of management are as follows:

(1) To preserve and enrich the growing stock in natural forests and to restock all under-stocked and degraded areas of the forests with the help of soil and moisture conservation measures, reforestation and regulation of grazing.
(2) Preservation and improvement of minor forest to obtain progressively increasing yield of small timber, fire wood, and poles in order to meet the demands of local people and to provide grazing area to local cattle.
(3) To combat ill effects of soil erosion wherever it has already started and to prescribe preventive measures.
(4) To increase the production of non-timber forest produce and to manage the same scientifically.
(5) To increase the productivity and ensure progressively increasing yield of forest produce in demand.
(6) To achieve compatible wildlife management with emphasis on rare, endangered and endemic species like tigers, panthers, four horned antelopes, sloth bears, wild dogs and sambhars.

SECTION: 1.8: ANALYSIS AND VALUATION OF THE CROP

1.8.1.1: 1% systematic line plot sampling method was adopted for enumeration of growing stock during 1990-93 for previous plan preparation by Survey of Forest Resources Unit (SOFR) Chandrapur-2. 1% systematic random sampling was contemplated by SOFR unit keeping confidence limit within ±5%. Due to life threat to personnel deployed for the purpose from naxalites, the same work could not be completed. As in the past, only 10% to 16% of the felling contemplated was carried out, the tract is not prone to illicit felling and the crop has not deteriorated in general, present and previous data for growth have been used for valuation of crop. It was also endorsed by State Level Committee during discussion on 2nd Preliminary Working Plan Report on 11th July, 2006. Efforts have been taken to procure latest satellite imageries for the tract. Analyzed data have been incorporated in appendix no-II in volume II of

this plan report. Crown Densities have been derived and accordingly, number of stems per ha has been arrived at.

SECTION: 1.9: CLASSIFICATION OF FORESTS

1.9.1.1: The State Government vide GR No MEP-1365/132211-Y, dated December 6, 1968 classified the state forests into following classes on functional basis:

(i) **PROTECTION FORESTS** This category includes forests on very steep slopes, 25° and over, along river banks, forest that have depleted through mal-treatment and further harvesting will accelerate soil erosion and adversely affect the productivity of agricultural lands in the lower regions. The management shall aim at soil and moisture conservation.

(ii) TREE FORESTS: - This includes forests that are situated in remote areas, prominently suited for growing a large sized timber and other products of commercial value.

(iii)MINOR FORESTS: - It includes forests that are honey combed with cultivated lands capable of producing small timber and providing grazing to local cattle.

(iv)PASTURE LANDS: - This category includes open and under stocked forests and the lands that have ceased to yield even small timber but these are conveniently suitable for grazing to the local cattle.

(v)MISCELLANEOUS FORESTS:

(a)GRASS RESERVES: - Open forests that are interspersed with cultivated lands mainly suitable for producing of fodder, are included in this category.

(b)REMAINING AREAS: - Areas needed for other works.

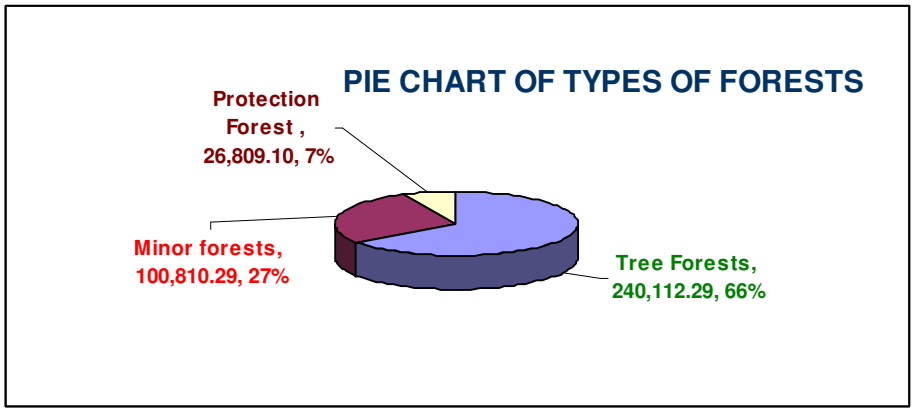
1.9.1.2: With regard to wildlife habitats, the entire tract is potential habitat for many kinds of wildlife. Floral forms of wildlife are found in plenty. But faunal forms of wildlife are found in comparatively less number.

Table No. 56

TABLE SHOWING THE EXTENT OF FORESTS AS PER FUNCTIONAL CLASSIFICATION OF FORESTS

SrNo	Class of Forests	Area in ha	% wrt Dn
1	Tree Forests	240,112.287	65.3%
2	Minor forests	100,810.294	27.4%
3	Protection Forest	26,809.100	7.3%
4	Miscellaneous Forests		0.0%
5	Total	367,731.681	100.0%

GRAPH-23



SECTION: 1.10. METHOD OF TREATMENT

1.10.1.1. Method of treatment is influenced by situation and condition of the forests, condition of regeneration of the crop, needs of local people and availability of labours, staff and resources.

1.10.1.2: PROTECTION FOREST: - These areas have been excluded from the commercial felling except bamboo exploitation. Preservation of tree growth and to conserve soil and moisture is paramount need for these forests. No felling and plantation have been prescribed in these areas. Seed sowing of local species by seed dibbling is contemplated through local Forest Beat Guard.

1.10.1.3: TREE FORESTS: - Better quality forests capable of producing large timber away from human settlements have been included in this category. These areas have been managed under selection-cum-improvement system of B.P.Singh`s Plan. Steep slopes have been excluded from harvesting. Tending of natural regeneration, soil and moisture conservation works wherever necessary and plantation of teak in the areas where natural regeneration is inadequate have been prescribed. These areas will be treated under Selection cum Improvement Working Circle and Teak Plantation Working Circles. Matured and over matured crop have been prescribed to be treated by taking up teak plantation after removal of over wood in the growing stock.

1.10.1.4: MINOR FORESTS: - Poor quality of forests with density less than 0.4 subjected to heavy biotic pressure are included in this category. Soil and moisture conservation works, plantation of indigenous species specially for small timber, poles, fodder and fire wood will be taken to meet the local demand. Tending of existing natural regeneration will be taken up. These areas will be treated under Improvement Working Circle and Plantation Working Circles.

SECTION: 1.11: FORMATION OF WORKING CIRCLES

1.11.1.1 Based on the objectives of the management and the methods of treatment, the following working circles are being carved out:

Table No. 57

SrNo	Name of the Working Circles/ Mandatory Chapters	Area Allotted (ha)
1	Selection cum Improvement Working Circle	187,785.906
2	Improvement Working Circle	102,530.594
3	Protection Working Circle	26,809.100
4	Bamboo (Overlapping) Working Circle	238,912.300
5	Non Timber Forest Produce	Overlapping.
6	Joint Forest Management	Overlapping.
7	Wildlife Management	Overlapping.
8	Ecotourism	Overlapping.
9	Forest Protection	Overlapping.
10	*Miscellaneous area	50,606.081
11	Working Plan area	367,731.681

* Miscellaneous area consists of 50,606.081 ha as difference in planimetted and notified area.

GRAPH-24

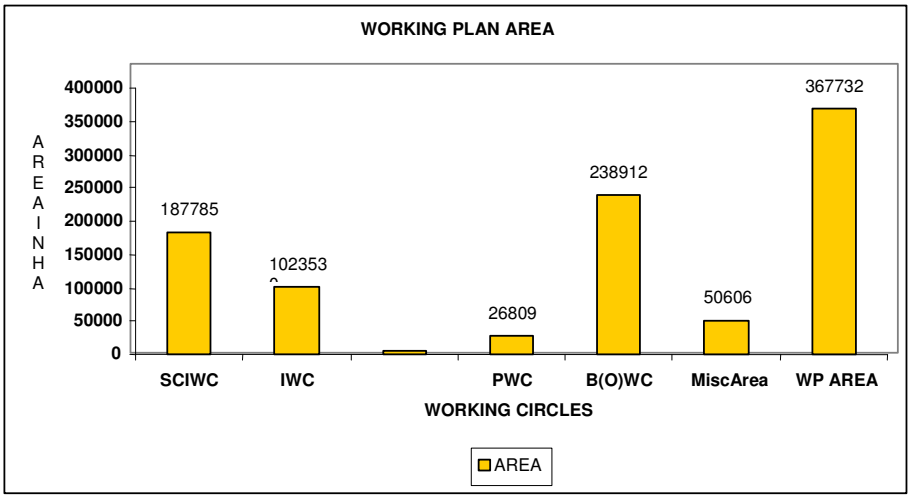


Table No. 58

1.11.1.2. COMPARISION OF WORKING CIRCLE AREA OF PRESENT PLAN TO THAT OF PREVIOUS PLAN

SrNo	Name of the Working Circles/ Mandatory Chapters	B.P.Singh Plan (ha)	Present Plan (ha)
1	Selection cum Improvement Working Circle	209,529.47	WCA = 187,785.906 WA = 172,840.206 UWA = 14,945.700
2	Improvement Working Circle	54,308.70	WCA = 102,530.594 WA = 86,700.594

			UWA = 15,830.000
3	Protection Working Circle	37,180.76	W CA = 26,809.100 WA = 26,038.700
			UWA = 770.400
4	Bamboo (Overlapping) Working Circle.	WCA=234,885.39 WA=167,038.47	W CA = 238,912.300 WA = 159,446.910 UWA = 79,465.390
5	Existing old Teak Plantation	3,988.14	4,014.640
6	Non Timber Forest Produce	Overlapping.	Overlapping.
7	Joint Forest Management	Not Prescribed	Overlapping.
8	Wildlife Management	Overlapping.	Overlapping.
9	Ecotourism	Not Prescribed	Overlapping.
10	Forest Protection	Not Prescribed	Overlapping.
11	*Miscellaneous area	Not Given	50606.081
12	Working Plan area	305,007.07	367,731.681
13	Bhamaragarh Wildlife Sanctuary (BWLS)	No provision	10,438.600 WLS Bhamaragarh carved out & excluded from Working Plan

NOTE

- Miscellaneous area consists of 50606.081ha as difference in planimetted and notified area.
- WCA = Area of working circle
- WA = Workable area
- UWA = Unworkable area
- EOTP = Existing Old Teak Plantations.

* The forests were notified as protected forests approximately survey number wise in surveyed villages and block wise in unsurveyed villages. Even notification for reserved forests followed the same pattern. Forest areas were planimetted during previous and present plan preparation. 50606.081ha area does not conform to notified and planimetted area balance. Hence 50606.081ha area has been kept under miscellaneous area to conform to notified area as per Form No. I of the Division.

1.11.1.3 Range wise and working circle wise distribution of forest area has been given in the following table

Table №59

TABLE SHOWING RANGE WISE & WORKING CIRCLE WISE AREA

Range	Range area	SCIWC	IWC	PWC	BOWC	Misc Area
Bhamaragarh	86,204.460	15,309.911	26,329.089	26,809.100	67,931.30	
Etapalli	99,085.714	55,115.410	28,209.690	0.000	46,959.20	
Gatta	64,468.490	33,519.281	20,714.819	0.000	52,227.40	50,606.081
Kasansur	66,094.060	49,931.299	14,853.601	0.000	43,829.20	
Tadgaon	51,878.957	33,910.005	12,423.395	0.000	27,965.20	
Division	367,731.681	187,785.906	102,530.594	26,809.100	238,912.30	50,606.081

SECTION: 1. 12: BLOCKS AND COMPARMENTS:

1.12.1.1 Notifications of Forest areas as protected forests were declared as village wise and survey number wise in surveyed villages and block wise in unsurveyed villages**.** Block wise surveyed and unsurveyed village wise details of area have been given in Appendix No-I in Volume II of this Plan Report. 877 compartments have been carved out. Out of which 38 compartments have been handed over to Wild Life Sanctuary and remaining 839 compartments have been allotted to various working circle.

SECTION 1.13: PERIOD OF THE PLAN:

1.13.1.1: The period of the plan is fixed for 10 years from 2007-2008 to 2016-17. If the controlling officer in charge of the Forest Circle under whose jurisdiction the tract dealt with is supervised finds prescriptions not conducive to fulfillment of objectives, mid term review of the plan may be taken up by him during 2012-13.

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CHAPTER- II

WORKING PLAN FOR SELECTION-CUM-IMPROVEMENT WORKING CIRCLE

SECTION. 2.1. GENERAL CONSTITUTION OF THE WORKING CIRCLE

2.1.1.1. The area included in Selection Cum Improvement Working Circle is area under taken in SCI WC of B.P. Singh`s Plan and still adheres to the norms fixed for that. It also consists of area which was in Improvement Working Circle in earlier Plan and conforms to the norms of SCI WC.

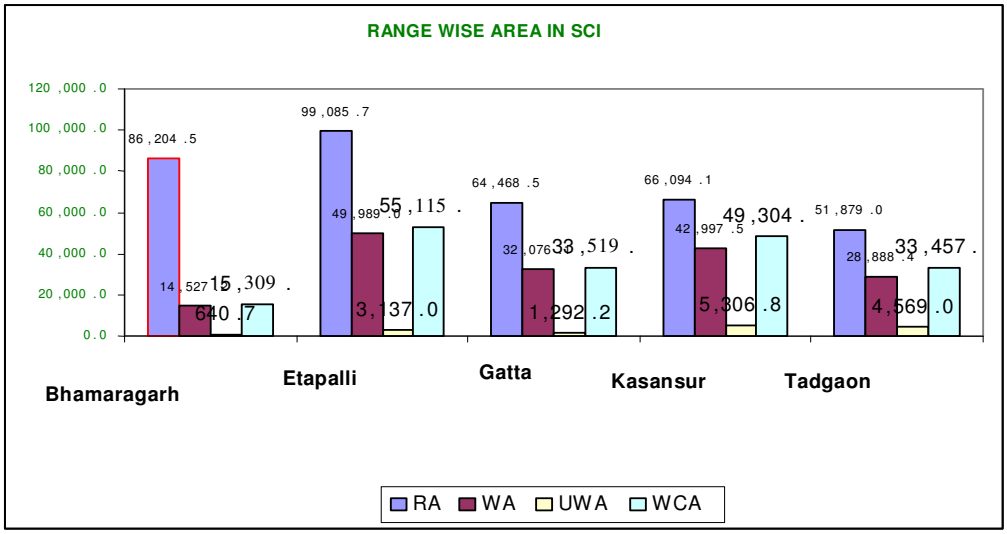
2.1.1.2. Range wise distribution of forest area under Selection Cum Improvement Working Circle is given in the following table**.**

TABLE NO-60

TABLE SHOWING RANGEWISE DISTRIBUTION OF AREA IN SCIWC

Sr No	NAME OF RANGE	RANGE AREA(RA)	WORKABLE AREA(WA)	UNWORKABLE AREAWA(UWA)	WORKING CIRCLE AREA(WCA)
1	Bhamaragarh	86,204.460	14,669.211	640.700	15,309.911
2	Etapalli	99,085.714	51,978.410	3,137.000	55,115.410
3	Gatta	64,468.490	32,227.081	1,292.200	33,519.281
4	Kasansur	66,094.060	44,624.499	5,306.800	49,931.299
5	Tadgaon	51,878.957	29,341.005	4,569.000	33,910.005
	Division Area	**367,731.681**	**172,840.206**	**14,945.700**	187,785.906

CHART -25



SECTION. 2. 2. GENERAL CHARACTER OF THE VEGETATION.

2.2.1.1. The areas allotted to Selection Cum Improvement Working Circle are mainly tree forests which are capable of producing large sized timber trees with varying degree of dispersal of bamboo.

2.2.1.2. The stand is of mainly miscellaneous species with small area of *teak.* The main species in *these* forests are *ain, bija, dhaoda, tendu, moha, lendia, haldu etc.* Percentage of teak in mixed miscellaneous forests varies from 0.5% to 2%. Bamboo of class I & II are found in most of the area. Common species of bamboo is *Dendrocalamus strictus*. Along the river side or nala side, bamboo species of *Bambusa* arundinaceae is also found. The terrain is mostly undulating. These forests exhibit a great genetic diversity. Crop density is mostly more than 0.5 and is upto 0.9 and in some areas it is of full strength 1.0. The site quality of All India Site Quality varies from II to III with occasional I and IV. The site quality, density and composition of the crop change from place to place and within short distances. The status of natural regeneration of most of the miscellaneous species is satisfactory. But that of *teak* and *shisham* is unsatisfactory. The stand is mainly uneven aged forests.

2.2.1.3. The advantage of natural regeneration will be taken to regenerate the area. To increase the stocking of particular species, preferential treatment to regeneration of that species will be given in the form of cut back operation, cleaning and singling of recruits and seedlings.

SECTION.2. 3. BLOCKS AND COMPARTMENTS

2.3.1.1. Selection cum Improvement Working Circle consists of forest areas to the tune of
185,690.58 ha which is 50 % of the total plan area. No block formation has been segregated for exclusive management of forests under this working circle. The distribution of the compartments allotted to this working circle will be given in appendix no-XVII in Volume II of this working plan report.

SECTION. 2.4. SPECIAL OBJECTS OF MANAGEMENT

2.4.1.1. The special objects of management are:

(i) To improve the quality and to increase the proportion of valuable species by giving preferential treatment to naturally regenerated seedlings.
(ii) To produce large size timber by utilizing the full potential of the site.
(iii) To maintain and improve the soil cover by way of soil and water conservation measures particularly on the principle of water shed management.
(iv) To bring normalcy in the forest.
(v) Consistent with the above, to derive optimum sustained yield of timber, firewood and bamboo and non timber forest produces.
(vi) To ensure conducive habitat for rare and endangered wildlife.

SECTION. 2.5. ANALYSIS AND VALUATION OF THE CROP

2.5.1.1. ENUMERATION. - Enumeration of growing stock was contemplated to be carried out by the Survey of Forest Resources Units Chandrapur during 2006-06 and 2006-07. But due to life threat given by naxalites not to do the survey of forest resources, the work could not be completed. Partial enumeration works were completed in three ranges and results show positive increase in growing stock and regeneration increased due to rest given to crop and comparatively low biotic interference. Hence, the result of enumeration conducted during preparation of previous plan and as accepted during discussion on 2nd PWPR in State Level Meeting on 11th July, 2006 is here by used to arrive at the percentage removal of silviculturally available trees.

2.5.1.2. Tables showing girth class wise number of trees per hectare, basal area in square meter per hectare and growing stock in cubic meter per hectare as computed on the basis of enumeration during 1990-93 is given below.

Table No-61
Table showing distribution of trees/ha in SCIWC
(Girth class is in centimeter at breast height; BA = Basal Area in square meter and GS = Growing Stock in cubic meter)

Girth Class/SPP	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	>135	TOTAL
Teak	0.62	0.65	0.64	0.56	0.44	0.38	0.28	0.21	0.22	4.00
Ain	11.48	10.62	9.26	8.19	6.55	5.86	4.58	3.54	3.53	63.61
Bija	2.97	3.9	4.17	3.94	3.45	3.26	2.63	2.11	1.94	28.37
Haldu	0.08	0.12	0.13	0.13	0.1	0.12	0.09	0.06	0.1	0.93
Shisham	0.15	0.2	0.25	0.21	0.13	0.09	0.06	0.03	0.01	1.13
Shivan	0.05	0.07	0.09	0.09	0.06	0.05	0.03	0.02	0.01	0.47
tiwas	0.1	0.14	0.19	0.15	0.11	0.04	0.02	0.01	0	0.76
Lendia	8.49	6.07	3.97	2.37	1.29	0.84	0.44	0.23	0.07	23.77
Garadi	28.42	22.7	14.46	6.77	3.13	1.32	0.5	0.14	0.05	77.49
Dhaoda	7.54	7.19	6.74	5.62	4.29	3.51	2.43	1.6	1.4	40.32
Moha	2.5	2.54	2.61	2.51	2.25	2.26	1.9	1.54	1.73	19.84
Tendu	12.19	8.72	6.42	4.94	3.58	3.11	2.4	1.62	1.36	44.34
Khair	1.05	0.68	0.32	0.12	0.04	0.02	0.01	0	0	2.24
Aonla	2.6	2.78	2.53	1.68	0.81	0.42	0.15	0.05	0.03	11.05
Hirda	0.49	0.66	0.7	0.59	0.38	0.26	0.13	0.06	0.04	3.31
Beheda	0.16	0.22	0.23	0.19	0.16	0.13	0.09	0.06	0.03	1.27
Dikamali	0.03	0.02	0.02	0	0	0	0	0	0	0.07
Nirmali	0	0.01	0.01	0	0	0	0	0	0	0.02
Achar	5	4.67	3.2	1.68	0.74	0.34	0.1	0.04	0.01	15.78
Ghoti	3.06	2.69	1.6	0.7	0.18	0.06	0.02	0.01	0	8.32
Other	15.7	16.14	13.97	10.29	6.98	5.13	3.31	2.04	1.35	74.91
Total/ha	102.68	90.79	71.51	50.73	34.67	27.2	19.17	13.37	11.88	422.00
BA/ha	0.41	1.02	1.57	1.84	1.88	2.06	1.93	1.73	1.92	14.35
GS/ha	1.95	5.81	6.65	9.79	10.19	11.42	11.1	10.04	11.38	78.34

Table No-62
Table showing categories wise and girth wise distribution of trees/ha, basal area and volume in SCIWC

SrNo	Girth Class	No of tree/ha	Basal area / ha (square meter)	Growing Stock/ ha (cubic meter)	No of tree/ha for Group A spp teak, bija, haldu,kalamb, shisham, ain	No of tree/ha Groups B & C spp i.e. garari, lendia & khair	No of tree/ha Group D other than spp of Groups A, B & C.
1	16-30	102.68	0.41	1.95	15.30	36.91	50.47
2	31-45	90.79	1.02	5.81	15.49	28.77	46.53
3	46-60	71.51	1.57	6.65	14.45	18.43	38.63
4	61-75	50.73	1.84	9.79	13.03	9.14	28.56
5	76-90	34.67	1.88	10.19	10.67	4.42	19.58
6	91-105	27.20	2.06	11.42	9.71	2.16	15.33
7	106-120	19.17	1.93	11.1	7.64	0.94	10.59
8	121-135	13.27	1.73	10.04	5.95	0.37	7.05
9	135-150	9.32	1.50	8.88	4.52	0.09	4.65
10	151&up	2.56	0.42	2.50	1.28	0.03	1.31
11	Total	422.00	14.35	78.34	98.04	101.88	222.70

2.5.1.3. STOCK MAPPING. Stock mapping of the tract was updated by the staffs of Bhamaragarh Forest Division (Territorial) under guidance and supervision of Officers of Working Plan Division Chandrapur-2 during 2005-06. Help of satellite imageries for the tract was also taken to ascertain the stocking of the tract with ground truthing. Detail of results of stock mapping have been given in appendix no-I in volume II of draft plan report.

STOCK MAPPING RESULT IN SCI WC

Sr.No.	Site QualityType	Area in SCI WC (ha)	% w.r.t. SCI WC Area
1	Miscellaneous I	1126.615	0.6%
2	Miscellaneous II	29857.960	15.9%
3	Miscellaneous III	118680.692	63.2%
4	Miscellaneous IVa	12581.655	6.7%
5	Miscellaneous IVb	6009.149	3.2%
6	Miscellaneous Total	168256.172	89.6%
7	Teak T I	0.000	0.0%
8	Teak II	375.571	0.2%
9	Teak III	398.609	0.2%
10	Teak IVa	187.785	0.1%
11	Teak IVb	2065.644	1.1%
12	Teak Total	3004.575	1.6%
13	Plantation	2253.430	1.2%
14	Blank	14271.729	7.6%
15	Grand Total	187785.906	100%

2.5.1.4. DENSITY AND AGE CLASSES - The density of the stock varies from 0.5 to 0.9 and some under stocked and fully stocked areas intermingled with it. The age of the crop is all aged, mainly, middle to mature with patches of advanced growth and some over matured trees.

2.5.1.5. REGENERATION - Natural regeneration is satisfactory in the areas allotted to this working circle. Regeneration is scanty near the villages due to biotic pressures like cattle grazing, removal of fuelwood, small timber and recurrence of fire. Establishment of seedlings is hampered in the biotic pressure and fire prone areas.

SECTION. 2.6. SILVICULTURAL SYSTEM.

2.6.1.1. Based on the objects of management, quality and composition of the crop, the silvicultural system prescribed is Selection Cum Improvement to maintain the continuity of management practice adopted in previous plan operation. Natural regeneration will be encouraged by way of subsidiary silvicultural operations. Rigid protection from fire and grazing is to be given to the crop.

SECTION. 2. 7. CHOICE OF SPECIES.

2.7.1.1. As *teak* is the most valuable species, it will be given top priority wherever it occurs. Miscellaneous species to be favoured in the existing crop are *bija, shisham, haldu, ain, kalam, tiwas, dhaoda, khair, aonla, achar, ain, kulu, moha, tendu* etc. *Semal* will be reserved from felling apart from edible fruits and flower yielding species. For protection of medicinal plants, care will be taken so that herbs, shrubs, grasses which are important in respect of medicinal values shall be thriving in perpetuity.

SECTION. 2. 8. HARVESTABLE GIRTH.

2.8.1.1.The studies of growth pattern for *teak, bija and ain were conducted by* CF WP Chandrapur-2. Results of stem analysis of teak specie carried out for tract dealt have been given in Chapter VIII in Part-I. On the basis of analysis of growth of *teak* and other species on assuming comparable girth growth in other species as that of *teak*, ain and bija, harvestable girths have been fixed. Site Quality wise harvestable girths are as follows.

Table No- 63
TABLE SHOWING SELECTION GIRTH FOR TEAK AND MISCELLANEOUS SPPECIESFOR DIFFERENT SITE QUALITIES

Site Quality	Age in Year	Girth (OB) in cm	Harvestable Girth (OB) in cm
II	103	194	165
III	97	137	135

In case of lendia, garari and khair the harvestable girth has been fixed at 60 and 75 cm. As lendia and garari have characteristic to replace other species if given space and utility of these species is for pole and fuelwood, hence their harvestable girths is

to be fixed at 60 cm. For Khair, selection girth has been fixed at 75 cm as above 75 cm girth ,khair tends to deteriorate.

Table No- 64

TABLE SHOWING SELECTION GIRTH FOR TEAK AND GROUP OF SPECIES FOR DIFFERENT SITE QUALITIES

Group/Site Quality	SQ-II	SQ-III	SQ-IV
Group A	195 cm	135 cm	120 cm
Group D	195 cm	135 cm	120 cm
Group B	60 cm	60 cm	60 cm
Group C	75 cm	75 cm	75 cm

Where:
Group A consists of Teak, Ain, Bija, Haldu, Kalamb, Shisham, Tiwas.
Group B consists of Garari, Lendia
Group C consists of Khair.
Group D consists of species other than species included in Group A , Group B and Group C.

SECTION. 2.9.1.1. FELLING CYCLE. Felling cycle has been fixed as 15 years same as that in previous working plan.

SECTION. 2.10. FORMATION OF FELLING SERIES AND COUPES.

2.10.1.1. Total number of felling series carved out of the area allotted to selection cum improvement working circle is 60. Efforts have been made to retain the felling series as constituted in previous working plan. Each felling series contains 15 coupes numbering as I to XV. In previous Working Plan operation period coupe numbering from III to X had been worked out for main felling operation. The present plan report contemplates to work the remaining coupes in the sequence as prescribed in the previous plan i.e. operation will be carried out from coupe number XI to XV and then in cyclic order from I to V. The list of the felling series, felling series wise compartments and coupe wise details of areas have been given in appendix no- XVII in volume II of this working plan report.

SECTION. 2. 11. REGULATION OF YIELD.

2.11.1.1. In previous working plan, the yield calculation for Selection Cum Improvement Working Circle was made on the basis of Sagreiya`s modification of Brandis` formula. Since the continuity in the working is to be maintained, same formula has been utilised for yield calculation in the present plan.

2.11.1.2. Mathematical analysis for K.P. Sagreiya`s modification of Brandis` Method of determining the maximum sustained cut of trees of exploitable size from all-aged forest is given as below;
If-

(i) The number of trees in Class I (Exploitable Girth Class) is S_1;

(ii) The number of trees in classes II, III … are $s_2, s_3, \ldots$;

(iii) The fraction of the trees of classes II, III, … that survive and are eventually available for harvesting as class trees are x_2, x_3, …, so that $x_2 s_2 = S_2$; $x_3 s_3 = S_3$; …

(iv) The trees take Y_2, Y_3, … years in classes II, III, …, so that the average annual recruitments in the class periods are-

$S_2 / Y_2 = R_2$

$S_3 / Y_3 = R_3$, …

(v) The overall average annual recruitment for the entire enumeration period, i.e.,

$(S_2 + S_3 + \ldots.) / (Y_2 + Y_3 + \ldots) = S / Y$ is say R.

(vi) The felling cycle adopted is f years and

(vii) The accruing average annual recruitment during the 1st , 2nd , …. Cycles is R', R″, … , so that the recruitments, accruing in successive cycles, i.e. f R', f R″, … are given by as follows:

$$f R' = a R_x + (f - a) R_{x+1}$$
$$f R'' = b R_y + (f - b) R_{y+1}, \ldots.$$

Then the realizable recruitments R_{r1}, R_{r2}, … in cycles I, II, …. Will be

$$R_{r1} = \tfrac{1}{2} [f R' - a (R' - R_x)],$$

$$R_{r1} = \tfrac{1}{2} [f R'' - a (f R'' - R_y)], \ldots.$$

Therefore, the prescribed yield should be –

$$I/f [S_1 + f R'/2 - a (R' - R_x)/2],$$

$$I/2f [S_2 + f (R' + R''/2) - b (R'' - R_y)/2], \ldots.$$

According as the stock in hand has to be liquidated in 1 , 2 , … cycles , to obtain the maximum sustained yield, while the actual recruitment is still less than R. From this it follows that if the overall annual recruitment R is to be realized on a sustained basis even while the realizable recruitment in a cycle is less than fR, there must be a stock in hand of –

$$S_I = f [R - R'/2] + a (R' - R_x)/2],$$

$$S_{II} = f [2 R - (R' + R''/2)] + b (R'' - R_y)/2]$$

, ….

According as the deficiency continues for I, 2, 3, … felling cycles.

2.11.1.3. For the tract dealt with, in Selection Cum Improvement Working Circle consisting of all aged forests, we have girth wise distribution of trees, years to cross the class according to stem analysis of teak tree of Site Quality – III and selection girth fixed is 135 cm.

Table No- 64

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	**B**	**C**	**D**
I	Over 135	….	….
II	120-135	9	Y_2
III	106-120	10	Y_3
IV	91-105	12	Y_4
V	76-90	12	Y_5
VI	61-75	13	Y_6
VII	46-60	12	Y_7
VIII	31-45	11	Y_8
IX	15-30	9	Y_9
Total enumeration period		88	Y

2.11.1.4. Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

1.GROUP-A SPECIES

Table No- 65

TABLE SHOWING THE PECENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	150 & up	1.28					
I	135-150	4.52		100%			
II	120-135	5.95	s_2	76%	x_2	4.52	S_2
III	106-120	7.64	s_3	59%	x_3	4.51	S_3
IV	91-105	9.71	s_4	47%	x_4	4.56	S_4
V	76-90	10.67	s_5	42%	x_5	4.48	S_5
VI	61-75	13.03	s_6	35%	x_6	4.56	S_6
VII	46-60	14.45	s_7	31%	x_7	4.48	S_7
VIII	31-45	14.49	s_8	31%	x_8	4.49	S_8
IX	15-30	15.30	s_9	30%	x_9	4.59	S_9
	Total	78.34				36.09	S

2.11.1.5. As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is 36.09 / 97 = 0.372 per ha. The average annual recruitment during the size class period namely, $S_2/\ Y_2 = R_2$, $S_3/\ Y_3 = R_3$, … will be as following table:

Table No- 66

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP A

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	**B**	**C**	**D**	**E**	**F**	**G**
I	Over 135	9.32*	….	….		
II	120-135	4.52	9	Y_2	0.502	R_2
III	106-120	4.51	10	Y_3	0.451	R_3
IV	91-105	4.56	12	Y_4	0.380	R_4
V	76-90	4.48	12	Y_5	0.373	R_5
VI	61-75	4.56	13	Y_6	0.351	R_6
VII	46-60	4.48	12	Y_7	0.373	R_7
VIII	31-45	4.49	11	Y_8	0.408	R_8
IX	15-30	4.59	9	Y_9	0.510	R_9
		36.09	88	Y	0.410	R

(* As the enumeration was done during 1990-93, the silviculturally available trees at that point of time would not remain the same. Working of SCI WC area is only 16% during plan period. Growing stock would have increased if space and conducive environment would have been given. The tract dealt with is free from grazing and to some extent from fire. Even wind fall is not so acute, the stand is bound to have more silviculturally available trees. At the on set of previous plan, the number was 5.8. Due to lapse of 15 years the stem from penultimate girth class to selection girth class would be = No of years x annual recruitment = 15 x 0.410 = 6.15. Assuming 16% of 4.52 = 0.72 say 1 has been realised or fallen, additional trees/ha silviculturally available will be 3.52. Thus Class I trees at hand would be 5.80+3.52 = 9.32)

2.11.1.5. It is obvious that although there is stock in hand of 9.32 class I trees/ha and there will be a recruitment of 36.09 trees/a in the 88 years and thus theoretically annual yield of (36.09 + 9.32) / 88 = 0.516 trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_I + R_2)$. Of these , all the S_I existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2/2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year`s coupe will be only $\{S_I + R_2/2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it $S_I$ of existing class I trees as also one year`s recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2/2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_I + R_2 + R_2/2\}$. And so on.

2.11.1.6. Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-67

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP A SPECIES

(For Proposed Plan Felling Cycle of 15 years; n th year of operation; No of trees per ha)

SrNo	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_I	Realizable Recruitment = (n-½) R_2	Accruing Recruitment=
1	XI	1	1	9.32	½R_2 = 0.251	$9R_2 + 5½ R_3$ =7.023
2	XII	1	2	9.32	R_2 + ½ R_2 =0.753	$9R_2 + 4½ R_3$ =6.572
3	XIII	1	3	9.32	$2R_2$ + ½ R_2 =1.255	$9R_2$ +3 ½ R_3 =6.121
4	XIV	1	4	9.32	$3R_2$ + ½ R_2 =1.757	$9R_2 + 2½ R_3$ =5.670
5	XV	1	5	9.32	$4R_2$ + ½ R_2 =2.259	$9R_2$ +1 ½ $R3_2$ =5.219
6	I	1	6	9.32	$5R_2$ + ½ R_2 =2.761	$9R_2 + ½ R_3$ =4.768
7	II	1	7	9.32	$6R_2$ + ½ R_2 =3.263	$8R_2 + ½ R_2$ =4.267
8	III	1	8	9.32	$7R_2$ + ½ R_2 =3.765	$7R_2 + ½ R_2$ =3.765
9	IV	1	9	9.32	$8R_2$ + ½ R_2 =4.267	$6R_2 + ½ R_2$ =3.263
10	V	1	10	9.32	$9R_2$ + ½ R_3 =4.768	$5R_2 + ½ R_2$ =2.761
11	VI	1	11	9.32	$9R_2$ +1 ½ R_3 =5.219	$4R_2 + ½ R_2$ =2.259
12	VII	1	12	9.32	$9R_2$ + 2½ R_3 =5.670	$3R_2 + ½ R_2$ =1.757
13	VIII	1	13	9.32	$9R_2$ +3 ½ R_3 =6.121	$2R_2 + ½ R_2$ =1.255
14	IX	1	14	9.32	$9R_2$ + 4½ R_3 =6.572	$R_2 + ½ R_2$ =0.753
15	X	1	15	9.32	$9R_2$ + 5½ R_3 =7.023	½R_2 = 0.251
	Total	15		139.8	=55.704	=55.704
			Average	9.32	=3.71	=3.71

2.11.1.7. Thus overall average number trees per ha will be 9.32+3.71+3.71 = 16.74. Out of which available for selection felling would be 9.32+3.71 = 13.03. Percentage removal would be 13.03/16.74% = 77.8%. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 39%. For sake of simplicity say 40% of silviculturally available tree i.e. on average 40% of 13.03 = 5.21 trees per ha. In terms of number, 40 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 135-150 as timber = 0.485 cubic meter + firewood 0.330 cubic meter (Solid volume) = 0.815 cubic meter, We will have average yield = 5.2 x 0.815 = 4.238 cubic meter per hectare for entire felling cycle of 15 years. Our working Plan period is of 10 years. Hence, for ten years period yield will be 5.2x10/15= 3.5 trees/ha and 3.5x0.815 = 2.83cubic meter per ha per coupe.

2.GROUP-B SPECIES

Table No- 68

TABLE SHOWING THE PECENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS : **GROUP B & C**

Class	Girth Class (cm)	Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	>75	8.01					
I	61-75	9.14		100%			
II	46-60	18.43	s_2	50%	x_2	9.22	S_2
III	31-45	28.77	s_3	32%	x_3	9.21	S_3
IV	15-30	36.91	s_4	25%	x_4	9.23	S_4
	Total	101.88				27.66	S

Table No-69

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP B & C

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	**B**	**C**	**D**	**E**	**F**	**G**
I	61-75	27.0*				
II	46-60	9.22	12	Y_2	0.768	R_2
III	31-45	9.21	11	Y_3	0.837	R_3
IV	15-30	9.23	9	Y_4	1.026	R_4
		27.66	32	Y	0.864	R

(* As the enumeration was done during 1990-93, the silviculturally available trees at that point of time would not remain the same. Working of SCI WC area is only

16% during plan period. Growing stock would have increased if space and conducive environment would have been given. The tract dealt with is free from grazing and to some extent from fire. Even wind fall is not so acute, the stand is bound to have more silviculturally available trees. At the on set of previous plan, the number was 17.15. Due to lapse of 15 years the stem from penultimate girth class to selection girth class would be = 12x0.768+3x0.837= 11.73. Assuming 16% of 11.73 = 1.88 has been realised or fallen, additional trees/ha silviculturally available will be 9.85. Thus Class I trees at hand would be 17.14+9.85 = 26.99 say 27.0)

2.11.1.8. Taking selection girth as 60 cm gbh for this group of species, it is obvious that although there is stock in hand of 27.0 class I trees/ha and there will be a recruitment of 27.7 trees/a in the 32 years and thus theoretically annual yield of (27.0 + 27.7) / 32 = 1.71trees/ha is obtainable. As discussed for Group A species, for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-70

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP B SPECIES

SrNo	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_I	Realizable Recruitment = (n-½) R_2	Accruing Recruitment=
1	XI	1	1	27.0	½R_2 = 0.384	12R_2+2½R_2 =11.308
2	XII	1	2	27.0	R_2 + ½ R_2 =1.162	12R_2+1½R_2=10.471
3	XIII	1	3	27.0	2R_2 + ½ R_2 =1.930	12R_2+ ½ R_3 =9.634
4	XIV	1	4	27.0	3R_2 + ½ R_2 =2.698	11R_2 + ½ R_3 =8.842
5	XV	1	5	27.0	4R_2 + ½ R_2 =3.466	10R_2 + ½ R_2 =8.074
6	I	1	6	27.0	5R_2 + ½ R_2 =4.234	9R_2 + ½ R_2 =7.306
7	II	1	7	27.0	6R_2 + ½ R_2 =5.002	8R_2 + ½ R_2 =6.538
8	III	1	8	27.0	7R_2 + ½ R_2 =5.770	7R_2 + ½ R_2 =5.770
9	IV	1	9	27.0	8R_2 + ½ R_2 =6.538	6R_2 + ½ R_2 =5.002
10	V	1	10	27.0	9R_2 + ½ R_2 =7.306	5R_2 + ½ R_2 =4.234
11	VI	1	11	27.0	10R_2 + ½ R_2 =8.074	4R_2 + ½ R_2 =3.466
12	VII	1	12	27.0	11R_2 + ½ R_3 =8.842	3R_2 + ½ R_2 =2.698
13	VIII	1	13	27.0	12R_2+ ½ R_3 =9.634	2R_2 + ½ R_2 =1.930
14	IX	1	14	27.0	12R_2+1½R_2=10.471	R_2 + ½ R_2 =1.162
15	X	1	15	27.0	12R_2+2½R_2 =11.308	½R_2 = 0.384
	Total	15		405.0	86.919	86.919
			Average	27.0	5.8	5.8

2.11.1.9. Thus overall average number trees per ha will be 27.0+5.8+5.8 = 38.6. Out of which available for selection felling would be 27.0+5.8 = 32.8. Percentage removal would be 32.8/38.6% = 84.9%. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 42%. For sake of simplicity say 40% of silviculturally available tree i.e. on average 40% of 32.8 = 13.1 trees per ha. In terms of number, 40 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 60-75 as timber = 0.110 cubic meter + firewood 0.060 cubic meter (Solid volume) = 0.170 cubic meter, We will have average annual yield = 13.1x 0.170 = 2.227 cubic meter per hectare for felling cycle of 15 years. As the Plan Period is of 10 years we will have yield as 13.1x10/15= 8.7 trees/ha and 2.227x10/15 = 1.48 cubic meter per ha of worked coupe.

3.GROUP-D SPECIES

Table No-71

TABLE SHOWING THE PECENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS : **GROUP D**

Class	Girth Class	Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I during enumeration period	Symbol
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
	150 & up	1.31					
I	135-150	4.65		100%			
II	120-135	7.05	s_2	66%	x_2	4.65	S_2
III	106-120	10.59	s_3	44%	x_3	4.66	S_3
IV	91-105	15.33	s_4	30%	x_4	4.60	S_4
V	76-90	19.58	s_5	24%	x_5	4.70	S_5
VI	61-75	28.56	s_6	16%	x_6	4.57	S_6
VII	46-60	38.63	s_7	12%	x_7	4.64	S_7
VIII	31-45	46.53	s_8	10%	x_8	4.65	S_8
IX	15-30	50.47	s_9	09%	x_9	4.54	S_9
	Total	222.70				37.01	S

2.11.1.10. As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is 37.01 / 88 = 0.420 per ha. The average annual recruitment during the size class period namely, $S_2/\ Y_2 = R_2$, $S_3/\ Y_3 = R_3$, … will be as following table:

Table No- 72

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP D

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	**B**	**C**	**D**	**E**	**F**	**G**
I	Over 135	11.3*	….	….		
II	120-135	4.65	9	Y_2	0.516	R_2
III	106-120	4.66	10	Y_3	0.466	R_3
IV	91-105	4.60	12	Y_4	0.384	R_4
V	76-90	4.70	12	Y_5	0.392	R_5
VI	61-75	4.57	13	Y_6	0.352	R_6
VII	46-60	4.64	12	Y_7	0.386	R_7
VIII	31-45	4.65	11	Y_8	0.422	R_8
IX	15-30	4.54	9	Y_9	0.504	R_9
		37.0	88	Y	0.420	R

(* As the enumeration was done during 1990-93, the silviculturally available trees at that point of time would not remain the same. Working of SCI WC area is only 16% during plan period. Growing stock would have increased if space and conducive environment would have been given. The tract dealt with is free from grazing and to some extent from fire. Even wind fall is not so acute, the stand is bound to have more silviculturally available trees. At the on set of previous plan, the number was 5.96 say 6. Due to lapse of 15 years the stem from penultimate girth class to selection girth class would be = No of years x annual recruitment = 15 x 0.420 = 6.3. Assuming 16% of 6.3 = 1.008 say 1 has been realised or fallen, additional trees/ha silviculturally available will be 5.3. Thus Class I trees at hand would be 6.0+5.3 = 11.3)

2.11.1.11. It is obvious that although there is stock in hand of 11.3 class I trees/ha and there will be a recruitment of 37.0 trees/a in the 88 years and thus theoretically annual yield of (37.0 + 11.3) / 88 = 0.55 trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only ($S_I + R_2$). As discussed for Group A species, we will have for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-73

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP D SPECIES

(For Proposed Plan Felling Cycle of 15 years; n th year of operation; No of trees per ha)

SrNo	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_I	Realizable Recruitment = (n-½) R_2	Accruing Recruitment=
1	XI	1	1	11.3	½R_2 = 0.258	$9R_2 + 5½ R_2$ =7.207
2	XII	1	2	11.3	R_2 + ½ R_2 =0.774	$9R_2 + 4½ R_2$ =6.741
3	XIII	1	3	11.3	$2R_2$ + ½ R_2 =1.293	$9R_2 + 3 ½ R_2$ =6.275
4	XIV	1	4	11.3	$3R_2$ + ½ R_2 =1.809	$9R_2 + 2½ R_2$ =5.809
5	XV	1	5	11.3	$4R_2$ + ½ R_2 =2.325	$9R_2 + 1½ R_2$ =5.343
6	I	1	6	11.3	$5R_2$ + ½ R_2 =2.841	$9R_2 + ½ R_2$ =4.877
7	II	1	7	11.3	$6R_2$ + ½ R_2 =3.357	$8R_2 + ½ R_2$ =4.389
8	III	1	8	11.3	$7R_2$ + ½ R_2 =3.873	$7R_2 + ½ R_2$ =3.873
9	IV	1	9	11.3	$8R_2$ + ½ R_2 =4.389	$6R_2 + ½ R_2$ =3.357
10	V	1	10	11.3	$9R_2$ + ½ R_2 =4.877	$5R_2 + ½ R_2$ =2.841
11	VI	1	11	11.3	$9R_2$ + 1½ R_2 =5.343	$4R_2 + ½ R_2$ =2.325
12	VII	1	12	11.3	$9R_2$ + 2½ R_2 =5.809	$3R_2 + ½ R_2$ =1.809
13	VIII	1	13	11.3	$9R_2$ +3 ½ R_2 =6.275	$2R_2 + ½ R_2$ =1.293
14	IX	1	14	11.3	$9R_2$ + 4½ R_2 =6.741	$R_2 + ½ R_2$ =0.774
15	X	1	15	11.3	$9R_2$ + 5½ R_2 =7.207	½R_2 = 0.258
	Total	15		169.5	=57.171	=57.171
			Average	11.3	=3.8	=3.8

2.11.1.12. Thus overall average number trees per ha will be 11.3+3.8+3.8 = 18.9. Out of which available for selection felling would be 11.3+3.8 = 15.1. Percentage removal would be 15.1/18.9% = 80%. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will

be 40%. On average 40% of 15.1 = 6 trees per ha. In terms of number, 40 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 135-150 as timber = 0.485 cubic meter + firewood 0.330 cubic meter (Solid volume) = 0.815 cubic meter, We will have average annual yield = 6 x 0.815 = 4.89 cubic meter per hectare for felling cycle of 15 years. As the Plan Period is of 10 years we will have yield as 6x10/15 = 4 trees/ha and 4.89x10/15 = 3.21 cubic meter per ha of worked coupe.

On the basis of above calculation, annual yield will be as follows:

Table No-74

TABLE SHOWING ANNUAL YIELD OF SCIWC

Group of spp	**A**	**B&C**	**D**	**For one ha**	**For Working Circle 11,232 ha/year (Workable D type area 80%=8,986 ha/year)**
No of stem/ha	3.5	8.7	4	16.2	
Form Factor Timber	0.485	0.110	0.485		
Form Factor Fuelwood	0.330	0.060	0.330		
Timber	1.698	0.957	1.940	4.595	41,290 cubic meter
Fuelwood	1.155	0.522	1.320	2.997	26,931 fuel beat
Total	2.853	1.479	3.260	7.592	68,221 say 68,000 cubic meter

2.11.1.13. VOLUME SAFEGUARD: During felling cycle, no of stems per ha available for removal, above selection girth 135 cm for GROUP (A & D) will be 15 and for selection girth 60 cm for group B and 75 cm for group C is 17.4 trees per ha. Volume of silviculturally available trees will be on and average 15.183 cubic meter. Keeping the interest of guidelines issued by Government of India that only upto 50% of available yield is to be removed keeping future safeguard in mind have been protected, has been well maintained. As the removal is 7.592 out of total 78.3 cubic meter, which is less than 10% of total volume of the stand per ha.

2.11.1.14. Annual yield of 68,000 cubic meter per annum so arrived at is less than that of previous plan yield of 71,350 cubic meter per annum for SCIWC.

SECTION.2.12 . AGENCY OF HARVESTING

2.12.1.1. Demarcation of coupes and marking of trees for felling will be carried out departmentally to meet the silvicultural and technical requirement. Felling of trees and haulage of the felled material will be worked as per the directives issued by the Government. But cut back operations and other regeneration activities will be done departmentally.

SECTION .2.13. DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAPS AND MARKING TECHNIQUES.

2.13.1.1.DEMARCATION . Except 1st coupe due for working, rest of the coupes will be demarcated one year in advance of the main felling as given in sequence for working in appendix no. XVII in volume II. 1st coupe due for working will be demarcated, marking of trees will be carried out and felling will be executed during first year of operation of this plan to streamline the working of annual coupe. Demarcation and marking will be carried out as per the prescription given Chapter XII for Other Important Regulations.

2.13.1.2.PREPARATION OF TREATMENT MAP . After demarcation of the coupe, treatment map will be prepared by the Range Forest Officer and duly supervised by Assistant Conservator of Forests. Deputy Conservator of Forests of the Division will also inspect some of the coupes. Treatment map will be duly sanctioned by the competent authority. The treatment map will show the following type of areas.

2.13.1.3. TYPE A . PROTECTION AREA . Protection Area includes the following area .

(i) Areas with steep slopes more than 25°.
(ii) Areas eroded or liable for erosion.
(iii) 20 meter wide strip on either side of banks of the water course.
(iv) Riparian Zones .
(v) Sacred Groves .

2.13.1.4.TYPE–B . UNDER STOCKED AREAS. It includes the areas with crop density less than 0.4 but exceeding 2 ha in extent at one place .

2.13.1.5.TYPE-C . (a) GROUP OF YOUNG POLES . It includes patches of well grown pole crop of *teak* and other miscellaneous species suitable for retention as a future crop in addition to old plantations. The patch will not be less than five hectare. These patches will be spaced out for healthy growth.

(b) TEAK PLANTATION. Teak plantation taken during previous plans will be included in this category and treatment will be as per the prescription for old teak plantation i.e. cleaning and thinning will be done in the year as per sequence for that given existing old teak plantation. The sequence of cleaning and thinning is given in Appendix No.XIX .

2.13.1.6.TYPE D. WELL STOCKED AREAS . It includes the area with crown density more than 0.4 and adequate natural regeneration .

2.13.2.TREATMENT .

2.14.2.1. Following types of treatment will be given to areas as classified above. If necessary, nala bunding and gully plugging shall be done over the complete area of the coupe as per treatment map and model sanctioned by the competent authority. The area wise treatments proposed are as follows .

(i) **Type A - Protection Area .** Felling is not prescribed.

(ii) **Type B – Understocked Area .** *Teak* and suitable miscellaneous species will be promoted with tending of natural regeneration. Dead and malformed trees will be cut back. If natural regeneration is found to be inadequate, gap planting will supplement it.

(iii) **Type C – Pole Crop or advanced growth** . No planting will be done. Thinning will be done in the young pole crop to create interval between remaining trees to 1/3 of the average height as a thumb rule. *Teak* plantation areas shall be treated as per prescriptions provided for *teak* plantations working circle of this plan and such type of areas have been excluded from this working circle.

(iv) **Type D - Well Stocked Areas .** No planting will be done. Felling will be carried out as provided under Marking Rules and cut back operations will follow the main felling as per sequence given in appendix no-XVII in volume II of working plan report.

2.13.3.MARKING RULES AND MARKING TECHNIQUES .

2.13.3.1. Marking Rules. Marking will be done in the same year in which demarcation will be done. Before actual marking, at least 2 sample plots of size 60m X 60 m in each section of coupe will be taken. Sample plots should not be at the edge of the coupe. The distance between the centers of two sample plots should not be less than 200 m. In sample plots complete enumeration of trees of approach girth class and above selection girth will be done and the data will be compiled to determine the number of trees available for marking for felling.

2.13.3.2. Then the site quality will be determined. In the same coupe, if a patch of more than 5 ha is having different site quality, the enumeration data should be collected separately. The abstract of enumeration data will be prepared site quality wise. Then the number of stems to be removed from harvestable girth class is determined on the basis of groups of different species. In marking of the above surplus and mature trees, silvicultural, social and financial aspects of the species should be taken into account.

2.13.3.3. Marking technique has been described in detail in chapter XII under the head `Other Important Regulations`.

2.13.3.4. The marking rules for each type of area is prescribed as follows-

(i) TYPE – A- PROTECTION AREAS . No marking shall be done as felling is not prescribed. Dead trees will be removed leaving two dead trees per hectare to act as snags and dens. The root suckers will be encouraged. Bush sowing of suitable species will be carried out by the beat guards/van majoors.

(ii) TYPE – B- UNDERSTOCKED AREAS. Marking will not be carried out except**-**

(a) All the dead trees.

(b) All live high stumps to be cut as close to the ground as possible and dressed.
(c) All coppice shoots of valuable species, (Valuable species includes *teak*, *ain, bija, dhaoda, mowai* etc), malformed stumps and seedlings will be cut back, flush to the ground.

(iii)TYPE –C – (a) POLE CROP . Natural pole crop of not less than five hectare shall be spaced out in such a way that an average spacing of 1/3 of height of poles shall be maintained between two rows. The healthy poles will be preferred for retention.

(b) PLANTATION: Artificially raised pole crop will be thinned as per thinning schedule given under teak plantation working circle.

(iv) TYPE – D- WELL STOCKED AREA. All edible fruit yielding trees will be reserved from felling.

(a) All the trees of selection girth and approach class of each group i.e. A, B, C & D will be enumerated before marking in 15 cm girth classes.
(b) Except medicinal climbers, all climbers will be cut.
(c) Entire multiple coppice shoots or pole crops will be marked for felling.
(d) Group wise trees including t*eak* trees preferably of coppice origin and that of harvestable girth and above will be marked for felling as prescribed under yield regulation. Those harvestable trees which hinder growth of the seedling regeneration of the desired species will be removed in preference to others. Otherwise felling of trees from these girth classes will be first from the highest girth class and then next below and so on. Due care should be taken to remove trees of coppice origin while retaining the trees of seedling origin as far as possible. The trees which are not likely to survive till the next felling cycle will be preferred for removal.
(e) Irrespective of girth class, all malformed and dead trees will be marked for felling. **A tree is malformed** when it is defective or abnormal either in crown, or bole which includes conditions like slag headedness, crookedness, gnarls, twist or constrictions by climbers beyond recoupement etc.
(f) All yield including windfall must be regulated under the expected yield with ± 10% variation.

SECTION .2. 14 . SOIL AND MOISTURE CONSERVATION WORKS .

2.14.1.1. The soil and moisture conservation works will be taken up along with marking operation and completed before onset of monsoon in the next financial year. The soil and moisture conservation works will include gully plugging and nala bunding etc. These works will be taken up after preparation of a detailed treatment map of the area and model of soil and moisture conservation measure duly sanctioned by the competent authority.

SECTION .2. 15. REGENERATION

2.15.1.1. NATURAL REGENERATION : As the area under this working circle is having natural regeneration in plenty say profuse. Hence, the area will be naturally regenerated. These areas will be rigidly protected from fires, by resorting to rigid fire protection measures applicable to current coupe of working. The order of preference

for favouring miscellaneous species is *bija, shisham, haldu, ain, kalam, tiwas, dhaoda, bhirra, rohan*, and *lendia.* For all purposes natural regeneration seedling should be treated at par with the planted seedlings. Also Strict protection from grazing will be adhered in worked coupe area for 5 years to get the regeneration established.

SECTION –2. 16. SUBSIDIARY SILVICULTURAL OPERATIONS.

2.16.1.1. These works will be carried out in the subsequent years of the main felling. These works will be carried out departmentally as below.

2.16.1.2.CUTTING BACK OPERATION (CBO). CBO will be carried out in the next year of main felling. The operations will be confined only to D type areas. These operations are listed below.

(i) All standing trees marked for felling but not felled will be felled.
(ii) All damaged trees which are not likely to recover will be cut back.
(iii) All climbers interfering with the growth of regeneration will be removed.
(iv) All growth of inferior species which are likely to interfere with the growth of *teak* and valuable miscellaneous species will be cut.
(v) All malformed, suppressed and damaged advanced growth will be cut back.

2.16.1.3.CLEANING. Cleaning operations will be carried out in the coupe twice: (i) in the year before marking of the coupe for proper movement of enumerating and marking team and (ii) in the sixth year after main felling. The following operations shall be carried out.
(i) Climber cutting.
(ii) All dead, badly damaged and uprooted trees will be cut.
(iii) All coppice shoots will be cut.

SECTION-2. 17. OTHER REGULATIONS. Effective Protection is very important for establishment of natural and artificial regenerations. Strict and effective protection from fire, grazing, and pests for five years is prescribed.

2.17.1.1.PROTECTION FROM FIRE . Natural regeneration is badly damaged due to fire. Fire causes annihilation of natural or artificial seedlings. Hence, such areas will be rigidly protected from fire for five years after main felling.

2.17.1.2.GRAZING CONTROL. Grazing causes severe damage to establishment of regeneration . Due to grazing, young succulent, leading shoots are grazed/browsed or trampled by the animals. The areas after main felling will remain closed to grazing for a period of five years. The closed areas shall clearly be mentioned in grazing licensees and people shall be made aware about closure of the coupes.

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CHAPTER – III

WORKING PLAN FOR IMPROVEMENT WORKING CIRCLE

SECTION.3.1. GENERAL CONSTITUTION OF THE WORKING CIRCLE

3.1.1.1. The area included in Improvement Working Circle is area under taken in IWC of B.P. Singh`s Plan and still adheres to the norms fixed for that. It also consists of area which was in Selection Cum Improvement Working Circle in earlier Plan and does not conform to the norms of SCI WC i.e. area with deficient natural regeneration.

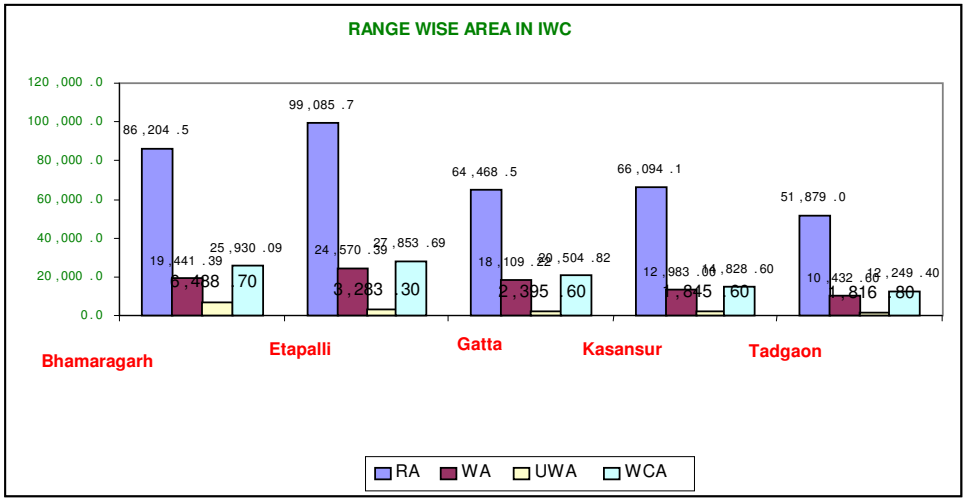
3.1.1.2. Range wise distribution of forest area under Improvement Working Circle is given in the following table.

TABLE NO-75

SHOWING RANGEWISE AREA DISTRIBUTION IN IWC

Sr No	NAME OF RANGE	RANGE AREA (RA)	WORKABLE AREA(WA)	UNWORKABLE AREA WA(UWA)	WORKING CIRCLE AREA (WCA)
1	Bhamaragarh	86,204.460	19840.389	6,488.700	26,329.089
2	Etapalli	99,085.714	24,926.390	3,283.300	28,209.690
3	Gatta	64,468.490	18,319.219	2,395.600	20,714.819
4	Kasansur	66,094.060	13008.001	1,845.600	14,853.601
5	Tadgaon	51,878.957	10,606.595	1,816.800	12,423.395
	Division Area	**367,731.681**	**86,700.594**	**15,830.000**	**102,530.594**

CHART -26



SECTION.3.2. GENERAL CHARACTER OF VEGETATION

3.2.1.1. The forests allotted to this working circle vary considerably in composition, density and growth. These are inferior in both quality and composition. The area is under stocked near villages but away from villagers it contains sizable patches of well stocked forests as well. These forests have degraded mainly due to biotic pressure because of their nearness to the human habitation.

3.2.1.2. The quality generally varies from III to IV and at places improves to II & I. The density varies from 0.4 to 0.6 and at places it is even below 0.4 at places, number of open patches and of scrubby growth is also found. The major species found in the crop are *ain, dhaoda, surya, biba, semal, tendu, garadi, lendia, mowai, khair & salai* etc. At places, bamboo is seen as under growth. It is scanty due to heavy grazing and occurrence of frequent fire. Unsound trees are common. Mature and over mature trees are less in composition. Natural regeneration of superior miscellaneous species is not satisfactory but that of other miscellaneous species is adequate. Coarse grasses have come up at some places. Crop is generally young to middle aged.

SECTION. 3.3. BLOCKS AND COMPARTMENTS

3.3.1.1. The details of compartments allotted to this working circle have been given in appendix no-XVIII in volume II of this working plan report.

SECTION .3.4. SPECIAL OBJECTS OF MANAGEMENT

3.4.1.1. Special objects of management of this working circle are as follows:

(i) To improve the stocking and bring it to be worked under SCIWC as soon as possible.
(ii) To check the soil erosion and conserve soil and moisture.
(iii) To improve the forests through active people participation wherever possible.
(iv) To have conducive habitat for wildlife development.

SECTION.3.5. ANALYSIS AND VALUATION OF THE CROP

3.5.1.1. STOCK MAPPING: The entire area under this working circle has been stock mapped by the staff of Working Plan Chandrapur and Bhamaragarh Forest Division (Territorial) under supervision of Officers of Working Plan Chandrapur-2. The results of stock mapping have been given in appendix no-II in working plan report**.**

STOCK MAPPING RESULT IN IWC

Sr.No.	Site QualityType	Area in I WC (ha)	% w.r.t. I WC Area
1	Miscellaneous I	615.184	0.6%
2	Miscellaneous II	15687.180	15.3%
3	Miscellaneous III	50957.705	49.7%
4	Miscellaneous IVa	9330.284	9.1%
5	Miscellaneous IVb	5844.243	5.7%

6	Miscellaneous Total	82434.598	80.4%
7	Teak I	0.000	0.0%
8	Teak II	102.530	0.1%
9	Teak III	717.714	0.7%
10	Teak IVa	102.530	0.1%
11	Teak IVb	615.184	0.6%
12	Teak Total	1537.959	1.5%
13	Plantation	2563.265	2.5%
14	Blank	15994.772	15.6%
15	Grand Total	102530.594	100%

3.5.1. 2.QUALITY AND AGE CLASSES: The general quality of the crop is III to IV. The crop is mostly young to middle aged.

3.5.1.3. DENSITY: The density varies from place to place. The density of the forests allotted to this working circle generally varies from 0.4 to 0.6. At places below 0.4 and also above 0.6 are also met with.

3.5.1. 4.ENUMERATION: Due to threat to life of personnel of Survey of Forest Resource Unit Chandrapur from naxalites, enumeration of growing stock could not be completed. Results of growing stock as enumerated during 1990-93 are reproduced here.

Table No-76
Table showing distribution of trees/ha in IWC
(Girth class is in centimeter at breast height; BA = Basal Area in square meter and GS = Growing Stock in cubic meter)

Girth Class/SPP	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	>135	TOTAL
Teak	1.00	0.57	0.72	0.52	0.69	0.61	0.57	0.43	0.24	5.35
Ain	15.69	11.61	11.61	9.85	9.30	6.20	5.41	3.72	1.87	75.28
Bija	3.39	2.65	2.65	2.50	2.63	1.98	1.74	1.56	0.72	19.82
Haldu	0.26	0.13	0.11	0.15	0.11	0.04	0.04	0.04	0.04	0.99
Shisham	0.39	0.22	0.19	0.19	0.17	0.22	0.06	0.02	0.02	1.48
Shivan	0.13	0.06	0.06	0.02	0.02	0.06	0.00	0.00	0.00	0.35
tiwas	0.61	0.50	0.41	0.37	0.22	0.11	0.11	0.00	0.00	2.33
Lendia	11.24	7.00	4.78	2.74	1.33	0.89	0.61	0.04	0.00	28.63
Garadi	27.56	25.59	19.81	12.46	9.26	3.91	0.91	0.19	0.15	99.84
Dhaoda	10.19	7.11	6.30	5.70	4.39	3.17	1.78	0.91	0.43	39.98
Moha	4.83	3.46	3.39	3.04	2.65	2.00	1.54	1.39	1.20	23.50
Tendu	14.02	9.69	7.37	5.93	3.76	3.39	1.98	1.28	1.17	48.59
Khair	5.87	3.98	1.59	0.91	0.13	0.11	0.06	0.00	0.00	12.65
Aonla	3.67	2.74	2.56	1.46	0.70	0.39	0.19	0.11	0.04	11.86
Hirda	1.41	0.98	0.98	0.72	0.54	0.41	0.07	0.04	0.00	5.15
Beheda	0.19	0.13	0.22	0.09	0.06	0.07	0.04	0.02	0.00	0.82
Dikamali	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Nirmali	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achar	8.85	5.93	3.76	2.04	0.89	0.69	0.26	0.11	0.06	22.59
Ghoti	3.02	2.15	0.94	0.91	0.28	0.20	0.22	0.00	0.00	7.72

Other	28.54	26.81	18.54	11.61	7.76	4.07	2.96	1.50	0.74	102.53
Total/ha	**140.93**	**111.31**	**86.01**	**61.17**	**44.93**	**28.59**	**18.56**	**11.36**	**6.68**	**509.53**
BA/ha	0.59	1.28	1.92	2.25	2.46	2.19	1.89	1.48	1.09	15.15
GS/ha	**2.68**	**7.12**	**8.00**	**11.81**	**13.21**	**12.01**	**10.75**	**8.53**	**6.40**	**80.51**

SECTION.3.6. SILVICULTURAL SYSTEM

3.6.1.1. The system to achieve the special objects of management is the improvement felling supplemented by planting and tending of naturally regenerated crop. In the plantation, species required by people for their domestic needs, will be preferred. For coppicing species, the coppice will be future crop.

SECTION.3.7. HARVESTABLE GIRTH

3.7.1.1. No harvestable girth is prescribed for improvement felling. However, to keep the hygiene of the crop, malformed, dead dying and diseased trees irrespective of girth class will be marked for felling and will be removed. Scattered mature trees will not be harvested. The small wood, poles and firewood obtained from above felling may be kept reserved for nistar to the limit of the bonafide requirement of the local people.

SECTION.3.8. CHOICE OF SPECIES

3.8.1.1. The species in the existing growth of indigenous species will be favoured, in order of their priorities, are *teak, bija, ain, tiwas, haldu, garari, lendia, dhaoda, rohan, bhirra* and *kalamb*. In the under story bamboo, for fuel kuda and dikamali will be preferred. Edible fruits and flower yielding trees, in general, are to be reserved everywhere. Same sequence of priority will be maintained in the tending of natural regeneration. In artificial regeneration besides local species, khair etc. will also be planted. These are of great importance for the local people. Some shade bearing trees like, ficus, gular etc, will also be planted for the benefit of wildlife.

SECTION.3.9. FELLING CYCLE

3.9.1.1. The felling cycle of 10 years has been fixed.

SECTION.3.10. FORMATION OF FELLING SERIES AND COUPES

3.10.1.1. The total area allotted to this working circle is 101,366.594 ha out of which 15,830.000 ha is unworkable. Workable area is 85,536.594 ha. The entire area has been divided into 35 felling series and each into 10 annual coupes. The sequence of working is given in appendix no-XVIII in volume II of working plan report.

SECTION.3.11. REGULATION OF YIELD

3.11.1.1. As no harvestable girth has been fixed, no yield regulation is prescribed.

SECTION.3.12. AGENCY FOR HARVESTING

3.12.1.1. The demarcation and marking will be done departmentally. Felling and disposal will be done by department. To carry out plantation works and other activities, wherever

possible, the Forest Protection Committees will be formed under the purview of the Government Resolution in respect of people's participation in forests management. The protection work will also be entrusted to these committees as per the provisions of the Government Resolution. The overall supervision will be of the department only. On failure of people for responding for the above activities the same will be carried out by the department.

SECTION.3.13. DEMARCATION OF COUPE, PREPARATION OF TREATETNT MAP AND MARKING RULES

3.13.1.1. DEMARCATION: Except 1st due coupe, main felling coupes will be demarcated one year in advance of main felling. In the 1st year of working of the plan, 1st and 2nd coupes will be demarcated and marked. But only 1st coupe will be felled in 1st year of year of operation of the plan.

3.13.1.2. PREPARATION OF TREATMENT MAP: Soon after the demarcation of main feeling coupes, a treatment map will be prepared by the RFO after thoroughly inspection the area and will be verified by an ACF. The DCF should check a few as a test case and when he is satisfied only then next step should be taken. The treatment map will show the following areas distinctly:

3.13.1.3. TYPE A: PROTECTION AREA: These will include

(i) Steep slope above 25^{o}.
(ii) 20 meter along either side of live water course.

3.13.1.4. TYPE B: UNDERSTOCKED AREA: It will include areas with density below 0.4 including blanks.

3.13.1.5. TYPE C: Successful old plantations and groups of young poles of advanced growth.

3.13.1.6. TYPE D: WELL STOCKED AREA: These will include all areas above 0.4 densities.

3.13.1.7. To facilitate the preparation of treatment map each coupe in general will be divided into 4 sections. Each type of area will be marked only if its, extent at one place is more than 5 ha. Except the nala banks, which will be marked irrespective of its area. The treatment map will be submitted to the DCF Bhamaragarh. The DCF. Will get it checked through an ACF and few by himself as the test case. After careful scrutiny, the same will be approved by the competent authority and will be sent to the RFO for compliance. No area will be treated as unworkable as some kinds of works will be required in each type of the area mentioned above.

3.13.2. MARKING RULES

3.13.2.1. Marking will be done in the same year in which demarcation will be done. Soon after the receipt of approved treatment map, making will be done. The marking technique is described in details in the Chapter XII under heading of Other Important Regulations. The marking rules o for each type of area, besides, climber cutting will be as follows:

3.13.2.2. TYPE A: PROTECTION AREA: No marking will be done.

3.13.2.3. TYPE B: UNDERSTOCKED AREA: All edible fruit and flower yielding trees will be reserved from felling. The following trees will be marked for felling:

(i) All dead and malformed trees.
(ii) All but one vigorously growing coppice shoots per stool.
(iii) All live high stumps.

3.13.2.4. TYPE C: SUCCESSFUL OLD PLANTATION AND GROUPS OF YOUNG POLES: Thinning will be done in the young pole crop to create interval between remaining trees to 1/3 of the average height as a thumb rule. *Teak* plantation areas will be treated as per prescriptions provided for *teak* plantations working circle of this plan and such type of areas have been excluded from this working circle.

3.13.2.5. TYPE D: WELL STOCKED AREA: All edible fruit and flower yielding trees such as *moha, achar, tendu, aonla, chinch, bel, sitafal*, and trees of *kulu* will be reserved from felling. The following trees will be marked for felling.

(i) All dead and malformed trees. [A tree is malformed when it is defective or abnormal either in crown, or bole which includes conditions like slag headedness, crookedness, gnarls, twist or constrictions by climbers beyond recoupement etc.]
(ii) All live high stumps.
(iii) All but one vigorously growing coppice shoots per stool where the stem density is less.
(iv) Procedure and other rules for coupe marking given in chapter II for SCIWC will be followed.

3.13.2.6. Bamboo working will be done as per sequence for Bamboo Coupe in the Bamboo Overlapping Working Circle and rules there under.

SECTION.3.14. SOIL AND MOISTURE CONSERVATION WORKS

3.14.1.1. Soon after the receipt of approved treatment map, soil and moisture conservation works will also be taken along with marking and will be completed before the onset of monsoon in the next year. Soil and Moisture Conservation model will be as sanctioned by competent authority only and duly approved by the Office of PCCF.

SECTION.3.15. METHODS OF REGENERATION

3.15.1.1. In the next year of marking, soon after the monsoon is over, a treatment map will be prepared showing the following areas:
(ii) With adequate natural regeneration and
(ii) Without adequate natural regeneration.
Regeneration will be taken as adequate if number seedling per ha is found to be more than 625. The treatments to above areas will be given as follows:

3.15.1.2. AREA WITH ADEQUATE NATURAL REGENERATION: In the year following the year of main felling, the naturally regenerated seedlings will be cleared off all undergrowth and will be spaced out uniformly so that the number of seedlings per ha is as required by the normal stand table for given site and composition of the crop. The miscellaneous species to be favored in order of priorities are *shisham, bija, haldu, ain kalamb, tiwas, dhaoda, bhirra, rohan, garari* and *lendia.* These seedlings will be treated

at par with the planted seedlings. Three weedings and soil working will be carried out around all the plants below 1 m height. Suitable soil mulching should also be done to the plants, lagging behind in growth. Tending, singling and cleaning will be done to plants. All other subsequent operations will be similar to those given in SCI working circle.

3.15.1.3. AREA WITH INADEQUATE NATURAL REGENERATION : In such areas method of artificial regeneration will be taken in the year following the year of main felling. The pre-monsoon works will be taken in the year of main felling only.

3.15.1.4. BAMBOO PLANTING: In the current coupes, bamboo under-planting will be done in all suitable sites, except in areas where the bamboo is already existing, planted or natural. The details of planting technique are given in Other Important Regulations.

SECTION.3.16. SUBSIDIARY SILVICULTURAL OPERATIONS

3.16.1.1. The following works will be carried out in the year following the year of main felling and in the subsequent years.

3.16.1.2. CUTTING BACK OPERATIONS: These will be carried out in the year following the year of main felling and will include:

(i) Felling of standing trees, marked for felling but not felled.
(ii) Felling of trees damaged during felling, which are not likely to recover.
(iii) Climbers which are not of medicinal utility will be cut.
(iv) Cutting of all coppice shoots where natural regeneration is adequate.
(v) Cutting of malformed regeneration of gbh more than 15 cm.

3.16.1.3. CLEANING: In the sixth year from the year of main felling, the following operations will be done:

(i) Climber cutting.
(ii) Cutting of all coppice shoots where naturally regenerated or planted seedlings are adequate and reducing them to two per stool where the regeneration is inadequate.
(iii) Removal of undergrowth interfering or likely to interferer with the growth of seedlings (natural or planted). Kuda, dikamali and other such species which provide firewood will be treated as seedlings instead of treating them as undergrowth.

3.16.1.4. THINNING: In advanced growth, marking will be done as per the stand table. For this site quality and average crop girth will be computed. That crop girth will be compared with the age at which it is comparable, assuming that the growth is at par with teak and stand table teak will be referred. The age of the stand will be assumed to be of nearest higher multiple of 5. e.g. if the average crop girth conforms to the age 27 year, the age of the crop will be assumed to be of 30 years. Accordingly, thinning will be carried out. This will include the following operations:

(i) Climber cutting.
(ii) Removal of dead, badly damaged trees or trees uprooted by wind or storm.
(iii) Removal of inferior growth, interfering or likely to interfere with the growth of species preferred to this working circle.
(iv) In plantation, thinning will be done as per prescription given in Appendix No.XIX.

(v) Fruit trees will not be touched during marking, except if they are congested themselves.

3.16.1.5. The sequence of CBO, cleaning and thinning is in given appendix no-XVIII in volume II of draft plan report.

SECTION.3.17. OTHER REGULATIONS

3.17.1.1. PROTECTION: These areas are in the proximity of the villages, special efforts will be required to protect them from fire, grazing and illicit cutting**.** The main felling coupes will be rigidly fire protected for a period of 5 years from the year of main felling. The detail of fire protection measures has been given in the Chapter XI on Forest Protection.

3.17.1.2. CLOSURE TO GRAZING: The main felling coupes will remain closed for grazing for a period of 5 years from the year of main felling. The closed coupes will be specifically mentioned in the grazing licenses and the villagers will be made aware of that by regular drum beating in the villages. In order to increase the availability of grasses in these areas, after working of soil, seed showing of superior grasses like paonia, sheda, and marvel may be done in suitable patches near villages. These areas should be kept closed to grazing from July to November during which the seedling of grasses becomes over. This closure is obligatory for the first year of sowing. Thereafter rotational grazing should be practiced.

3.17.1.3. PARTICIPATION OF LOCAL PEOPLE. The local people shall be made aware of the importance of protection to the forests from fire, illicit grazing, illicit cutting and encroachment. Participation of local people will be encouraged in protection and afforestation of forests through Joint Forest Management as far as possible. For this purpose, regular awareness campaigns will be arranged to explain the importance and benefit of regeneration and protection of forests. Village Forest Protection Committees will be formed and a comprehensive forest protection scheme will be undertaken under JFM.

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CHAPTER IV

WORKING PLAN FOR PROTECTION WORKING CIRCLE

SECTION 4.1. GENERAL CONSTITUTION OF THE WORKING CIRCLE

4.1.1.1. This Working Circle includes the hill and undulation areas having steep slopes. Such areas are in a compact block in Bhamaragarh, Kuakodi and Laheri Blocks. These areas were also included under Protection Working Circle in B.P.Singh`s Plan. The area handed over to Bhamaragarh Wildlife Sanctuary has been excluded from it. Areas which are also of steep slopes in other ranges have not been taken under this working circle. But care has been to treat those areas under protection in respective working circle under which they fall.

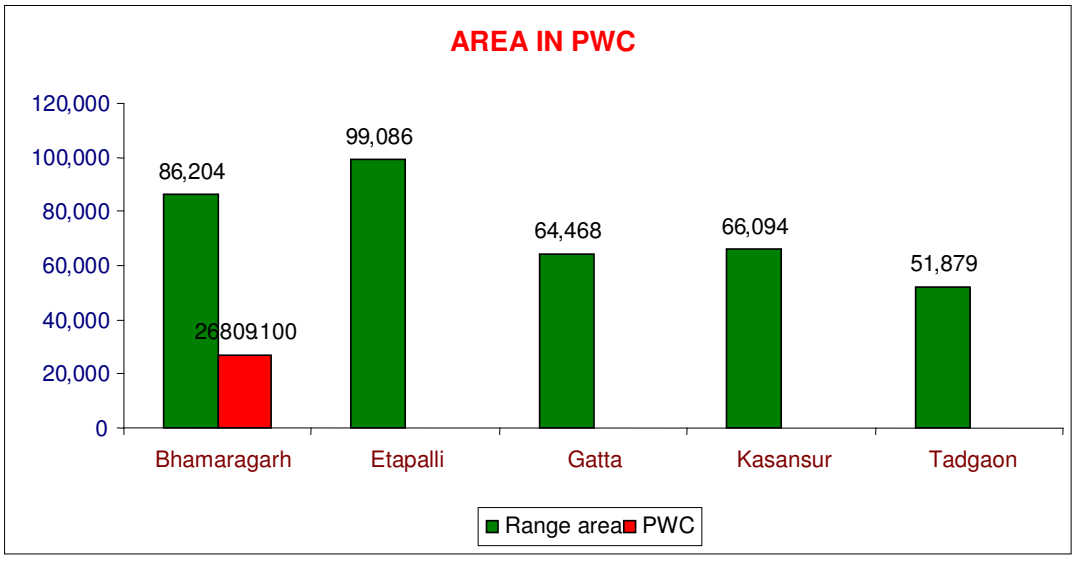
4.1.1.2. The total area of this working circle is 26,809.100 ha. Range wise and compartmentwise allotment has been given in volume II as appendix no-XXI in this working plan report.

Table N0-79

TABLE SHOWING RANGEWISE AREA IN PROTECTION WORKING CIRCLE (ha)

SrNo	Range	Range area	PWC : WA	PWC :UWA	PWC
1	Bhamaragarh	86,204.460	26,038.700	770.400	26,809.100
2	Etapalli	99,085.714			
3	Gatta	64,468.490			
4	Kasansur	66,094.060			
5	Tadgaon	51,878.957			
	Division Area	367,731.681	26,038.700	770.400	26,809.100

GRAPH-28



SECTION 4.2. GENERAL CHARACTER OF THE VEGETATION

4.2.1.1. The forest areas allotted to this working circle fall under protection forests as per the functional classification. The forests are mainly of mixed type. Main species *are ain, bija, dhaora, tendu, moha, garari, lendia, char, salai, ghoti, anjan, bhirra* etc. The understorey of Bamboo (Dendrocalamus strictus) is very thick.

4.2.1.2. All India Site Quality of the crop varies form, IV to II. Crown Density varies from 0.4 to o.9. Under stocked patches are common. The growth of the crop is stunted and malformed. Soil is shallow and bouldery. In the under stocked areas, *anjan* trees are commonly seen with understorey of *dikamali, ranbhendi, rohan, alichetu, traiempeta* and kusal grass. These areas are susceptible to soil erosion.

4.2.1.3. The over wood consists of *ain, dhaora, salai, mowai, lendia, achar semal, bija, tiwas, bhirra, anjan, rohan and garari.* The state of regeneration is adequate in entire area.

SECTION 4.3. SPECIAL OBJECTS OF MANAGEMENT

4.3.1.1. The special objects of management for these forests are as below.

(i) To preserve and improve the existing growing stock in these areas for protection of soil and conservation of water regime.

(ii) To conserve biodiversity.

SECTION 4.4. ANALYSIS AND VALUATION OF THE CROP

4.4.1.1. STOCK MAPPING: With the help of staff of Working Plan Chandrapur-2 and Bhamaragarh Forest Division under supervision of Conservator of Forests Working Plan Chandrapur-2 entire area under this working circle has been stock mapped. The results of stock mapping has been given in appendix no-II in volume II of this working plan report. Abstract of which is as follows;

SrNo	Site Quality	Area in ha	% area wrt WC
1	Miscellaneous I	1,231.6	5%
2	Miscellaneous II	11,706.0	44%
3	Miscellaneous III	13,101.1	49%
4	Blank	770.4	3%
	Area of working circle	**26,809.1**	100%

4.4.1.2. ENUNERATION: Due to life threat from naxalites to staff of SOFR, complete enumeration work was not carried out. Result of partial enumeration and previous data is as follows:

	Girth Class in Centimeter									
Specles	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	135& above	Total
Teak	0.07	0.09	0.10	0.09	0.06	0.06	0.03	0.02	0.02	0.54
Ain	7.26	6.14	5.67	4.95	4.22	3.91	3.19	2.28	2.36	39.98
Bija	2.73	3.50	3.56	3.40	2.89	2.68	2.21	1.45	1.29	23.71
Haldu	0.08	0.10	0.12	0.17	0.10	0.08	0.06	0.03	0.04	0.78
Shisham	0.15	0.21	0.23	0.13	0.11	0.07	0.06	0.02	0.05	1.03
Shiwan	0.01	0.03	0.03	0.03	0.03	0.03	0.01	0.00	0.00	0.17

Tiwas	0.05	0.07	0.07	0.09	0.03	0.03	0.03	0.00	0.01	0.38
Iendia	3.96	3.15	2.46	1.90	1.26	0.91	0.44	0.10	0.01	14.19
Garari	14.06	10.48	6.84	3.32	2.36	0.63	0.28	0.07	0.02	38.06
Dhaoda	5.32	5.17	4.66	3.89	3.13	2.77	1.94	1.00	0.61	28.49
Moha	1.97	2.03	2.21	2.22	2.14	2.20	1.73	1.31	1.20	17.01
Tendu	10.85	6.94	5.05	3.95	3.28	3.27	2.52	1.56	1.09	38.51
Khair	0.16	0.20	0.08	0.05	0.04	0.03	0.01	0.01	0.00	0.58
Aonla	1.85	1.82	1.66	1.00	0.51	0.24	0.12	0.04	0.01	7.25
Hirda	0.47	0.64	0.88	0.79	0.54	0.37	0.26	0.11	0.06	4.12
Beheda	0.18	0.27	0.26	0.20	0.17	0.10	0.10	0.08	0.07	1.43
Dikamali	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nirmali	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Char	2.82	2.86	2.41	1.29	0.56	0.23	0.11	0.01	0.02	10.31
Ghoti	2.92	2.64	1.72	0.56	0.18	0.13	0.08	0.00	0.00	8.23
Other	12.82	13.88	13.04	9.91	6.72	5.02	3.13	1.65	0.89	67.06
total	67.73	60.23	51.05	37.94	28.33	22.76	16.31	9.74	7.75	301.84

4.4.1.3. DENSITY AND AGE CLASSES: The crop is mostly young to middle aged with scattered mature trees. The density generally varies from 0.4 to 0.9. Some under stocked and blank patches are also included. Well stocked and dense areas are also noticed along water bodies.

4.4.1.4. REGENERATION: The overall status of regeneration is satisfactory.

SECTION 4.6. METHODS OF TREATMENT

4.6.1.1. Consistent with objectives of protection working circle, no felling of trees is prescribed here. Collection of M.F.P. items, like tendu leaves, char fruits, moha flower and fruits, bel fruits, tendu fruits, will be done. Area is having excellent growth of bamboo as under-story which will be harvested without doing any damage to the soil and soil cover.

4.6.1.1. To check the soil erosion and to improve the stocking in the under stocked area, following measures are being prescribed:

i) In the eroded areas, areas prone to erosion, gullies and small nalas appropriate soil and moisture conservation works will be carried out. To improve the vegetative cover, dibbling of seed and bush sowing of seeds of *neem, bakain* and *maharukh* may also be carried out through the available staff and fund.

ii) No new road should be constructed. Only old roads should be maintained without upgrading them. Besides, on repair of roads, passing through these areas, all materials required for repair shall be brought from out side. Even digging of borrow pits should not be done in such areas.

iii) Cross drains should be made at appropriate intervals, depending upon the slopes, across earth and murrum roads before on set of monsoon.

SECTION 4.7. FORMATION OF WORKING SERIES AND COUPES

4.7.1.1. The whole area is divided into 6 working series each containing 10 coupes of 10 years working cycle. A statement showing the allotment of compartments to the working series and their division into coupes and sequence of working is given in appendix no-XXI in volume II of working plan report.

SECTION 4.8. METHODS OF EXECUTION OF TREATMENT

4.8.1.1. Except 1st coupe, all coupes doe for main working will be demarcated one year in advance of main working. 1st coupe due for working will be demarcated in the 1st year of operation and main working will also be carried out in same year.

4.8.1.2. Soon after demarcation, RFO will prepare treatment map which will be thoroughly inspected by ACF. Treatment map will consists of following features.

(i) Areas eroded or prone to erosion.
(ii) Earth and murrum roads passing through the area.
(iii) Under stocked area.

4.8.1.3. Area (i) and (iii) will be demarcated by painting a geru ring on trees at b.h. standing on the periphery at suitable intervals.

4.8.2.1. TREATMENT PRESCRIBED: In area (i) Nala bunding and gully plugging will be carried out with locally available materials. In area (ii), roads requiring annual maintenance shall be treated as prescribed above. In area (iii) seeds of neem, maharukh, salai, dhaora and other locally available species will be dibbled at suitable spacing say 2m x 2m just before the onset of monsoon, preferably in the 1st or 2nd week of June. Seeds of *dhaora* and *salai* are locally available from 15th March to Aril end. The results are required to be evaluated so that improvement could be made by the D.C.F. Besides that, bush sowing will also be carried out. As the extent of work involved is of large quantum, this could not be got done by Beat Guard alone. This work should be carried out on plan basis as envisaged by DCF and sanctioned by competent authority.

SECTION 4.9: OTHER REGULATIONS

4.9.1.1. FIRE PROTECTION: The compartments of this working circle will be effectively fire protected. Fire tracing will be carried out along boundary of the area.

4.9.1.2. GRAZING CONTROL: Though the grazing pressure in the tract is negligible, efforts should be to avert the any grazing pressure in future.

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CHAPTER V

WORKING PLAN FOR BAMBOO OVERLAPPING WORKING CIRCLE

SECTION 5.1. GENERAL CONSTITUTION OF THE WORKING CIRCLE

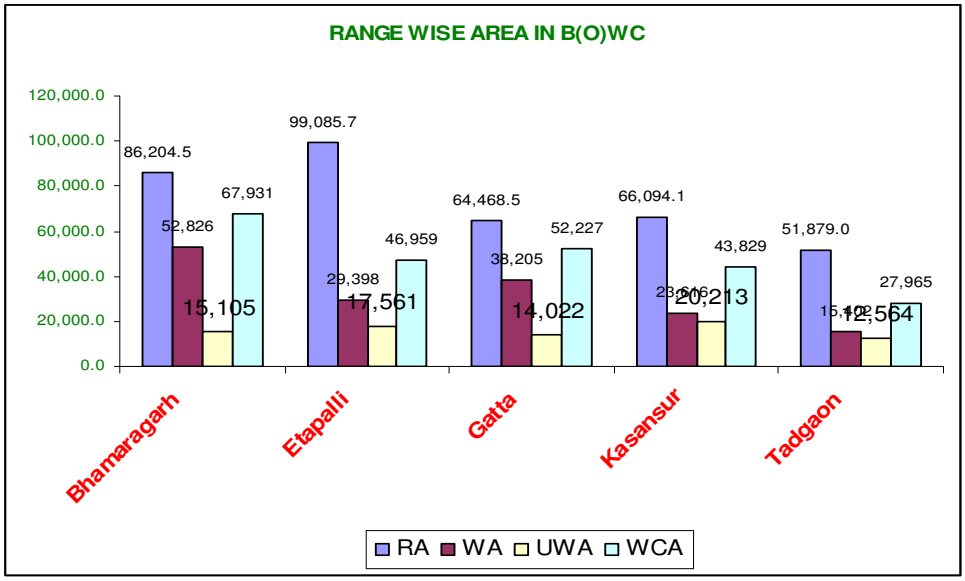
5..1.1. Bamboo Overlapping Working Circle consists of all areas allotted to that working circle in previous plan excluding the area handed over to Wildlife Sanctuary. In previous plan, such areas were included in this working circle which contained workable quantity of bamboo i.e. the areas with sufficient bamboo clumps and required independent bamboo working. Areas with scattered bamboo were not included in it. Present plan also includes such areas which had been left over but contain considerable quantity of bamboo. It excludes the compartments which are near to habitation and number of bamboo clumps has dwindled in past period. Successful bamboo plantations have been also included.

Table No-80

TABLE SHOWING THE RANGEWISE DISTRIBUTION OF BAMBOO AREA (in ha)

Sr No	NAME OF RANGE	RANGE AREA	WORKABLE AREA	UNWORKABLE AREA	BOWC AREA
1	Bhamaragarh	86,204	52,826.09	15,105.21	67,931.30
2	Etapalli	99,086	29,397.72	17,561.48	46,959.20
3	Gatta	64,468	38,205.47	14,021.93	52,227.40
4	Kasansur	66,094	23,616.02	20,213.18	43,829.20
5	Tadgaon	51,879	15,401.61	12,563.59	27,965.20
	Division Area	367,732	159,446.910	79,465.390	238,912.30

CHART -29



SECTION 5.2. GENERAL CHARACTER OF THE VEGETATION

5.2.1.1. The general character of the vegetation in the areas included in this working circle has been described in the respective working circles. The species of bamboo commonly found is *Karka* i.e. Dendrocalamus strictus. The other species found rarely in small quantity is Katang i.e. Bambusa arundinacea. The occurrence of *Katang* is confined along the water courses. Dendrocalamus strictus is found in all five ranges of the division. Out of 11 blocks in the division, bamboo is found in only 9 blocks. Only Etapalli Block practically does not have bamboo. In Bandia Block bamboo is in very limited area. The concentration of bamboo as an under storey is dense in the area of Bhamragarh, Kuakodi and Laheri Blocks of Bhamragarh Range, Garewada Block of Gatta Range and Surjagarh and Gatta Blocks of Etapalli Range. On other areas of the division, the concentration of bamboo is comparatively less. The potential of bamboo in this division is very high. Bamboo area having bamboo of length more than 10 m is classified as quality I area and below 10 m length as quality II area. The ratio of quality I & II bamboos is approximately 2:1. Some clumps get flowering every year. But the extent of flowering is not of the gregarious in nature.

SECTION 5.3. LOCAL AND COMMERCIAL DEMAND

5.3.1.1. Local people use bamboo for their local requirements like tattas, baskets etc. Many attractive articles are made by local artisans who are in great demand. Bamboo is also used in construction of temporary walls of hut, compound fencing, cattle shed. It is also used for fencing of agricultural field to protect from cattle and wild animals. Apart from local demand there is heavy commercial demand of the bamboo based industries.

5.3.1.2. Local demand for bamboo is very limited as the population density is less and supply is more. After fulfilling the bonafide requirements of locals, remaining bamboo areas have been leased out to Ms Ballarpur Industries Limited (BILT) for making Paper Pulp.

SECTION 5.4. BLOCKS AND COMPARTMENTS

5.4.1.1. Bamboo areas have been arranged in 75 Felling Series out of which 56 is Nistar Bamboo Felling Series (NBFS) and remaining 19 as Commercial Bamboo Felling Series (CBFS). Felling Series wise details of compartments and bamboo area are given appendix no-XX in volume II of Draft Plan Report.

SECTION 5.5. SPECIAL OBJECTS OF MANAGEMENT

5.5.1.1. Special objects of constituting this working circle are as follows:

(i) Harvesting of bamboo on scientific lines to obtain maximum sustained yield.
(ii) To meet the local people demand for bamboo to the greatest extent.
(iii) To meet the demand of crafts and artisans for bamboo in the tract.
(iv) To meet the demand of industries based on the bamboo.
(v) To increase the crop to increase the productivity.

SECTION -5.6. ANALYSIS AND VALUATION OF THE CROP

5.6.1.1. STOCK MAPPING: The bamboo areas have separately been stock mapped. Compartment wise bamboo bearing area is given in appendix no-I in volume II of working plan report.

5.6.1.1. ENUMERATION: Due to threat to life of SOFR personnel, enumeration work was not completed. Result of previous enumeration is given in appendix no-II.

SECTION .5.7. CUTTING CYCLE

5.7.1.1. Cutting cycle is fixed as 3 years and for this each felling series is divided into three cutting sections, namely, A, B and C approximately as equiproductive as possible.

5.7.1.2. The Silvicultural system followed is coppice selection system. Rhizomes are stems of bamboo plant.

SECTION 5.8.: METHODS OF TREATMENT

5.7.1.1. The crop will be treated on clump basis, i.e. each clump will be treated independently as per the requirement. Culms of 1st and 2nd year growth are not cut. The practice of leaving eight mature culms (more than one year old) in each clump has been standardized.

SECTION .5.9. METHOD OF EXECUTION OF HARVESTING

5.9.1.1. DEMARCATION OF COUPE. Demarcation of coupes will be carried out in the months of April-May (before onset of monsoon) in that year in which the coupes become due for harvesting well before the working season starts by erecting wooden posts at suitable intervals. On the wooden posts compartment number, coupe and name of the felling series will be written.

5.9.1.2. Sample plots will be laid down to estimate the quantity of bamboo available in the coupe after rainy season. The sampling will be carried under strict monitoring by Range Forest Officer and thoroughly verified by Assistant Conservator of Forests in charge. Deputy Conservator of Forests will also verify some plots to follow the principle of sustainability and to avoid excessive felling.

SECTION .5.10. IDENTIFICATION OF BAMBOOS

5.10.1.1. Since the marking of bamboo is highly selective, it is essential to distinguish current year or a previous year or mature culms from each other.

(1) Current year. Culms sheath is present on lower half of the culms, branches are present throughout the length of the culms and white bloom is present abundantly and comes off easily.

(2) Second year. Culms sheath is absent; branches are present practically at all nodes. White bloom is patchy and comes off easily.

(3) Third Year. Culms sheath absent, branches are present practically at all nodes, white bloom is absent, and are replaced by blackish gray.

SECTION 5.11. METHOD OF WORKING

5.11.1.1 . Present practice of working bamboo forests areas on three years cutting cycle is hereby prescribed to be continued as follows:

(i) No harvesting works will be permitted between 15th June to 30th September.
(ii) No culms below the age of two years will be felled.
(iii)Following culms shall be removed from all clumps.

(a) All dead, decayed and dry bamboos.
(b) Culms whose half or more top part is broken or damaged.
(c) Twisted or malformed culms.

(iv) In a mature clump the following types of culms (green and living) will be retained:

(a) All current season's (i.e. less than one year old) culms.
(b) From the rest culms equal in number to the current season culms (i.e. less than one Year old) or eight, which one is more.

(v) The remaining culms will be considered available for harvesting.

(vi) The cutting height of culms will be between 15 cm to 45 cm above the ground level i.e. above the first internodes above the ground. The cut shall be slant with a sharp instrument.

(vii) In case of any flowering, no culms from flowered clump shall be felled in the year of flowering.

(viii) No clump should be considered fit for harvesting unless it contains more than 8 culms (one year as well as two years old included).

(ix) Harvesting of bamboo shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two years old are retained on periphery for the purposes of support to the new culms.

(x) Following Acts will be strictly prohibited.

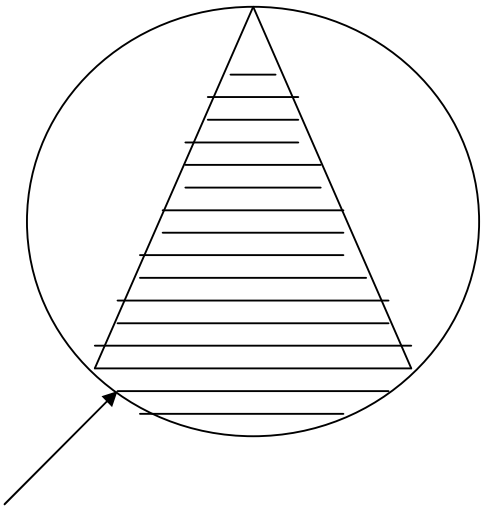
- (i) Digging of rhizome.
- (ii) Lopping of bamboo culms for fodder.
- (iii) Use of tender bamboo culms for bundling.
- (iv) Use of bamboo new shoots for consumption.
- (v) Climbers infesting with growth of bamboo clump shall be cut.

(xi) A clump will be distinguished as an independent clump where its periphery is easily discernible from the adjacent clumps, irrespective of its distance from other. Only when such a distinction is not possible, two clumps within one meter distance will be considered as one.

(xii) The exposed bamboo or rhizome on the periphery should be covered with the slash and earth to provide nourishment to spreading rhizomes and thus promoting peripheral growth of culms.

5.11.1.2. It is observed in the field that the congested clumps are seldom worked. It leads to more congestion in the crop. Also it is a natural loss to society. In such congested clumps, opening should be done in the Wedge form cutting about one third of the existing bamboo irrespective of the age.

SHAPE OF REMOVAL OF ONGESTION



Area to be cleared of bamboo

5.11.1.3. IMPROVEMENT OF NISTAR BAMBOO FELLING SERIES: Nistar Bamboo Felling Series bamboo forests are mainly near the village habitation. Due to traditional way of using bamboo from these areas has caused depletion in bamboo stocking. Growth of bamboo clumps has also been affected. To improve the quality of bamboo and to increase the bamboo area following works are prescribed to be done.

(i) Congested and stunted clumps will be earmarked during demarcation of coupes.
(ii) Congested clumps will be decongested.
(iii) Stunted clumps will be cleaned by removing dead, dried and crooked culms.
(iv) In bamboo deficient areas, bamboo plantation upto 25 ha extent in each coupe will be taken. Spacing of bamboo plantation will be 5m x 5m. Species of bamboo to be planted will be Dendrocalamus strictus only. Planting stock should be not less than one year old rhizome in poly bag.
(v) Area will be strictly protected from grazing.
(vi) If possible, Forest Protection Committees will be actively involved in improvement of bamboo production and just utilization.

SECTION 5.12. AGENCY FOR HARVESTING

5.12.1.1. The harvesting will be done as per the Government policy. Some Nistar Fellings are being worked departmentally to cater the need of locals. Remaining bamboo felling series are being presently harvested by BILT, Ballarshah. Since there is limited local demand by other agency to work in the tract due to naxal fear, therefore, all coupes will be worked by the same agency as per terms and conditions of contract between Government of Maharashtra and Ms BILT.

SECTION .5.13.BAMBOO FLOWERING. -

5.13.1.1. Flowering is either periodic or annual. It is either gregarious, sporadic or both. Gregarious flowering is usually followed by the death of clumps, but in some cases of sporadic flowering, the clumps do not die after flowering. The gregarious flowering proceeds from one end of the forest to another in waves. In two to three years the entire forest flowers. Because of this phenomenon, bamboo flowering is an important event to reckon with in estimates of sustained supplies. The common bamboo *(Dendrocalamus strictus)* found in this area shows an irregular flowering in which one or few culms in one clump or a few clumps in one locality flower at any one time. While at other times all culms of one clump and all clumps in one district are simultaneously covered with flowers. The physiology of bamboo flowering is still not fully understood. Rhizome planted away from the parent rhizome also maintains the physiological cycle of the parent. There is also a belief that bamboo flowering synchronizes with famine year. This is accountable to the fact that drought period hastens up flowering. It is also noticed that in the year previous to flowering no new shoots are put up. In case of *Dendrocalamus strictus,* it has been observed that intensity of flowering varies from locality to locality and from year to year in the same locality.

5.13.1.2. After the gregarious flowering and subsequent death of old bamboos, the profuse regeneration of bamboo comes up. Many a time's fallen seeds are attacked by fungus which destroys the seeds. In order to avoid fungus attack, a mild solution of fungicide may be sprayed over the seeds. The viability of the bamboo seeds is very less i.e. hardly a month or so. Therefore the seeds should be immediately collected and spread manually in the deficient areas. It takes nearly eight years for new regeneration to reach the exploitable size, but often it takes considerably more time. The following prescriptions will be followed while dealing with natural regeneration of bamboo.

5.13.1.3. The areas where clump formation has not yet completed.

(1) The area should be thoroughly gone over and 80 cm diameter foci at the rate of 250 per hectare should be formed and distributed evenly over the whole area.

(2) All the rank growth and even bamboo seedlings around the foci formed above and up to a distance of 1.5 m all around from each focus should be cleared so that the growth of the bamboo seedlings in the selected foci is not hampered. If this is not done, it will lead to a switch growth

(3) All climbers within and around the foci up to 1.5 m should be completely removed.

(4) The whole area should be strictly protected from fire and grazing.

5.13.1.4. In areas where clump formation has commenced, but the crop is yet immature for exploitation.

(1) The 250 foci per hectare initially established may be reduced to 125 per hectare well distributed over the whole area retaining only foci containing promising and removing switch culms.

(2) From the selected foci, all badly grown, twisted and otherwise damaged culms should be removed.

(3) All climbers within and around the foci upto a distance of 1.5 m should be completely removed.

(4) The trees overtopping or likely to overtop the bamboo clump should be thinned.

(5) The whole area should be strictly protected from fire and grazing

5.13.1.5. Crop age above 8 years. When the crop age is above 8 years, the clump formation is normally completed and clumps are mature enough for exploitation. The treatment during this period will be of the nature of exploitation-cum-tending. The cutting rules already prescribed in the earlier paragraphs, will be applied here.

SECTION .5.14 .OTHER REGULATIONS

5.14.1.1. FIRE PROTECTION. Fires cause extensive damage to the new shoots of bamboos and, therefore, these areas must be completely protected from fire by removing all debris from the forest in the form of cleaning.

5.14.1.2. GRAZING. These areas should be protected from grazing especially after flowering and in the rainy seasons in which the recruitment of new culms takes place.

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CHAPTER-VI

WORKING PLAN FOR NWFP (NON WOOD FOREST PRODUCE) (OVERLAPPING) WORKING CIRCLE

SECTION: 6.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

6.1.1.1: This is an overlapping working circle covering the entire forest area of the tract dealt with. The non-wood forest produce includes both minor forest produce (MFP) and also the medicinal plants found in this tract. The tract is rich in availability of non wood forest produce.

SECTION: 6.2: NON WOOD FOREST PRODUCES OF THE TRACT:

6.2.1: MINOR FOREST PRODUCE (MFP):

6.2.1.1:-There are numerous minor forests produce available in this tract and are found in almost entire tract with varying degree. These contribute sizeable income to the locals as well as generate employment to local forest dwellers directly or indirectly. NWFP plays an important role in rural economy.

6.2.1.2: The important non wood forest produce, found in this tract are *Moha* Flower, *Moha* Todi (Moha seed), *Bamboo*, *Tendu* Leaves, *Myrobalon (Hirda, Beheda, and Aonla), Charoli, Honey, Gum, Broom Grass* etc. The compartment wise distribution of a few important species in different girth-classes as per analysis of tree enumeration data is given in appendix no-II in volume II.

6.2.2: MEDICINAL PLANTS

6.2.2.1: The tract is rich in variety of medicinal plants which are used for curing various ailments by the local people. Medicinal plants occupy an important position in the socio-cultural, spiritual and medicinal arena of local villagers which are mainly tribals. Their sustainable management and harvesting can conserve bio-diversity, sustain human and environmental health, generate employment and earn foreign exchange by promoting exports.

6.2.2.2: The importance of medicinal plants and their uses are now world wide felt need of humanity. Even World Health Organisation (WHO) is concerned about this. These plants are not only necessary for maintaining the environmental balance and biodiversity, but also they are looked upon as the future source of Medicare of humanity. As most of the resources are still to be explored and their proper uses are yet to be brought to the knowledge domain of the people on grass roots and acceptable level**.** The tract dealt with may be looked upon as a treasure for future as far as medicinal plants are concerned. But the present methods of extraction of medicinal plants in the tract are not conducive for future conservation as the method is primitive and of crude nature. The methods of non-destructive harvesting are also not known to the common people.

6.2.2.3: For sustainable and ecological development of medicinal plants it has been realized that medicinal plants conservation in the tract need to be intensified. Field

surveys and studies are required at micro level for *in situ* conservation. The present inventory survey by the Survey of Forest Resources (SOFR) Units is at macro level and does not give true picture. The timing of surveys of resources by SOFR is after rainy season. It is not appropriate for NWFP. By the time surveys are conducted most of the herbaceous plants disappear due to their life cycle. Also mere identification of species does not suffice. Survey should be exhaustive and at the appropriate time with respect to NWFP species, which are annual and have short life cycle. This needs to be done by the territorial field staff.

6.2.2.4:- The important medicinal plants which have been identified by Botany Professor of Nagpur University, Mr. Padhye and his team, in this tract have been given in the Medicinal Plants found in the tract.

SECTION-6. 3: SPECIAL OBJECTS OF MANAGEMENT:

6.3.1.1:- As per the National Forest Policy, 1988 the development of non wood forest produce (NWFP) has been one of the objectives in forest management. Therefore, consistent with the above policy, the special objects of management are enunciated as bellows.

(1) To manage NWFP and medicinal plants scientifically and to utilise the existing potential optimally and thereby to enhance the productivity of these species.
(2) To take measures for conservation and sustainable use of the species identified as NWFP.
(3) To generate employment for providing work to the local people and thereby improving their socio-economic conditions.
(4) To provide better and improved quality of life of tribals through inclusion of traditions which support and link their life styles into sustainable harvest and use of NWFP.
(5) To identify and conserve the forest areas rich in NWFP and medicinal plants.

SECTION.6.4: METHOD OF TREATMENT: The treatment to be given to particular NWFP differs from each other. Treatment for some important NWFP is given here. Recorded production of some important NWFP is given in following table.

Table No-81

Table showing recorded MFP production during previous plan period

Production in Quintal.	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05
Gum	46.44	56.38	87.29	55.3	62.42	66.38	28.04	21.81	60.29	26.28
Moha	0	911.77	0	364.84	555.03	0	60.52	0	0	0
Harra	0	700.95	60.03	718.73	1800.17	2270.78	147.26	233.23	77.79	177.07
Mohatoli	0	1621.83	0	42.21	26.56	0	24.6	0	1.87	0
Biba	0	0	26.5	1.08	0	0	0	0	0	0
Chinch	0	0	38.94	0	5.19	0	1.74	0	0	3.06
Aonla	0	0	9.74	171.68	2.37	0	0	.80	0.78	115.18
Amaltas Shenga	0	0	7.25	0	0	0	0	0	0	0
Beheda		0	16.91	0	8.32	0	0	0	0	0
Chinch seed	0	0	29.67	0	2.97	0	0	0	0	0.48
Tendu leaves (Std Bags)	46791	47858	37378	47919	50490	53496	51188	57887	45423	34479

6.4.1. MOHA FLOWER & MOHA TODI

6.4.1.1. PARTS USED: Moha flower and Moha seed (known as Moha Todi) are used.

6.4.1.2. SPECIES & ITS DISTRIBUTION: Moha or Mahua is the species. Its botanical name is *Madhuca indica*. It is widely distributed tree specie in the tract. It plays a vital role in tribal economy and their nutritional requirement. Its flower is used for consumption in different ways by locals. It is regarded as poor man dry fruit i.e. kismis or dry draksha. It is also used to prepare local beverage commonly known as Tharra or Gavathi Daru which contains alcohol. As per record average distribution of tree is about 4.7% of total growing stock. It is found in the entire tract dealt with.

Table No-82
Table showing distribution of Moha trees

Girth Class/SPP	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	>135	TOTAL
MOHA	2.5	2.54	2.61	2.51	2.25	2.26	1.9	1.54	1.73	19.84

6.4.1.3. PRODUCTION: Recorded production of moha flower and moha Todi in the past is as given in table no 86. But due to large scale consumption at local level and non procurement of produce by Monopolized Trade by Tribal development Corporation in time leading to illegal trade, actual production is not given. Taking each tree producing 10 kg dry moha flower on average only 50% trees bearing flower, annual production in the tract will be [367,732 x 19.84 x 10]/2 kg = 36479 Metric Tone, say 36000 MT which is not reflected in the reported figure. Similarly, taking 1 kg of seed production from each tree, annual production of moha Todi will be 3600 MT. If the non destructive harvesting of these produce is upto 50% of the production leaving remaining for regeneration and for wildlife consumption, the available production will be to the extent of 18000 MT moha flower and 1800 MT moha Todi respectively.

6.4.1.3. FORMATION OF UNITS AND COUPES: As the entire tract dealt comes under Schedule Area in terms of Constitutional provisions and Panchayat Raj Extension to Schedule Area, ownership of minor forest produce lies in Gramsabha. Hence no Unit and Coupe will be formed. Each village will collect these produce in its jurisdiction. Forest department will regulate the collection and keep the record of production through its Beat Guard of respective area.

6.4.1.4: AGENCIES FOR COLLECTION: The collection of moha flowers and seeds is presently being done by individuals in each village. Normally they confine themselves around their villages only to collect moha flowers and seeds. Almost entire moha flower available are collected by the locals, there is no need to have separate agency for collection.

6.4.1.5:-MARKETING: The collection of moha flower and seed was done by the tribals and purchase of the same was done earlier by the Tribal Development Corporation (TDC) a Maharashtra Government Undertaking, which comes under Monopoly Act. Presently, no proper market is available. They sell it to local purchaser. But value added operation is not done. Hence the locals are not getting proper prices for

it. With help of Panchayat Raj Institution, Forest Department will facilitate the activities of collection, processing and value addition and marketing to enhance the economy of the villagers. That will form the core discussion on people participation in forest management and their immediate benefits to their kitty. Even Industry based on these produce will suffice the cause of concern for people and forest management on participatory note.

6.4.1.6: OTHER REGULATIONS:

(1) No moha tree will be felled under any silvicultural prescriptions.
(2) Compartment wise list of moha trees should be prepared and maintained at beat, round, range and division levels.
(3)The marked moha trees should be allotted to particular individual family for collection of flowers and fruits depending upon the number of trees and number of families around it under Gramsabha or Joint Forest Management.
(4) To collect Moha flowers, fire is used to clean the ground from leaves and litter which leads to forest fire. Therefore, before the start of flowers falling, the ground under the moha tree should be cleaned by the family to whom the trees have been allotted. The concerned Beat Guard will supervise the work.
(5)The measures for enhancing the production and productivity by local means should be explored. Local people should encourage adopting the trees and using the necessary work to enhance its production.

6.4.2. GUM

6.4.2.1: USE AND VALUE: -*Kulu* (*Sterculia urens)*, D*haoda (Anogeissus latifolia)* and Salai *(Boswellia serrata)* gum are the main sources of gum production in this tract. These are used in medicines, chemicals, cosmetics and food industries. Salai gum is mostly used as incense and is also used in the Indian medicines for rheumatism and nervous diseases. It has the possibility of becoming an important substitute for imported Canada balsam, used as mounting media in the preparation of microscopic slides. This gum is very similar to turpentine oil. It has also been found suitable in the manufacture of elastic adhesive, lacquers, oil cloth compositions, ink varnish, paints and perfumery. *Kulu* gum is the costliest gum and is having export potential. *Dhaoda* gum is very good for the preparation of many food articles.

6.4.2.2: YIELD: -The compartment wise estimated distribution of such trees in different girth classes is given in appendix no –II in Volume II in draft plan report. The study of yield of gums has not been done in this tract. The production is low. No scientific method for tapping has been used so far in this area. This field has got potential for employment generation and revenue earning. Besides, the regulations of the collection are very important from protection of forest from fire point of view. Recorded production in the past is in table no 86.

6.4.2.3: TAPPING RULES:-The rules for tapping of gum, derived by the FRI, Dehradun, are as follows:

(i) The tapping season will commence from November to end of May each year. No tree below 90 cm in girth will be tapped.
(ii) Tapping will be confined to the main bole of trees between 15 cm from ground level to the point from which first branch is given off.
(iii)Only trees above 90 cm in girth at breast height will be tapped.

(iv) Each tree will be tapped continuously for 3 years and will be given a rest for 3 years thereafter. The second tapping cycle will begin in the 7th year after the commencement of tapping season and will continue for another period of 3 years.

(v) The initial blaze of 20 cm wide and 30 cm in length or height may be made in the month of November on trees at 15 cm above ground level with a sharp edge having 75 cm wide blade the blaze is made 06 cm deep in the dark. Blaze may be made horizontally leaving approximately equal space between the two blazes the blazes should not have any loose fiber. The lower surface of the blaze should be slightly slopping outwards to avoid lodging of guggul in the blazed pocket in case initial blazing is done by adze.

(vi) The guggul starts oozing out soon after blaze are made and may be collected initially after a month, i.e. about December when the blazes may also be freshened. Subsequent collections and freshening may be done fortnightly upto May. Thus 12 freshening may be required to be made during the year.

(vii) In each freshening the lower surface is not to be freshened. The edge may be scraped so that only 38 cm increase is on either side in width at the end of 12 freshening. This means that about 03 cm should be scraped off either side in width in each freshening.

(viii) The lowest row of blazes will be at one meter above the ground level. The next row of blazes will be made at the height of 60 cm from the lower i.e. at a total height of 1.6 meter from the ground level, the vertical portion of the blaze of upper row will alternate with similar portion of the row and no two blazes of the two rows will be directly one above the other.

(ix) The number of blazes to be made on each tree will depend on its girth at breast height as given in the following table:

Table No-83

TABLE SHOWING THE NUMBER OF BLAZES ON TREE FOR GUM

SrNo	Girth at breast height	Max no of blazes to be made on each trees
1	0.9 m to 1.3 m	2
2	1.3 m to 2.0 m	3
3	2.0 m to 3.0 m	4
4	Over 3.0 m	1 Blaze for every 45 cm girth in addition to category 3 above

(x) No fresh blaze will be made on the partially healed up surface or old wounds. Each blaze will be in a shape of parabola with a 2.5 cm side base. The curved side of the parabola will be upwards and of height not more than 7.5 cm and the depth of the blaze will not exceed 0.6 cm in the wood

(xi) At the end of the season, the height of the blaze shall not be greater than 12.5 cm Maximum permissible dimension of each blaze shall be 10 cm x 12.5 cm x 0.6 cm in width, height and depth respectively.

Since the tapping is to be done continuously for three years the total height of the blaze at the end of three years of tapping will be 37.5 cm the width and depth remaining the same. In the second cycle i.e. in the 7th year (after three years rest) new blazes will be made in the same way in the unglazed portion, in between the blazed portions of the

first cycle. This blazing will continue for another three years in the manner described above and the operations will be repeated till unglazed is fully covered.

6.4.2.4: FORMATION OF UNITS: As discussed under Moha Flower, no unit is formed.

6.4.2.5: AGENCY: - All operations will be carried out either through member of Village or Joint Forest Management committees or local people under supervision of field staff.

6.4.2.6: MARKET: As the ownership on MFP is of Gramsabha, marketing will be done by it only. Forest Department will do role of facilitator. Value added activities need to be taken to enhance the income of the poor people collecting it. Export of raw or finished goods should also be thought of.

6.4.2.7: OTHER REGULATION

(i) The compartment wise list of such trees should be prepared and maintained at beat, round, range and division levels.
(ii) Cleaning around the trees to facilitate gum collection and to avoid fire should be done.
(iii) To improve the stocking of salai trees soil around these trees should be dug up in the form of a ring with a radius 1.5 times that of crown. By doing so roots get injured and root suckers come out profusely.
(iv) Gum producing trees should be reserved from felling.
(v) Strict watch is necessary to enforce tapping rules.
(vi) Production of gum should be recorded at village level and maintained upto Division level to assess the actual production.

6.4.2.8: OTHER ACTIVITIES: Division has taken initiative to enhance the gum production under FDA.

6.4.3: TENDU LEAVES

6.4.3.1: USE: Tendu Leaves is one of the most important NWFP of the tract which gives handsome revenue to exchequer and opportunity for gainful employment to forest dwelling people. Tendu Leaf is used for manufacture of bidi. Presently people are benefited from it only by way of getting wages for collection of leaves

6.4.3.2: YIELD: - The production of tendu leaves and royalty obtained in the previous years as per record is follows:

Table No-84

TABLE-SHOWING THE RECORDED PRODUCTION AND REVENUE:

SrNo.	Season	Total Sold Units/ Groups of units	Actual Production (Standard Bags)	Revenue (Rs.in Lakhs)
1	1995	28	46719	218.14
2	1996	28	47857	211.28
3	1997	21	37378	137.84
4	1998	26	47019	191.37
5	1999	28	50490	258.31

6	2000	28	53496	288.42
7	2001	28	51188	291.48
8	2002	28	57884	244.95
9	2003	23	45423	132.39
10	2004	18	34479	104.09
11	2005	13	27549	64.79

6.4.3.3:- To get the good flush of tendu leaves, pruning and pollarding of tendu trees are carried out every year. No other scientific efforts are made to augment the tendu leaves production in this tract so far.

6.4.3.4:FORMATION OF UNITS :- The Government of Maharashtra has constituted tendu units for the purpose of regulation of trade of tendu leaves under its Forest Produce (Regulation of Trade) Act, !969 vide its № MFP. 2182 / 240911 / F-1 dated 19th November 1983. In the tract dealt with 28 tendu units/group of units have been constituted. List of units, its estimated yield has been given appendix in volume II of working plan report.

6.4.3.5: AGENCY FOR TENDU LEAVES COLLECTION: - With the enactment of "Maharashtra Forest Produce (Regulation of Trade) Act, 1969" the trade in tendu leaves has been Nationalised under this Act, tendu units are auctioned to pluck process and dispose off tendu leaves by tender. Successful tenders are referred as licensee. Prior to 1991, the standard bag system was in practice. But after that the lump sum system has been adopted. In the current system, the lump sum cum notified yield is prescribed for each unit. The leaves puckers are given wages as per the wage decided by government on year to year basis. In the shadow of Naxalites puckers are demanding more wages than sanctioned by the Government. Government has taken decision that profit is not the concern. Royalty received will be plough back to the tract in the form of Bonus to Pluckers and development works for betterment of forest and forest dwellers.

6.4.3.6: MARKET OF TENDU LEAVES: As **t**he tendu leaves are used in bidi manufacturing as wrapper to bidi and Government has imposed on production on Tobacco, the ingredient of bidi, the trade is facing downward trend. Young generation is also not taking bidi smoking. Bidi market is shrinking. It is feared that this trade is going to be windup in near future.

6.4.3.7: OTHER REGULATIONS:-

(1) To improve the tendu stocking, soil around tendu trees should be dug up 15 to 20 cm depth in a circular ring of diameter equal to that of the crown so as to promote root suckers. The trees of gbh more than 45 cm should be selected for such operation.
(2) Pruning and lopping should not be done yearly. It should be done at an interval of 3 years to allow some seedlings to get established and become the future tree crop.
(3) Village wise Tendu Leaves collection must be recorded and kept at range and division level for Gram Sabha to know the quantum of MFP available in its jurisdiction-

6.4.4: BAMBOO:-

6.4.6.1. This is one of the important forest produce of this tract. This is popularly known as poor man's timber the local people make use of it in a variety of ways. Tribal people use tender rhizomes as vegetable during the monsoon. Besides, it is used

by Burads to prepare bamboos articles. Local people use it for construction of huts, houses, cattle sheds and fencing. The bamboo is also used in a number of industries such as Paper and Pulp, Ice cream etc. Details have been discussed in separate chapter VI in part II as Bamboo (Overlapping) Working Circle in this plan
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6.4.5.: MYRABOLONS, DIKAMALI AND NIRMALI FRUITS:-

6.4.5.1: USE: - These minor forest produces are used in many ways. Hirda, Beheda and Aonla are most common amongst Myrobalon. These are of high medicinal value and are used in many Ayurvedic medicines. Hirda and Beheda are given to child in villages invariably for cold, cough and stomach disorder. Dikamali and Nirmali fruits are used in chemicals and in many other industries.

6.4.5.2: YIELD: - So far no study has been conducted to assess the yield of fruits for trees of such species. The compartment wise distribution of such species in different girth classes will be given in draft plan report on the basis of enumeration of forest resources. It is envisaged that under Joint Forest Management, committee members in the area assigned to them should enumerate the trees of these species and yield should be recorded yearly in registers. All such data will be collected in the division office and updated fro time to time.

Table No-85

SPECIES	No of tree /ha	% wrt total
AONLA	11.05	2.62
HIRDA	3.31	0.78
BEHEDA	1.27	0.30
DIKAMALI	0.07	0.02
NIRMALI	0.02	0.00

6.4.5.3: FORMATION OF UNITS AND COUPES: - The village will be the unit. Since working is annual and covers the entire area and so unit will also be the coupe.

6.4.5.4: AGENCY FOR HARVESTING:-At present, monopoly over collection and disposal of MFP is of TDC. But in the light of Extension of Panchayat Raj to Schedule areas in respect of ownership over minor forest produces, these forest produces should be disposed off as per the mode adopted by the Panchayat Raj Institutions. Because entire tract is in Schedule areas, Forest Department will facilitate in providing technical guidance about non destructive collection of these forest produces.

6.4.5.5: MARKET: -Panchayat Raj Institution should market the minor forest produces with a view to reduce the burden of forest staffs and enable them to devote more for protection and conservation of forests and environment.

6.4.5.6: OTHER REGULATIONS:-

(1) The annual out turn of these forest produces should be maintained at range and division levels.
(2) The detailed list of such species should be prepared and maintained at beat, round, range and division levels.
(3) These species should be excluded from felling.

6.4.6: BROOM GRASS:-

6.4.6.1: USE: - This grass is used in preparation of broom which is usually used in houses. It is a seasonal crop and localized one.
6.4.6.2: YIELD OF BROOM GRASS: - So far no formal study has been conducted to assess the yield of this grass.

6.4.6.3 FORMATION OF UNIT: - The Range will be the unit.

6.4.6.4: AGENCY: - As decided by the Panchayat Raj Institution under strict silvicultural guidance of forest staffs/officials.

6.4.6.5: OTHER REGULATIONS:-
(1) The areas suitable for this grass should be managed for grass production.
(2) The compartment wise details should be prepared and maintained at beat, round, range and division levels.
(3) The area should be fire protected.

6.4.6: CHAROLI

6.4.6.1: Charoli seed is widely used as dry fruit. It is obtained from achar (Buchanania *lanzan*) tree. In this tract this tree is found to the extent of

Table No-86

SPECIES	Number of tree /ha	% wrt total
CHAR	15.78	3.74

Though it is widely found in the tract, its recorded production is not available. The scope of this produce is enormous. It will be tapped in the interest of enlistment of economy of tribal. Seed is annual. Hard kernel is to be decoated to get the charoli also known as chirounji. Non destructive harvesting is essential. As trend in young generation is to fell the trees to collect the fruits. It is to be stopped. Local tabboos may be used to sensitize people to collect the seed. Akshay Trutiya is regarded by the tribal. No seed should be collected before Akshay Trutiya. Value addition will be essential to augment the remuneration by establishing decoating machine in the tract under FDA etc.

6.4.7: LAC

6.4.7.1. . The entire area of this division consists of healthy *Palas* and *Kusum* trees which are conducive to lac cultivation. The only effort required is to seed the Plants with brood lac, and the production of lac can be sustained for years together resulting into revenue generation. Such experimentation has already been carried out in three villages at Ettapalli Tahsil namely Bhapda, Dindvi and Sarkheda. The technique of rearing lac has been standardized and hence reproduction is not made hare.

6.4.8. HONEY

6.8.1.1. Taking advantage of the scheme National Afforestation Programme initiated by the Government of India, Bhamragarh division has taken steps to provide the benefits of MFP to the local villages. Under the N.A.P. scheme, Honey collection, processing and marketing unit has been set up at Etapalli which has proved to be a grand success. Honey is collected from the people, processed, bottled with Brand name 'Bhamaragarh Nectar' and marketed under Jiwangatta Joint Forest Committee under Bhamaragarh Forest Development Agency. Estimates show that the potential of honey production in this division is to the extent of nearly 30 M.T. per annum. It is a healthy effort made by Forest Department to win over the confidence of people and ameliorate their condition. Mechanized processing unit for Honey, packing and marketing has been set up to augment the revenue generation to the FDA. Honey so collected, processed, canned is now being marketed in the Trade name of "Bhamaragarh Nectar".

SECTION-6.5: MEDICINAL PLANTS

6.5.1.1: ANALYSIS AND VALUATION OF THE MEDICINAL PLANTS

6.5.1.1:Methodology for studying the medical plants-Survey etc: In order to assess the potential of areas rich in medicinal plants the field surveys is contemplated in the Bhamaragarh Forest Division the method of stratified random sampling. SOFR unit of Chandrapur also conducted enumeration of 0.1% of the entire tract for trees and shrubs. Enumeration of herbaceous plants and grasses should be done following separate schedule as these species occur in monsoon season. It should be done by the territorial division.

6.5.1.2: MANAGEMENT OF THE AREA: - Medicinal plants are mainly herbaceous, tubers, shrubs and some trees. Hence the management of medicinal plants is the same as that of non wood forest produces. It is a new concept in forest management. Judicious utilization of medicinal plants need detailed studies about its occurrence, area, extent, phenology, production level and non destructive exploitation.

6.5.1.3: METHOD OF TREATMENT: - The involvement of People Participation in management of medicinal plants to augment their income should be the basis of management. Division should facilitate the training for treatment of medicinal plants their product along with marketing**.** Help of taxonomists of local science college or university should also be sought for identification of plants. Creation of market links and bank guarantees for sale of produce will lead to generating confidence for forest management. Methodology to be adopted should be as follows:

(i) Selection of suitable non-degraded areas where medicinal plant collections are already underway.

(ii) Involvement of a competent local NGO for organizing the community.

(iii) Establishing a system of sustainable harvest based on collection guidelines for specific species that are informed by "conservation science".

(iv) Joint management of forest sites by the local Forest Department and organized local communities. Assign specific forest areas to specific local village communities with clear delegation of responsibilities, privileges and full accountability. Proceeds of the harvest of medicinal plants to be shared under the JFM framework.

(v) Creation of market links for sale of produce at the outset of the programmes.

(vi) Building and strengthening community institutions for sustainable management.

(vii) Only such plants/parts of the plant specified for each species whose medicinal values are recognized should be collected e.g. fruits and seeds of neem tree.

(viii) Removal of plants or plant parts of species other than the specified ones shall be totally prohibited.

(ix) Lopping of branches to gather buds, fruits or leaves shall be totally prohibited.

(x) Fruits and seeds that have fallen to the ground alone are to be collected. May be the branches can be gently shaken to facilitate the shading of fruits and seeds.

(xi) For each medicinal plant/tree species about 1-2 % of the population shall be left as seed bearers for encouraging natural regeneration and also seed collection. These trees shall be numbered and ring marked and no collection shall be done from these seed bearers.

(xii) Species to be raised for use in Primary Health Care, trade in the RF/PF areas will be listed out category wise, well in advance to facilitate nursery operation. Information already generated on nursery and plantation techniques for the chosen species will be used for artificial regeneration.

(xiii) Based on the outcome of the survey of the vegetation, the proportion of medicinally important species shall be increased while taking up reforestation works under eco-restoration and water augmentation programmes.

(xiv) Tending of coppice shoots/root stocks of existing trees shall be taken up and the natural regeneration shall be encouraged.

(xv) Seeds/seedlings shall be sown/planted in the barren patches and in the weeded and soil worked areas around the tree saplings. Medicinal plant species of the nature of the climbers can be planted close to the naturally existing trees and shrubs or their natural hosts.

(xvi) If contour trenching is carried out, the species mentioned in the previous Para can be raised on the mounds in the first year and in the trenches during the next year when some silt gets deposited in them.

(xvii) At convenient contour intervals, say 30 m shrubs like Kumari (Aooe barbensis), Adhatoda (*Justicia adhatoda*), Nochi (*Vitex negundo*) and Vettiver (*Vetiveria zizaniodes*) can be raised as vegetative barriers along the contour. These species can also be planted along the RF boundary. This will incidentally facilitate demarcation of the RF from the buffer zone.

(xix) In the swamps, along the stream banks and on the waterspread areas and aprons of check dams and percolation ponds, hydrophytes like *Neerbrahmi (Bacopa monnieri), Vallarari (Centella asiatica), Vasambu* (*Acorus calamus*), *Arathai (Alphinia calcarata)* etc can be planted.

6.5.1.4:SUSTAINABLE HARVESTING OF MEDICINAL PLANTS: Information suggesting norms for sustainable levels of harvest shall be worked out by the territorial Deputy Conservator of Forests after taking into consideration the results of vegetation survey and availability of medicinal plants species and the parts of the plant or tree used for medicinal uses. Untimely harvesting should not be permitted otherwise natural regeneration will be affected. In case where the roots/tubers/rhizomes or the specific plant parts are used in medicine, the natural regeneration of these species shall be ensured by leaving well distributed and adequate numbers of seed bearers. An alternative would be to replant the area after harvest. Destructive collection should be prohibited. In some plants whose leaves are used for medicinal purposes, it is common practice to uproot the whole plant and therefore in such cases only the leaves should be allowed to be collected. In case of vettiver, the roots alone are used in medicine. Since it is raised as a soil binder and vegetative barrier, harvesting can be taken up only when the slips establish, produce tillers and the clumps form a thick barrier. At this stage, leaving a strip of grass barrier on the uphill side tillers can be uprooted on down hill side. Similarly in case of *Cymbopogon* species leaves are to be harvested every quarter. On no account should the clumps be allowed to set fire to, to encourage tillering and development of new and young shoots. In this case if the clumps lie scattered, the harvesting will be done only once a year and that to well after the plants flower and seed dispersal has taken place.

6.6.1.1: **RESEARCH WORKS**: There are so many nonwood forest produce in the forest which are unidentified and untapped. The efforts of the department should be to explore them and manage them scientifically. The identification of medicinal plants is the field to be taken for study immediately. This has wide scope in future. Dr M.N.Padhye of Nagpur and his team have been conducting a survey of medicinal plants in the forests of Gadchiroli and Chandrapur Districts. Over 150 such plants have been identified so far. This is not the exhaustive list of medicinal plants. It is open to add more names of such plants. Besides, identification and localization of the same is the field for future study. Innovation and research works should always be carried out and the same is recorded and reported properly so that those could be of use to those who come next.

6.7.1.2. Each Beat Guard must be entrusted with at least one ha of forest of his beat in which he will demarcate the area 100m x 100m. He will prepare list of each species like tree, shrub, herb, grass, climber and wildlife found in that plot. He will note the flowering, fruiting of each plant. He will collect the fallen twig, grass harvested, MFP collected personally or by the villagers in his guidance. DCF, ACF, RFO and Foresters will check his work and guide him as he requires. In that way a genuine data will be collected and Forest Personnel will find themselves deeply involved in the working of the Forestry.

6.8.1.1: TRAINING OF STAFF FOR NWFP AWARENESS: Field staff will be given training in NWFP collection, processing, storing and marketing. At present staff are working with timber orientation. It should be directed towards NWFP to increase the diversity in forest produce and earning of the locals. In that way optimization of uses of forest resources without causing annihilation to may be endangered, endemic or strategically important species. Regular training will be given at Beat, Forester, Ranger, ACF and DCF level to impart due knowledge and methodology in NWFP management.

6.9.1.1: SURVEY OF NWFP IN THE TRACT: Tract is blessed with varieties of NWFP**.** Regular surveying of these NWFP will be done at Beat Level to know the occurrence of NWFP, the extent of area, floristic composition, proper identification, parts in use, level of non destructive harvesting, impact on local economy etc. The records so obtained will be compiled at range and Division level. After two years data collection, DCF will prepare a comprehensive scheme for NWFP management and will present it Conservator of Forest (Territorial). CF will analyze the scheme and, if necessary, will seek sanction from competent authority at State Level or/and GOI level

SECTION-6.10.1.1: GENERAL RULES TO BE FOLLOWED: The following are the important rules

(1) The annual estimates of collection of NWFP shall be based upon the experiences. The annual estimates of collection of NWFP shall be approved by the Conservator of Forests.

(2) The Range Forest Officer of the respective range shall issue the passes for collection of NWFP to the JFM Committees or lessees and keep record of the collection etc. The minor forest produce lease units shall have distinct boundaries.

(3) NWFP collection estimates shall be based upon the inventories of forests resources.

(4) Measures shall be taken for improving yield of NWFP e.g. plantations, protection against disease etc.

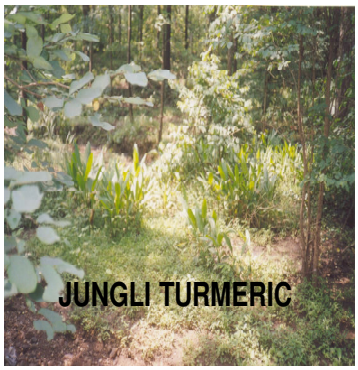
6.3.8.3. SUGGESTIONS

(i) Looking into the above facts, the potential of the area can be better tapped if the collection of the various NWFP is done through JFM committees. For this input, like, funds for development, collection and marketing will be required. A serious thought on these lines is required to be done to reap the benefits of this potentially major source of providing revenue to the Tribal Village as well as providing wages to the poor tribals of the area. The funds required for collecting, processing, value adding and marketing is suggested to be utilized from the entry point activity of F.D.A. scheme. Other source being village Development fund, gathered from M/s BILT at the rate of Rs. 50/- per M.T. (to the extent of Rs. 44 lakh per annum) can be better utilized if it is ploughed back for these purposes. Similarly, royalty from tendu leaves collection may be utilized to enhance the technique of collection, processing and marketing of MFP. This will serve the dual purpose of procuring non timber forest produce and generating revenues as well as for the development of the villages.

6.3.8.3. As the area is suitable for species which provide NWFP, plantation of *Char, Hirda, Beheda, Khair, Semal, Karu, Tendu* can be taken up in blanks in entire area especially in the SCI areas. This will result into better crop composition and also will increase NWFP production.

NONWOOD PRODUCE: MEDICINAL PLANTS

CANE BRAKE

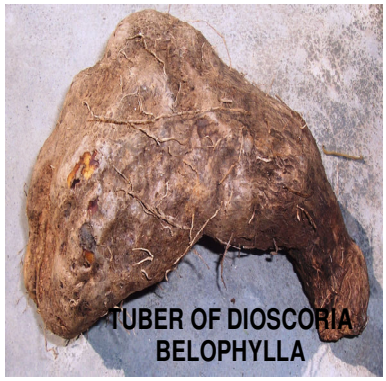


JUNGLI TURMERIC

BROOM GRASS

TENDU LEAVES

MOHA TREES: 20 tree/ha
MOHA FLOWER: 36000 MT
MOHA TODI: 3600 MT



TUBER OF DIOSCORIA BELOPHYLLA

CLIMBER USED AS MEDICINAL PLANT BY LOCALS.

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CHAPTER- VII

JOINT FOREST MANAGEMENT

SECTION: 7.1: NEED FOR JOINT FOREST MANAGEMENT

7.1.1.1: National Forest Policy 1988 emphasizes the importance of the traditional rights of forest dwellers and the importance of their role in protecting the forest. Priority for the use of forest products is given to forest dwellers in respect of meeting the requirements of fuelwood, fodder, minor forest products and small timber. It also envisages creating a massive people movement with involvement of women in protection, management of forests and minimizing pressure on existing forests.

7.1.1.2 National Forest Policy, 1988 also mentions that forests should not be looked upon as a source of revenue, but as a national asset to be protected and enhanced for the well being of the people and the nation.

7.11.3 As per F.A.O. (Food and Agriculture Organisation) forestry project with rural people's participation has been defined as "as set of inter connected actions and works executed primarily by local community residents to improve their own welfare: those may be outside inputs….extension, training, guidance, technical help, financing etc. - but its basic focus is on community involvement in doing something for itself."

7.1.1.4: The Government of India vide letter No 621/89-PP dated 1st June,1990 conveyed to all the State Governments, a framework for creating massive people's movement through involvement of village communities for the protection, regeneration and development of degraded forest lands. Govt of India vide Ministry of Environment and Forests, Forest Protection Division Circulars No 22-8/98-FPD dated February 11, 2000 and No22-8/2000-JFM(FPD) dated February 21, 2000 has issued detail guidelines for the Joint Forest Management Programmes to be taken up by the States.

7.1.1.5: Government of Maharashtra vide Resolution No SLF-1091/PK119/F-11 Mantralaya, Mumbai dated March 16,1992 realizing the fact that illegal felling of Forests can not be controlled and checked without the active participation and cooperation of local people in the management, protection and regeneration of forests, issued guidelines and instructions for the preparation of plans for the management of Forest areas with the active participation and cooperation of local population living in and around Forest areas.

7.1.1.6: The guidelines and instructions contained in the Government of Maharashtra Resolution dated March 16,1992 encouraged the preparation of Management plans for degraded areas in the State involving the local inhabitants from adjoining areas to Forests and seeking their participation through JFM.

7.1.1.7: The selection of areas will be done on the basis of guidelines and instructions contained in Govt of Maharashtra Resolution dated March 16, 1992. The Deputy Conservator of Forests, Bhamaragarh will take all efforts to motivate villagers to participate in the Joint Forest Management plan. The areas allotted to Joint Forest

Management programmes will be under stocked mostly open with crop density less than 0.4.

7.1.1.8: The Government of India vide its subsequent reference No 22-8/2000-JFM(FPD) dated 21/02/2000 issued further instructions to the State Government mainly related to participation of women in JFM Committees and the extension of JFM programmes to the good forest area. The GOI, in the above reference has stated that at least 50% of the members of the JFM general body should be women, and the presence of 50% of woman member is a pre requisite for holdings general body. Besides that 33% of the Executive Committee members should be women. It has further stated that the JFM activities may be extended even to good areas which were till, confined to poor areas only. According to the circular, the JFM activity in good areas is to confine to NWFP activities only, and under no circumstances, the silvicultural prescriptions should be altered. The sharing mechanism should be different, than usual and sharing of profit from timber will be only when the Committee protects the area for at least 10 years and sharing percentage not to exceed 20% of final harvest. The JFM area extending to good forests shall not exceed 100 ha and within 2 km. It further says that JFM in good area shall be on a pilot basis and should be done, only after the degraded areas have exhausted.

7.1.1.9: The tract dealt with is under severe grip of naxal activities. The people have been alienated from forest as far as participatory forest management is concerned.

7.1.1.10: Forests around the human habitation i.e. around villages are to somewhat degraded. These forests need rehabilitation to increase their productivity.

SECTION: 7.2: GENERAL CHARACTERISTICS OF THE VEGETAION:

78.2.1.1: The forests around villages are degraded and less productive. The density is generally less than 0.4. Rooted stock is available. Heavy biotic pressures are experienced. The species are *bhirra*, *moha*, *ain, dhaoda*, *garadi* etc with no under storey. The regeneration is almost absent due to no seeding or non establishment of seedlings. Growing stock is inadequate. The soil is eroded and sometimes denuded rocks are seen. Efforts in past to rehabilitate these areas by artificial regeneration are almost failures.

SECTION: 7.3: SPECIAL OBJECTS OF MANAGEMENT:

7.3.1.1: The special objects of management have been defined keeping in view the National Forest Policy 1988 and the cost of increasing population pressure on the forest areas resulting in loss of tree over, depletion of soil and soil erosion due to demand for timber and fuelwood, grazing pressure , fires and the forest land for agriculture, industries and housing etc. In order to check further loss of forest cover and to regenerate the degraded forest areas the objects of management have been enunciated as follows:

(i) To rehabilitate and regenerate the degraded forest areas.
(ii) To check soil erosion.
(iii) To maintain an optimum level of carrying capacity in the forests.
(iv) To protect the forests and

(v) To utilize the degraded forest areas for productive purposes in order to meet the demand for fuel, fodder and timber and ultimately achieving the integrated development of the adjoining villages with the help of other development agencies.

SECTION: 7.4: SOCIO-ECONOMIC CONDITION OF THE PEOPLE:

7.4.1.1. The tract dealt with is the remotest tract of the Maharashtra State. It is on the south east of Maharashtra bordering Chhattisgarh and in contiguous to Bastar region i.e. the most backward area of the Country. Total geographical area of the tract is 4000 square kilometer. Out of which forest area constitutes 3778 sq km amounting to 92% of geographical areas. Population dynamics on the basis of Socio Economic Survey published by Economic and Statistical Directorate for Gadchiroli District and pertaining to tract dealt with in chapter III of part I. On perusal of the give data, it is found that the Scheduled Tribe population is about 84% and Scheduled Caste 4%. Population density is 23 people per square kilometer.

7.4.1.2. Similarly the cattle population amount to cattle unit 125,000. Whereas carrying capacity of these forests is about 334,000 cattle units. Enough area is available for cattle for grazing. But grazing incidences are localized which result in heavy pressure on certain area resulting in their degradation. Migratory cattle have no place in the tract. Hence the pressure is certainly very much localized in pockets.

7.4.1.3. It creates imbalance on forest resource utilization pattern. Hence the pressure is much felt on forests. But abundance of forest resources in the tract is disincentive for participatory approach of management. Even poverty in the tract is so acute that people cannot wait to tomorrow to get the benefits of forest resources after protecting the forest for ten years. They need immediate benefit. Rather they are enjoying forest resources at their will. They do not find any constraints in availing resources. Encroachment on forest land is another hindrance in participatory management as it is one of the obligations on part of people not to resort to encroachment and if any to be evicted. Naxalite movement in the tract is forcing people not to form any state sponsored body. But active People Participation in management of forest will eliminate the naxalites from the area and forest will improve.

SECTION: 7.5: COMPARTMENTS AND FELLING SERIES

7.5.1.1: As the execution and implementation of the prescriptions under this venture are totally dependent on the willingness of the villagers, neither the compartments are allotted nor the felling series are formed. But the list of villages which need to be tackled under this chapter will be given in the appendix no-XXII in volume II of working plan report. The micro plan prepared for the area allotted to a particular village or joint forest management committee shall be in consonance with prescriptions given for that area under this plan. Any deviation from that shall be duly sanctioned by the competent authority.

SECTION: 7.6: THE PRINCIPLES AND ETHICS.

7.6.1.1: Following principles and ethics should be adhered to as guidelines during the implementation of J.F.M. in any village.

(a) Eco system conservation and sustainable use of resources is the ultimate goal of resource management.
(b) Participatory, democratic structure will enable development of strong institution in the long run.
(c) Open communication is the soul of democratic set up.
(d) Management responsibility and benefit sharing in relation to traditional usage should be ensured.
(e) Gender equity should be prime concern.
(f) Community responsibility must be infused in the system.
(g) Effective conflict resolution mechanism should be devised.
(h) Traditional rights and uses should be respected and rational approach should be followed in accepting or rejecting it.
(i) Discrete jurisdictions and explicit terms of agreements should be defined.
(j) Effective monitoring and appraisal systems should be in place.

SECTION: 7.7: METHOD OF TREATMENT:

7.7.1.1: In areas where the villagers are willing to participate in Joint Forest management plan, the Deputy Conservator of Forests Bhamaragarh shall prepare `Micro Plans` for the areas to be tackled as provided in the Government of Maharashtra Resolution dated March 16, 1992 and guidelines issued by Government of India and Government of Maharashtra from time to time in this matter. The Micro Plan prepared for the particular village shall be in consonance with the prescriptions contained in Working Plan in so far as the village is concerned. The micro plan shall be sanctioned by a committee constituted by the Maharashtra Government under the Government Resolution meant for Joint Forest Management.

7.7.1.2: The execution of works and control shall be exercised strictly in accordance with the guidelines issued by the Govt of India, Ministry of Environment & Forests letter No 6-21/89-FP dated June 1, 1990 and Govt of Maharashtra Resolution NoSLF-1091/CN119/F-11 Mantralaya, Mumbai dated March 16, 1992 as also the various guidelines, circulars and Resolutions issued by the Govt of India and Govt of Maharashtra from time to time.

7.7.1.3: The micro plan and the Joint Forest Management Scheme shall be implemented through Forest Department or any other agency approved by the competent authority.

7.7.1.4: Joint Forest Management committees shall be constituted under the guidelines given by the Government in this regard from time to time. There should not be any ambiguity in terms and conditions laid down. The area allotted should be strictly shown on the map, incorporated in the memorandum of understanding. The micro plan should be prepared with active participation of the people and on scientific line and the site specific estimates should be prepared and sanctioned by the competent authority, before execution.

7.7.1.5: Activities to be taken: Following activities are to be undertaken:
(a) Effective protection of forests allotted to it.
(b) Involvement of local people in regeneration of forests.
(c) Protection of forests from fire.

(d) Protection of forests from grazing.
(e) Inhibition from encroachment upon forest land.
(f) Non-destructive collection and value addition of minor forest produces and sharing by members, as per agreement.
(g) Helping the forest officials in law enforcements and patrols.
(h) Conducting meetings timely and helping the Government official in this regard.

7.**7.1.6.** For protection from grazing integrated efforts should be taken to improve the quality of cattle so that the income of people enhances and concept of ownership developed. Help of Rural Development Department and allied departments should be sought. The role of forest department should be as facilitator to such schemes. For the fire protection, JFM committees should be assigned the certain fire lines and forest area to protect the forest from fire. The money meant for protection of forests from fire in the form of fire watcher and burning of the fire lines after cutting should be directly remitted to JFM committees after successful protection of the forests from fire. All legal and moral help should be provided to members protecting the forests from illegal activities. Only then forest conditions will improve.

SECTION: 7.8: ROLE OF FOREST OFFICIALS

7.8.1.1: Role of forest official in JFM is as the facilitator.

(a) They are supposed to give technical input and support for the activities prepared under JFM for ensuring scientific forest management.
(b) They are expected to create awareness amongst the villagers about the role and benefits of forests and need to sustain the same.
(c) All matters related to duties and benefits of local people, JFMCs and staff should be specified and formalized through an agreement by the officials concerned.

7.8.1.2 Site specific, social, economic and ecological factors combine together to provide both opportunities and limitations on the type of management options that may be available in a particular area and the village. The status of regeneration and ecological viability of the forest is influenced by a range of biological conditions including species compositions, utilization history, soil and climate. Participating forest department and communities require greater institutional capacity to make collaborative forest protection activities success and final end in getting the economic returns and regenerating the forests. The efforts must yield sufficient income to sustain the management activities over the time. Thus, forest officials have to take adequate measures in formalizing participatory forest management in a particular village or forest areas.

SECTION: 7.9. REWARDS FOR EXCEPTIONAL WORKS DONE BY JFM COMMITTEES:

7.9.1.1. Government of Maharashtra has taken positive step to give rewards to Joint Forest Committees for their exceptional works. The rewards come under “Saint Tukaram Vangram Yojana”. Maharashtra Government vide its G.R. No-FDM 2005/C.N-313/F-2, Mantralaya Mumbai, dated 23-11-2006(Marathi) has launched reward system in which in each district three joint forest committees will be rewarded for their exceptional works every year. Out of district selected committees, State Level committee will be selected

for State award. Award will be announced and given on "World Forestry Day, 21st March".

7.9.1.2. Saint Tukaram Vangram Utkrushta sanyukta Vanvyasthapan Samiti Purskar-Cash Award Implementation consists of following procedures:

(i) Publicity of Yojana.
(ii) Selection of Joint Forest Committees.

7.9.1.3. For selection of JFMCs, following Evaluation committees have been constituted.

(a) Range Level Committee: Range Level committee will consists of following members:

(1) Sub Divisional Officer (Revenue) of the area **–** Chairman.
(2) Assistant Conservator of Forests in which supervision Range is- Deputy Chairman.
(3) Tahsildar of the area- Member.
(4) Block Development Officer- Member.
(5) Police Inspector of area- Member.
(6) Nearest Plantation Officer of Social forestry division- Member.
(7) Taluka Agriculture Officer- Member.
(8) Forestry related two Non Governmental Organisation members selected on rotation basis. Members.
(9) Range Forest Officer- Member Secretary.

(b) District Level Committee: District Level committee will consists of following members:

(1) District Collector **–** Chairman.
(2) Chief Executive Officer of the District Zilha Parishad- Member.
(3) District Superintendent of Police- Member.
(4) Joint Director of Social Forestry- Member.
(5) District Agriculture Officer- Member.
(6) Two members of N.G.O. related to forestry activities selected on rotation basis.
(7) Deputy Conservator of Forests/ Sub Divisional Forest Officer- Member Secretary.

(c) District Level Committee: District Level committee will consists of following members:

(1) Hon` Minister of Forest **–** Chairman.
(2) Hon` State Minister of Forest- Deputy Chairman.
(3) P.C.C.F. M.S.- Member.
(4) P.C.C.F.(WL) M.S.- Member.
(5) A.P.C.C.F. (B.P.D.)M.S.- - Member.
(6) Two members of N.G.O. related to forestry activities selected on rotation basis by Forest Minister.
(7) Conservator of Forests(JFM)- Member Secretary.

7.9.1.4. Mode of Rewards: Rewards will be given cash to selected committees. Cash Awards will be as follows:

Sr.No	Standing of Committees	District Level Cash Award	State Level Cash Award
1	First	Rs. 25,000.	Rs. 10,00, 000.
2	Second	Rs. 15,000.	Rs. 5,00,000.

3 Third Rs. 7,500. Rs. 3,00,000.

JFM committee selected for first award for state will not be considered for further five years.

7.9.1.5. Criteria for selection: Each Committee`s works will be evaluated on the basis of its works on following items. Evaluating committees will evaluate the performance and give marks for each item as stipulated in following table.

TABLE NO.87

Sr.No	Item	Maximum Marks	Marks Given
1	Plantation	10	
2	Soil & Moisture Conservation	10	
3	Protection	10	
4	Control over Forest Fire	5	
5	Eviction of Encroachment	5	
6	Control over Grazing	5	
7	Wildlife Protection	5	
8	Provision of Water Hole to WL	5	
9	Shramdan i.e. Free Labour	5	
10	Participation in Forest Management	5	
11	Women Participation	5	
12	Use of alternate source of fuel	5	
13	Proper & just utilization of Fund	5	
14	Proper Record keeping	5	
15	New ideas muted	5	
16	Awareness generation	5	
17	Awareness in students	5	
	Grand Total	100	

SECTION: 7.10: PRESENT STATUS OF J.F.M. IN BHAMARAGARH FOREST DIVISION.

7.10.1.1 At present Joint Forest Management is limited to 35 villages where input is made available to FDA by the Central Government. The list of FDA villages will be given in appendix no-XXII in Volume II of the working plan report. Micro-Plans have been prepared and sanctioned by the competent Committee. Presently Jiwangatta J.F.M. Committee is working on collection, processing, bottling and marketing honey in the trade name **"BHAMARAGARH NECTAR".** It is tremendously effective in its functioning due to initiative taken by then Deputy Conservator of Forests Shri Anwar Ahamad IFS and Assistant Conservator of Forests Shri D M Bhagat is still inspiring there. The committee is getting financial assistance from various sources like Nationalised Bank, District Small Scale Industries etc. Technical know how is also given. Emphasis is given on capacity building to tribal youths and non destructive harvesting of Honey from nature.

7.10.1.2 There are 283 villages in or around the forest. Total number of villages in the tract dealt with is 283. The division will constitute J.F.M. committees in all villages in or around the forest.

SECTION: 7.11: GOVERNMENT'S G.R.s AND ORDERS.

7.11.1.1 Present Government Resolutions and orders have been appended in Appendix in working plan report.

SECTION: 7.12. ACTIVE PARTICIPATION OF LOCAL PEOPLE

7.11.1.1. The local people shall be made aware of the importance of protection to the forests from fire, illicit grazing, illicit cutting and encroachment. Participation of local people shall be encouraged in protection and afforestation of forests. For this purpose, regular awareness efforts like meeting, hoarding, workshops, visit to successful areas etc shall be arranged to explain the people about the importance and benefit of regeneration and protection of forests. Village forest protection committees shall be formed and a comprehensive forest protection scheme shall be undertaken. For protection from grazing integrated efforts should be taken to improve the quality of cattle so that the income of people enhances and concept of ownership developed. For the fire protection, JFM committees should be assigned certain fire lines and forest area for protection from fire. The money meant for protection of forests from fire in the form of fire watcher and burning of the fire lines after cutting should be directly remitted to JFM committees after successful protection of the forests from fire. It should be made obvious to committees and all legal and moral help should be provided to members protecting the forests from illegal activities.

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CHAPTER –VIII

WORKING PLAN FOR WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

SECTION 8.1: HISTORY AND WILDLIFE PROTECTION

8.1.1.1: The tract dealt with has been an ideal natural habitat for the wildlife. The forests are mainly of miscellaneous species and are dense and rich so far as varieties of species are concerned. As per records a good varieties of wild animals inhabited the tract. But today the number is insignificant. Causes of depletion of number of wildlife are many folds. Main reason is that the pressure of human population is now more felt in the form of various forestry and non forestry activities in and around the forests. Traditional behaviors of original forest dwellers regarding the meeting the protein requirement from the forests is to be considered major concern. Area is now naxalites infested and causing the impact on just and proper management of forests and wildlife.

8.1.2.1: DISTRIBUTION OF WILDLIFE: The wild fauna are widely distributed in areas adjoining rivers. The wild animals commonly found in the past and comparatively less number at present in this tract are as follows:

8.1.2.2: CARNIVORE

Table No-88
Showing list of wildlife

Sr.№	COMMON NAME	SCIENTIFIC NAME	SCHEDULE/PART
1	Bagh/Sher/Tiger	*Panthera tigris*	I/I, (39)
2	Bibta/Panthe/Tendua	*Panthera pardus*	I/I, (16B)
3	Fox/Lomadi/Lomas	*Vulpes bengalensis*	II/II (1-B)
4	Jackal/Kolha/Siyar	*Canis aureus*	II/II (2-B)
5	Jungle cat/Ran Majar	*Felis chaus*	II/II (2-C)
6	Tadas/Lakadbagha	*Hyena hyena*	III (12)
7	Wild dog/Ran Kutra/Jungli Kutta	*Cuon alpinus*	II/I (22)
8	Wolf/Landaga/Bhendia	*Canis lupus pallipus*	I/I (13)

8.1.2.3: HERBIVORE

Table No-89

Sr.№	COMMON NAME	SCIENTIFIC NAME	SCHEDULE/PART
1	Aswal/Bhalu/Riksha/ Bear	*Melursus ursinus*	I/I, (31C)
2	Bandar/Monkey	*Rhesus mulatta*	II/I (17A)
3	Bhekar/Barking Deer	*Muntiacus muntjak*	III (2)
4	Bison/ Gaur	*Bos gaurus*	I/I, 8E(2)
5	Chausingha/Four horned antelope	*Tetraceros quadricornis*	I/I, (8A)
6	Cheetal/Deer/Hiran	*Axis axis*	III (5)
7	Common langur/ Hanuman	*Presbytis entellus*	II/I (4A)

	Bandar		
8	Hare/Shasha	*Lepus ruficaudatus*	IV (4)
9	Nilgai/Blue Bull	*Boselaphus tragocamelus*	***III(14)***
10	Sambhar	*Cervus unicolor*	***III (16)***
11	Wild boar/Ran Dukar/Jungali Suar	*Sus scorfa*	***III (19)***

8.1.2.4:– RODENTS

Table No-90

Sr.№	COMMON NAME	SCIENTIFIC NAME	SCHEDULE/PART
1	Flying squirrel	*Petaurista petaurista*	*II/II (1-C)*
2	Giant squirrel	*Ratufa macroura*	*II/II (1-D)*
3	Mongoose	*Herpestes spp*	*II/II (16)*
4	Porcupine/Shahi	*Hystrix indica*	*IV (4E)*
5	Mice		*V (5)*
6	Rats		*V (6)*

8.1.2.5: BIRDS

Table No-91

Sr.№	COMMON NAME	SCIENTIFIC NAME	SCHEDULE/PART
1	Painted Sandgrouse	*Pterocles indicus*	*IV 11 (60)*
2	Common Sandgrouse	*Pterocles exustus*	*IV 11 (60)*
3	Pea Fowl/Mayur/Mor	*Pavo cristatus*	*I/III (11)*
4	Grey Jungle Fowl/Jungli Murga	*Gallus sonneratii*	*II/II (17)*
5	Painted Partridge	*Francolinus pondicerianus*	*IV 11(51)*
6	Black breasted Quail	*Couturnix coromandelicus*	*IV 11(57)*
7	Red Spour Fowl	*Galloperdix spadicea*	*IV 11 (36-A)*
8	Crane	*Grus antigone*	*IV 11 (16)*
9	Spotted Bill Duck	*Anas poecillorhyncha*	*IV 11 (21)*
10	Pigeon	*Treron phoenicoptera*	***IV 11 (54)***
11	Dove	*Streptopelia spp*	*IV 11919)*
12	Cotton Teal	*Nettapus coromandelienus*	***IV 11 (70)***
13	*Cuckoo*	*Cuculus varius*	***IV 11(170***
14	*Snipe*	*Capella galliachges*	***IV 11 (62)***
15	Great Indian Horn Bill	*Buceros bicornis*	***I/III (4)***
16	Vultures	*Gyps indicus, Gyps bengalensis*	***I/III (21)***
17	Whistling Teal	*Dendrocygna javanica*	***I/III (7A)***
18	Woodpecker	*Picidae spp*	***IV 11 (79)***

8.1.2.5: REPTILES

Table No-92

Sr.№	COMMON NAME	SCIENTIFIC NAME	SCHEDULE/PART
1	Crocodile/Magar	*Crocodilus porosus*	*I/II (1D)*
2	Chameleon	*Chameleo calcarats*	*II/I (24)*
3	Cobra	*Naja naja*	*II/II (11)*
4	Karait	*Elapidae spp*	*IV (12)*
5	Viper	*Vipera ruselli*	*II/II (14)*
6	Dhaman or Rat Snake	*Ptyas mucosus*	*II/II (9)*
7	Ghorpad	*Varanus griseus*	*I/II (1)*
8	Common Lizards	*Varanus spp*	*II/II (15)*
9	Pythons	*Genus python*	*I/II (14A)*

Where: Schedule means Schedule of animals as given Indian Wild Life Protection Act, 1972 and part means part of that schedule, e.g. I/II (12) means schedule I and part II of schedule I at serial number 12.
Besides these species, a large number of other animal species e.g. insects, beetle, moths, scorpions, lizards etc are found in the tract.

8.1.2.6:-The tract dealt with is situated in the interior most part of the district and away from town. Due to this the wildlife was having least disturbances. Besides, with the existence of perennial water courses in the form of main rivers and stagnant pools formed the area highly capable for supporting a variety, of wild animals and birds in the past. In present days, the tract is experiencing pressure on habitats of wildlife.

SECTION: 8.2: ABUNDANCE AND STATUS OF WILD ANIMALS IN THE PAST AND PRESENT

8.2.1.1:- The forests of the tract dealt with are abundant in wildlife to some extent even today are mostly away from the densely populated areas. These forests are mostly inaccessible. Wild animals and birds here enjoy natural protection. The tract was part of Aheri Jamindari. Shooting of wild animals by the jamindars and their men was common. No regularization was imposed. In past, no scientific control was enforced in hunting of wild animals. License for game used to be given upto late seventies in the last century. After that no license had been issued.

8.2.1.2. Wild animals which need special attention and protection have been enlisted in six schedules as per The Wild Life (Protection) Act, 1972. Important species concentration is discussed below:

(1)BISON *(Bos gaurus)*: Earlier Bisons were found in entire tract in the hilly region. Bisons occur in small herds in the hilly regions of the tract which are mainly migratory to Chhattisgarh area.

(2)TIGER (*Panthera tigris*): Tiger (Sher) was occurring in moderate number. During summer they usually remained confined to the watercourses. A few migratory ones occasionally used to enter into this tract from Kanker District of Chhattisgarh. Presently, only one tiger has been reported during 2005 estimation.

(3)PANTHERS (*Panthera pardus***)**: They were less common in this tract. They were seen frequently only around the villages. Sometimes they used to enter into villages and do considerable damage to the cattle. No panther has been reported during recent estimates.

(4)SAMBHAR (Cervus unicolor)): They are confined in the foothills only. Now- a- days sambhars are found in entire tract but in small number.

(5) CHEETAL (*Axis axis*) - Cheetal are found in entire area. Herd of 25-30 animals are seen in almost all forest blocks and water courses.

(6) BLUE BULL (*Boselaphus tragocamelus-* Blue bull is found in entire tract. They are commonly seen in the forest near the human habitation. They, sometimes, causes damage to agricultural crop in the village field. They get protection due to religious beliefs of people.

(7)BARKING DEER (*Muntiacus muntjak*)-They are found in entire tract. They are solitary animal. They are seen in one or two in the tract.

(8) SLOTH BEAR (Melursus ursinus) - The people are very much afraid of this animal as it attacks unprovoked. Therefore, they are still available in this tract in good number.

(9)WILD BOAR (*Sus scorfa*) They are very common all over the area. They are found in small herd in the entire tract.

(10)WILD DOG (*Duon alpinus***)** They move over in pack and do considerable damage to the wild animals. These packs are seen moving in the forests.

8.2.1.3. COMMON ANIMALS- The Malabar squirrel (Scrinus *spp*), Flying squirrel, jackal (Canis aureus), Hyena (Hyena *hyena),* Porcupine (*Hystrix indica),* are common all over the tract. Langur monkey (*Presbytis entellus*), Bandar monkey (*Rhesus macaque)* are found on the fringe of forests. In interior part of the tract they are not seen at all. It is said that Madia tribe is fond of monkey. Whenever a monkey is seen in their area , entire village come together and resort to tree felling in group to cordon the creature and ultimately the poor animal has to pay for tress passing in that locality.

8.2.1.4:-BIRDS: - Pea fowl (*Pavo cristatus*), Grey jungle fowl (*Gallus sonneratii*) are common. Ducks are commonly found in the rivers. Titar (Francolinus pondicerianus), *Bater (Coturnix coromandelicus)*, Saras crane (*Antigone antigen*) are common in the tract. Great Indian Horn Bill is found in Nelgunda forests near Indravati River.

8.2.1.5: REPTILES: - Snakes are found all over the tract. Every year hundreds of human death occurs due to snake bite and improper medical attention. Crocodiles are found in Indravati river near deep dohs (deeper tract of river belt). Many types of lizards including monitor lizards are found in tract in general.

8.2.1.6: The forest dwellers eat lizards, red ants and many other animals which are not poisonous. Earlier before introduction of Wildlife Protection Act 1972, village Patel used to do shikar and distribute the meat to the villagers. This system is now not in practice.

SECTION: 8.3. PAST MANAGEMENT OF WILDLIFE AND ITS RESULTS

8.3.1.1. Prior to the abolition of proprietary rights in 1951, there existed no rules for the regulation of hunting in these forests and the killing of animals for pleasure as well as for the sport was common. Subsequent to the abolition of proprietary rights in 1951, the then Madhya Pradesh Government framed rules for regulating shooting in the village forests in the year 1953.

8.3.1.2. Subsequently when these forests were notified as Protected Forests under Section 29
of the Indian Forest Act, 1927, the management of wildlife came to be regulated as per the rules framed under Section32 (J) of the Act together with the prevalent rules under CP and Berar Games Act, 1953 and the Game Block Rules as specified in Madhya Pradesh Forest Manual Volume II.

8.3.1.3. In October 1961, the Government of Maharashtra extended the Rules framed under Bombay Wild Animals and Wild Birds Protection Act of 1951 to Vidarbha region and hence it was applicable to the tract dealt with. That Act was superceded by the Wildlife (Protection) Act, 1972 which came into force from June 1, 1973 and Rules, 1975. Hunting of animals has been completely banned except for the shooting permission given to the cultivators during the harvesting season to shy away wild boars.

8.3.1.4. Vide notification dated 17.1.2003 effective from 1.4.2003 huge powers have given to law enforcing authorities and provisions for heavy penalties and punishment have been made The Wild Life (Protection) Act, 1972.

8.3.1.5. Nothing in concrete in the past had been done for wildlife conservation. In recent past salt licks are being placed at suitable places to meet the requirements of herbivore. Vantalis and Khodtalis are being taken to provide water to wildlife in the pinch period. The drive of cattle immunization is never contemplated by the authority. The reason for this is probably abundance of forests in the surrounding, low concern for wildlife, almost no budget for this activity and lack of motivation by the forest protection staff.

SECTION: 8.4: LEGAL POSITION

8.4.1.1. Wildlife Protection Act, 1972 and rules frame under it are in enforcement to the tract. Other rules and regulations pertaining to protection are also applicable. Recent amendments to wildlife protection Act 1972 have been made for strict protection of wildlife in protected areas. The concept of Community Reserve and Protected Reserves has been forwarded to protect the wildlife out side the Protected Areas and Reserved Forests to encompass the wildlife found outside the PA or RF.

SECTION: 8. 5: RIGHTS AND CONCESSIONS:

8.5.1.1: No rights and/or privilege are granted to any person over wildlife. But under section 17-A of WPA, a member of schedule tribes can subject to the provisions of Chapter IV of Wildlife Protection Act, pick collect or possess in the district he resides any specified plants or plant derivative thereof for his bona fide personal use. However, permits under section 17-B can be granted by the Chief Wildlife Warden with prior

approval of the State Government for the special purposes or education, scientific research and collection of specimen for recognized zoos, museums and similar institutions.

SECTION: 8.6: OTHER MEASURES ADOPTED FOR PROTECTING WILDLIFE:

8.6.1.1. Besides the legal provisions under the Wildlife (Protection) Act, 1972, amended from time to time and the various rules made there under, following measures have been taken to protect the wildlife.

8.6.1.2.Compensation is paid to the owner whose cattle are killed by a tiger in the forest areas as per the provisions contained in Government Resolution No WLP/1570/224482-X-II, dated September 30, 1971, No MSC-1075/113554/F-1, dated March 25, 1977 and No WLP/1579/6200/4/F-1, dated May 29, 1979 This provision was extended to the cattle killed by panther also and the killing by tiger or panther outside the forest areas also was included vide Government Resolution No WLP/1581/116974/F-5, dated August 22, 1984 and amended from time to time.

8.6.1.3. Provision has been made for compensation in case of death or injuries to human life by wild animals vide Government Resolution No WLP/1002/Pr.Kr. 258/F-1 dated, January17, 2003. The maximum amount of compensation in case of death is Rs 200,000/- , in case of serious injury Rs 50,000/- and for minor injuries Rs 7500/-. As per Government Resolution issued from time to time in case of cattle killing the amount of compensation is upto 9000 vide above GR.

8.6.1.4. In 1972, with a view to check illicit shooting of wild animals, the State Government sanctioned the grant of reward to the informants in respect of unlicensed shooting provided that the information is found to be valid and leads to the conviction of the offender. In addition, the State Government has decided to sanction the rewards equal to 50% of the compensation actually recovered from the offender for illicit shooting to the Gram Panchayat or its office bearers or individuals who render cooperation in detecting such illicit shooting. Besides, the above mentioned legal provisions for protection of wildlife, public awareness for protection and preservation of wildlife is created through the celebration of wildlife week from October 2, every year since 1951.

SECTION: 8.7: INJURIES TO WILDLIFE:

The following agents are mainly responsible for the destruction of wildlife in the tract.

8.7.1.1. POACHING/SHIKAR: Poaching and shikar by tribals, though not recorded, is the most important reasons for destruction and depletion of the wild animals in the tract. The local tribal, particularly Madia is very fond of meat and shikar. They go for shikar resulting into the fact that not even a langoor is seen in most part of this tract now. Besides, because of spread of good network of tar roads in the past making the inaccessible areas also motorable and easily reachable to outside poachers and meat lovers, wild life has become prone to killings by outsiders heavily. It is a fact, in the past some poachers from outside the tract have damaged the wildlife to a great extent.

Presently, the threat to the wild animals is not only from local Madia and other tribals of the tract but also from the anti social elements taking cover under naxalite activities.

8.7.1.2. FIRE: The entire forest of the tract is prone to recurring fires annually. Sometimes remotest areas caught fire causing serious damage to wildlife and its habitat. This leads to exposure of wild animals to human habitation and thus provides opportunity to be hunted. Fire not only burns the tract vegetation but also changes the vegetal cover and its quality which is detrimental for survival of wildlife in its perpetuity. More often than not, fire is caused by local tribal hunters and outsiders to ensure clear ground for trapping and chasing animals through domesticated and trained dogs. Composite fire protection scheme by central government is being implemented to protect the forest and wildlife in the tract.

8.7.1.3. WATER: Most of the streams, except a few big rivers, become dry during summer. Therefore, animals have to visit only a few water bodies. This fact makes the villagers and poachers easy to kill the wild animals. But long stretch of perennial rivers along the boundaries of tract serves as heaven for wildlife.

SECTION: 8.8. MEASURES TO BE TAKEN TO PROTECT WILDLIFE

8.8.1.1. Periodical estimation survey is necessary to have the distribution of wild animal's population and their distribution known to manager of the tract. Estimation will of carnivore as well as that of herbivore at a regular interval coinciding with All India Estimation of Wild life.

8.8.1.2. In summer the water availability in the interior of forests recedes leading to wild animal concentration around river and water pool. That makes these animals vulnerable for to be liquidated by greedy people. Hence, alternative to natural water resources, water is to be provided in the form of Water Holes at proper places.

8.8.1.3. Multipurpose watch Tower will be erected at suitable places to have watch on movement of wildlife, fire control and check on grazing.

8.8.1.4. Herbivore needs salt to meet their requirement. At suitable places, Salt Licks will be placed to meet the requirement of these animals.

8.8.1.5. To be more sensitive towards wild animals, from time to time, awareness camps regarding wildlife and their importance must be organized for public as well as forest personnel.

8.8.1.6. In wildlife abundance areas, meadow will be developed by clearing the tree species in 25 hectare in first phase in first year of working. Another meadow will be developed in second year of working. Area should be of the order of 20 ha. In subsequent years if success is promising another areas will be taken for which DCF will get sanction from CF.

8.8.1.7. For nesting of birds like Great Indian Hornbills, tall, lofty salai, bija, semal, ain trees should be identified particularly along Indravati river tract along Chhattisgarh State

boundary. Author had an opportunity to have the glimpses of Great Indian Hornbill near Nelgunda village on lofty tree on the bank of Indravati.

8.1.1.8. Along the long stretch of roads passing through the tract, fruit trees like jamun, neem, mangos and ficus species should be planted to have shelter and fruits.

SECTION: 8.9: DOMESTIC ANIMALS AND WILDLIFE MANAGEMENT

8.9.1.1. Domestic animals and wildlife share the same common resources for their sustenance. Not only that they also share common diseases. It is very difficult to control the wildlife from contiguous diseases. It is, therefore, prescribed to have common cattle immunized from cattle diseases from time to time. Only such immunized animals should be allowed to graze in the forest.

SECTION: 8.10. JOINT FOREST MANAGEMENT AND WILDLIFE MANAGEMENT

8.10.1.1. The environment in which wildlife does not survive is also not conducive to survival of human beings. Wild life should be focal point of Joint Forest Management. Wildlife should not be looked upon as competing in utilization of resources but as co sharer of common resources. Symbiotic relation in coexistence of human kind and wildlife is the need of hours. The fund flow for wildlife management will be shared by the Joint Forest Management Committees, if they successfully protect the wildlife and their habitat. Competition will be generated amongst the different JFM committees to be more passionate towards wildlife. Ecotourism will be encouraged to facilitate the JFM committee's members to have gainful opportunities and protection of forest resources and wildlife.

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CHAPTER IX

ECOTOURISM IN THE TRACT

SECTION: 9.1. WHY ECOTOURISM?

9.1.1.1. Ecotourism is new arena in forest management of the tract. The tract has enormous potential for ecotourism. The tract is rich in flora and fauna and its variation, natural water resources, distinct social and cultural groups of tribals, natural landscape etc. Keeping in view the potential resources as above, it has been contemplated to have a chapter on Ecotourism.

9.1.1.2. As per "Eco-Tourism in India – Policy and Guidelines, 1998", Ministry of Tourism, Government of India: Eco-Tourism can be defined as follows: "The activities of persons traveling to and staying in places outside their usual place of residence for not more than one consecutive year for leisure, business or other purposes constitute tourism. Such visits for being close to enjoy its enormous creations, both biotic and abiotic, in most environment - friendly manner, without any adverse impact on the ecosystem, is particularly known as ecotourism.**"** The tract dealt with presents an ideal environment in the form of distinct vegetal covers, enchanting mountains ranges and bewitching river flows and above all unique tribal population and their distinct cultural social chores.

9.1.1.3. According to World Tourism Organisation (WTO), "Tourism that involves traveling to relatively undisturbed natural areas with specified object of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects (both of the past or the present) found in these areas" is defined as ecotourism. Nature tourism (ecotourism) is distinguished from mass tourism or resort tourism by having a lower impact on the environment and by requiring less infrastructure development.

9.1.1.4. The key elements of ecotourism include a natural environment as the prime attraction, an optimum number of environment-friendly visitors, activities which do not have any serious impact on the eco system and the positive involvement of the local community in maintaining the ecological balance.

9.1.1.5. Forest Ecotourism is `losing` oneself in a beautiful natural forest or landscape-watching animals, birds and trees in forest.

SECTION: 9. 2. GENERAL CHARACTER OF THE VEGETATION, LANDSCAPE AND SOCIAL – CULTURAL ASPECTS

9.2.1.1: VEGETATION. The vegetation found in the tract dealt with is of varied nature-in respect to floristic composition and edaphic and climatic variations. Forests of Bhamaragarh have been categorised as under Chapter II of Part I. The scenic beauty of these forests is unmatched. Continuous arrays of trees of varied varieties in the midst of lofty mountain ranges and flowing riparian dances of Paralkota, Pamela Goutami and meandering Indravati River are amusing the passerby in all its primitive form as its population of Tribes like Madias.

9.2.1.2. Entire tract is repository of floral abundance.

(a) **Moist Forests of Bhamaragarh**: Bhamaragarh forests boast with distinct vegetation paradise. Many places have distinct floral variation. The beautiful *teak, bija, dhaoda, salai, mowai, kulu, ficus, jamun, haldu* etc trees, dense *bamboo* forests, occasional *cane brakes* and unlimited herbs and shrubs and mention not the spiraling climbers embracing and curling the trees are bound to mesmerize the on going visitors. Chirping of jungle fowl, peacock and other birds with serene voices of barking deer, prancing herds of cheetal, wandering of sambhars and nilgai to occasional fearsome presence of His Majesty the Royal Bengal Tiger to cunning leopard to dancing of sloth bear are bound to attract any body with passion to watch the nature in its abode.

(b) **LOKBIRADARI PROJECT OF HEMALKASA: LAND OF BABA AMATE SOCIAL WORK**. In the midst of forests and on the bank of rivers Pamela Goutami, Paralkota and Indravati, Nonagenarian Baba Amate place of Selfless Service to humanity is the Lokbiradari Project at Hemalkasa 3 kilometer away from Bhamaragarh. Baba Amate`s three generations are rendering selfless services to deprived poor, illiterate lots of tribal. It is a modern pilgrimage site. One is mesmerized to see the cause of humanity served by this project.

(c) **HOLY CONFLUENCE OF INDRAVATI, PAMULGOUTAMI AND PARALKOTA at BHAMARAGARH**. Bhamaragarh at the confluence of three rivers namely Indravati, Pamela Goutami and Paralkota. It is the TRIVENI of this tract. Forest Rest House is at confluence site. Lord Rama might have been amused to see this pious place and might have spent his most of times during Vanvas in Dandakaranya. Still this place is so attractive that one desires to build hut here and settle for ever.

(d) **GREAT FALL OF BINAGUNDA.** Landscape of Binagunda in Bhamaragarh Forest Range near Binagunda village bordering Chhattisgarh having a local fall in serenity is amusing and to be bound by just words. Only, passionate visitors may realize the abundance of nature.

(e) TREASURE OF SURJAGARH. Modern treasure of present world lies in its deposits of valuable minerals. Tract is bestowed with huge Iron Ore deposit in Surjagarh Hill in South Etapalli Range. Project of big Iron Ore Extraction is in the pipeline. On execution of project is going to be a boon to economy of the tract and real tourism accompanied with Eco tourism is bound to get a long stride in near future.

(f) CANE BRAKE OF MOHARLI. Unique cane brake is found in South Etapalli range, Moharli round, Compartment N0-SE200. Such type of forest is not found elsewhere in Maharashtra except this tract. One is enchanted to see such forest.

(g) LARGEST TEAK RECORDED IN PUPLBPA HILL RANGE. Teak tree measuring 6.48 meter girth at breast height has been recorded in Kusumaagarh in Gatta range. It is measuring more than that recorded at Glory of Allapalli i.e. 5.65 meter girth at breast height. Front page of this working plan report is boasting with photo of this tree.

SECTION: 9.3.SPECIAL OBJECTS OFMANAGEMENT

9.3.1.1. Referring to National Wildlife Action Plan, 2002, special objects of management of ecotourism are spelt out. The national policy on tourism stipulates that tourism should become a unifying force nationally and internationally, fostering better understanding through travel. It should also help to preserve, retain and enrich out world-view and life-style, our cultural expressions and heritage in all its manifestations. The prosperity that tourism brings should strengthen and cause accretion, rather than damage, to our social and cultural values and depletion of our natural resources. Realisation of these policy objectives particularly in context of ecotourism would involve a selective approach, scientific planning, effective control and continuous monitoring. The developmental process itself should meet the following cardinal principles:

(1) It should involve the local community and lead to the overall economic development of the area.
(2) It should identify the likely conflicts between resource use for tourism and the livelihood of local inhabitants and attempt of minimize such conflicts.
(3) The type and scale of tourism development should be compatible with the environment and socio-cultural characteristics of the local community. and
(4) It should be planned as a part of the overall area development strategy, guided by an integrated land-use plan and associated with commensurate expansion of public services.

9.3.1.2. Based on above cardinal guidelines, the special objects of the management are as follows:

(1) Development of ecotourism in the tract dealt with without disturbing the socio-cultural and ecological environment of the area or with low impact on it.
(2) Participation of local people in development of ecotourism and their overall socio-economic development but by maintaining ecological balance.
(3) With the help of ecotourism in the tract, to expose the ethnic groups to the mainstream of social, cultural and temporal life and involve them in harnessing potentials of ecotourism for their overall well being.
(4) To involve governmental and non governmental agencies to generate awareness for environment and the people residing in that environment and to work for their well beings with dignity.

SECTION:9. 4.1: WHERE TO PRACTICE ECOTOURISM IN THE TRACT?

(1) BHAMARAGARH – CONFLUENCE OF RIVERS. Bhamaragarh is situated at the confluence of Indravati, Pamalgautam and Paralkota rivers. It is the Triveni of Maharashtra. It is modern holy place. One finds serenity and calm at the confluence. Forest Rest House at that point is strategically situated. Lofty hillock, beautiful environment clad with green forest trees form the place of important eco friendly.

(2) NELGUNDA. In Bhamaragarh range, on the border of Maharashtra and Chhattisgarh place named Nelgunda is situated. It is site of river Indravati meandering to form a unique water body surrounding with lofty trees. It has a deep doh boat able through out the year. Great Indian Hornbill nests here on lofty trees. Otters i.e. Udbilaos are found

in the water of pool. BILT temporary hut structure renders the shelter which an eco friendly tourist can enjoy with the courtesy of BILT.

(3) BINAGUNDA. Binagunda is on the border of Maharashtra and Chhattisgarh. It has unique environment. Full grown bamboo forests, series of forests formed under shifting cultivation practiced by local tribes and bubbling fall (Indus Fall) of Rajpuri nala present the unmatched opportunity for eco tourism. One can enjoy Garuga, a drink like Todi at BILT work center if permitted by BILT.

(4) ANHUDA FALL. In local dialect, Anhuda means unknown. There is a beautiful water fall like Indus Fall just 4 kilometer away from there. It has been claimed by Shri Anwar Ahmad IFS, and then DCF Bhamaragarh that fall had been brought into notice by him along with Shri Bhupinder Singh Huda IFS then DCF Central Chanda. Present author had an opportunity to have glimpses of that magnanimous fall along with these officers. Hence the name of fall itself was given to Anhuda meaning discovered by Anwar and Huda or **unknown one**.

(5) LAHERI. Laheri is a Round Head Quarter in Bhamaragarh. It is regarded as door to paradise. Lofty hill ranges filled with unending forest cover and lake like water body presents unimaginable environment.

(6) KASANSUR. Semi evergreen forests surrounding with unending forest trails are superb to be watched in perpetuity. It is head quarter of Kasansur forest range.

(7) HEMALKASA. World Known Social Worker Baba Amate had passion for humanity. He realized the humanitarian needs to serve the forgotten tribals suffering with disease, illiteracy and poverty. Even State could not find its desire to serve the neglected lots. Baba Amate established Lokbiradari Project with selfless service to these people. Prakash Amate son of Baba son and his wife followed the foot prints of Baba. Now Prakash`s son and daughter in law are doing the same thing. Hemalkasa is the place in Tadgaon range very near to Bhamaragarh just 3 kilometer away. Hospital, School, Hostel and Wildlife Orphanage are the hub of activities. These people are so dedicated to serve the humanity that the area will not be in a position to pay the debt of services rendered for ages.

(8) SURAJAGARH. In South Etapalli range and in Abujmal hill range huge deposit of Iron Ore is going to be a hub of modern development of Modern India with its Iron Ore Mining Activities in recent near future. It is situated in the midst of unparallel forest greenery.

(9) FODEWADA. Shifting Cultivation practiced by primitive tribe in Bhamaragarh has produced a series of even aged forests. Modern foresters wish to have such forest with modern input. It paves the way to have their insight in these forests and to think of Joint Forest Management in its prime with true liberty to locals to practice their cultivation without damaging the ecology. Eco tourists may find such a natural management system practiced by Tribals with their tradition remained intact.

SECTION: 9.5. ROLE OF FOREST DEPARTMENT

9.5.1.1. Forest Department will create ecotourism centers. Ecotourism centers should include controlled access points at Allapalli, Tadgaon, Etapalli, Bhamaragarh, Gatta, Kasansur, Bhamaragarh, Laheri, Nelgunda, and Binagunda. Ecotourism centers include roads; self guided nature trail, transportation options, interpretation centers, signs, observation towers and blinds, adequate but unpretentious lodging and dinning facilities, garbage disposal facility and other utilities as per the requirement.

9.5.1.2. Structures creating visual pollution, unaesthetic values and non compatible architecture, should be controlled and temporary structures using local building material and befitting the local environment should be prepared.

9.5.1.3. Specify environmental, physical and social carrying capacities to limit development activities. Ensure continuous monitoring of adverse effects of tourism and initiate suitable corrective measures.

9.5.1.4. The division will provide visitor information and interpretation services covering particularly- (i) what to see? (ii) How to see? (iii) How to behave? It will be in the form of broachers, leaflets, specialised guides, visitor information centers etc.

9.5.1.5. Division will prepare and widely distribute codes of conduct to all visitors. It will also organise training programmes for forest personnel and general public in general and JFM villagers in particulars to enhance the ecotourism.

SECTION: 9.6. CODE OF CONDUCT AND EXPECTATION FROM VISITORS

9.6.1.1. Visitors are expected to maintain some kinds of self constraints to have effective ecotourism. They are advised to abide by the guidelines prepared for them. The guidelines included are:

(i) Help conserve habitats of flora and fauna and any sites, natural or cultural, which may be affected by tourism.
(ii) Make no open fires and discourage others from doing so. If water is to be heated with scarce firewood, use as little as possible. Where feasible, use kerosene or fuel-efficient wood stove.
(iii) Remove litter, burn or bury paper, and carry back non degradable litter.
(iv) Keep local water clean and avoid using pollutants such as detergents in streams or springs. If no toilet facilities are available, try to relieve yourself at least 30 meters away from water sources and bury or cover the waste.
(v) Plants should be left to flourish in their natural environment and avoid taking away cuttings, seeds and roots.
(vi) Leave the camp sides clean after use.
(vii) Remember that another party will be using the same camp side after your departure.
(viii) Help guides and porters should follow conservation measures. Do not allow groups/porters to throw garbage in the streams or rivers.
(ix) Respect the natural and cultural heritage of the area and follow local customs.
(x) Respect local etiquette and wear loose clothes. Kissing in public is disapproved off.

(xi) Respect privacy of individuals and ask permission and use retrained in taking photographs of local inhabitant.
(xii) Respect holly places. Do not or remove religious objects.
(xiii) Strictly follow the guidelines for personal safety and security and always take your own precautions and safety measures.

SECTION: 9.7. ROLE OF NON GOVERNMENT ORGANISATIONS / SCIENTIFIC AND RESEARCH INSTITUTIONS

9.7.1.1. Non Government Organisation / Scientific and Research Institutions are welcome to take lead in ecotourism in the tract and harness potential of ecotourism to the development of local people. It will be taken in the form of following practices:

1. Create awareness, amongst all concerned, about the importance of sound eco practices in ecotourism development.
2. Motivate the local community to increase their involvement in sustainable ecotourism activity.
3. Organise training program to prepare the local for taking up various locations relating to ecotourism easy guiding, catering, and transportation and affording housing and providing social and cultural activities etc.

SECTION: 9.8: ROLE OF COMMUNITY

9.8.1.1. In ecotourism development the major thrust is on environment, people and ecotourists. The role of local people to develop the ecotourism as a means of eco development, enhancement of living standards of the people and to make aware the outsider about the ecological and biological diversity available in the tract. This is to be done in the form of:-

(1) Forming Joint Forest Management group with forest department and acting as efficient caterer, guide and facilitator to ecotourists.

(2) To be friendly with visitors and help them to practice ecotourism course.

(3) Realize and react to potential threat of investors who see opportunities in his development but lack sensitivity to local value.

(4) Practice conservation and nature and cultural as a way of life.

(5) Realize and respect the values of the environment, flora and fauna, the monuments and the cultural heritage.

(6) Become effective nature guides and conservationists of natural areas by enhancing the practical and ancestral knowledge of the natural features of the area.

SECTION: 9.9: THE ENVIRONMENTAL PLEDGE

9.9.1.1. In course of promoting ecotourism in the tract following environmental pledge should be displaced at strategic places:

(1) **STATIONERY AND OTHER PUBLICITY MATERIAL ON RECYCLED PAPER.** We will introduce the use of recycled paper for our stationery and other publicity items such as broachers and establish recycling programmes.

(2) POLYTHENE BAGS: We will convert wherever possible, from use of polythene bags to paper bags, cloth bags and other alternatives.

(3) ALTERNATE SOURCE OF ENERGY FOR FUEL. Wherever possible, we will convert to solar power such as solar heating and lighting, to reduce the use of thermal electricity.

(4) GARBAGR DISPOSAL. We will introduce the system of separating recyclable and non-recyclable garbage emanating from our operations and dispose non-biodegradable garbage in a responsible way, so as to not harm the environment.

(5) WATER CATCHMENT AND TREATMENT. Whenever possible, we will recycle water by incorporating water treatment schemes. We will also make storage and catchments facilities for rain water to be used for our operations.

(6) ECO LODGES AND RESORTS. We pledge to conserve the ecology, animal and birdlife of the area, our properties are located in.

(7) PLANTING OF SAPLINGS. We will encourage the planting of saplings and greening of the local environment. We will take saplings and encourage our tourists to help plant them near our camp sites or on the trails.

(8) ALTERNATE USE OF FUELS. We will limit the burning of firewood and use alternate sources of fuel for both cooking and heating.

(9) USE OF LOCAL ETHNIC MATERIALS IN CONSTRUCTION OF PROPERTIES. In keeping with the local landscaping, we will incorporate architectural styles typical to the area, thus blending with the environment.

(10) EMPLOYMENT OF LOCAL COMMUNITIIES. Wherever possible, we will hire locally for our business, to enhance the economy of our area.

(11) LIMIT DISFORESTATION. We will make no open fires and discourage others from doing so. Wherever water is heated using scarce firewood, we will not use it or use as little of it as possible. Wherever possible, we will choose accommodation that uses kerosene or fuel-efficient firewood stoves.

(12) NON BIODEGRADABLE GARBAGE. We will leave campsites clean and take back all non-biodegradable litter to the road head towns for proper disposal. We will bury only biodegradable food waste.

(13) KEEP LOCAL WATER CLEAN. Toilet facilities will be pitched at least 30 meters away from the water source and all waste will be covered properly. We will not allow detergents to be used in streams and springs.

(14) PLANTS LEFT IN THEIR NATURAL ENVIRONMENT. We will not take away cuttings, seeds and roots of plant if not permitted to do so.

(15) RESPECT LOCAL CULTURES. We will promote the appreciation and preservation of religious places and local villages by never allowing clients to buy religious objects or heirlooms from remote villages.

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CHAPTER X

FOREST PROTECTION IN THE TRACT

SECTION: 10.1: NEED FOR FOREST PROTECTION:

10.1.1.1: Bhamaragarh Forest Division is geographically one of the most remote tracts of Maharashtra State. It comes under Gadchiroli District. Chhattisgarh is along the eastern border. The tract dealt with is not only remotest part but it is socially, educationally and economically the most backward areas of the Maharashtra. No adequate infrastructures for development are established in the tract. Not only that land holding in the tract is meager as the forest itself constitutes about 92% of total geographical area. Industrial development is totally absent in the tract. Hence the per capita income is lowest (Rs 7800 per capita) in the tract with comparison to that of average for Maharashtra State (Rs 30000 per capita). Direct or indirect dependence of people on forests is more in the tract.

10.1.1.2. Due to inaccessibility of the tract, plenty of forest produce and absence of market, protection of forest from illicit felling of tree is not a major problem in the tract. Organized illicit felling is seldom reported here. Presence of naxalites in the tract also presents protection of forests from illicit felling. But naxalites are against the presence of Forest Personnel.

10.1.1.3. Forest official and staff engaged in protection of the forest are facing unprecedented conditions in the tract. Many vehicles have been burnt by the Naxalites. Many assaults on forest personnel have been inflicted by the anti social elements in the recent past. Not only that forest offices and residential quarters have been burnt by the Naxalites. Naxalites are advocating the eviction of forest personnel from the tract while beating the staff and causing damages to forest properties.

Table No-93

TABLE SHOWING THE INCIDENCES OF BEATING OF STAFFS:

Year	*No of Incidences*	*No of staff affected*	*Area of Incidence*
2003			
2004	***1***	***6***	***Manerajaram***
2005	***2***	***4***	***Kothi, Halewara***

Table No-94

TABLE SHOWING THE INCIDENCES OF BURNING OF VEHICLES:

Year	No of Incidences	No of Vehicles affected	Nature of vehicles
2001	1	2	tractor
2004	1	2	tractor
2005	1	3	trucks

Even residential premises of Forest Staff and interior Forest Offices had been set ablaze in the past. The list is long. These incidences demoralize the morale of Forest Personnel and casuality becomes the Forest and Environment.

10.1.1.4. Being the deciduous forests and hot temperature, the tract is vulnerable for fire. The cause of fire is mainly due to ignorance of local and wrong practices of collection of minor forest produces. The nature of fire is generally ground fire. The regeneration is badly affected due to fire incidences. Many species suffer die back in establishing the seedlings. Even, production of good fodder grasses suffers. Many herbaceous species are getting their existence in danger. Wildlife, also, suffer from the burnt of fire.

10.1.1.5. Grazing is another enemy of regeneration of forests. The carrying capacity of the tract is 335,000 cattle units. The total cattle unit in the tract is 125,000. If the cattle are uniformly distributed in the tract and entire forests are open for grazing all the time, then, the impact of grazing will be negligible. But the villages in the tract are mainly along the river or water bodies and hence the cattle. Also the entire forests are not remaining open for the grazing all the time. Concentration of cattle grazing is around the villages. Hence the impact of grazing around the villages is tremendous. Due to impact of grazing, fire and illicit felling, the forests around the villages are badly degraded. Forests around the villages are deprived of regeneration due to over grazing and trampling of seedlings. Seedlings seldom get established there. Hence the ground storey is completely missing around the villages.

10.1.1.6. Under the banner of naxalite activities, forests of Bhamaragarh are facing the burnt of encroachment. The reported encroachment on forest land is given in the following table.

Table No-95
Encroachment status as reported

SrNo	Period	No. of encroachers	Area under encroachment in ha.
1	Upto 1978	5442	9273.54
2	After 1978	1995	2317.59
Total for division		7437	11591.13

But the ingression of encroachment in the forest is taking place off and on. In many cases these encroachments are not reported due to threat from Naxalites.

10.1.1.7. Poaching of wildlife in the tract is not so prominent due to Naxalites presence. But the hunting of wild animals by the local tribes is sometimes reported due to traditional value. Even traditional hunting is not so common. But stray cases of hunting of carnivore or seizure of articles/trophies of carnivore are reported in the tract.

10.1.1.8. The tract is bestowed with presence of major mineral like Iron Ore. Mining of Iron Ore not yet started. Hence the question of illegal mining does not arise.

SECTION: 10.2: PROTECTION FROM ILLICIT FELLING

10.2.1.1. To protect the valuable forest from the burnt of illicit cutting of trees and to check the illegal transit of forest produces from tract, it becomes obligatory to Forest Department to have special efforts.

10.2.1.2. SPECIAL PROTECTION CAMPS: - As the tract does not have major threat for illicit felling, no special efforts are essential. Existing Mobile Squad will be strengthen to check any illegal activities in time.

10.2.1.3. SPECIAL CHECK POSTS/NAKAS. State Highway is passing through the tract joining two States namely Maharashtra and Chhattisgarh. State Highway links the tract with other part of Maharashtra. To have proper check on transit of forest produces through the tract it hereby proposed to erect check posts at strategic places. These checkpost must be duly notified by the competent authorities and published for the benefit of public and other law enforcing authorities. The strategic points identified are:

Table No-96

Sr No.	Place	Range	Site
1	Tadgaon	Tadgaon	On State Highway
2	Etapalli	Etapalli	On State Highway
3	Kasansur	Kasansur	On State Highway
4	Bhamaragarh	Bhamaragarh	On State Highway

These check posts should be manned by Forest Guards and Van Majoors in rotations to have effective control.

10.2.1.4. PROVISION OF MOBILE PHONE TO EACH TERRITORIAL STAFF: Each Territorial staff including Forest guards, Foresters, Range Officers, Assistant Conservator of Forests, and Deputy Conservator of forest should be provided with efficient mobile phone hand set and services to have effective communication in forest protection.

10.2.1.4. PROVISION OF MOBILILTY FACILITIES TO EACH TERRITORIAL STAFF: Each forest guard should be at least provided with Motor Cycle to traverse his Beat. Similarly forester will be given Motor Cycle. Range Forest Officer and higher Officer should be given Jeep/Car to have effective control over protection, conservation and just utilization of forest resources.

10.2.1.5. Not only that the Government will provide above facilities, the forest personnel will have to work in tandem to existing laws, rules and statutory orders issued by the competent authorities from time to time.

10.2.2. STANDARD PROVIDED FOR PROTECTION OF FORESTS

10.2.2.1. The Government of Maharashtra vides its G.R. No TRS-06/2001/C.N. 209/F-6 Mantralaya, Mumbai, dated 8/5/2003 has given detailed standards to deal with Forest Protection and dealing with Forest Offences.

10.2.2.2. CLASSIFICATION OF BEATS: Beats will be classified as hypersensitive, sensitive or normal beats on the following basis by Conservator/Chief Conservator of forests (Territorial) for three years. It may be review after that.

Table No-97

Sr No	Annual Standard	Normal Beat	Sensitive Beat	Hypersensitive Beat
1	**Illicit tree felling:**			
	a. No of trees			
	Teak	Less than 25 trees	25-50	More than 50
	Non Teak	Less than 100 trees	100-200	More than 200
	b. Value of trees	Less than Rs 1 lakh	Rs 1 – 2 lakh	More than Rs 2 lakh
	c. No of offences.	Less than 15	15-25	More than 25
2	Forest fire: Extent of area	Less than 25%	25% - 50%	More than 50%
3	Illegal grazing	Less than 3	3 - 5	More than 5
4	Illegal hunting	Beat in which illegal hunting occurs will be treated as hypersensitive.		

10.2.2.3. Beat Checking: The primary responsibility of forest protection revolves on the protective staffs, which generally detect and report the offences. Following norms have been fixed for Beat Checking.

10.2.2.4. Range Forest Officer: Range Forest Officer will inspect at least one Beat and send its report to his Deputy conservator of Forests.

10.2.2.5. Deputy Conservator of Forests: He will set the annual target and schedule of Beat Checking for his Subordinate staff.

10.2.2.6. Assistant Conservator of forests and Deputy Conservator of forests will do sample Beat checking to confirm the work of Beat Checking done by subordinate staff whether they have inspected Beats properly and taken note of cognizance of offences properly or not.

10.2.2.7. Saw Mill Inspection: standard for Saw Mill inspection is as follows.

able No-98

Sr No	Designation of post	Standard of Saw mill inspection
1	Range Forest Officer	Minimum 12 per month. If no of saw mill is less than 12, all saw mill will be inspected in each month.
2	Asstt. C.F.	Minimum 6 saw mill per month.
3	Dy. C.F.	Minimum 4 saw mill per month.
4	C.F./C.C.F.	Minimum 2 saw mill per month.

10.2.2.8. Tour of tract: standard for touring is as follows.

Table No-99

Sr No	Designation of post	Norms of tour
1	Range Forest Officer	Minimum 210 days per annum.
2	Asstt. C.F.	Minimum 180 days per annum.
3	Dy. C.F.	Minimum 150 days per annum.
4	D.F.O. Vigilance	Minimum 120 days per annum.
5	C.F./C.C.F.	Minimum 120 days per annum.

Out of total touring days, Officers are expected to stay in forests in nights for 75% days.

10.2.2.9. Beat Khairiat Report: Forest Guard of Beat will keep with him the Beat Khairiat register. He will keep the records of daily illicit felling or other offences in that register. He will submit Beat Khairiat Report to his RFO by each 5th day of month. RFO will submit the consolidated Beat Khairiat report of his Range to DCF by 10 th day of month.

10.2.2.10. Investigation of offences: Officers/staff responsible for protection of forests are responsible to book the offences as well as to have measures to control such happening not to crop up in future. Also it is expected to report such offences to Government from time to time within stipulated time frame work. The following time schedule has been prescribed for inspection of illicit cutting area by the respective officers:

Table No-100

Sr No	In situ value of illicit cutting at a place	Designation of the Inspecting Officer	Period within which inspection should be completed
1	2	3	4
1	Upto Rs 50,000	RFO	3 days from detection/receipt of intimation of detection.
2	Above Rs 50,000 but not exceeding Rs 2,00,000	ACF	3 days from the receipt of information.
3	Above Rs 2,00,000 but not exceeding Rs 5,00,000	Deputy CF	3 days from the receipt of information.
4	Above Rs 5,00,000	CF/CCF	7 days from the receipt of information.

(The value of illicit felling is for one fortnight for a Beat)

10.2.2.11. Registering of forest offences: Preliminary Offence Register book will have 4 copies each for an offence booked. First copy will be sent to D.C.F. directly. Second copy will be sent to R.F.O. directly. Third copy will be sent to Round Officer. Fourth copy will be retained by Beat Forest Guard as an office copy.

10.2.2.12. Office Inspection: To have effective control over smooth working of offices, reporting of offences, Beat checking, regular report compliances, regular inspection of offices by superior officers are essential. Standard set for office inspection is as follows.

Table No-101

Sr No	Name of office	Inspecting Officer and Norms
1	Round Office	A.C.F. will inspect once in 3 months.
2	Range Office	# A.C.F. In charge will inspect once in a year. # D.C.F. will inspect 3 RFO offices in a year. # C.F. / C.C.F. will inspect one RFO office of each division in a year.
3	Divisional Office	C.F. / C.C.F. will inspect two Division offices of his circle in a year.

10.2.2.13. Offences to be reported to Judicial Court: Forest offence involving value of forest produce more than Rs 10,000 will be booked in Court of Law. The offence in which habitual offender and/or motor vehicle is involved will be invariably booked in Court of Law irrespective of value involved.

10.2.2.14. Offences to be handled by staff or officer:

Table No-102

Sr No	Designation	Norms of Investigation
1	Round Officer	Offence involving value of forest produces upto Rs. 10,000.
2	Range Forest Office	Offence involving value of forest produces to the tune of Rs. 10,000. – Rs. 25,000.
3	A.C.F.	Offence involving value of forest produce more than Rs. 25,000 and offences related to Saw Mill, Mechanised vehicles and Wildlife.

SECTION-10.3. TRANSIT RULES FOR FOREST PRODUCES

10.3.1.1. The transit of forest produce is regulated as per the Bombay Transit of Forest Produce Rules, 1960, which were published by the Agriculture and Forest Department under NoIFA-1057/22947-(VI)-J, dated April 23, 1960.

10.3.1.2. The Government of Maharashtra vides Notification No TRS/1083/91822 (ii) CR-87/F-6; dated May 13, 1985 has amended Section 61 of Indian Forest Act, 1927 making the law more stringent. It has authorised certain officers, Assistant Conservator of Forests and above, to be called as authorised officer for the purpose of this Act, who are competent to confiscate the vehicle, instruments, forest produces etc involved in forest offence related to the illicit removal of notified forest produces.

10.3.1.3: To facilitate the issuing of passes, the Government vide TRS/1089/PK-267/89/F-6, dated May 14, 1990 has stated that the decision regarding the issue of passes, to an applicant should be taken within 45 days of the submission.

SECTION: 10.4: FIRE PROTECTION:

10.4.1.1. The forests are valuable and need careful fire protection over the entire area. Due to fire a considerable damage is caused to the timber besides causing long range effects on the soil fertility, young crops and regeneration. The special and determined efforts are needed to enforce the proper fire discipline. For the purpose of fire protection the areas are classified as follows.

10.4.1.2. CLASS I. FORESTS COMPLETELY PROTECTED.

This class includes:

(i) All plantations.

(ii) All forests of Protection Working Circle and all main felling and thinning coupes of Selection cum Improvement Working Circle, *Teak* Plantation Working Circle and Improvement Working Circle.

(iii) All regenerated coupes of all working circles till; the young crop has attained an age of 10 years.
(iv) All Government Timber Depots.
(v) Any other areas of special importance ordered by the Conservator of Forests.

11.4.1.3. All areas in this class will be isolated by means of fire lines and cut guidelines. They will be patrolled by fire watchers. Any fire incidence in these areas will be a calamity. It must be reported to Deputy Conservator of Forests Bhamaragarh in writing giving the details of area burnt and the various types of losses occurred to the forest crop.

10.4.1.4. CLASS II: FORESTS GENERALLY PROTECTED. This class includes:
(i) The remaining areas of Improvement Working Circle and Selection-cum-Improvement Working Circle.
(ii) Such other areas as the Conservator of Forests South Chandrapur Forest Circle may for special reasons direct.
(iii) All areas in this class will be isolated from the surrounding country by means of external fire lines and will be divided into convenient blocks of interior fire lines No guidelines will be cut.
(iv) Fire watchers may be engaged for patrolling in this area if sanctioned by the Conservator of Forests.

10.4.1.5. CLASS III: FORESTS PROTECTED BY LAW ONLY. All other forests not included in the above two classes, are included in this class. In forest of this class deliberate burning is prohibited but no special measures of protection will be undertaken.

10.4.1.6. The following lines will be maintained as fire lines and will be kept clear of all growth and kept clean of combustible material during the fire season:
(i) All external Reserve Forest boundary lines to a width of 12 meters.
(ii) 6 meter wide lines around all plantations up to 10 years from the year of planting.
(iii) 3 meter wide coupe lines which from the boundary between class I areas and areas of class II and III for period of 10 years from the year of main felling.
(iv) Compartment boundaries, Inter State boundaries, Inter Division boundaries and Inter Range boundaries of standard widths.
(v) 6 meter wide line on both sides of all roads and Cart tracks passing through the forests.
(vi) 40 meter wide line on all sides of the timber, bamboo and fire wood depots.

10.4.1.7. To reduce the possibility of forest fires following should be observed
(i) The cutting and cleaning of fires lines should be completed by the end of December and burning should be completed before the end of February.
(ii) Dry leaves and other dry material on fire lines must be collected from time to time and deposited along the edge of the fire lines and burnt before the fire season starts. But the burning of such material on the fire lines after the hot weather has commenced, is strictly prohibited.
(iii) Except with the express order of the Deputy Conservator of Forests Bhamaragarh, no fire lines shall be burnt after the end of February. If such permission is granted, the burning should be done in the presence of the RFO at his risk and cost.

10.4.2. LEGAL PROVISIONS AVAILABLE. Under the relevant sections of Indian Forest Act, 1927 and rules frame under it, forest fire can be controlled effectively.

STEPS TO BE TAKEN TO CONTROL FIRE

10.4.2.1. CUTTING AND BURNING OF FIRE LINES. The cutting of the lines will be completed by the end of December and burning will be completed before the end of February. Dry leaves and other dry material on fire lines will be collected from time to time and deposited along the edge of fire lines and burnt before the fire season starts. Except with the express permission of the Deputy Conservator of Forests Bhamaragarh, no fire lines will be burnt after the end of February. If such permission is granted, the burning should be done in the presence of the Range Forest Officer concerned. If possible, modern fire fighting tools will be used for extinguishing the fire.

10.4.2.2. Fire Watchers

(i) The fire watchers will constantly patrol the fire lines in the areas assigned to them. They should keep them entirely free from the inflammable material and prevent the carrying and kindling of fire in the forest area. As soon as a forest fire occurs he should inform the concerned Beat Guard and assist him in procuring the manpower from the nearby areas and also help in extinguishing the fire. The fire watchers should not leave their areas. The watch towers will be constructed at such elevated points from where the fires even at distant places can be easily detected.

(ii) The persons involved in lighting of fires are mostly local villagers only. Therefore, it is very much essential to have an open dialogue with villagers and they should be made aware of the disastrous effect of forest fire. Repeated dialogue and persuasion can be of great help in solving the problem. Solution will be asked from them only. After doing all these things, areas vulnerable to fire will be identified around each village and for that area a gang of fire watchers of that village will be employed under Joint Forest Management. Who will have the sole responsibility of the fire protection of that area? If the village is big then a list of fire watchers will be prepared after taking meeting of villagers and having dialogue with then and rotational employment of fire watchers will be thought of. The money meant for fire protection will be directly given to Joint Forest Management Committee and that amount will be paid to fire watcher employed by that Joint Forest Management Committee.

(iii) Before the fire season starts, a scheme will be prepared in which the strategic locations will be marked on a map at which gang of fire watchers of 5 to 10 will be kept, who will supervise the area around that point and can reach the spot where fire is noticed. Daily reports from the fire watchers should be called for.

(iv) The staff associated with the fire protection work will monitor the working of fire watchers and will coordinate the working of different gangs located at different points.

(v) The available vehicles will be deployed at strategic locations which can be approached by any gang, in case of help required by them. These vehicles will help in transport of fire fighting Labourers, water and other equipment required for fire fighting.

(vi) The regeneration area of Selection cum Improvement Working Circle, *Teak* Plantation Working Circle, and Improvement Working Circles will require special efforts. For this, the area will be divided into section. For each section, special efforts will be taken to protect the area from fire and grazing.

10.4.3. WHEN FOREST FIRE IS REPORTED.

10.4.3.1. As soon as the smoke is seen rising anywhere in or near the forest, by any Range Forest Officer or Forester or Forest Guard, he shall at once collect such aid as is immediately available and proceed in person to the spot to extinguish forest fire. If the fire is out-side his own Range, Round or Beat, he will continue there till the fire is extinguished and the concerned RFO or Forester or Forest Guard arrives on the spot. This rule will apply to all the three classes of the forests.

10.4.3.2. The utmost care should be taken to extinguish the fires and to quench the smoldering material absolutely. Filling earth over such material will be found every effective. No official shall leave the burnt locality till the senior forest officer present on the spot has ascertained and satisfied himself that no smoldering material remains. All men assisting in extinguishing fires in Government forest shall be paid according to the amount of assistance rendered.

10.4.3.3. Use of wireless Though the area is infested with naxalism and use of wire less system is not going to be tolerated by the anti social element, a welfare state demand is that one should not be afraid of such element. A scheme will be prepared for establishing the wireless network in the whole division so that the communication becomes easier and faster. This will help not only in the fire protection works but will also be helpful in overall protection of the forest.

10.4.4. RESPONSIBILITY

10.4.4.1. The Range Forest Officer will be held personally responsible for the efficient fire protection in his range.

10.4.4.2. Where the forests of two ranges which are to be fire protected adjoin, the responsibility for efficient protection and clearing of common fire line will rest with one of the Range Forest Officer to be selected by the Deputy Conservator of Forests Bhamaragarh.

10.4.4.3. In cases of common boundary between two divisions of the same circle, the above responsibility will be fixed by the Conservator on one of the Range Forest Officer. In cases of the common boundary between Bhamaragarh and Allapalli and Bhamaragarh and Bhamaragarh forest divisions, which are of the same South Chandrapur Forest Circle, Conservator of Forests South Chandrapur will fix the responsibility on one of the Range Forest Officer concerned.

10.4.4.4. The Deputy Conservator of Forests Bhamaragarh will be held personally responsible for carrying out efficiently all protective and prohibitive measures (as envisaged under various acts and rules and regulations made there under) in the areas of his division.

10.4.4.5. Deputy Conservator of Forests Bhamaragarh must satisfy himself that the exterior fire lines and other fire lines have been properly cleared and burnt thoroughly before the end of February. He must carry out inspections inquire about the implementation for the various prohibitory orders and ensure that sufficient protective

staff is available to implement these orders. He must take frequent visits to the areas where the incidences of fire are common.

10.4.4.6. The Deputy Conservator of Forests Bhamaragarh must, during his tour satisfy himself by constant enquiries and inspections that no fires in forest areas any where have gone unreported, and that the areas of reported fires have been accurately estimated. These checks require extensive and thorough personal inspection by him. A strict watch should be kept on the tendu leave contractors and their agents who engage the local people to put fire to the forest floor in order to get a good flush of tendu leaves. These fires are generally made between 1st of March and 15th of April each year.

10.4.5. FIRE REPORTS

10.4.5.1. The Range Forest Officer shall report the out break of a fire in his area to the Deputy Conservator of Forests Bhamaragarh at once. Special messenger should be used if the fire extends over a large area. The Range Forest Officer must maintain a proper communication and coordination between outbreak of fire by him and further transmitting it to the Deputy Conservator of Forests Bhamaragarh. After the fire is extinguished a detailed final report covering the area burnt and other details along with a sketch map should be submitting by the Range Forest Officer to the Deputy Conservator of Forests Bhamaragarh within 15 days after thorough inspection of the burnt area by himself.

10.4.5.2. Deputy Conservator of Forests Bhamaragarh will submit monthly return (in prescribed preformed Form No IX-74) to the Conservator of Forests showing therein the serial number of fire, date of occurrence, cause, area burnt, extent of damage and measures taken to extinguish fire. This report will cover:-

(i) All fires in class I areas.
(ii) All fires that have occurred in class II areas after the date given for completion for the line burning works prescribed in the previous paragraphs.
(iii) All fires that have occurred in class II areas before the date fixed for completion of line burning works. All records of fires will be shown on maps of scale 1": 2 mile and the record of fire will be filled in the concerned compartment history and the map will be attached to it. This work will be done both at the level of RFO and Deputy Conservator of Forests Bhamaragarh.

10.4.5.3. A fire record will be maintained in the Deputy Conservator of Forests Bhamaragarh office showing name and the length of fire lines burnt with costs. All fire lines burnt and areas especially Protected shall be indicated on the map. Incidence of fires in class I, II and III areas in each range will be serially numbered in chronological order and the details of areas burnt will be shown on the map.

10.4.5.4. Areas deliberately burnt for silvicultural reasons e.g. to destroy felling debris or to stimulate reproduction, will be excluded from the schemes of fire protection. Such fires will not be reported unless they spread into a protected area. Deliberate burning is only permissible if prescribed in the working plan or sanctioned by the Conservator of Forest. The steps to cut back the badly damaged young regeneration in the naturally and artificially regenerated areas due to fires, should be under taken by the Range Forest Officer in consultation with the Deputy Conservator of Forests Bhamaragarh.

10.4.5.5. Financial loss due to fire will be communicated to the Accountant General as per Control Form.

SECTION: 10.5. GRAZING CONTROL

10.5.1.1. The success of regeneration will depend upon the effective control on grazing and protection from fire. The cattle population in the villages around the forest area is very large. Due to large population of cattle, the forests are subjected to heavy grazing. Further the cattle population is not uniformly spread over all forest areas; therefore, some areas are more vulnerable to grazing.

10.5.1.2. A functional classification of the forest is given in section 2 of chapter I, Part II as enunciated in the grazing policy formulated by the Government of Maharashtra vide its resolution No MFP-1385/132211-Y, dated 8-12-1968. Grazing will be controlled as per the prescribed grazing incidence for each class of forest in the interest of forests and pasture. As per the provisions contained in A-259 of BFM Vol II, Part VI, coupes can be closed to grazing for a period upto 10 years or more where it is difficult to get successful regeneration in shorter period.

10.5.1.3. SELECTION-CUM-IMPROVEMENT WORKING CIRCLE. As per functional classification, this working circle comprises of tree forests and the maximum incidence of grazing prescribed for it is 1.2 ha per cattle unit. All main felling coupes will remain closed to grazing for a period of 10 years from the year of main felling. Thus with a felling cycle of 15years, $5/15^{th}$ or $1/3^{rd}$ area will remain closed to grazing at any time after 5 years from the commencement of this plan.

10.5.1.4. IMPROVEMENT WORKING CIRCLE This working circle comprises of minor and degraded forest and the maximum incidence of grazing prescribed for it is 0.8 ha per cattle unit. All main felling coupes will remain closed to grazing for 10 years from the year of main felling. Thus with a felling cycle of 10 years, $5/10^{th}$ or $1/2^{nd}$ area will remain closed to grazing at any time after 5 years from the commencement of this plan.

10.5.1.5. All the forest are not going to be opened for grazing at a time and cattle are not uniformly distributed, it is hereby prescribed that cattle exceeding the carrying capacity of the area opened should not be allowed to enter upon the forest. The remaining cattle can be accommodated by taking the fodder development works in the community lands in these villages with the help of Joint Forest Management Committee or voluntary agencies. At the same time the villagers will be persuaded to stall feed their cattle, the grass for which will be allowed to be removed from the closed coupes. They will be made aware of the ill effects of excessive grazing on the forest growth. Besides, the staff should have dialogue with the local villagers to discuss the issue. The Deputy Conservator of Forest Bhamaragarh should think for rotational grazing in areas which are not due for working. The experiment of silage preparation should be conducted and through this, stall feeding should be advocated. The preparation of silage will solve the problem completely. People should be motivated for rearing cattle in less number but of better breed to have better return and fewer problems.

10.5.1.6. Grazing rules made applicable vide Government of Maharashtra Revenue and Forest Department Resolution No MFP-1371/237035-Z, dated 3^{rd} November, 1973 have been given in this final draft plan in appendix no V in volume II.

SECTION: 10.6. ROLE OF JFM

10.6.1.1. Joint Forest Management committees will be used as a tool in controlling in illicit felling of trees, encroachment, fire control measures and grazing control. With constant dialogue wit JFM committees for importance of protection of forest from illicit felling, encroachment, fire and unauthorized grazing, the committee member will be allocated forest lines and area for protection of those to be carried out. The committees will be given the amount ear marked for fire protection after successful protection of the same. In such way JFM will get employment as well good will of forest department and above all the purpose of protection of forests from fire is met out. Effective involvement of people will generate environment for protection of forest from illicit tree felling, encroachment, fire and grazing.

SECTION: 10.7.CONTROL OF NAXALITE ACTIVITIES

10.7.1.1. Any administrative or managerial approach towards achieving its objects is based on the assumption that law and order condition in that area is normal. But in case of Bhamaragarh Forest Division, the law and order condition is not normal. The tract is infested with infiltration of Naxalites from Andhra Pradesh and Chhattisgarh. Local lads are also joining the hands with these Naxalites. As, with respect to total geographical area, the forest area constitutes about 92%, the impact of naxalite activities is more felt by the Forest Department. Though the major target group is Police and Revenue, the Forest is equally affected. Forest personnel cannot render their normal duties in such conditions. Hence, it is proposed to take adequate measure by the State Government to curb the naxalite activities in the tract as soon as possible. Otherwise, the forests of this tract are going to suffer to great extents and once the forest cover is lost the tract would be converted into degraded lands.

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CHAPTER – XI

OTHER IMPORTANT REGULATIONS

SECTION: 11.1. DEMARCATION OF COUPE AND MARKING OF TREES

11.1.1.1. Coupes due for main operations in a particular year of operation will be demarcated and marked one year in advance except the first year of operation in which demarcation, marking and main operation of felling will be carried out in the first year of operation of working plan. It is in the view of working of last year of main operation of working to be carried out in that particular year itself. Thus in general coupe will be demarcated one year in advance as mentioned under different working circles and a treatment map will be prepared by the RFO which will be verified by the ACF. After that a coupe demarcation certificate along with the treatment map will be furnished by the concerned RFO in the following format:

I,----------,RFO,----------certify that I have personally inspected the demarcation of coupe No----------in compartment No----------of----------FS----------WC on dated----------month ----------year----------and have prepared the treatment map as per the prescriptions of the working plan for Bhamaragarh Forest Division.

The area of the coupe is----------ha.

Place ----

Date-----

Signature

(----------)

(Range Forest Office, --------)

Countersign

Place----- (----------)

Date --------- (Assistant Conservator of Forests, ----------)

After demarcation having been certified by the RFO, stock map and treatment map shall be prepared by the Assistant Conservator of Forests or the RFO concerned as given in the working circle. The areas distinguished for the purpose of marking, shall be delimited as per the instructions given in the text of the plan report.

11.1.1.2. DEMARCATION OF COUPE

(i) Annual coupe will be demarcated by cutting and clearing bushy undergrowth on 3 m wide line and by erecting pillars or posts in the middle of the line at suitable intervals, except where the coupe boundary runs along a big nala, a fire line or a road. Coupe number, working circle and felling series will be written on the pillars on the side away from the area of the coupe.

(ii) Selected trees at suitable intervals, standing on the periphery of the coupe, will be given two coal tar bands and a geru or red band in between. The lower coal tar band will be at breast height and the other coal tar band will be 15 cm above it. Just below the lower coal tar band serial number in Arabic will be

given on the side away from the area of the coupe The serial numbers of such trees will be maintained in the marking register in the following form

PROFORMA FOR TREES ON THE PERIPHERY OF COUPE & GIVEN SERIAL NUMBERS:

TABLE №103

Serial Number	Species	Girth at Breast Height (cms)	Remarks.
(1)	(2)	(3)	(4)

For example, on the periphery of coupe, a teak tree will be given the required bands and serial number 45 in the marking register, the girth at breast height is 125 cms as follows:

TABLE №104

Serial Number	Species	Girth at Breast Height (cms)	Remarks.
(1)	(2)	(3)	(4)
45	Teak	125	**Not to be felled**

(iii) No trees bearing coupe demarcation bands will be marked for felling.

11.1.1.3. DEMARCATION OF SECTIONS

(i) To control extraction, each coupe marked for felling in SCIWC, IWC, TPWC and Bamboo (Overlapping) Working Circles will normally be divided into four approximately equal sections. Coupe Section will be demarcated by 1.5 m wide cut lines by clearing brushwood unless the section line runs along a permanent feature, e.g. nala.

(ii) Trees above 45 cm girth, selected at suitable intervals on the inner edge of the 1.5 m wide cleared section line will be given two coal tar bands 15 cm apart, the lower coal tar band being at breast height. Just below the lower coal tar band section number will be given on the side away from the area.

11.1.1.4. DEMARCATION OF PROTECTION AREAS

(i) Selected trees, on the periphery of the protection areas will be given two geru bands 15 cm apart, lower band being at gbh. In addition, a cross mark (**X**) in geru colour between the bands will also be given on the side away from the protection areas. All those trees will be serially numbered. The serial number will be given just below the lower geru band, on the side bearing the cross mark. All the protection areas will be numbered in Roman numerals and the trees standing on the periphery of each protection area will be numbered in Arabic, adopting separate series for each area, so that the trees on the periphery of protection area № I will bear the Sr № I/1 and the similar trees on the periphery of protection area № II will bear the № II/1 etc. The serially numbered trees will be recorded in the following form

Table No-105

Serial Number	Species	Girth at Breast Height (cms)	Remarks.
(1)	(2)	(3)	(4)
I/1	Tendu	140	Not to be felled

II/1	Dhaoda	90	Not to be felled
III/1	Teak	150	Not to be felled

11.1.1.5. DEMARCATION OF OTHER AREAS GIVEN IN THE TREATMENT MAP

The other categories of areas will be marked by giving one geru band and one coal tar band. The geru band will be at gbh and the coal tar band 5 cm above this. The serial number to selected trees on the periphery of such areas will be given in the proforma given above and noted in register of marking of trees.

11.1.2.1. MARKING TECHNIQUE

(i) All trees to be marked for felling will be given a geru band at gbh after removing the bark and will bear marking hammer marks at both gbh and base on a clear blaze of size: (10 cm x 10 cm).

(ii) The following trees in addition will bear digit serial №s at both gbh and base.

(a) All trees of teak, bija, shisham, ain, tiwas, haldu, karam, dhaora and shiwan of 45 cm and over in girth at bhob.

(b) Trees of all other species of and above 60 cm girth at gbh.

(iii) All remaining trees marked will bear serial number, which will be given by coal tar. The digital and coal tar numbers will form separate series. Malformed trees alone will be recorded as fuel trees except that of teak. A tree will be classified as fuel tree only when it is incapable of yielding any useful sawn timber or pole.

(iv) All trees bearing serial number will be individually recorded in marking (recording) book giving following details :

TABLE №106

Sr№		Species	Girth at bhob cm	Remarks
Digital	Coal tar			
1	2	3	4	5

(v) Abstract of trees marked for felling will be made in 15 cm girth classes. Timber, poles and firewood trees will be shown separately.

(vi) The number on the trees will be put in the vertical direction as shown below:

7

Tree №786---------- → **8**

6

SECTION: 11.2. HARVESTING AND DISPOASAL OF FOREST PRODUCES

11.2.1.1. TIMBER AND FIREWOOD All coupes of main felling shall be either worked departmentally or allotted to Forest Labourers Co-operative Societies (FLCS) or as per Government policy. However all thinning coupes need to be worked only departmentally except in extraordinary conditions. All timber and firewood will be extracted to the established Government depots or duly sanctioned depot by competent authority for sale or auction or disposal. The quantity of timber, poles and

firewood to be given on nistar at concessional rates will be kept separately in these depots.

11.2.1.2. TENDU LEAVES Tendu Leaves collection, processing and disposal are covered under "Maharashtra Forest Produce (Regulation of Trade) Act, 1969 (amended from time to time)." The trade in tendu leaves has been nationalised. The disposal of tendu leaves will be done in accordance with the provisions of this Act and Government Policy in this regard.

(1) Branches below 23 cm in girth of tendu trees are permitted to be lopped. Also seedlings below 1.25 meter in height are permitted to be coppiced.

(2) Regarding, coppicing and pruning of tendu seedling or trees, research studies is to be conducted to perpetuate the production of quality tendu leaves.

11.2.1.3. BAMBOO. Bamboo will be harvested in accordance with the prescriptions laid down for Bamboo (Overlapping) working circle. Bamboo coupes may be allotted to the lease holder or departmentally or both as per the Government policy in this regards. After harvesting the bamboo will be brought to established Government depots or the depots sanctioned by the competent authority. The material will be sold to Burads holding nistar privileges or other people for the same at concessional rates. Remaining bamboos will be disposed of as per the prevailing Government policy. In the area where bamboo is available for harvesting but not included in Bamboo (overlapping) working circle, Dy C.F Bhamaragarh will prepare a scheme, get it sanctioned by Conservator of Forests and endorsed to Working Plan Officer.

11.2.1.4. GRASSES. Disposal of grasses from closed coupes will be done as per the instructions contained in the Panchayat Raj Extension to the Schedule Areas and ownership to the minor forest produces to Panchayat Raj Institutions. Also, the involvement of Joint Forest committees in protection of forests and utilisations of intermediary forest produces for their benefits to be adhered.

11.2.1.5.: GUMS. Gums also comes under the purview of minor forest produces. Their collection and disposal should be on the line of the spirit of the Extension of Panchayat Raj to Scheduled Areas Act and or as per the understanding for JFM.

11.2.1.6. HONEY, WAX, BROMM GRASS. These items are under minor forest produces and are covered under the ownership to Panchayat Raj Institutions. Hence these produce will be disposed of as per the letter and spirit of that Act or as per the Joint Forest Management Committees involvement to protect the forests or on the norms prevailing time to time fixed by the competent authority.

11.2.1.7. ALL OTHER MINOR FOREST PRODUCES. The remaining minor forest produces will also be collected and disposed of as per the existing Government Policy in that regards.

11.2.1.8. GENERAL. Sound and young growth of all important species yielding minor forest produces or medicinal plants such as *Mahua, Charoli, Hirda, Beheda, Aonla, Tendu leaves & fruits, Satawari, Kambarmodi, Safed Musli, Sarpgandha* etc should be retained in areas earmarked for harvesting in such a manner that they are suitably dispersed and would also serve as subsidiary crop to main species and would

constitute a source of availability of minor forest produce to people residing in or around the forests and remain as gene pool for posterity.

SECTION: 11.3. IRREGULAR HARVESTING: Irregular harvesting of timber, firewood and other minor forest produce is prohibited, except in the following cases:

11.3.1.1. Removal of dead fallen timber and firewood and trees uprooted by wind or storm from all parts of the forests, except the coupes due for working, will be done in the following manner. Every year in the month of October each Beat Forest Guard will report compartment wise the availability of dead fallen firewood and trees uprooted by wind or storm to the concerned RFO. The RFO will then prepare compartment wise estimates for such material by marking these trees. Marking in a compartment will be done only if the number of such trees is more than 2 per ha as this much number will be required to be left in the forest to decay in order to benefit the wildlife in the forest. After the approval of estimates by the Deputy Conservator of Forests, harvesting will be done and the material will be taken out of the compartments. This material may be given to the Gram Panchayats or Forest Protection Committees at concessional rates approved by the Conservator of Forests or disposed of as per the existing Government Policy regarding this. Further distribution will be done by the Gram Panchayat or Committees under the supervision of the concerned RFO. Where there is no demand for this material, it will be brought to the sale depot and sold in open auction. The details of material obtained from each compartment, number of beneficiaries and revenue realised from it will be entered in the respective compartment history form.

11.3.1.2. Approval of felling of trees on the fire lines will be given by the Deputy Conservator of Forests, with reference to the Conservator of Forests regarding the approval of fire line and its category for which the Conservator of Forests is to decide whether the fire line is to be maintained or not.

11.3.1.3. Approval of felling of trees under electric and telephone lines existing prior to coming in force of Forest Conservation Act, 1980 or after that may be given by the Deputy Conservator of Forests, as per the sanctioned accorded by the competent authority.

11.3.1.4. Felling of trees on forest land required by the other departments such as Irrigation, PWD etc for other than Forestry Purposes will only be undertaken after the proposals for the use of forest land for non forestry purposes are approved by the Government of Indian under the provisions of Forest Conservation Act, 1980. The material obtained from such harvesting will be brought to the depots and will be disposed of along with regular coupe material.

11.3.1.5. The disposal of forest produce obtained from submergence areas of dams and tanks, from construction of roads etc will be carried out according to the orders, issued by the competent authority, in writing, in case of sanctioned projects.

11.3.1.6. No irregular harvesting for the purpose of undertaking plantations / afforestation work under schemes outside the scope of this working plan will be taken up in any of the areas under this working plan.

11.3.1.7. The felling of trees for the purpose of growth study, preparation of volume table or yield table to be carried out by the working plan division will need no permission from Central Government, except giving the details of the plan of work to the territorial Conservator of Forests well in advance getting sanction from him. Felling should be strictly as per the objects of the work.

11.3.1.8. Removal of dead trees- Very often due to insect or fungus attack there is a large scale mortality of pole and tree crops. Removal of such dead trees/pole crops will be permitted as part of irregular harvesting.

11.3.1.9. Removal of High stumps – The high stumps left over by the illicit removers shall be cut and flushed to the ground. The timber will be harvested but before harvesting an inventory of such high stumps duly verified by ACF shall be prepared.

11.3.1.10. Removal of dangerous trees – The trees leaning dangerously on the road or on the public or private property likely to cause injurious damage can be removed and shall constitute an irregular harvesting.

SECTION: 11.4. MAINTENANCE OF BOUNDARIES

11.4.1.1. In general the present state of forest boundaries and their maintenance is unsatisfactory in the tract. Though the efforts are being taken to survey and demarcate these forests permanently, same is not in satisfactory pace due to paucity of staff in Land Record Department. At present, at many places, boundary marks do not exist on the ground. At many places forests areas have been encroached. It is, thus, necessary that the whole area should be surveyed and demarcated without loss of time. Accurate maps shall be prepared. Major parts of these forests areas have been declared, as Reserved Forests vide Notification No FLD 3685/9316/CR-42/F-3, dated 5.5.1992. Therefore, the Deputy Conservator of Forests, Bhamaragarh shall prepare a special scheme for five years to demarcate these areas. He shall prepare the map showing the boundary pillars, their longitude, latitude and altitude with the help of GPS. One map should be supplied to the Conservator of Forests, Working Plan, and Chandrapur-2 for his record and for showing the pillar numbers on the master set maintained in his office. This work should be taken up without loss of time as early as possible, latest in very first year of the implementation of this working plan. Besides, the compartment boundaries of these RF of 3 meter width clear line should be made and maintained by cutting under growth regularly. The external boundary demarcation of the forests must be done by RCC cairns of approved designs. The Principal Chief Conservator of Forests MS Nagpur vide his office letter NOOI/भु.अ. /68/2000-2001 नागपुर दिनांक 29-5-2001, has circulated to all Chief Conservator of Forests/ Conservator of Forests (Territorial) in the State the design of the RCC pillars for the survey and demarcation of the forest lands in order to observe the uniformity of the boundary pillars in the state. The design of the RCC pillars shall be as approved by the office of PCCF. Traditional cairns preparation should be preferred as the area is remote one and RCC pillars have been noticed to be broken by villagers to take out iron rod.

11.4.1.2: Similarly, remaining Protected Forests also need be surveyed and demarcated on the ground so as to distinguish it from the revenue land. A special

scheme should be prepared and the Deputy Conservator of Forests, Bhamaragarh Division should launch a special program for immediate survey and demarcation of these areas. He shall take drive for preparation of accurate maps for the same. This work can be done simultaneously while doing survey and demarcation of Reserved Forests.

11.4.1.3: Boundary survey and demarcation should be done very meticulously. A special programme should be launched by the Deputy Conservator of Forests, Bhamaragarh Division for survey, demarcation and preparation of accurate maps. Survey of forests shall be as per the notifications issued for the same from time to time.

11.4.1.4: The external and internal boundaries of the forest will be maintained according to 1/5 boundary demarcation and verification scheme. The boundaries of the forest will be maintained as given below:

(i) The width of the cleared area of the outer boundary of the Government forest will be 12 meters. The clearing will consist of cutting down only all the undergrowth that impedes the view, preventing one forest boundary mark being seen from its neighboring one. Trees on the boundary line will not be cut down so long as they do not obscure the view of the boundary marks one from the other except, where natural features form the boundary, demarcation will be done by cairns.

(ii) The specification about shape, descriptions, foundation, dimension, colour wash etc of boundary marks are given in the Principal Chief Conservator of Forest's letter dated 29/5/2001. The boundary marks (cairns) will be placed at visible distance one from the other, so that from any mark it's neighboring one on both sides can be seen clearly. Where there is no change in direction over a large distance, the boundary marks will be erected at intervals not greater than 500 meters. Each cairn will bear a serial number, a fresh series being given for each adjoining village.

11.4.1.5: BOUNDARY MARKS SPECIFICATION

(i) The specifications of boundary shall be as approved by the PCCF MS.

(ii) In addition to the boundary marks, tin plates will be fixed on the boundary trees at a height of 3m, preferably at the boundary of two compartments. These plates will indicate the compartment numbers with arrows and below them will be pillar numbers on either side of the plates. The metal plates will be of size 45 cms x 45 cms. They will be painted white and compartment number and boundary pillar number will be written in red.

11.4.1.6. While carrying out annual maintenance, the following points need special attention:-

(i) That the pillars are correctly located as per map and demarcation register.
(ii) That the forest boundary is cut to the required width.
(iii) That the repairs to the cairn are done and the wooden post is replaced where necessary.
(iv) That the boundary posts bear the correct number and the same is engraved and written with coal tar or paint.

(v) That there are no encroachments. If there are any encroachments or are suspected, the matter should be pursued and the encroachments got removed.

11.4.1.7: RULES FOR INSPECTION AND MAINTENANCE OF FOREST BOUNDARY MARKS:

(i) The **forest guard** of the beat will be responsible for the maintenance and protection of all the boundary marks in the forests of his beat. He himself will colour wash them annually after rains and will make a special report of having preformed this work. Each forest boundary mark in his beat will be specially inspected by the beat guard at least once every year. A record of his inspection will be entered in his diary and sent to RFO.

(ii) The **Round Officer** will be responsible for the maintenance and protection of all the boundary marks in the forests of his round. He will see that they are maintained properly, repaired and colour washed by the beat guard, as directed. The Round Officer will check all the boundary marks in a year which come up for maintenance and repair as per the $1/5^{th}$ boundary demarcation scheme. A mention of this will be made by him in his diaries. The Round Officer will annually submit to the Range Forest Officer a certificate in the following form:

"I, ----------, Round officer, ---------- certify that the annual length of boundary lines in my jurisdiction as prescribed under the scheme given in Appendix no…of the working plan for the forests of Bhamaragarh division has been verified by me personally on __, ___, __and that boundary lines and marks and pillars are found to be correct as per the demarcation registers and maps. I, further, certify that next pillars (cairns) on either side of a pillar (cairn) are visible and they are in proper condition and bear correct serial number. There are no encroachments or encroachments are as detailed below: - ---------- ----------".

Signature.
(Name:).
(Designation:).

(3) The Range Forest Officer will check at least 25% of the annual boundary line as per the 5 year program and 5% verification will be carried out by the ACF.

11.5.1.8: MAINTENANCE OF COMPARTMENT BOUNDARIES: The compartment boundaries will be cleared to a width of 3 meters, except where the same runs along big nala, or road. Rectangular tin plates of size 30 cm x 30 cm will be fixed with nails on the trees at 3 meter height standing on the boundary of the compartment at regular intervals of 250 meters and also at all the corners. After painting the tin plates white, the compartment numbers will be written on them with red paint.

11.4.1.9: LEGAL PROVISIONS AVAILABLE FOR PROTECTION OF THE BOUNDARY MARKS : Under section 63 (c) of the IFA, 1927 altering, moving, destroying or defacing any boundary marks of any forests to which the provisions of this Act apply, is punishable with imprisonment for a term which may extend to two years, or with fine, or with both. This offence is non-compoundable under section 68 of the above Act. This legal provision should be made use of at all levels

by the field staff. Strict watch will be kept on the persons who do so and they should be booked under the above provisions contained in IFA, 1927.

11.4.1.10: Area register shall be maintained in the office of the Deputy Conservator of Forests Bhamaragarh and shall be updated every year after execution of survey and demarcation works described as above.

11.4.1.11: The Deputy Conservator of Forests Bhamaragarh shall supply a copy of the corrected maps and area register to the Conservator of Forests, Working Plan Chandrapur-2 every year in the month of June. He shall take all preventive steps and legal steps to prevent illegal actions. He shall prevent encroachment on Forest areas.

SECTION: 11.5: ARTIFICIAL REGENERATION

11.5.1: PLANTING OF TEAK AND MISCELLANEOUS SPECIES

11.5.1.1: In the areas suitable for planting teak and miscellaneous species, planting will be done in the year following the year of main felling. Teak will be planted through stumps/root trainer stock and miscellaneous species will be planted through polythene bag/root trainer stock. The details of various works will be as follows:

11.5.1.2: PREMONSOON WORKS: They will be carried out in the year of main felling along with the felling. They will include following works.

11.5.1.3: FENCING : The whole coupe if more than 70% area is to be planted, otherwise compartment will be taken for fencing. TCM of standard cross section of 1.90 m x 0.60 m x 1.0 m will be dug where the boundary runs along the contour. No TCM will be dug when the boundary of the coupe runs across the contour or inside the compartment. In that case, live-hedge fencing will be taken. Live hedge fencing will consist of two outer rows of agaves 50 cm apart and 3 inner rows, 50 cm apart, on which sowing of seeds of fast growing locally available thorny trees like babul etc and planting of cutting of shrubs like Vitex, Dodonea etc will be done after the monsoon.

11.5.1.4: PIT DIGGING: For planting of miscellaneous species pits of size 30 cm x 30 cm x 30 cm will be dug. The dug up soil will be kept on the upper side of the slope. The pit digging will be completed upto March and the soil will be allowed to wither during summer. Pit filling will be done before on set of Monsoon. The number of plants of teak and miscellaneous species will be upto 2500/ha at the spacing of 2m x 2m. Proper care should be taken in alignment of pits so that in no case pits are dug under influence shadow zone of retained trees and treating established natural regeneration as if already planted saplings.

11.5.1.5. NURSERY

(i) TEAK: Teak stumps will be prepared from one year old seedlings raised in the beds as per standard nursery technique. The source of seed must be from known source and certified by the competent authority. The stumps should not be below thumb thickness.

(ii) MISCELLANEOUS PLANTS: The miscellaneous/teak plants will be raised in the polythene bags/ root trainer pot. The standard size of the polybag plants suitable for planting will be when the collar of the plant is approximately thumb thick and is woody in appearance. The height of the plants will vary from species to species. To achieve the optimum sized polybag plants, the nursery work will be started latest by October in the previous year of planting. The polythene bags will be sifted every 15 days, once the height of plants reaches ten cm. Care will be taken that each bag contains only one seedling. During the shifting the bags will be arranged in descending order of plant heights. Suitable fertilizer and manure will be given to the plants at regular intervals. Before planting, the planting stock will be examined by an ACF and he will certify the suitability of the planting stock.

11.5.1.6. FIRST YEAR OPERATIONS : As soon as the monsoon starts, seed sowing in 3 rows for live hedge fencing, described earlier, will be done by raking the soil along the line 10 cm deep. Planting of agave on the outer two rows of live hedge fencing at a spacing of 50 cm and planting of shrub cutting on the inner 3 rows, will be done. Teak stump planting in crow bar holes and polybag planting in pits will also be done along with the planting on live hedge. The polythene bags will be planted in such a manner that their collars are at the ground level and it will be covered with soil upto a height of 5 cm above collar. All these operations will be completed in not more than 15 days after the break of monsoon.

11.5.1.7. SUBSEQUENT OPERATIONS: Immediately after the completion of planting, first weeding will be started. Casualty replacement will be done along with the first weeding. Second and third weeding will be done in the month of September and October respectively. The last weeding will include soil working and mulching to reduce the evaporation losses. One more soil working may be done in the month of January, if there are winter rains, subject to the availability of funds. Weeding and soil working to the seedlings on live hedge will also be done in order to enhance their growth and survival.

11.5.1.8. In the second year of plantation, casualty replacement will be completed soon after the start of monsoon. Two weeding will be carried out in the month of August and October respectively. Soil mulching will be carried out at the time of second weeding.

11.5.1.9. In the third year one weeding with soil mulching will be carried out in the month of September.

11.5.2. BAMBOO PLANTING

11.5.2.1. Bamboo will be planted, at a spacing of 5m x 5m. The details of various works will be as follows:

11.5.2.2. PREMONSOON WORKS : Pits of size 45 cm x 45 cm x 45 cm will be dug before March. The dug up soil will be kept on the upper side of the slope. The pits will be filled in before the onset of monsoon.

11.5.2.3. NURSERY: One or two years old bamboo seedlings with well developed rhizomes will be used for planting. The best method for preparing the good seedlings

will be by establishing rhizomes bank at suitable sites in each range. Bamboo seeds from known source will be sown in beds of size 12 m x 2 m x 0.3 m, two years in advance of planting. In the month of February and March of the year of planting, the seedlings from the beds will be transplanted into polythene bags after cutting their branches above 3 to 4 nodes. They will sprout within 15 to 20 days. After sprouting, suitable fertilizers will be given to get the vigorous growth.

11.5.2.4. FIRST YEAR OPERATION: At the onset of the monsoon, the polypots seedlings will be transported to the planting site and will be planted in pits. At the time of planting, suitable fertilizers and insecticides will be given to each plant in the pits. Casualty replacement will be done at the end of July or in the first week of August. Three weedings and soil working will be done.

11.5.2.5. SUBSEQUENT OPERATIONS : Casualty replacement and two weeding with soil working will be done in the second year. One weeding and soil working will be done in the third year. Insecticides will be used if there is termite attack.

SECTION: 11.6: SOIL AND MOISTURE CONSERVATION WORKS

11.6.1.1. To minimize the soil run off and conserve moisture regime, soil and water conservation measures are to be taken. The nature of soil and moister conservation measure will be decided by the topography of the area and rain fall intensity. Models will be adopted as approved by competent authority.

11.6.1.2. CONTOUR TRENCHING : As the tract is of gentle slope and intensity of rainfall is higher, contour trenching, in general, is not recommended.

11.6.2. NALA BUNDING/CHECK DAMS:

11.6.1.1: The basic aim of nala bunds or check dams will be to reduce the run off and to arrest the silt. Nala bunding will start from the top of nala downwards. Nala bunds/check dams will be prepared from the loose boulders found in or around the nala bed. No digging or blasting will be done. Where sufficient boulders are not available brushwood can also be used. Nala bunds will be prepared on nalas upto 8 m bed width. Beyond that these structures will not be useful and permanent engineering structures will be required. For the design of nala bunds, the nalas have been divided into three categories, namely (i) upto 4 m bed width (ii) between 4 m to 6 m bed width and (iii) between 6 m to 8 m bed width. The design of nala bund must be approved by the competent authority. Nala bunds should be started from one side of the bed. Semi circular boulder pitching should be done on the top of the bunds, so that the stones are compact and are not washed away by water. The batter on upstream and downstream should be 2/1 and 1/1 respectively. The distance between the successive bunds will be such that standing on the site of lower bund the base of upper bund should be in line of eye sight of the person, standing on the nala for general guideline the distance between successive bunds for different slopes will be same as that for contour trenches.

SECTION: 11.7. SAW MILLS

11.7.1.1. No saw mill is operating in the tract.

11.7.1.2 Saw Mills are controlled Rule No-88 under Bombay Forest Rules, 1942 amended from time to time and made applicable for whole Maharashtra.

SECTION: 11.8. CHARCOAL KILNS

11.8.1.1. Under normal condition, no permission to manufacture charcoal to the private person is given in the Reserved or Protected Forests or in private areas upto 1 km from the boundaries of the forests.

SECTION: 11.9: USE OF HAMMERS

11.9.1.1. The territorial Conservator of Forests shall issue guidelines and circulars regarding the shape and size of various types of hammers which will be used for the following works:

(i) Marking of coupes.
(ii) POR case material to be marked by Forest Guard.
(iii) POR case material to be marked by Foresters/Round Officers.
(iv) POR case material to be marked by Range Forest Officers.
(v) POR case material to be marked by Asstt Conservator of Forests.
(vi) Marking of material from Jungle Depot to Coupe Depot.
(vii) Marking of material from coupe depot to sale depot.
(viii) Marking of sold material.
(ix) Marking of malki materials/ timbers by ACF.

SECTION: 11.10: SCHEDULE OF RATES FOR OFFENCE CASES MATERIAL

11.10.1.1. The Conservator of Forest (Territorial) shall in the beginning of the calendar year circulate the schedule of rates for offence cases material to all the Deputy Conservator of Forests (Territorial) in his circle.

SECTION: 11.11: MARATHI TRANSLATION OF THE WORKING PLAN

11.11.1.1. The territorial Conservator of Forests, shall entrust the work of translation of this working plan for the Bhamaragarh Forest Division in Marathi language to one of the Assistant Conservator of Forest and for supplying copies of the translated Marathi working plan document to the local field staff.

SECTION: 11.12. DEVIATIONS : As per National Working Plan Code 2004, chapter XI, Deviations to the sanctioned working plan prescriptions are to be handled in following ways.

11.12.1.1. Following is the format of Deviation Statement:

Table No-107

STATEMENT SHOWING DEVIATIONS FROM WORKING PLAN PRESCRIPTIONS

Year ---------- Division- ----------

Serial No of deviation	Control book name, form no, Page	Reference to working plan		Nature of deviation requiring PCCF`s sanction
		Paragraph	Nature of Prescription	

11.12.1.2. Deputy Conservator of Forests Bhamaragarh will forward through Conservator of Forests South Chandrapur Forest Circle Chandrapur typed copies of the above form in triplicate yearly with his copy of control forms. No explanatory remarks are required on this form, but these should be given in the forwarding letter. One copy of the statement will be returned to the Deputy Conservator of Forests Bhamaragarh and another to conservator of Forests South Chandrapur Forest Circle, Chandrapur after the deviations have been sanctioned by the PCCF. If the PCCF or the Working Plan Conservator's sanction has been obtained in advance, the sanction number and date should be quoted in the last column.

11.12.1.3. All deviations, which permanently alter the basis of management laid down in this working plan, will require prior sanction of the PCCF. All deviations, which do not permanently alter the basis of management and with necessity of which he agrees, may be approved and sanctioned by the Working Plan Conservator on behalf of the PCCF. In case where there is difference of opinion between the Working Plan Conservator of Forests and the Territorial Conservator, the former will refer them to the PCCF for instructions. The PCCF/CFWP, as the case may be, will countersign the deviation statement.

11.12.1.4. Minor deviations can be sanctioned at the level of the Conservator of Forests Working Plan or the PCCF as the case may be; but the PCCF, before sanctioning the major deviations of following nature, will necessarily take prior approval of the Regional Chief Conservator of Forests, Bhopal of the Ministry of Environment and Forests, Government of India:

(I) Change in silvicultural System;
(ii) Clear Felling of Natural Forest;
(iii) Formation of new Felling Series; and
(iv) Large Scale felling due to natural calamities, which cannot be adjusted against future yield.

SECTION .11.13. IMPLEMENTATION OF WORKING PLAN

11.13.1.1. The Territorial Conservator of Forests will ensure that the prescriptions of the working plan are meticulously implemented by the territorial Deputy

Conservator of Forests and the works shall be inspected as per the norms fixed by the office of PCCF MS. The norms for inspection of works will be in consonance with various standing orders and circulars issued by the Government of Maharashtra and the Department in this behalf. The responsibilities for any lapses will be fixed by the disciplinary authority in accordance with law. The Conservator of Forest (Territorial) will be the competent authority to decide any technical matter prescribed under the working plan and he will guide the subordinates in all such matters.

SECTION: 11.14: TRIBAL WELFARE

11.14.1.1. To ensure a proper environmental and ecological balance, it is essential that the cultural survival and socio-economic well being of tribal is well taken care of. Unless it is done all attempts aiming at protection of forests will be futile. Thus to ensure this, it is essential that the social and economic stability of tribal through forest based industries/programmes, safeguarding their genuine domestic needs of forest produce like bamboo, firewood and constructional timber, is under taken by the forest department. All activities of minor forest produce enshrined in Non-Wood Forest Produce Working Circle will be set up for tribal through forest department. Besides, the tribal can also be encouraged for collection of other minor forest produce which have not been covered under (NWFP) Working Circle.

SECTION- 11.15. PREVILEGES AND CONCESSIONS FOR FOREST PRODUCE

11.15.1.1. As per the National Forest Policy of1988, the first charge on the forest produce is that of tribal and other villagers living in and around the forests. Accordingly, the forest produce obtained from the forests will first be supplied to the local people at the rate fixed by the competent authority in consultation with Territorial Conservator of Forests. The arrangement for supply of material will be made in such a way that the people should get the material within a radius of 2 km from their inhabitation. Only the surplus forest produce or the forest produce which is not required by the local people, will be sold in open auction.

SECTION -11.16. BAMBOO HARVESTING OUTSIDE BAMBOO WORKING CIRCLE

11.16.1.1. The bamboo clumps existing outside the bamboo overlapping working circle should be harvested from time to time for nistar supply or for departmental use or for sale by auction or tender. Such bamboo clumps shall be harvested as per directions issued by the concerned Conservator of Forests South Chandrapur Forest Circle, Chandrapur. For that DCF Bhamaragarh will prepare a scheme and get sanctioned from CF Territorial.

SECTION 11.17. BAMBOO PLANTATION

11.17.1.1. Bamboo plantation must be encouraged all over the division wherever possible and the produce obtained from such areas should be made available to the local people and burads for construction and other cottage industries purposes.

11.17.1.2. In Gadchiroli District lot of Burads are there who prepare bamboo mats and other articles to earn their livelihood. Bamboos are required by agriculturists also. Their requirements are fulfilled through departmental working of nistar coupes. However, in the present working plan the requirement is to be met but on the supply of bamboos by the agency, who will work for bamboo.

SECTION 11.18. SMALL TIMBER, POLES AND FIREWOOD

11.18.1.1. Small timber and poles for agricultural purposes and repairs to houses and firewood for domestic use will be supplied from the depots at concessional rates, depending upon the availability of these produce. Depots will be opened at suitable places, throughout the division, so that people have to go to minimum possible distance to procure these produce. Range, Round or Beat head quarters will be chosen for this purpose, so that supervision and maintenance of these depots becomes convenient.

SECTION 11.19. REMOVAL OF EDIBLE FLOWERS, FRUITS, SEEDS AND OTHER MINOR FOREST PRODUCES

11.19.1.1. Collection of moha flowers and seeds, charoli, tendu fruits, bor and other minor forest produce may be allowed free to tribal and local villagers for their consumption. However, no forest produce will be allowed to be removed free for commercial purpose. During collection of any produce, no felling or hacking of trees will be allowed. Collection of MFP should non destructive harvesting. As per thumb rule non destructive harvesting of MFP is about 50% of the expected yield or 10% of net primary production. Ownership of MFP is now to Gram Sabhas. Gram Sabhas should use their powers under the limit of carrying capacity and within threshold of non destructive harvesting.

SECTION: 11. 20. FORESTRY EXTENSION

11.20.1.1. In order to promote the forestry activity in the division, the forestry extension; programmes should be taken up by Deputy Conservator of Forests Bhamaragarh and regular awareness camps at regular intervals all over the division should be taken up with the active participation of local people, grampanchayats and voluntary agencies and the benefits of forestry and forest conservation should be explained to the local people through audio video programmes, poster presentation, nature walk and nature studies , forestry lectures, TV, programme etc.

SECTION .11. 21. WATER SUPPLY

11.21.1.1: Due to erratic rains, water scarcity is felt in the summer during the year in which rainfall is scanty. At some places shortage of drinking water occurs. Adequate arrangements are needed to supply drinking water to staff at such places. The nurseries will be located at such places, where the water availability is sufficient. The augmentation of water supply can be thought of by constructing anicuts at suitable places. Besides, deepening of the existing wells and creating tube wells by using modern machinery available can also be thought of.

SECTION 11. 22. CAMPING SITES

11.22.1.1. No camping site for the harvesting purpose or for any other produce should be permitted within half a kilometer radius of the existing waterholes. The exhaustive list of such waterholes shall be prepared and maintained at divisional level and the copy of the same shall be provided to the Conservator of Forests, Working Plans-II, Chandrapur for record.

SECTION 11.23. RAINGAUGE AND TEMPERATURE RECORDING STATIONS

11.23.1.1. Etapalli and Bhamaragarh have facilities for recording rains and temperature. There is no recording station in the interior. It is, therefore, recommended that the rain and temperature recording instruments should be installed at least at Range Headquarters where the forest staff can been trusted with the working of recording the same. Automatic self recording rain gauge may also be used for the same.

SECTION 11. 24. METEROLOGICAL OBSERVATIONS

11.24.1.1. Since there are observatories at Gadchiroli and Bhamaragarh and so there is no need of a separate observatory for the department.

SECTION 11. 25. BUILDINGS

11.25.1.1. The details of buildings is given in appendix no. XI in volume II of the draft plan report.

SECTION 11.26. ROADS, CART TRACKS AND CULVERTS

11.26.1.1. The details of roads, cart tracks and culverts will be given in this final plan in appendix no. XII in volume II. The construction of new roads on the forest lands is not
permitted under the Forest Conservation Act , 1980 without prior permission from Government of India.

SECTION: 11.27: ESTABLISHMENT AND LABOUR

112.27.1.1. The total area of the divisions 367,731.681 ha. The forest of the Division is more or less compact. Hence, for better control of all working plan operations, the RFOs and subordinates shall be properly placed. The Deputy Conservator of Forests Bhamaragarh will fix the headquarters of subordinates' staff, according to work load. Norms of Beat, Round and Range should be as per the guidelines given by office of the PCCF MS. Labours will be mainly local people. But in case of paucity out side labours will be arranged to have timely execution of prescriptions.

11.27.1.2. Maintenance of Land Records - The land records will be maintained as per the proforma fixed by Land Cell in the office of PCCF MS.

11.27.1.3. Mutation of Land records – The 7/12 extract of record of right shall be mutated in favour of forest department, where not done earlier. This will prevent any unlawful diversion. In each 7/12, the following entries will be recorded (in Seven) Govt of Maharashtra ;महाराष्ट्र शासन) Forest Department (वनविभाग) Reserved/Protected Forest (रा खीव / संरं क्षत वने). The above entries shall be in a manuscript and no stamps should be used to show these descriptions.

SECTION: 11.28: MISCELLANEOUS AREAS

11.28.1.1: Most of the forest areas in this division have been declared forest either protected forest or reserved forest in blocks in unsurveyed villages and survey number wise in surveyed villages in the past. But the proper survey and demarcation of these areas have not been carried out. Due to that exact area statement is to be finalised. As long as, the final survey and demarcation is not completed some areas is bound to remain in abeyance. Also some reserved forests are bed of rivers forming the Inter State Boundary. These areas are not the part of any working circle. Some areas are under various forestry purposes e.g. Offices, Forest Depots, and Nursery. Such areas have been treated as areas under miscellaneous areas which extent is 50,606.081 ha.

SECTION 11.29. ENCROACHMENT

11.29.1.1: Encroachment upon forest land in the tract dealt with is a chronic disease eating the body of forest slowly. The government of Maharashtra had taken decision in 1978 and 1979 that certain encroachment on forest area pertaining to 1-4-1972 to 31-3-1978 were to be regulated if found eligible as per the conditions laid down for that purpose. The process of ascertaining the eligibility of encroachers is still going on various authority levels. There is no recorded encroachment of pre 1978 period.

Table No108
TABLE SHOWING EXTENT OF ENCROACHMENT

SrNo	Range	AREA	PERIOD	No OF ENCROACHERS	ENCROACHED AREA (ha)
1	Bhamaragarh	86,204.460	POST 1/4/1978	248	301.49
2	Etapalli	99,085.714	POST 1/4/1978	500	643.91
3	Gatta	64,468.490	POST 1/4/1978	392	423.30
4	Kasansur	66,094.060	POST 1/4/1978	594	656.96
5	Tadgaon	51,878.957	POST 1/4/1978	261	291.93
	Total Division	367,731.681	POST 1/4/1978	1995	2317.59

SECTION 11.30.FOREST CONSERVATION ACT IMPLEMENTATION

11.30.1.1. No major or medium project has been sanctioned for forest land for non forestry purpose. One major project for Iron Ore Mining is expected to come in the tract.

SECTION 11.31. WORKING PLAN NOTE

11.31.1.1. At end of the working plan period working plan note shall be prepared by the Conservator of Forests (Territorial) in consultation with Deputy Conservator

of Forests (Territorial) Bhamaragarh division and the note will be presented as 1st Preliminary Working Plan Report get sanctioned from 1st State Level Committee. That will constitute the basis for preparation of Preliminary Working Plan Report to be prepared by Working Plan Officer.

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CHAPTER – XII

CONTROL AND RECORDS

SECTION –12.1: CONTROL AND RECORDS: -

The following records will be maintained in the Bhamaragarh Forest Division Office:

(1) Control Form.
(2) Compartment History.
(3) Plantation and Nursery Registers.
(4) Divisional Note Book

12.1.1.1: CONTROL FORMS:- All control forms and records shall be maintained as per the guidelines given in chapter No IX of Working Plan Code of Maharashtra State and the Standing Order No 24, Chapter I prescribed by the office of the Principal Chief Conservator of Forests, Maharashtra State, Nagpur (then CCF, MS Pune, dt 30.11.967). National Working Plan Code, 2004 also stipulates that Working Plan Officer will prepare proforma for control forms to regulate the various forestry operations as prescribed for and duly sanctioned Working plan. These control forms are thus, in conformity with the National Working Plan code, 2004.

12.1.1.2:- The records of all harvesting, subsidiary cultural operations, regeneration works and soil and moisture conservation works carried out as per this working plan prescriptions, will be maintained in the control forms. The prescribed proforma of the control forms have been given in the Volume II in Appendix №XVI.

CONTROL FORM NO – 1

CONTROL FORM FOR SELECTION CUM IMPROVEMENT WORKING CIRCLE AND IMPROVEMENT WORKING CIRCLE

WORKING CIRCLE — FOREST CIRCLE: South Chandrapur
FELLING SERIES — FOREST DIVISION: Bhamaragarh
PRESCRIBED OPERATIONS VIDE PARAS: — RANGE:
APPENDIX NO. :

Prescribed operations					Results
Year of working	Coupe No.	Comptts. included	Total area in ha.		Year of working
			Workable	Unworkable	
1	2	3	4	5	6

Operations		Operations Actually Carried out	
Total area Worked	Total number of trees of selection size & over enumerated	Total number of trees of selection size and over felled	Total number of trees of pre selection class felled

			No of trees permissible to be felled No of tree actually felled			
	Species	No.	Species	No.	Species	No.
7	8	9	10	11	12	13

Yield Details					
Species: No. & m3	Logs : No. & m^3	Poles in No. & m^3	Fuel in Beat and m^3	Revenue realised	Expenditure incurred
14	15	16	17	18	19

Artificial regeneration carried out			Remarks
Year	Species	Area	
20	21	22	23

CONTROL FORM NO – 2
CONTROL FORM FOR PLANTATION / AFFORESTATION WORKING CIRCLE

NAME OF THE WORKING PLAN: CIRCLE: South Chandrapur
WORKING CIRCLE: DIVISION: Bhamaragarh
FELLING SERIES : RANGE:
APPENDIX NO. :
PRESCRIBED OPERATIONS VIDE PARAS:

Prescribed operations						Actual working	
Year of working						Year of working	
Comptt. No.	Coupe No.	Marking	Felling	Planting		Marking	Felling
				Teak Misc.	Bamboo		
1	2	3	4	5	6	7	8

Year of working		Results of operations actually carried out				
Planting		Outturn if any			Revenue Realised Rs.	Expenditure Incurred Rs.
Teak Misc.	Bamboos	Timber m^3	Pole No./ m^3	Fuel m^3		
9	10	11	12	13	14	15

Results of operations actually carried out			
Area planted (ha)		Expenditure incurred Rs.	Remarks
Teak Misc.	Bamboo		
16	17	18	19

CONTROL FORM NO-3
(Not prescribed)
CONTROL FORM FOR TUSSAR CULTIVATION WORKING CIRCLE

NAME OF THE WORKING PLAN: CIRCLE: South Chandrapur
WORKING CIRCLE: DIVISION: Bhamaragarh
FELLING SERIES: RANGE :
APPENDIX NO. :
PRESCRIBED OPERATIONS VIDE PARAS:

Prescribed Operations				
Year of working	Name of villages	Comptt. No.	Area in ha.	Species selected
1	2	3	4	5

Actual Working						
Year of working	Planting				Area covered In ha.	Expenditure Incurred in Rs.
	Village	Comptt.	Species	No.		
1	2	3	4	5	6	7

Results of operations actually carried out											
Year of production	Production of cocoons in Khandi & Rev. in Rs.								Production of Sabai grass in Qntl.& Rev. in Rs.		REMARKS
	1st crop		2nd crop		3rd crop		Total		Grass	Rev.	
	Cocoon	Rev.	Cocoon	Rev.	Cocoon	Rev.	Cocoon	Rev.			
1	2	3	4	5	6	7	8	9	10	11	12

CONTROL FORM NO –4

CONTROL FORM FOR CULTURAL OPERATIONS

NAME OF THE WORKING PLAN: CIRCLE: South Chandrapur
WORKING CIRCLE: DIVISION: Bhamaragarh
FELLING SERIES: RANGE :

PRESCRIBED OPERATIONS VIDE PARAS:

Prescribed operations					Actual working	
Year	Nature of operations prescribed	Comptts No.	Coupe No.	Area In ha.	Year in which. worked	Area actually Worked In ha.
1	2	3	4	5	6	7

Results of operations actually carried out					
Out - turn if any			Revenue Realised In Rs.	Expenditure Incurred In Rs.	Remarks
Timber in m^3	Poles In No. & m^3	Fuel in m^3 & beat			
8	9	10	11	12	13

CONTROL FORM NO - 5

CONTROL FORM FOR OVERLAPPING WORKING CIRCLE

NAME OF THE WORKING PLAN:
WORKING CIRCLE:
FELLING SERIES:
PRESCRIBED OPERATIONS VIDE PARAS:

CIRCLE: South Chandrapur
DIVISION: Bhamaragarh
RANGE :

Prescribed Operations				
year	Range	Unites, Coupes or Comptt. Nos.	Area in ha.	Year of working
1	2	3	4	5

Results of operations actually carried out				
Total area Worked In ha	Balance + In Blue - In Red	Revenue Realised In Rs.	Expenditure Incurred in Rs.	Remarks
6	7	8	9	10

CONTROL FORM NO – 6
CONTROL FORM FOR FIRE PROTECTION

A. - PERMANENT FIRE LINES
B. - SPECIAL LINES
NAME OF THE WORKING PLAN

CLASS I: FOREST AREAS COMPLETELY PROTECTED
CLASS II: FORSET AREAS GENRALLY PROTECTED
PRESCRIBED OPERATIONS VIDE PARA

Year	Ranges	Class & Areas	Length of fire lines to be cut and burnt	
			(a) External, Artificial only (b) Internal (c) Roads (d) Artificial lines	Km.
1	2	3	4	5

Results of operations actually carried out					Reasons for Shortfall
Length of fire lines cut and burnt during the year		Expenditure in Rs.	Shortfall Particulars of lines not covered Should be given		
a) External, Artificial only (b) Internal (c) Roads (d) Artificial lines	Km.		Location of fire lines	Length In km.	
6	7	8	9	10	11

Results of operations actually carried out			No. of fire watchers		
Accidental fires & Area burnt due to accidental fires	Nature of damage	Expenditure Incurred In Rs.	Prescribed	Actually appointed	Expenditure Incurred In Rs.
12	13	14	15	16	17

Results of operations actually carried out	Remarks
Total expenditure in Rs. (Total of column Nos. 8,14, & 17)	
18	19

CONTROL FORM NO – 7

CONTROL FORM FOR 1/5th BOUNDARY DEMARCATION AND VERIFICATION SCHEME

NAME OF THE WORKING PLAN:
WORKING CIRCLE:
FELLING SERIES:
PRESCRIBED OPERATIONS VIDE PARAS:
APPENDIX NO. :

CIRCLE: South Chandrapur
DIVISION: Bhamaragarh
RANGE :

A: NEW DEMARCATION ONLY

5	6	7	8	9

Year	Range	Location of boundary	
		From	To
1	2	3	4

Target for the year	Length actually demarcated	Shortfall or excess + in Red -in Blue	Total No. of Cairns or RCC Pillars built	Remarks (Details about different types of cairns erected should be given)

B: MAINTENANCE AND VERIFICATION OF LINES

Year	Range	Location of boundary	Prescribed	
			From	To
1	2	3	4	5

Boundary actually Verified and maintained	Shortfall or excess + in Red -in Blue	Remarks (Among other matters special mention about the encroachments noticed during verifications should be made)
6	7	8

CONTROL FORM NO. - 8
CONTROL FORM FOR GRAZING

NAME OF THE WORKING PLAN:
WORKING CIRCLE:
FELLING SERIES:
PRESCRIBED OPERATIONS VIDE PARAS:
APPENDIX NO. :

CIRCLE: South Chandrapur
DIVISION: Bhamaragarh
RANGE :

Prescriptions vide paragraph No.				Maximum incidence permissible according to the classification.
Grazing Unit No. Class of Forest etc.	Year	Area in ha.		
		Total area	Average area open to grazing	
1	2	3	4	5

Actual grazing conditions					
Maximum No. of cattle admissible			No of sections closed to grazing	Free bulls Bullocks Or cows	Buffalos
Bulls Bullocks or cows	Buffaloes	Total cattle Units (Cows, bullocks buffalos)			
6	7	8	9	10	11

Privileged rate		Commercial rates				Total cattle Unit grazed
Bulls Bullocks Or cows	Buffalos	From listed villages		From other villages		
		Cows Bulls Bullocks	Buffalos	Cows Bulls Bullocks	Buffalos	
12	13	14	15	16	17	18

12.1.1.3. Two sets of control forms will be prepared. One set will be kept in the divisional office and the other set will be flying for the use of the Conservator of Forests Working Plan Chandrapur II. The flying set will be sent annually by the Deputy Conservator of Forests Bhamaragarh Division to the Conservator of Forests Working Plan Chandrapur II not later than October, 1 every year taking the necessaries entries. All entries showing the deviations from the prescriptions will be underlined in red. The CF Working Plan Chandrapur II will scrutinize it and will send it to the Territorial Conservator of Forests South Chandrapur Forest Circle at Chandrapur. Conservator of Forests South Chandrapur Forest Circle at Chandrapur will in turn send it to Chief Conservator of Forests Working Plan Nagpur with his remarks not later than February, 1 of the following year. The Chief Conservator of Forests Working Plan Nagpur in turn will forward them to the Additional Principal Chief Conservator of Forests (Production and Management) Maharashtra State, Nagpur for perusal and orders where required.

SECTION – 12.2: COMPARTMENT HISTORY:

12.2.1.1. Compartment histories i.e. the records of various forestry activities and observations made in the past year will be maintained in form № I to V as given in the Appendix № XVI of this plan.

Form № I: Description of the Compartment.
Form № II: Records of plantations and changes in growing stocks.
Form № III: Records of operations and output - outturns
Form № IV: Records of observations.
Form № V: Records of injuries.

COMPARTMENT HISTORY FORMS
COMPARTMENT HISTORY FORM NO-1
DESCRIPTION OF THE COMARTMENT

Name of the Block: - Compartment No.:- Date:-
Forest Map Sheet:-
Range: - Stock Mapper:-
Scale: - Camp: - Area in ha. :-

1. Location
2. Boundaries
   North
   East
   South
   West
3. Permanent Futures
4. Topographical Futures – (Give altitudinal varieties, aspects and slope.)
5. Geology and Rock.
6. Soil – (Give types, distribution, origin, colour, texture, composition, depth, humus, drainage etc.
7. The Forest:-
   (i) General Description : General Description of types and local sub-types of forest, qualities, density, age principal associates, reproduction of principal species etc. to be given.
   (ii) Floristic :- (to be given separately for each sub-type distinguished under I- Top Canopy, II – Second storey, IIa – Bamboos III – Shrubs, IVa – Herbs, IVb – Grasser, V – Climbers, Epiphytes & Parasites, Occurrence of principal species to be indicated by letters (Va) – very abundant, (a) – abundant, (f) Frequent, (c) – common, (o) occasional, (r) – rare, (La) – locally abundant, (Lc) – locally common.
   (iii) Regeneration:

(a) Nature: to be described under

   (i) By coppices the felled trees.
   (ii) By nature seeding or seedling coppices. (It should be clarified whether reproduction is adequate to restock the areas. Such portions should be indicated as far as possible)

(b) Artificial Regeneration: (Details to be given under item 11)
Grazing: (Mention availability of grazing units and grazing incidence)
Injuries : (Extent of illicit cutting. encroachments and illicit grazing, damage due to wind and cyclones, fires, draught frost, insects and spread of lantana of Karvi or other weeds.
Soil Erosion: (Give type and extent)
Past History : (Among others items information should be recorded about years of harvesting and also the type of harvesting; standards left, ultimate girth, trees reserved against fellings; full details, such as year of planting, method of planting, area & species planted and results about artificial regeneration should also be given.

Any Other Information: (Among other matters information about Experimental Plots (E.P.), Sample Plot (S.P.) Preservation Plot (P.P.), Increment Plot (L.I.P.) wildlife and privileges to be given.)

COMPARTMENT HISTORY FORM NO-2
RECORDS OF PLANTATION AND CHANGES IN GROWING STOCK

Compartment No. Coupe No.

Year/Date	Description of Works on plantation and charges in growing stock	Revenue (in Rs.)	Expenditure in (Rs.)
1	2	3	4

COMPARTMENT HISTORY FORM NO-3
REGISTER OF OPERATION AND OUT TURN

Compartment No. Coupe No.

Year/Date	Description	Revenue (in Rs.)	Expenditure (in Rs.)
1	2	3	4

COMPARTMENT HISTORY FORM NO-4
RECORDS OF OBSERVATION

Compartment No. Coupe No.

Date	Name of the Office	Extracts from Diaries, notes and Reports
1	2	3

COMPARTMENT HISTORY FORM NO-5
RECORD OF FIRE

Compartment No. Coupe No.

Date of Occurrence	Description	Cost in Rs.
1	2	3

Area burnt of Coupe No.

Details of damage and its approximate volume

Damage to Regeneration

Damage to standing trees

Timber

Cart load fuel

Cart load grass

Bamboos

Expenditure incurred for putting out fire as per fire

Case No. _____ of _____ was Rs. _____

Range Officer

12.2.1.2: Each Compartment must have a separate file for its records. Compartment History must be maintained in the office of Bhamaragarh Forest Division since they keep the record of past management practices and their effects on the growing stocks.

12.2.1.3: Every year, in July, the Range Forest Officer should fill in the necessary information and will send it to DCF Bhamaragarh Forest Division for scrutinizing, editing through ACF in charge, who after doing so will get them typed and sign them. One copy of the forms will be filed in the divisional compartment history file while one copy each will be sent to the RFO and CF Working Plan in the month of August in the following year.

SECTION: –12. 3: PLANTATION AND NURSERY REGISTERS:

12.3.1.1: Plantation registers will be maintained for all the areas regenerated artificially in the Form № 1 to Form № 9 as given below.

PLANTATION REGISTER FORM № 1
TEMPRATUE MAP

(Trace showing the areas under rabs, trenching, pitting, Uralis, or any other type of soil preparation depending upon the slope, drainage type and depth of soil etc. should be given).

PLANTATION REGISTER FORM № 2
GENERAL INFORMATION

1. Name of the Plantation :
2. Year of the Plantation :
3. Name of the Range/Division :
4. Location :

5. Area in Categories such as -

(i) Reserved Forests

(a) Already in charge of Forest Department

(b) Taken over from Revenue Department.

(ii) Protected Forests

(a) Already in-charge of Forest Department

(b) Taken over from Revenue Department

(iii) Any other type.

6. Topography, Aspect, Slope, Rock and Soil (Trial pits should be taken and soil profiles described)

7. Climate

Rainfall:

Year	Total Amount of Rainfall	No. of Rainy Days

Temperature:

Year	Maximum / Months	Minimum / Months

PLANTATION REGISTER FORM № 3

TRACE SHOWING AREAS PLANTED WITH DIFFERENT SPECIES

PLANTATION REGISTER FORM № 4

DESCRIPTION OF WORKS DONE

Details of operation carried out:

(a) Rabbing

(b) Trenching Total Area

Type	Size	No. Trench	Area Covered

(c) Pitting

Type	Size	No. Trench	Area Covered

2. Any other operations

(i) Staking – No. of Stakes.

(ii) Manuring.

3. Plantation works carried out.

(a) Species and method of planting or showing, with spacing adopted.

(b) Details of seed shown, its origin and viability, seedling or stumps planted.

(a)

Species	Quantity of seed sown	No. of stumps Planted	No. of Seedlings Planted with dates of Planting

(b)

Species	Date of showing	Date of planting	Naked	Mossed	Potted	Total

4. Causalities Replacement

Year !st / 2^{nd}	Species	No. of Seedlings/Stumps	Date of Replacement

5. Weedings

Year 1^{st} /2^{nd} /3^{rd}	Types of Weeding 1^{st} / 2^{nd} / 3^{rd}	Period of Weeding	Remarks Clean / Strip / Around Paints etc.)

6. Fertilizers

Kinds	Quantity	Dosage Given	Date

7. Insecticides Use:

Type	Quantity	Dosage	Date

8. Fire Protection:

Year	Date	Length	Width

PLANTATION REGISTER FORM № 5
COUNT OF SURVIVALS

Sr. No.	Name of Species	No. Planted	Year	Survival				Remarks
				as on 31st Oct.		as on 30th May		
				No.	Percent	No.	Percent	

PLANTATION REGISTER FORM № 6
COST OF OPERATION (In Rs.)

1. Demarcation and Marking
2. Clear Felling (or Clearance of Site)
3. Pre – Plantation Works.
4. (a) Plantation of Rabs.
   (b) Digging of Pits.
   (c) Contour of Pits.
   (d) Formation of Uralies.
   (e) Any Other Operation. (Cost of Manuring)

(f) Burning and reburning.

(g) Refilling of Pits.

(h) Preparation of Stakes.

(i) Aligning and Staking.

5. Collection of seed for direct sowing

6. Preparation of Stumps & Transportation.

7. Weedings-

I

II

III

8. Causalities Replacement in the 1st year of Planting.

9. Fire Protection.

10. Nursery Preparation Cost.

11. Any Other items such as fencing etc.

Total Expenditure to the end of 1st Year

PLANTATION REGISTER FORM № 7
COST OF SUBSEQUENT YEARS OPERATION.

year	Brief Account of work done and dates	Total Expenditure incurred in Rs.	Expenditure per ha. in Rs.	Remarks
1	2	3	4	5

PLANTATION REGISTER FORM № 8
RECEIPT REALISED

Year	Date	Particulars	Amount Realised in Rs.	Remarks
1	2	3	4	5

PLANTATION REGISTER FORM № 9
INSPECTION NOTES

Date	Inspection Notes and Instruction issued	Remarks about compliance wherever necessary
1	2	3

13.3.1.2: Nursery registers will be maintained in the Form № 1 to Form № 10 as given below.

NURSERY CONTROL FORM No-1

Division Range Area

(1) Name of the Nursery

(2) Location -

(3) Year of Formation

(4) Locality Factor

(a) Climate Average Temperature

Rainfall Max Min

(b) Topography

(c) Soil Condition and Classification.

(5) Previous Vegetation:

(6) Legal Position of the land:

(7) Water Supply

(8) Scope for future Expansion.

NURSERY CONTROL FORM No-2
INITIAL FORAMATION
PART – I
NON – RECURRING ITEMS

Item	Brief Description of Work Done	Total Expenditure of the Item	Sanctioned Amount	Remarks
1	2	3	4	5

PART – II

SUMMARY OF ANNUAL RESULT

Year	Total Cost Incurred	TOTAL PLANTING STOCK PRODUCE							
		Regular Plantation		Afforestation		Van Mahotsava		Miscellaneous	
		Name of Species	No.	Name of Species	No.	Name of Species	No.	Name of Species	No.
1	2	3		4		5		6	

DISPOSAL OF THE PLANTING STOCK					
Regular Plantation			Afforestation		
Spp.	No.	Where Used	Spp.	No.	Where Used
7	8	9	10	11	12

DISPOSAL OF THE PLANTING STOCK						
Van Mahotsava			Miscellaneous			Remarks
Spp.	No.	Where Used	Spp	No.	Where Used	
13	14	15	16	17	18	19

PART – III

REMARKS OF INSPECTING OFFICERS

Date	Inspecting Notes	Remarks about compliance wherever necessary
1	2	3
Total Cost Initially Incurred		
Year	Item	Non- recurring expenditure in subsequent years (Rest. of the columns as above)

NURSERY CONTROL FORM No-3

RECURRING ITEMS

(To be filled in for every year and tagged on the register.)

Year	Item	Total Expenditure for the item in Rs.	sanctioned Amount in Rs.
1	2	3	4

1. Renovation of beds
2. Manuring
3. Providing side support
4. Shading of beds
5. Purchase and collection of seed and origin of seed
6. Purchase of Container.
7. Purchase of other materials if any
8. Showing
9. Transplanting in beds
10. Showing of transplanting in containers
11. Cost of mossing of seedlings.
12. Wages of Mali and temporary staff
13. Wages of Labourers.
14. Cost of Running Pump.
    a) Diesel Oil
    b) Lubricating Oil
    c) Maintenance including repairs and parts.

Any Other Items.

15. Brief description of works

(Type, Size, and No. of beds, method of formation etc. details of containers used etc.)

Total Cost For the Item

NURSERY CONTROL FORM No-4

DETAILD LAY – OUT OF THE NURSERY

(To be shown roughly to a scale of 1" = 33' or any other suitable scale)

NURSERY CONTROL FORM No-5A (i)

STOCK LEDGER FOR GERMINATION BEDS

Species	Size of beds & No.	Dates of sowing	Quantity of seed sown	Period of germination	Stock raised	Distribution of Stock		Remarks
						Transplanting on beds	Transplanting in Polythene bags	
1	2	3	4	5	6	7A	7B	8

NURSERY CONTROL FORM No-5A (ii)

STOCK LEDGER FOR TRANSPLANTING BEDS

Species	Period of Transplanting	No. Beds	No. of Beds Transplanting	Spacing	*Distribution*	
					No. of how used	Balance
1	2	3	4	5	6	7

NURSERY CONTROL FORM No-5B

STOCK LEDGER OF SOWN BEDS

Species	Size of beds and No.	Date of showing	Quantity of seeds sown	Period of germination	Stock raised	Distribution	Remarks
1	2	3	4	5	6	7	8

NURSERY CONTROL FORM No-6
DETAILS OF PLANTING STOCK RAISED OTHERWISE THAN IN BEDS

Species	Type of Containers	No.	Direct showing or Transplanting	Disposal		Remarks
				No. of Seedlings	No. of Seedling disposed of	
1	2	3	4	5	6	7

NURSERY CONTROL FORM No-7
SUMMARY OF ANNUAL RESULTS

year	Total Cost Incurred in Rs.	TOTAL PLANTING STOCK PRODUCED							
		Regular Plantation		Afforestation		Van – Mahotsava		Miscellaneous	
		No. of Spp.	No.	No of Spp.	No.	No. of Spp.	No.	No. of Spp	No.
1	2	3	3(a)	4	4 (a)	5	5(a)	6	6(a)

a) Recurring

b) $1/10^{th}$ of total non - recurring

DISPOSAL OF THE PLANTING STOCK PRODUCED									
Regular Plantation			Afforestation			Van – Mahotsava			Remarks
Spp	No.	Where Used	Spp	No.	Where Used	Spp	No.	Where Used	
7(a)	7(b)	7(c)	8(a)	8(b)	8(c)	9(a)	9(b)	9(c)	10

Cost incurred in the year under report

NURSERY CONTROL FORM No-8
REMARKS OF INSPECTING OFFICERS

date	Inspecting notes and Instruction issued	Remarks about compliance with the note
1	2	3

NURSERY CONTROL FORM No-9
REVENUE REALIZED, IF ANY

year and Date	Amount in Rs.	Details	Remarks
1	2	3	4

NURSERY CONTROL FORM No-10
GERMINATION TEST

species	Origin of seed	Seed weight	Result of cutting test	Pre-treatment	No. of seeds used	Date of showing	Date of germination	Number Germinated	Remarks
1	2	3	4	5	6	7	8	9	10

SECTION: – 12.4: DIVISIONAL NOTE BOOK:

12.4.1.1:-At divisional level all important matters will be recorded by the DCF every year with his explicit opinions about the working plan operations. A brief note about the plantation will also be recorded by the DCF under appropriate heads. The division note book proforma have been given as below.

DIVISIONAL NOTE BOOK

Serial No.	Subject	Reference
1	2	3

1. **BLACK LIST OF**

   (a) Government servants
   (b) Contractors.

2. **STATISTICS**

   (a) Teak
   (b) Semal
   (c) Other species

3. **OTHER SPECIES**

4. **WORKING PLANS**

   (a) General
   (b) Silviculture

(i) Seed year
(ii) Reproduction of tree species either by seed or by coppice as a result of working the forests or advance grazing closures.
(iii) Nursery ands plantations (Inspection notes of superior officers in the nature of a periodical review)

5. **INJURIES TO WHICH THE CROP IS LIABLE.**

(a) Natural phenomena i.e. frost, drought etc.
(b) Insects and fungi
(c) Wild animals
(d) Erosion
(e) Climbers

6. **MINOR FOREST PRODUCES**

(a) Kulu gum
(b) Tendu leaves
(c) Katha etc.

7. **FINANCIAL RESULTS**

8. **GRAZING.**

(a) General
(b) Effects of closures on pasture conditions and reproduction of tree species.

9. **FIRE PROTECTION**

10. **LABOUR SUPPLY**

11. **EXPERIMENTS AND TESTS**

12. **FOREST BOTANY**

13. **FOREST ZOOLOGY**

14. **FORST OFFENCES (mention only those of a special nature)**

15. WATER SUPPLY

16. PROTECTED FORESTS

17. MISCELLANEOUS

SECTION – 12.5. FIRE RECORDS

12.5.1.1. They should be maintained as per the latest orders from State Government from time to time.

SECTION 12. 6. OTHER RECORDS

12.6.1.1. List of amendments to the working plan and list of area changes will be maintained in prescribed forms.

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CHAPTER XIII

FINANACIAL FORECAST

SECTION: 13.1. WHY FINANCIAL FORCAST?

14.1.1.1. Working plan for the Bhamaragarh Forest Division has been prepared with special objectives in respective working circles. Various prescriptions have been given to achieve these objectives. Execution of works needs proper planning and adequate financial provision for that. Execution of works will render services to society, environment and generate revenue to exchequer. That is why we need financial forecast for the plan.

SECTION: 13.2: EXPENDITURE

13.2.1.1. EXPENDITURE ON ESTABLISHMENT: To run the proper administration, an efficient administrative set is required. It is recurring expenditure on the set of organization i.e. on salary and other benefits to officials and staff. Maintenance of offices, vehicles, roads, buildings, machines, communications and other paraphernalia will require expenditure to be incurred.

13.2.1.2. EXPENDITURE ON EXPLOITATION OF FOREST PRODUCES: During the implementation of prescriptions of the draft report, some forest produces are going to be harvested. In selection cum improvement working circle, teak plantation working circle, bamboo (overlapping) working circle and improvement working circle and to some extent in protection working circle and non wood forest produce (overlapping) working circle, forest produces in the form of timber, firewood, bamboo or other produces like tendu leaves etc will be harvested. It will need expenditure to be incurred on various activities.

13.2.1.3. EXPENDITURE ON REGENERATION ACTIVITIES: Main objective of this plan report is to have sustainable development of forests. It ultimately requires regeneration of forests either naturally or artificially. Regeneration activities will be implemented through spending expenditure and rendering services.

13.2.1.4. EXPENDITURE ON CONTROLLING ACTIVITIES: This plan report envisages to have controlled activities to achieve its objectives. Activities like fire and grazing control need constant vigilance and expenditures to be incurred.

13.2.1.5. EXPENDITURE ON SOIL AND MOISTURE CONSERVATION: Soil and moisture conservation measures will require expenditures to be incurred for their executions.

13.2.1.6. EXPENDITURE ON WILDLIFE PROTECTION, ECOTOURISM AND CONSERVATIONS: Protection of wildlife in both faunal and floral forms and their conservation and practicing ecotourism certainly leads to incurring of expenditures.

13.2.1.7. EXPENDITURE DETAILS: Since the expenditure on various items are linked with minimum wage rate for wages and the prevailing salaries of staffs and officers in a dynamic linkage with market rate and dearness to the point of time. It is not possible to

work out the expenditure on specific item at a point of time. We can have the glimpses of it, based on certain assumptions. First of all we assume that wage rate and salaries and other commodities consumption are going to be static. The quantum of works to be carried out also going to be constant and furthermore the areas to be tackled yearly are also not going to vary. Based on these assumptions, the calculations are made. These are symbolic and not final.

(a) **HARVESTING:** Cost of harvesting per cubic meter timber = Rs. 2000/-
Cost of exploitation per beat firewood = Rs. 600/-
Bamboo/ADMT = Rs. 1500/-

Table No-109

Sr No	Working Circles	Area in ha	Area per annum in ha	Yield		Expenditure in Rupees in lakh
				Timber	Firewood	
1	SCIWC	187,785	12,380/8422	40,000	26,000	1,138
2	IWC	102,530	8558/4280	1,000	1,000	
		Total		41,000	27,000	
3	BOWC	253008/ 159,997	53,332	100,000	ADMT*	1,500*
			*BILT/Departmental	300,000 LB	Long Bamboo	18
			Departmental	50,000	Bundle	4
4	NWFP	TENDU	50,000 Std bags	@ Rs 1600/sb	By licensee	800*
	Total					1,160 + 2,300*

Yield calculation has been assumed for respective working cycles as follows:

(i) SCIWC 16.2 trees/ha, 0.485 cubic meter timber and 0.330 fuel beat per tree an so on.
70% of workable coupe area under D category = 8,600 ha/year.

(ii) IWC 0.5 cubic meter timber and 0.5 fuel beat per ha for improvement felling.
50% of coupe area for improvement felling.

(iii) Expenditure= timber @ Rs 1500/- per cubic meter & Rs 500/- per beat.

(iv) Bamboo Production to BILT Leased area: 100,000 Air Dried Metric Ton (ADMT). Expenditure @ Rs1500/- per ADMT. Bamboo area leased to Ms BILT will be worked by BILT. Expenditure will be incurred by BILT. BILT will provide opportunity of work to the local people to the tune of Rs 1500 lakh per year.

In Nistar area production is estimated 300,000 Long Bamboo and 50,000 Bundle per year. Expenditure @ Rs 6/- per Long Bamboo & @ Rs 8 per bundle.

* Expenditure will be borne by Licensee i.e. BILT in case of Bamboo and other licensee in case of Tendu Leaves collection, processing & disposal

.**REGENERATION**

(i) **NATURAL REGENERATION:** Natural regeneration will be carried out in selection cum improvement, improvement working circle and protection working circle.

Table No-110

Sr No	Working Circles	Area in ha	Area/ year in ha	Expenditure(Rupees in lakh, (Rate @ 5 man days/ha & @ Rs 80/- per day)	Remarks
1	SCIWC	172,840.206	12,268/8,600	34.4	70% NR
2	IWC	86,700.594	8,558/4,280	17.1	50% NR
3	PWC	26,038.700	2,604/260	1.04	10% NR
Total				52.54 say 53	

(ii) ARTIFICIAL REGENERATION: Artificial regeneration works are required in teak overwood removal and IWC. The expenditure will incurred as per the rate sanctioned by the office of PCCF MS.

Table No-111

Sr No	Working Circles	Area in ha	Area/ year in ha	Operation	Expenditure in Rupees in lakh Rate of expenditure @ 10000/ha & @ 80/- per daily wage
1	IWC	86700	500	PPO/PYO	35.5
			Upto 6%	FYO	57
				SYO	35.5
				TYO	25
				4^{th} YO	20.5
				5^{th} YO	13.5

(c) SOIL AND MOISTURE & OTHER ITEMS: - Exhaustive plan will be prepared and expenditure will be procured from National Employment Guarantee Schemes of Centre and State Department Schemes. Hence no quantification has been attempted. Assuming it to be of the tune of 20 Lakhs.

13.2.2.1:- YEAR WISE DETAILS OF EXPENDITURE: Expenditure to be incurred during plan period summarized in following table.

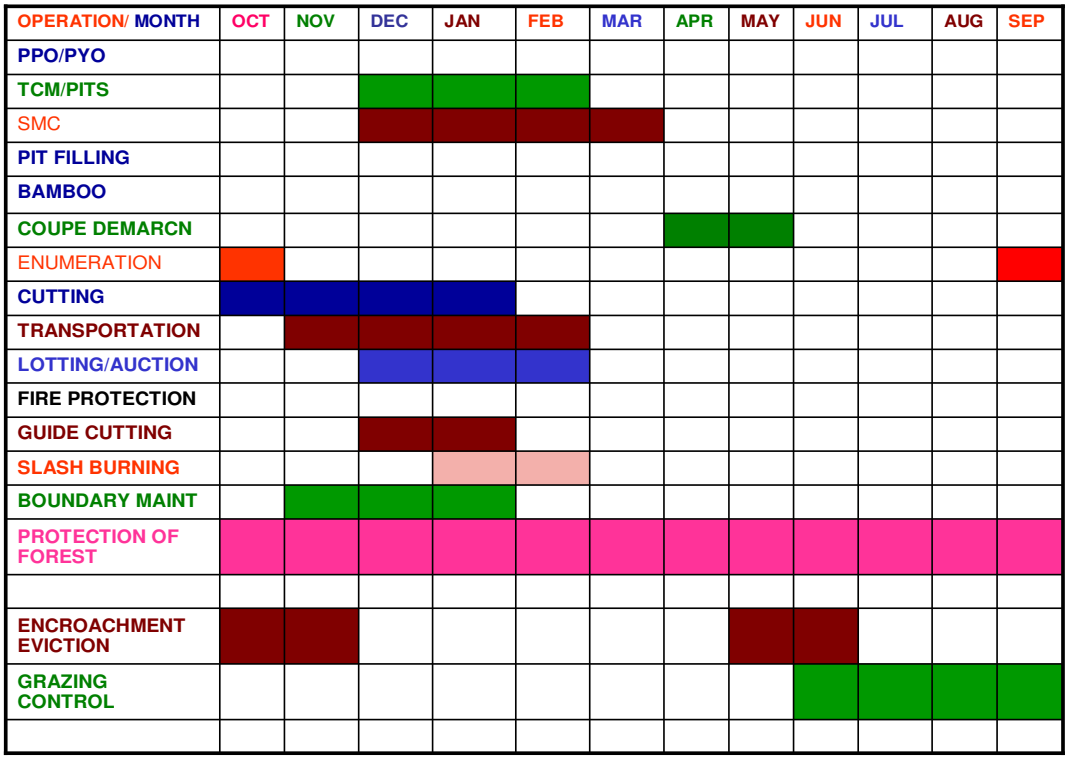
Table No-112

All expenditures are in Rupees in lakh.

Year	Establishment	Timber	S&M works	Natural Reg	Artificial Regeneration						TOTAL
					PPO	FYO	SYO	TYO	4th YO	5th YO	
07-08	350	1160	20		42.8	…	…	…	…	…	1572
08-09	350	1160	20	53	42.8	68.4	…	…	…	…	1694
09-10	350	1160	20	53	42.8	68.4	42.8	…	…	…	1737
10-11	350	1160	20	53	42.8	68.4	42.8	30	…	…	1767
11-12	350	1160	20	53	42.8	68.4	42.8	30	24.6	…	1792
12-13	350	1160	20	53	42.8	68.4	42.8	30	24.6	16.2	1806
13-14	350	1160	20	53	42.8	68.4	42.8	30	24.6	16.2	1806
14-15	350	1160	20	53	42.8	68.4	42.8	30	24.6	16.2	1806
15-16	350	1160	20	53	42.8	68.4	42.8	30	24.6	16.2	1806
16-17	350	1160	20	53	42.8	68.4	42.8	30	24.6	16.2	1806

FORESTRY OPERATIONS CHART

OPERATION/ MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DEMARCATION												
MARKING TREES												
FELLING OF TREES												
TRANSPORTATION												
LOTTING/AUCTION												
TENDU/ AUCTION												
TENDU/PLUCKING												
NURSURY												
TEAK BEDS												
TEAK SEED SOWING												
TEAK BED WEEDING												
STUMP PREPN												
STUMP PLANTN												
POLYBAG FILLING												
SEED SOWING												
WATERING/ MAINT.												
TRANSPORTATION												
PLANTING												
WEEDING/MULCHING												



SECTION: 13.3: ANNUAL REVENUE EXPECTED FROM ALL SOURCES:

13.3.1.1: REVENUE FROM EXPLOITATION OF FOREST PRODUCES: - Exploitation of forest produces not only leads to incurring expenditure but also generates revenue in the forms services and goods. Revenue is going to be received from exploitation of timber, firewood, bamboo, tendu leaves, services of grazing, ecotourism, minor forest produces etc.

13.3.1.2: REVENUE FROM ALL SOURCES

Table No-113

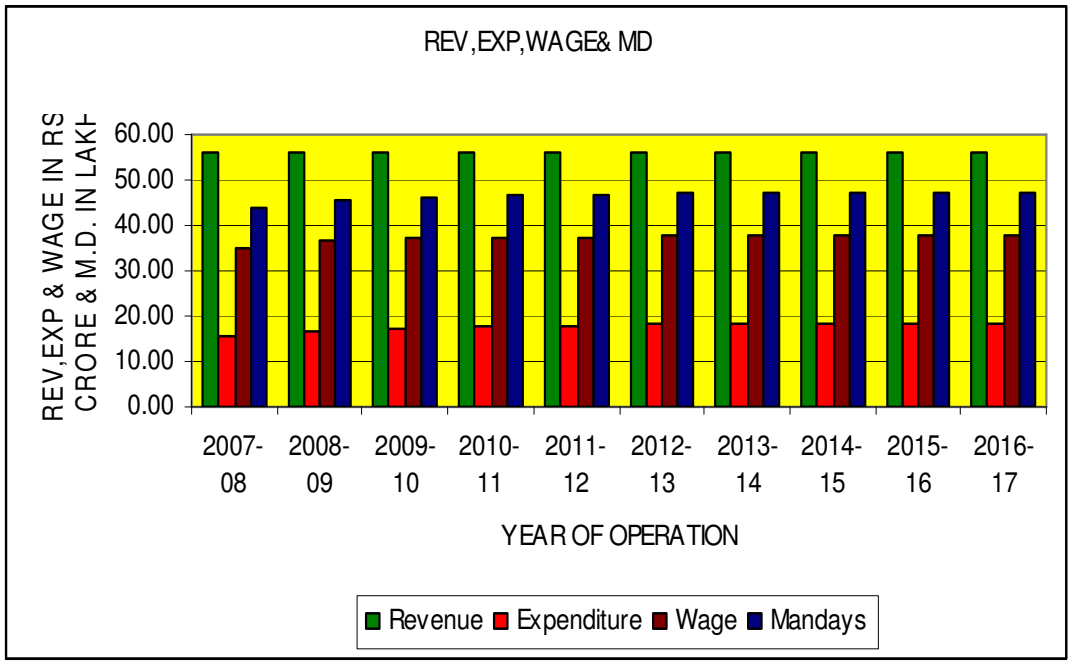
Sr No	Item	Quantity	Rate	Revenue in lakh
1	Timber	46,000 cmt	T Rs 25,000/cmt NT Rs 8,000/cmt	3,836
2	Fuel Beats	33,000 beat	T Rs 2000/beat NT Rs 800/beat	273
3	Pole	10,000 No	Rs 150/pole	15
4	Bamboo	100,000 ADMT	Rs 800/ADMT	800
5	Tendu	50,000 std bags	Lump sum	600
6	Miscellaneous	3 lakh LB, 0.5B	Lump Sum	76
5	Total			**5,600**

Where:
Timber @ 2% Teak Timber, @ Rs 25,000/- per cubic meter.
Timber @ 98% Non Teak Timber, @ Rs 8,000/- per cubic meter.
Fuel Beat @ 2% Teak Fuel Beat, @ Rs 2,000/- per fuel beat.
Fuel Beat @ 98% Non Teak Fuel Beat, @ Rs 800/- per fuel beat.
Bamboo exploited by BILT as per rate fixed by State Government. Rate assumed @ Rs 800 per ADMT. Long Bamboo @ Rs 10/- per bamboo and @ Rs 20/- per bamboo bundle.
Tendu leaves license fees Lump Sum Rs 200 lakh.

13.3.2.1:- STATEMENT OF REVENUE AND EXPENDITURE FOR THE ENTIRE PLAN PERIOD: (In Rupees in lakh)

Table No-130

Sr No	Year	Revenue in Rs Lakh	Expenditure in Rs Lakh	Wage Component Departmental + licensees	Mandays Generated in lakh mandays(Wage @ Rs 80/- per day)
1	2007-08	5,600	1572	3,522	44.025
2	2008-09	5,600	1694	3,644	45.550
3	2009-10	5,600	1737	3,687	46.088
4	2010-11	5,600	1767	3,717	46.463
5	2011-12	5,600	1792	3,742	46.775
6	2012-13	5,600	1806	3,756	46.950
7	2013-14	5,600	1806	3,756	46.950
8	2014-15	5,600	1806	3,756	46.950
9	2015-16	5,600	1806	3,756	46.950
10	2016-17	5,600	1806	3,756	46.950



Where: Revenue, Expenditure & Gross Wage component of expenditure including to be incurred by licensees are in Rs. Crore.
M.D. Mandays to be created for local employment (Notional @ Rs 80/- per day as wage rate)

SECTION: 13.4: EXPENDITURE ON PLAN PREPARATION: - Expenditure on preparation of working plan of Bhamaragarh Forest Division cannot be separately worked out. Working Plan Division Chandrapur-2 has been given the responsibility of preparing working plan for Forest Divisions and conducting enumeration survey of forest resources of various forest divisions. Revision of Working Plan for Bhamaragarh Forest Division was taken during 2005-06 and simultaneously, Revision of Sironcha Forest Division. Survey of forest resources of Gadchiroli and Bhamaragarh have conducted during this period partially. Office of Chief Conservator of Forest Working Plan Nagpur also incurs expenditure on GIS Cell pertaining to divisions related to this division. Hence actual expenditure on preparation of this plan cannot be separated out. Actual expenditure incurred by this division is given as below.
Expenditure incurred for plan preparation during 2005-06 & 2006-07 = Rs 120 Lakh

Area of the Plan = 367,731.681 ha
Expenditure on plan per ha = Rs 32.63.

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(Ravikaran Govekar)
Deputy Conservator of Forests,
Bhamragarh Forest Division
Allapalli

(N.K.Sudhanshu)
Collector,
Gadchiroli

(R.S.Yadav)
Conservator of Forests,
Working Plan
Chandrapur-2

(A.S.K.Sinha)
Chief Conservator of Forests,
(Conservation)
M.S.Nagpur

(Ramanuj Choudhary)
Chief Conservator of Forests
Working Plan
Nagpur

(V.S.Negi)
Regional Chief Conservator of Forests,
(Central)
Representative of G.O.I.
Bhopal

(B.Muzumdar)
Principal Chief Conservator of Forests,
(Wild Life)
Maharashtra State
Nagpur

(Mahip Gupta)
Conservator of Forests,
South Chandrapur Circle
Chandrapur

(R.R.Sahai)
Chief Conservator of Forests
(P.T.& S.P.)
Nagpur

(S.D.Sontakke)
Chief Conservator of Forests
(Protection)
M.S.Nagpur

(J.S.Grewal)
Addl. Principal Chief Conservator of Forests
(Budget & Planning)
M.S.Nagpur

(A.B.Bhangare)
Addl.Principal Chief Conservator of Forests,
(Protection & Management)
Maharashtra State
Nagpur

(Jwala Prasad)
Principal Chief Conservator of Forests,
Maharashtra State
Nagpur

भारत सरकार

GOVERNMENT OF INDIA

पर्यावरण एवं वन मंत्रालय

MINISTRY OF ENVIRONMENT & FORESTS

सत्यमेव जयते

क्षेत्रीय कार्यालय, पश्चिम क्षेत्र,
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अणुडाक /E-mail: rccfbhopal@gmail.com

Dt- 06- 12- 2007,

No. : 12-13/2005 (FOR)/ 4452

To,

The Principal Secretary,
Revenue and Forest Department,
Mantralaya,
MUMBAI

Sub : **Approval of Working Plan proposal for Bhamragarh Forest Division, written by Shri Ramjisingh Yadav, I.F.S. for the period of 2007-08 to 2016-17.**

Ref : 1. Revenue and Forest Department, Government of Maharashtra letter FDM 2007/C.R. 171/F-2, dated 11th June, 2007.
2. Principal Chief Conservator of Forests, Government of Maharashtra letter No. D-14/WP/CR-80/798/07-08, dated 14.11.2007.

Sir,

With reference to the above mentioned subject, I am to inform you that after careful examination of the Working Plan of Bhamragarh Forest Division, the Central Government hereby conveys its approval to the said working plan in accordance with the powers vested under Forest (Conservation) Act, 1980 subject to following conditions:-

(1) The currency of the Working Plan shall be for a period of 10 years i.e. from 2007-08 to 2016-17.

D-14 (2) The modified definition of "malformed tree" shall be followed in the implementation of "Improvement Working Circle".

वनसंरक्षक (3) The entire area proposed for "Teak Plantation Working Circle" shall be incorporated in
-आयोजना) "Selection-cum-Improvement Working Circle".
नागपुर.

(4) The orders of Hon'ble Supreme Court in the matter of Godaverman Therumalkpad Vs Union of India in W.P. (Civil) No. 202/95 and related Inter Locutory applications shall be strictly adhered to. Any prescription or operation at variance with the Hon'ble Supreme Court's order shall be kept in abeyance till the order is in force or otherwise modified.

(5) Further, in compliance with orders of Hon'ble Supreme Court's dated 22.09.2000, the state government of Maharashtra shall ensure that regeneration of forests is commensurate with fellings carried out under this working plan.

(6) No felling shall be carried out without allocating necessary fund for implementation of regeneration operation so as to make regeneration commensurate with fellings. In the event of failure in regeneration or any shortfall in carrying out regeneration operation, no further felling shall be undertaken until the failure/shortfall is made up.

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(7) Following the directions of the Hon'ble Apex Court in their order dated 22.09.2000, a Core Group has been constituted under the Chairmanship of the Director General of Forests and Special Secretary for deciding the extent of harvesting that could be permitted under approved Working Plans for ensuring regeneration to be commensurate with fellings. Instruction/directions of the Central Government in the matter to be issued in future shall be strictly complied with. Felling to be done by State Government only after seeking permission from Core Group constituted by the MOEF, New Delhi.

(8) No forests bearing naturally grown trees shall be clear felled for any purpose whatsoever.

(9) Prescriptions of microplans for JFM (if made) should not deviate the broad framework/guidelines of the working plan and shall be in accordance with various orders of Hon'ble Supreme Court.

(10) Felling carried out on forest land after seeking approval of the Central Government under Forest (Conservation) Act, 1980 will not be treated as deviation. However, proposed felling in the forest division shall be restricted proportionately in the current/following years to compensate this removal.

(11) No deviations shall be made from the prescriptions of working plan read with the conditions stipulated herein without prior approval by the Central Government under Forest (Conservation) Act, 1980. However, deviations of positive nature i.e. out of turn plantations carried out outside the worked area under any project, schemes and compensatory afforestation may be approved by the competent authority of the State Government.

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

Yours faithfully,

(Dr. B.N. Mohanty)
Chief Conservator of Forests (Central)

Copy to :

1. The Additional Director General of Forests (FC), Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi - 110 003.
2. The Principal Chief Conservator of Forests, Govt. of Maharashtra, Seminary Hills, Nagpur.
3. The Chief Conservator of Forests (Working Plan), Government of Maharashtra, Nagpur.

5.12.07

(Dr. B.N. Mohanty)
Chief Conservator of Forests (Central)