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GOVERNMENT OF MAHARASHTRA

VOLUME-II

WORKING PLAN

FOR

JALGAON FOREST DIVISION

OF

DHULE CIRCLE

PERIOD: 2019-20 TO 2028-29

By

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PART - 1

CHAPTER–1

THE TRACT DEALT WITH

1.1: NAME AND SITUATION

This Working Plan deals with the entire reserved forests, protected forests and unclassed forests of Jalgaon Forest Division of Dhule Forest circle. The total forest area of 869.14 sq km, of this division. The area is spread over in Twelve talukas, namely Dharangaon, Amalner, Bhadgaon, Bhusawal, Bodwad, Chalisgaon, Erandol, Jalgaon, Jamner, Pachora, Parola and muktainagar talukas of Jalgaon district. The Divisional headquarter situated at Jalgaon.

This Division is divided into Eight territorial ranges namely Jalgaon, Chalisgaon, Erandol, Parola, Pachora, Vadoda, Jamner, Muktainagar The forest are situated between 21^0-24'-55" to 20^0 15' 34" north latitude & 74^0-45'-54" to 76^0 20' 49" east longitude. The boundaries of the division are as follows:

North – Tapi river and Yawal forest Division.

South – District boundary of Aurangabad and Jalna District.

West – Disrtict boundary of Dhule and Nashik District.

East – Madhya pradesh State

The first working plan were introduced between 1894 – 1908.

1.2: CONFIGURATION OF THE GROUND

The area falls in the Deccan plateau, it has more or less western aspect. There are two distinct regions – viz. alluvial plains of Tapi valley and barren ridges of Satmala and Ajanta ranges.

The valley is badly dissected and banks of Tapi are high and bare. South of the Tapi valley, the country is much more varied. The Ajanta Range covers the southern part of the district for a distance of about 120 km. The main river of the district is westward flowing Tapi, which flows about 125 km. within the district. The Tapi receives many tributaries from both sides. Purna, Bhogawati, Waghur, Girna and Bori are the main rivers, which

flow from the South and join Tapi on its left bank. The rivers flowing from the south emanate from the Sahayadris except for Purna and Waghur. They drain much wider tracks.

The Tapi Banks Are Subject To Heavy Erosion Resulting In Ravine Formation. Intense Ravine And Gully Erosion Occurs Along The Banks Of Tapi River, Though Tapi Valley Is A Vast Alluvial Plain.

1.3: GEOLOGY, ROCK AND SOIL

Deccan trap covers almost the whole of the Division except a few strips of alluvium covered land on both the sides of major streams.

Soil: The soil of the district are generally derived from the underlying basalt, though older alluvium has a deep cover all along the broad Tapi valley. The soils mainly fall in to four categories viz. Medium Black Soils, Deep Black Soils, Loamy Soils and Sandy Soils.

The soil mainly falls into Four catogaries, as per following.

Medium Black Soils: Medium Black Soils (Madhyam Kali) are clay loams, brownish black to black in colour. They cover the Northern portion of Pachora and Jamner Tahsils. Most of the soils of Chalisgaon, Erandol, Bhusawal, Jalgaon and Bhadgaon Tahsil also belong to this type.

Deep Black Soils: Deep Black Soils (Bhari Kali) are found in Northern part of Amalner, Erandol, Jalgaon, Bhusawal and Edlabad tahsils.

Loamy Soils: Loamy Soils (Malai or Galwat) are fertile and are observed on banks of river. They occur in a continuous strip in the southern most portions of Amalner, Erandol, Jalgaon, Bhusawal and Edlabad tahsils.

Sandy Soils: Sandy Soils occurs near the southern hillocks in Chalisgaon, Pachora, Jamner, Bhusawal, Parola, Erandol and Bhadgaon tahsils.

Soil Survey And Land Use Planning:

National Bureau of Soil survey and Land Use Planning in cooperation with Department of Agriculture, Maharashtra, developed soil resource maps for Maharashtra state. NBSS & LUP has also published soil maps at 1 : 500,000 scales.

The Jalgaon Forest Division, which comprises of Twelve Tahsils namely Jalgaon, Bhusawal, Bodwad, Muktainagar, Jamner, Bhadgaon, Amalner, Pachora, Parola, Chalisgaon and Erandol has the following soil categories as per NBSS & LUP classification. The polygon numbers and their description is given below. The soil map of Jalgoan division is prepared along with this working plan. The polygon numbers of Jalgaon division are 097, 162, 180, 188, 212, 234, 241, 242, 244, 249, 256, 257, 260, 262, 268, 269, 270, 276, 278, 284, 299, 300 and 302.

097: Very shallow, well drained, clayey soils on gently sloping summits/spurs of upper plateau with severe erosion: associated with very shallow, well drained loamy soils with severe erosion and moderate stoniness.

162: Extremely shallow, well drained, loamy soils on gently sloping undulating lands with mesas and buttes with severe erosion and strong stoniness: associated with very shallow, well drained, clayey soils with moderate erosion and moderate stoniness.

180: Rock out crops; associated with very shallow, well drained, clayey skeletal soils on gently sloping summits and spurs with moderate erosion.

188: Very shallow, well drained, loamy soils on gently sloping summits/spurs of lower plateau with severe erosion; associated with shallow, well drained, clayey soils on very gently sloping summits/spurs with moderate erosion.

212: Slightly deep, well drained, fine, moderately calcareous soils on gently sloping lands with moderate erosion; associated with slightly deep, well drained clayey moderately calcareous soils with moderate erosion.

234: Shallow well drained clayey soils on very gently sloping plains and valleys with moderate erosion: associated with shallow, well drained, clayey calcareous soils with moderate erosion.

241: Deep, well drained, fine soils on gently sloping plains and valleys with slight erosion; associated with shallow, somewhat excessively drained, clayey soils with moderate erosion.

242: Deep, moderately well drained, fine soils on very gently sloping plains and valleys with moderate erosion: moderate salinity and slight sodicity; associated with deep, moderately well drained, clayey soils with moderate erosion.

244: Slightly deep, moderately well drained, fine soils on very gently sloping plains and valleys with moderate salinity; associated with moderately deep, well drained clayey calcareous soils with moderate erosion.

249: Deep, moderately well drained, clayey soils on gently sloping plains and valleys with moderate erosion; associated with shallow, well drained, clayey soils with moderate erosion.

256: Very deep, moderately well drained fine calcareous soils on very gently sloping plains and valleys with moderate erosion; associated with shallow, well drained, clayey soils with moderate erosion.

257: Deep, imperfectly drained, fine, calcareous soils on very gently sloping plains and valleys with moderate erosion; moderate salinity and slight sodocity; associated with deep, moderately well drained, fine , calcareous soils with moderate erosion.

260: Very deep, moderately well drained, fine calcareous soils on very gently sloping plains and valley with moderate erosion: and slight salinity; associated with slightly deep well drained, fine soils with moderate erosion.

262: Deep, moderately well drained, fine calcareous soils on very gently sloping plains and valleys of lower plateau with moderate erosion; associated with shallow, moderately well drained, clayey soils with moderate erosion.

268: Very shallow, somewhat excessively drained loamy soils on gently loping isolated hillocks and pediments with severe erosion; associated with shallow somewhat excessively drained soils on steeply sloping isolated hillocks and pediments with severe erosion and slight stoniness.

269: Extremely shallow, somewhat excessively drained, loamy soils on moderately sloping isolated hillocks and pediments with severe erosion and moderate stoniness; associated with very shallow, some what excessively drained, loamy soils with severe erosion and moderate stoniness.

270: Slightly deep, well drained, clayey soils on moderately sloping isolated hillocks and pediments with moderate erosion: associated with very shallow, some what excessively drained, loamy soils with severe erosion and moderate stoniness.

276: Very shallow, well drained, loamy soils on gently sloping lands with mesas and buttes with severe erosion, associated with shallow, well drained loamy soils with moderate erosion.

278: Very shallow, excessively drained, clayey soils on moderately steeply sloping undulating to rolling lands with mesas and buttes with severe erosion and strong stoniness: associated with shallow, excessively drained, loamy soils with severe erosion and strong stoniness.

284: Very shallow, well drained, loamy soils on gently sloping rolling lands with mesas and buttes with severe erosion; associated the shallow, well drained clayey soils with severe erosion.

299: Exetremely shallow, well drained, clayey soils gently sloping dissected tablelands with sere erosion and strong stoniness; associated with extremely shallow well-drained, loamy soils with severe erosion and strong stoniness.

300: Very shallow, somewhat excessively drained, clayey soils on gently sloping dissected table lands with severe erosion and strong stoniness, associated with very shallow, well drained clayey soils with moderate erosion.

302: Very shallow, somewhat excessively drained, loamy soils on gently sloping dissected table lands with severe erosion; associated with very shallow, somewhat excessively drained, loamy soils on moderately loping dissected table lands with severe erosion and moderate stoniness.

1.4: CLIMATIC PARAMETERS

Climate :- Being far away from the coast there are large variations in temperature in the district. The year may be divided into four seasons. December to February forms the cold season, followed by hot season from March to May. The monsoon is from June to September, while October and November form the post monsoon season. December is the coldest month. The temperature rises steadily from March and by May, the hottest month of the year, mean daily maximum temperature reaches 45^0 C.

Rainfall: The district enjoys moderate rainfall and the range between maximum and minimum is not large. The central and eastern portion gets slightly high rainfall than the western part of the district. The variation in the rainfall in the district from year to year is

larger. The average annual rainfall is 793.6 mm, July being the month with the highest rainfall. Winter precipitation is almost negligible.

Sr. No.	Year	Max. Temp. (^{0} C)	Min. Temp. (^{0} C)	Avg. rainfall (mm.)
1	2008	42.8	8.3	547.3
2	2009	42.9	8.1	717.3
3	2010	42.8	8.2	848.3
4	2011	43.0	4.2	612.0
5	2012	42.9	8.2	366.9
6	2013	43.9	8.3	1127.2
7	2014	43.3	8.9	916.4
8	2015	43.7	7.3	471.8

Drought :-

In most of the villages, open wells and taps are main source of drinking water. The major source of irrigation is well (with electricity), other sources are canals, rivers etc. However, scarcity of water is felt during summers and water table goes down. A no. of perennial river's existing in Satpuda's and the notable are Tapi, Aner, Girna, Waghur & Purna.

Storms, floods and frost : -

The bulk of the rainfall is derived from south – west monsoon form mid June to mid September. The winter is moderate and of short duration. The hot season is from February to June. The maximum summer temperature 47.2^0 C. Frost is unknown.

Soil erosion : -

The process of soil erosion is proceeding at an alarming pace in all the marginal areas of the reserved forests of the tract. As result of fires and excessive grazing, the soil is deprived of its protective cover and consequently in the rainy season, the valuable top layers of the soil are washed away. The forest crop in such areas has degenerated into under stocked open scrub. Further degradation of such areas into valueless blanks will be only a matter of time if effective measures are not followed at once.

Distribution of area in water sheds :-

The area of Jalgoan Division is distributed in 70 G.S.D.A. Watersheds. The Watershed Map of the Division is attached in vol.II

State of boundaries :-

At present the entire forest boundary is demarcated by dry rubble cairns which are not numbered. Also the entire forest area is distributed in patches, surrounded by agriculture land or village boundaries. The cairns are not very effective and hence it will be helpful in protection, if they were replaced with concrete pillars which would be duly numbered and proper record maintained. Also in few places, the existing boundary will change to the extent, that forest area has been added under compensatory Afforestation schemes.

Legal position :-

The Reserved Forests included in this plan were settled and constituted into Reserve Forests between the years 1879 and 2014 by several notifications.

Compensatory lands taken in lieu of Forest Land diverted for non forestry purpose have been declared as either Protected Forests or Reserved Forests under Section -29, 1031.00 hectare area taken over by the Division for Compensatory Afforestation is yet to be notified as PF.

Health:-

The weather is usually oppressive in the summers and very sultry and humid during monsoons. However, during winter it is pleasant. Due to improvement in health services, epidemics are rare. However cases of Gastro-enteritis and Malaria occur in remote villages during the monsoon.

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CHAPTER-2

MAINTENANCE / INCREASE IN THE EXTENT OF FOREST AND TREE COVER

2.1: AREA OF FORESTS UNDER DIFFERENT LEGAL, CLASSES (RF.PF. UF. & OTHER)

Area description :

The total forest area as per the notification and Form No.I of Jalgoan Forest Division is 869.14 Sq.Km. of which 836.33 Sq.km is the Reserved Forest, 26.145 sq.km.is the is notificed under Section 4 of IFA 1927 and 6.663 Sq.Km. is un-classed forest.

Table No. 2.1 Range wise area Statement of Jalgoan Forest Division.

Sr. No.	Name of Range	No. of Round	No. Of Beat	Legal status wise area (ha)			
				Reserved Forest area	Under Section-4 area in ha	Unclassed Forest	Total Forest area
1	Chalisgaon	2	7	11760.11	264.92	--	12025.63
2	Parola	3	7	7621.01	626.56	94.54	8342.14
3	Erandol	2	5	6398.73	257.28	58	6713.26
4	Pachora	2	5	5851.47	204.99	513.85	6569.33
5	Jamner	4	11	13417.23	456	--	13874.1
6	Jalgaon	2	6	8894.59	54.46	--	8948.82
7	Muktainagar	4	10	15037.64	535.36	--	15573.88
8	Vadoda	3	10	14652.05	215	--	14866.97
Total		**22**	**61**	**83633.17**	**2614.57**	**666.39**	**86914.13**

Note: Out of total 86941.13ha. Reserved forest, 2614.57 ha. is notificed under Section 4 of IFA 1927 as and 666.39 ha.Unclassed forest.

Administrative units : For administrative convenience, the ranges, rounds and beats were reorganized.The entire division has been divided into 8 Ranges, 22 Rounds and 61 Beats.

Legal position : The Forest of the tract was constituted into Reserved Forest during the period, 1879 to 1910 by means of several notifications. The details of which are given in

Volume II of this Plan. The details of P.F. was constituted out of the area received under Compensatory Afforestation.

Reserved forest : The forests were originally declared Reserved Forest under the provisions of the Indian Forest Act, VII of 1878, as per the notification. Subsequent changes are effected under the authority of the State Govt. Gazette notifications issued from time to time. Orders of settlement officers and corrections intimated by the Survey of India, Dehra Dun have been incorporated in the area statement i.e. in Form 1 of the Division.

Protected forests : These forests were declared as Protected Forests under section 4 of the Indian Forest Act, of 1927 vide Govt.of Maharashtra Notification.

In exercise of powers conferred by section 30 and 32 of Indian Forest Act, 1927, notifications reserving trees, etc., were issued and rules were framed by the Govt. of Maharashtra under No.FLD-015/L.205/F-3 dated. 06/05/2015.

Distribution of the area :

Jalgoan forest division comprises of Jalgaon, Chalisgaon, Erandol, Parola, Pachora,Vadoda, Jamner,Muktainagar Ranges. Area of the division lies in Dharangaon, Amalner, Bhadgaon, Bhusawal, Bodwad, Chalisgaon, Erandol, Jalgaon, Jamner, Pachora, Parola and muktainagar Talukas of Jalgaon district.

The distribution of the area under Range, Round and Beat areas is shown in **Appex. no. X**

The area of 2083.3632 hectare of Reserved Forest area was transferred to various project authorities under Forest Conservation Act 1980 for non-forestry purpose. However, the status of the land continues to be Reserved Forest. The details of the land transferred to other Agencies for non-forestry purpose is given in the **Appex.no. VI.**

The are of 1031 Ha. land was received as Compensatory land in lieu of diverted Forest land have been notified as Protected Forest, 2090.59 hectare is notified under Sec 4 of IFA 1927 and 2844.60 hectare remained un-classed and is under the process of notification under Sec 4 of IFA 1927.

The area of 12274.063 ha. excluded from total area of Jalgaon forest divison 86914.13 ha. for Muktai Bhavani conservation reserve.

Rights and concessions :

The only rights with which these forests are burdened are rights of way and access to watercourse. As regards concessions, these are enjoyed in accordance with Forest Privilege Code which forms part of the BFM Vol. III, Part C. With the enactment of 73rd constitutional amendment rights to minor forest produce have been given to Gram Sabha / Village Panchyat, but forests of Jalgaon Division do not constitue part of notified scheduled areas. The privileges extened needs to be reviewed in view of the present state of the Forests and other developments such as JFM approach for protection and management of the forests.

As per J.F.M. Gr. FDM//2011/C.R.100/F-2 dt. 5/10/2011 JFMCs have been given the power to regulate the cattle grazing in the forest area by levying suitable fee, also they have rights over collection of grasses and after NTFP in their respective areas. They also have rights to prepare their own micro plans in consonance with the general working plan for management of such areas. Also under forest rights act the extent of rights given in this division is as follows. **Table No. 2.2**

Range	Taluka	Approved Claims (No.)		Total Claims	Area (ha)		Remarks
		Agriculture	Residence		Agriculture	Residence	
Jamner	Jamner	18	--	18	20.13	--	
Erandol	Erandol	--	58	58	--	0.18	
Chalisgaon	Chalisgaon	26	21	47	30.92	0.071	
	Total	**44**	**79**	**123**	**51.65**	**0.251**	

2.2: FOREST AREA UNDER DIFFERENT WORKING CIRCLES:

The area under the different Working Circles in the Division is given in the following tables.

Table No. 2.3

Sr.No.	Name of Working Circle	Area allocated (Ha.)
1.	Protection Working Circle	3038.35
2.	Improvement Working Circle	40017.9
3.	Anjan Working Circle	952.60
4.	Fodder Working Circle	12131.90
5.	Afforestation Working Circle	10786.3
6.	Misc. Area Mangt	7713.03
Total Area of Division		**74640.10**

Sr.No.	Name of Working Circle	Area allocated (Ha.)
6	Chapter Non-timber Forest Produce.	Entire
7	Chapter Forest Protection	Entire
8	Chapter Joint Forest Management	28168.21
9	Chapter Wildlife Management	Entire
10	Chapter Eco- Tourism	Entire

Range wise allocation of the area of different working circles is shown in the table below:

Table No. 2.4 : Range-wise Area Allocation of Different Working Circle

Sr. No.	Range	Total Area in ha.						
		P.W.C.	I.W.C.	A.W.C.	Anjan W.C.	Fodder W.C.	Misc. Area Mangt	Total
1	Chalisgaon	3038.35	4245.48	1734.09	645.42	996.19	1366.1	12025.63
2	Erandol	0	3987.43	1336.51	0	873.091	516.23	6713.261
3	Jamner	0	10069.16	360.87	0	2337.66	1106.31	13874
4	Jalgaon	0	5456.41	1080.64	0	1303.39	1108.38	8948.82
5	Muktainagar	0	6365.65	4136.75	0	3932.47	1139.01	15573.88
6	Pachora	0	4338.81	216.49	0	1411.33	602.7	6569.33
7	Parola	0	4305.84	1920.96	0	1277.79	837.55	8342.14
8	Vadoda	0	1249.109	0	307.18	0	1036.75	2593.039
Grand Total		**3038.35**	**40017.9**	**10786.3**	**952.6**	**12131.9**	**7713.03**	**74640.10**

Table No. 2.5

Range	Total Area in ha.				
	NTFP (O/L) W.C.	J.F.M. (O/L) W.C. (Ha.)	WL.Mgt. (O/L) W.C.	Forest protection (O/L) W.C.	Ecotourism (O/L) W.C.
Chalisgaon	Entire area	6014.43	Entire area	Entire area	Entire area
Parola		2425.07			
Erandol		1108.85			
Pachora		4178.68			
Jamner		5339.59			
Jalgaon		1727.00			
Muktainagar		4067.73			
Vadoda		3306.96			
Grand Total		**28168.31**			

2.3 : PERCENTAGE OF FOREST WITH SECURED BOUNDARIES

State of Boundaries :

The total length of the external boundary is 1592.53 km of which about 109.25 km, is formed by permanent natural features and 133.55 km is demarcated. These demarcated artificial boundaries are cleared lines 12 m wide with numbered pillars at suitable intervals. Each pillar is surrounded by cairn of stones or earth and is placed in the middle of the 12 m wide boundary line. The pillars are serially numbered in–anti-clock-wise direction. Separate series of numbers are adopted for boundary lines passing through different villages. Half width boundary line lies wherever the Reserved Forest adjoins the Protected Forests and other areas.

The total length of external boundary line 1592.53 km. The boundary line and the cairns are not well maintained. Repairs of the pillars and construction of new cement pillars were carried out as per the availability of the fund.

2.4 : LAND USE, LAND USE CHANGE AND FORESTRY (LULUCF)

The total geographical area of Twelve Talukas Jalgaon, Bhusawal, Bodwad, Muktainagar, Jamner, Bhadgaon, Amalner, Pachora, Parola, Chalisgaon, Dharangaon and Erandol comparises Jalgoan Forest Division is 8794.54 sq. km. Out of that forest area of Jalgoan Forest division is 866.00 sq.km.The condition of the forests and forest cover over the last decade during the implementation of the Plan based on the sanctioned as per PWPR data is as follows:

Table No. 2.6 : Forest cover over the Last Decade during the Implementation of the Plan (As per Sanctioned PWPR.)

Name of working circle	Forest density (Before implementation of Mr.TSK Reddy's working plan)					
	Total Area	> 0.4 Dense	< 0.4	Blank	Scrub Forest	Water Bodies
Protection	8839.86	788.45	4696.36	3281.14	63.47	10.44
Improvement	44202.43	2735.12	19308.04	15516.19	6404.41	238.67
Afforestation	12300.35	29.11	965.41	10760.41	413.30	132.12
Anjan	7366.49	465.8	3552.09	3202.41	00	146.19
Fodder	12995.34	302.32	2142.18	9902.59	604.18	43.07
Babul	1209.93	525.30	333.69	247.81	000	103.13
Total	**86914.40**	**4846.1**	**30997.77**	**42910.55**	**7485.36**	**673.62**

Name of working circle	Forest density (After implementation of Mr.TSK Reddy's working plan)					
	Total Area	**> 0.4 Dense**	**< 0.4**	**Blank**	**Scrub Forest**	**Water Bodies**
Protection	8839.86	550.50	4570.15	3540.27	158.70	20.24
Improvement	44202.43	3080.50	17568.70	13970.50	8756.32	826.41
Afforestation	12300.35	105.15	1663.00	9250.2	1142.00	140.00
Anjan	7366.49	380.43	3489.12	3215.15	131.79	150.00
Fodder	12995.34	310.15	2000.40	9950.70	674.09	60.00
Babul	1209.93	478.24	305.27	270.88	55.54	100.00
Total	**86914.4**	**4904.97**	**29596.64**	**40197.7**	**10918.44**	**1296.65**

From the above table it is very clear that there is an overall decrease in forest cover density (> 0.4 Dense)

Table No. 2.7 : Statement showing details of Forest Density in Jalgoan Division.

Protection W.C.	No. of Compartment	Total area (ha)	Forest density before Implementation of Mr. Reddy's working plan Area (ha.)	Forest density (After Implementation of Mr. Reddy's working plan) Area (ha.)	Increase/ Decrease in density (Ha)	% increase/ Decrease
Protection	35	8839.86	788.45	550.50	-237.95	- 31
Improve-ment	94	44202.43	2735.12	3080.50	345.38	12
Anjan	34	7366.49	29.11	105.15	76.04	261.2
Afforastation	57	12300.00	465.8	380.43	-85.37	-18.3
Fodder	44	12995.35	302.32	310.15	7.83	2.6
Babul	14	1209.93	525.30	478.24	-47.06	-8.95

From the above table it is very clear that there is Vary of forest cover in all Compartment.

The threats to the forests from land use and use change and forestry (LULUCF) is real and affects large areas as pressure on land for habitation, agriculture, industries, developmental works and other activities mount up as the population increases and the accompanying wants expand.

Area diverted for Non-forestry purposes under Forest Coservation act, 1980

Area diverted under FCA 1980 through final sanction is 2187.363 ha. details are given in **Appendix No-VI.**

Areas diverted under Forest Right Act, 2006.

Under Section 3 (2) of FRA, 5.584 ha. involving 33 cases has been diverted for Non-forestry purposes. and Under Section 3 (1) of FRA, 51.65 ha.involving cases 123. The status of Implementation of FRA 2006 in Jalgoan Forest Division is as below:

Table No. 2.8 : Status of Implementation of FRA 2006.

IFR Cases 3(1)				CFR Cases 3(1)		CFR cases 3 (2)	
No.of sanctioned cases	**Area in ha.**	**No. Pending cases**	**Area in ha.**	**No. of cases**	**Area in ha.**	**No. of cases**	**Area in ha.**
123	**51.65**	**0.00**	**0.00**	**---**	**--**	**33**	**5.584**

This diversion of forest land to the traditional forest dwellers has further fragmented the area of the Division.

2.5 : THREATS TO THE FOREST :

In due course of time the encroachment may be the threal unless it is properly and timely be demarcated on ground.

2.6 : DISTRIBUTION OF DIFFERENT FOREST TYPE :

The Forest of Jalgoan Division has been classified as follows as per Champion and Seth's classification and following are the forest types found. The majority of the forest comes under 5A/C_3 Southern Tropical dry mixed deciduous forests with very insignificant areas of the other types.

Table No. 2.9 Forest Types of Jalgoan Forest Division

Type		**Local sub-type**
Tropical Dry Deciduous Forest		
I Southern Tropical Dry Deciduous Forest		
A Group 5A/C1	Dry Teak bearing forest	
i) 5A/C1a	Very Dry Teak Forest	Inferior Teak Coppice Forest

	B Group 5A/C3 Edlabad Hill Forest	Southern Dry Mixed Deciduous Forest
II Southern Tropical Thorn Forest		
A Group 6A/C1	Southern Thorn Forest	Scrub Forest
III Subsidiary Edaphic Types		
A) 5 E3	Dry Deciduous	Babul Forest
B) 5 E4	Dry Deciduous	Anjan Forest

2.7 : TREE COVER OUTSIDE FOREST AREA :

Jalgoan forest division comes under Jalgaon, Bhusawal, Bodwad, Muktainagar, Jamner, Bhadgaon, Amalner, Pachora, Parola, Chalisgaon, Dharangaon and Erandol Talukas. These 12 Talukas are having geographical area 8794.54 sq.km. of which Jalgoan Forest Division is having 869.14 Sq.km. area.

The Plantation/Tree outside Forests (TOF) for State of Maharashtra according to the State of Forest Report 2015 is 1,232.17 sq. kms adding 2.38% to the forest cover of the State.

The tree outside forests in the state of Maharashtra has not been assessed yet as per the requirement of the Code and carried out by the Forest Survey of India. However, the Social Forestry Department (SFD) of the State has assessed the trees that are available from plantation that it has carried out in the District which form a substantial quantity and forest cover in the areas outside forests. The SFD has been carrying out plantations in the private areas since 1982 in the District which include block plantations, agricultural bund planting and roadside plantations. It is interesting to note that the Department has also carried out the assessment of the success and survival of these plantations in 2005 and the results are very encouraging.

Trees Outside Forests planted under Social Forestry Jalgaon Division during the period 1982 to 2007.

1. Total beneficiaries :- 822

2. Total Planted Area :- 9869.71 ha.

3. Road side plantations in km.	:-	484.50
4. Total No. of seedlings planted	:-	13.95 lakh
5. No. of surviving trees upto 2007	:-	6.97 lakh
6. Percentage survival --	:-	49.99 %

plantion taken up in the plan period may have added a substantionl additional forest area in the district.

Trees Outside Forests planted under Social Forestry Jalgaon Division during the period 2008 to 2017.

Block Plantation

1. Total Planted Area -	237.51 ha.

Road-side Plantation

1.Total lengthin Km. -	352.25 km.
2. Total No. of Seedlings Planted	5,73,038
3. Survival count of seedlings at the time of handing over the scheme	2,86,519

The above information has been extracted from the booklet prepared by the Jalgaon Social Forestry Division where year-wise, scheme-wise and species planted are given. The same is too bulky to appended.

2.8 : SHIFTING CULTIVATION :- Shifting cultivation is not practiced in this Forest Division.

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CHAPTER-3

MAINTENANCE, CONSERVATION AND ENHANCEMENT OF BIODIVERSITY

3.1: FOREST COMPOSITION AND DISTRIBUTION

The Forest of Jalgaon Division of Jalgaon District, mainly belongs to Southern Tropical dry mixed deciduous Forest as per the Revised Survey of the Forest Types of India by Champion and Seth. The composition of the growing stock shows considerable local variations on account of various locality and biotic factors. The following main types and sub-types are distinguished for the purpose of describing these forests.

The biotic factors which have resulted in the degradation of the forests, are excessive grazing, dependence on forest for fuel wood, weed infestation and frequent fire. Seedling stages are particularly exposed to extermination due to excessive grazing and fire. The species surviving during degradation stages, are resistant ones, that can withstand to grazing and fire. These species are 1. Karanj, 2. Papada 3.Palas 4.Neem 5.Maharukh 6.Hivar

Teak pole forests: Teak Pole forests characterized by the fact that Teak is predominant species attaining a pole size in its mature state. It occurs in Chalisgaon and Jamner ranges of Jalgaon division.

In Chalisgaon range the forests are situated on Satmala hills and Teak is of very poor quality. In Jamner the Teak forests are situated in plains and on scattered hill ranges. The configuration on the ground varies from steep hill slopes and undulating terrain to almost flat ground, with deep black cotton soil. The varying depth and the quality of soil occurring in these different types of terrain determine the quality and composition of the crop. Quality of Teak varies considerably depending upon the depth of the soil and drainage where there are favourable conditions, it attains good size upto 36" in a girth, although specimens of large size are met, which are not common. This type is seen in the present Coppice with Reserve Working Circle and part of Protection Working Circle. In Jamner and Chalisgaon Ranges IVth quality is rarely touched.

These forests fall under dry deciduous type and the principal species that occur are Teak, Salai (*Boswella serreta*), Dhavada *(Anogeissus latifolia*), Khair (*Acacia catechu*), Kakad (*Garuga pinnata*), Modal (*Lannea grandis*), Sadada (*Terminalia tomentosa*), Anjan

(*Hardwickia binata*), species like Bija (*Pterocapus marsupium*), Sisam (*Dalbergia latifolia*), Bondara (*Lagerstroemia pariviflora*), Kalamb (*Mitrajyna parivifolia*), Palas (*Butea monosperma*), Tembhrun (*Diospyros melenoxylon*), Kadai (*Sterculia urens)*, are also found. Salai is the typical species occurring throughout the forests and is very conspicuous. On the upper slopes and on poor shallow soils, Salai increases in proportion and is often found in pure groups. Density of the crop varies very much from place to place and forests in general are open. Coarse grasses form the main bulk of undergrowth and large grassy blanks with few trees scattered over are met with.

3.1.1. Anjan forests: Anjan forests occur in parts of Chalisgaon and Vadoda Ranges. The soil of the tract carrying this type of forests is characteristically hard gravelly or gritty with admixture of pebbles of quartz of different colours. The depth of the soil varies considerably depending upon the topography, out crops of rock and sheet rocks are often met with. Over major portion of the tract the soil is shallow. Although Anjan retains its predominance throughout the tract, the composition varies from almost pure crop of species on level and undulating ground to mixed on the slopes of the hills. The species commonly associated with Anjan (*Hardwickia binata*) are Salai (*Boswellia serrata*), Dhavada (*Anogeissus latifolia*), Khair (*Acacia catechu*), Modal (Lannea grandis) species like Bija (*Pterocarpus marsupium*), Sadada (*Terminalia tomentosa*), Shisam (*Dalbergia latifolia*). It is also seen that Anjan is associated with Salai or Salai and Dhawada where the later species are predominant. Density of the crop varies very much from place to place and forests in general are open and grassy blanks and large.

3.1.2. Thorny scrub forests: Scrub forests are very low type of forests situated on inferior sites. These forests occur practically in every range and stunted Khair is the chief species. The forests are poor and the height reached is less than 20 feet. The density is very low. Khair of a stunted variety forms the principal stand in association with Bor (*Zizphus jujuba*), Salai (*Boswellia serrata*), Dhavada (*Anogeissus latifolia*), Hivar (*Acacia leucophlea*), Tembrun (*Diospyros melanoxylon*), Palas (*Butea monosperma*), Neem (*Azadirachta indica*). Forests slightly superior to Scrubs are met with in the parts of Edlabad and Chalisgaon Ranges. The quality and density is poor. All the species of Scrub Forests are seen here also.

3.1.3. Babul forests: Babul forests or blocks are the pure Babul forests situated on Purna River bank in Edlabad (Muktainagar) Range and Sur River Bank in Jamner Range. These

are riverian forests where Babul comes up naturally. In Jamner Range it is mixed mainly with Neem. In Edlabad Range also it is mixed with Neem and some Anjan in the Northern portion. Natural regeneration of Babul is fair.

3.1.4. Pasture forests: The Pasture forests are situated in Jamner, Jalgaon, Parola, Chalisgaon Ranges and are scattered over the tracts. Though these areas are constituted as reserved forests and are capable of producing stunted type of tree growth, they considerably differ from the forests described earlier. Grass forms the main component of the crop which these areas can produce. Quality and characteristics of these forests vary greatly from place to place. The open exposed slopes are generally devoid of any valuable growth. In ravines and sheltered situation, the quality slightly improves. Teak is seen in stunted form in Jamner Range and is absent in other areas. The growth in general is thorny stunted and is of dry deciduous type. Species commonly occurring are Dhavada (Anogeissus latifolia), Khair (Acacia catechu), Kansar (*Albizzia amara*), Salai (*Boswellia serrata*), Hivar (*Acacia leucophloea*), Amoni (*Rhus parvifolia*), Henkal (*Gymnosporia spinosa*), Medsing (*Dolichan-drone-falcata*).

3.2: PLANT SPECIES DIVERSITY :

The floral diversity of the Division consists of 53 trees, 8 shrubs, 6 herbs, 2 bamboo, 6 grass and 10 climbers. There are more than 15 species of medical plants in the District forests. Few species of Algae, Fungi etc. present in the District were also given in the plan based on information received from the local Institutions. The list is evidently not exhaustive and inadequate for the purpose of identifying the expanse of species diversity of the plant kingdom existing in the Division. It is therefore necessary that the Division must carry out a detailed Biodiversity study, which will include both the Flora and the Fauna. In dealing with the flora, it is proposed to have detailed study of the tree spp., the shrubs and herbs species with their frequency, total basal cover, dominance and the study should also include, among others, documentation of the species that are found in the forests including insects and fungi, parasites, frost, assessment of the sensitive / Rare-Endangered-Threatened species/ IUCN Red List Species, assessment of the traditional and lesser known NTFP including Medicinal and Aromatic Plants, identification of unique and specific vegetation that might be present in an area, etc

3.3: STATUS OF BIODIVERSITY CONSERVATION IN FORESTS :

The forests of Jalgoan are moderate in Biodiversity. Mukatai Bhavani Conservation Reserve and area adjoining to the Gautala Autram Ghat Wildlife Sanctuary area are rich in Biodiversity. However, in view of the presence of large areas under Teak, the repeated fire over the years, preferential treatment to commercial species; the enhancement of biodiversity in the forests as a whole needs to be addressed.

The plant diversity and faunal richness of the area needs to be maintained and enhanced with sincere effort of the Department, the help of the public, the initiative for formation of Biodiversity Committees, reducing the threats to the wildlife etc.

Among the important Schedule I species found in the area of the Division are as below ;

Carnivora : Tiger**,** Panther, Hyena, Jackal, Fox, Wild Dog, and Jungle Cat etc.

Herbivora : Spotted deer, Wild boar, Indian Hare, Barking deer, Nilgai, Common languor etc.

Omnivora : Bear,

Aves : Peacock, Golden backed wood pecker, Common quail, Gray partridge etc.

Heavy damage is caused by wild animals especially in plantations. Nilgai, Cheetal, Chinkara and Chausinga, Pig cause damage to regeneration and sapling.

3.4: STATUS OF SPECIES PRONE TO OVER EXPLOITATION :

The Status of species prone to over exploitation in the Jalgoan Division needs further studies with the help of the conservation experts and subject specialist. Habitat rejuvenation and improvement works should be taken. No felling had been done in this area.

Injuries To The Wildlife :

Fire and Poachers are mainly responsible for destruction of Wild life in Satpuda Forest. Forest fire which occur frequently in Satpuda forest, destroy the natural habitat of the wildlife.The number of poaching incidences which occurred in the Division in the past 10 years are as under.

Table No. 3.1 Abstract of Species -Wise Offence Cases about wildlife in the Jalgoan Forest Division.

Year	Name of Animal	Accidental Death	Natural Death	Poaching	Total
2011-2012	Nilgai	08	00	0	08
	Barking deer	04	01	0	05
	Monkey	02	00	00	02
2012-2013	Nilgai	04	00	00	04
	Barking deer	03	00	00	03
	Panther	0	0	01	01
	Black Buck	03	0	0	03
	Indian Gazelle	03	00	00	03
2013-2014	Nilgai	07	00	00	07
	Barking deer	05	00	00	05
	Panther	00	01	01	02
	Black Buck	05	00	00	05
	Indian Gazelle	01	00	00	01
2014-2015	Nilgai	00	02	00	02
	Indian Gazelle	01	00	00	01
	Monkey	00	02	00	02
	Wild Cat	01	00	00	01
	Black Buck	02	00	00	02
	Panther	00	01	00	01
2015-2016	Tiger	00	01	00	01
	Barking deer	02	02	00	04
	Black Buck	02	00	00	02
	Jackal	01	00	00	01
	Indian Gazelle	01	01	00	02
	Panther	00	02	00	02
	Nilgai	03	00	00	03
	Samber	01	00	00	01
	Deer	02	00	00	02

Table No. 3.2

Year	Name of Animal	Accidental Death	Natural Death	Poaching	Total
2016-17	Barking deer	05	01	00	06
	Spotted deer	05	00	0	05
	Black Buck	10	01	00	11
	Nilgai	10	03	00	13
	Indian Gazelle	03	00	00	03
	Indian Wildboar	00	00	01	01
	Panther	01	01	00	02
	Jackle	00	01	00	01
	Monkey	02	00	00	02

	Chausinga	00	01	00	01
	Hyena	02	00	00	02
	Wild cat	00	01	00	01
	Fox	01	00	00	01
2017-18	Tiger	00	01	00	01
	Panther	05	00	00	05
	Barking deer	05	00	00	05
	Chital	02	00	00	02
	Black Buck	23	01	00	24
	Nilgai	18	01	00	19
	Chinkara	06	00	00	06
	Monkey	01	00	00	01
	Hyena	01	00	00	01

Incidence of attack by wild animals :- There was no incidence of death of human being due to animal attack however, some incidences of injury to human beings are reported. The cases of cattle lifting by wild animals are not very alarming.

The following table gives details of attack by wild animals on human beings and domestic animals.

Table No.3.3 Abstract about attack cases of wildlife in the Jalgoan forest division.

Year	No of persons killed or injured in attack		No & type of domestic animal killed in attack
	Killed	Injured	
2007-08	00	03	09
2008-09	00	07	66
2009-10	00	01	17
2010-11	02	14	75
2011-12	01	10	45
2012-13	01	09	57
2013-14	00	03	27
2014-15	00	04	47
2015-16	03	25	172
2016-17	00	15	227
2017-18	06	20	241
Total	13	111	983

Compensations have been paid to the 983 domestic animal owners, Thirteen humans were killed and One Hundered and Elevan persons who were injured by wild animals, during the year 2007-08 to 2017-18.

3.5: CONSERVATION OF GENETIC RESOURCES :-

The genetic resources of the forests is an invaluable asset that needs to be studied in detail. The documentation of the flora and the fauna of the Division should be taken at the earliest with the help of experts in the field. The Research wing of the Department needs to identify areas of high biodiversity in collaboration with the territorial wing to carry out research and documentation of the species available.

Nilgiri, Anjan, research plot (20 ha.) has been taken up in Compartment no. 350 Near Parola Village in Parola Range.

Teak research plot (36 ha.) has been taken up in Compartment no. 391 in Erondol Range.

Anjan Seed research plot (38 ha.) has been taken up in Compartment no. 348 near Mondala Village in Parola Range.

There is no identified Medicinal Plant Conservation Area in the Division of Jalgoan.

Preservation plots where valuable species are found, where local bio-climate has brought about different crop composition and any area of biological or silvicultural significance should be identified for creation of Preservation Plots in Jalgoan.

3.6: FAUNA AND THEIR HABITATS :

Distribution of the wildlife :

Jalgoan division has a fairly good distribution of wildlife especially adjoining to the Gautala Autram Ghat Wildlife Sanctuary & Mukatai Bhavani Conservation Reserve. Top Carnivores i.e. Tigar, Panthers are present in this area. Jackal, Wild dog, Fox, Jungle Cat and Hyena are also common. Large avifauna can be seen in the tract. Migratory birds near tanks are common during the season. Peacock, Golden backed wood pecker, Common quail, Gray pattridge are found in the tract.

The wildlife in the tract dealt with is seriously depleted due to the indiscriminate shooting during the jamindari regime. Apart from indiscriminate shooting, poaching and hunting, the population explosion and economic developments have led to the severe degradation of natural habitat of wildlife. The food, water and shelter, the basic needs of the wild animals have become scarce in plain, accessible areas.

Biodiversity conservation is an important mandate of the forest department and with the enactment of Wildlife (Protection) Act 1972, wildlife management has become synonymous with biodiversity conservation. The history of wildlife management, summary of Wildlife (Protection) Act, 1972 and other important issues of man-animal interface have been summarized under this chapter.

Description of the Wildlife :

The division is rich in wild life. Almost all the forest areas of the divisions have a fairly good distribution of wild animals, but population density varies with the availability of habitat condition like food, water and shelter. Representative Central Indian fauna is found in the division and the category wise list of the animals usually found is as shown below:

Carnivora : (i) Panther (*Panthera pardus*) (ii) Hyaena (*Hyaena hyaena*) (iii) Wild Dog (*Cuon alpines*) (iv) Jackal (*Canis aureus*) (v) Common Fox (*Vulpes bengalensis*) (vi) Jungle Cat (*Felis chaus*). (vii) Tiger (*Panthera tigris*)

Herbivora : (i) Sambhar (*Cervus unicolor*) (ii) Cheetal (*Axis axis*)(iii) Wild pig (*Suss crofa*) (iv) Nilgai (*Boselaphus tragocamelus*) (v) Barking Deer (*Muntiacus muntijak*) (vii) Sloth bear (*Melursus ursinus*) (viii) Black Buck (*Antilope cervicapra*) (ix) Four horned antelope (*Tetraceros quadricornis*) (x) Chinkara or Indian gazelle (*Gazella gazelle*)

Rodents : (i) Fivestriped Palm squirrel (*Funambulus pennanti*).

Reptillia : Snakes – Bamboo pit viper, slender coral snake, Bronze back snake.

Spiders- Giant wood spider, Signature spider, Camel spider, Lynx etc. ,

Frog – Skittering frog, Burrowing frog, Microhyla sp.

Birds : (i)Baya//Baya Weaver Bird/(*Ploceus philippinus*), (ii) Bharadwaj/Crow Pheasant of coucal/(*Centropus sinensis*), (iii) Chota basant/Crimson fronted Barbet or Coppersmith/(*Megalaima haemacephala*), (iv) Chimani/House Sparrow/(*Passer domesticus*), (v)Deshi Myna/Common Myna/(*Acridotheres tristis*), (vi)Ghar/Black shouldered kite/(*Elanus caeruleus*), (vii)Ghar/Parian Kite/(*Milvus migrans govinda*), (ix)Ghubad/Indian Screech Owl/(*Stri xjavanica*), (x)Ghubad or Pingla/Spotted Owlet/(*Athene brama*), (xi)Harial/Common green pigeon/ (*Teron phoenicoptera*),

(xii)Holga/ Laughing Dove/(*Streptopelia senegalensis*),(xiv) Kabutar/Blue Rock Pigeon/(*Columba livia*), (xv) Kala Baza/Indian Black ibis/(*Pseudibis papillosa*), (xvi) Kala Teetar/ Grey partridge/(*Framcolinus pondiceranus*), (xvii) Khandya/Common or SmallBlue kingfisher/(*Alcedo atthis*), (xviii) Khandya/Pied kingfisher/(*Ceryler udis*), (xix) Kokila/Koel/(*Eudynamys scolopacea*), (xx) Kotwal/Black Dronga or king Crow/(*Dicrurus adsimillis*), (xxi) Kotwal/Greater Racket tailed/ Drongo/(*Dicrurus paradiseus*), (xxii) Lahuri/Jungle Bush Quail/(*Perdicular asiatica*), (xxiii) Lal Munia/Red Munia/(*Estrilda amandava*), (xxiv)Mor /Common peafowl/(*Pavo cristatus*), (xxv) Nilkanth/Indian Roller or Blue Jay/(*Coracias benghalensis*), (xxvi) Partringa/Little Green Bee Eater/(*Merops orientalis*), (xxvii) Peelak/Blackhooded Oriole/(*Oriolus xanthornus*), (xxviii) Peelak/Goldern Oriole /(*Oriolus orielolus*), (xxix) Popat/Rose ringed parakeet/(*Psittacul akrameri*), (xxx) Satbhai/Common Babbler/(*Turdoide scaudatus*), (xxxi) Satbhai/Jungle Babbler/ (*Turdoides striatus*), (xxxii) Shikara/Shikara/ (*Accipiter badius*), (xxxiii) Shimpi/Tailor Bird/(*Orthotomus sutorius*), (xxxiv) Sutar/Maharatta Woodpecker/(*Picoides mahrattensis*), (xxxv) Tambat/Hoopoe/(*Upupa epops*), (xxxvi) Gai Bagala/Cattle Egret/(*Bubulcu sibis*), (xxxvii)Bagala/Grey Heron /(*Ardea cinerea*), (xxxviii)Bagala/Pond Heron or Paddy Bird/(*Ardeola grayli*), (xxxix)Pan kawla/Little Cormorant/(*Phalacrocorax niger*), (xxxx)Pan Kombadi/White breasted waterhen/(*Amaurornis phoenicurus*), (xxxxi)Titavi/Red Wattled lapwing /(*Vanellus indicus*), (xxxxii)Kala Pidda/Pied Bushchat/(*Saxicoli caprata*), (xxxxiii)Swargiy nartak/Asian Paradise Flycatcher/ (*Terpsiphone paradise*), (xxxxiv)Dhanesh/Common Grey Hornbill/(*Tockus birostris*), (xxxxv)Telia munia (*Sinewas sp.*)/Spotted Munia/ (*Lonchura punctulata*), (xxxxvi)Myna/Indian Night jar/(*Caprimulgus asiaticus*), (xxxxvii)Khandya/White Breastedkingfisher/(*Halcyon smyrnensis*), (xxxxviii) Chuvak/Indian Robin/ (*Sazicoloides fulicata*), (xxxxix) Dyal/Magpie Robin/ (*Copsychus saularis*), (xxxxx)Khatik/Bay backed shrike/(*Lanius vittatus*), (xxxxxi)Jambhal Surya Pakshi/Purple sunbird/(*Nectarinia asiatica*), (xxxxxii) Ababed Leishra/Swallow/ (*Hirundo rustica*),(xxxxxiii) Leishra/Wiretailed Swallow/(*Hirundo smithii*), (xxxxxiv)Myna/Tree Pie/(*Dendrocitta vagabunda*), (xxxxxv) Parit/Grey Wagatai/(*Motacilla capsica*).

3.7: THREATS AND CHALLENGES TO WILDLIFE :

Poaching : In spite of stringent provisions as aforesaid, poaching for skin, bones and flesh continues to be the most important reason for destruction of wildlife in the division. The

animals are particularly vulnerable during summer. Water in a water hole recedes to minimum.

Setting of nets and traps for catching birds, hares and sometimes small animals like deer has been employed in the past.

Electrocuting the animals by laying electric wires on the tracks followed frequently by wild animals and by drawing electric current from the high tension lines passing through the forests is another method which is proving to be a potential threat to animals, besides sometimes being hazardous to local people.

Wild animals are poached for the skin, bone and meat, and sometimes trapped to serve as pets; Water holes are generally the most vulnerable sites for the poaching. Nets and traps are used for trapping birds, deer and small mammals.

Disease : The livestock from the villages in the forests regularly frequent the forests and share space and resources. Water borne (contagious diseases) disease are passed from livestock to wild animals. Most frequent is foot and mouth disease. Other diseases which may occur are (1) Anthrax (2) Rabies (3) HS (*Haemorrhagic septicaemia*) (4) Canine distemper, FMD has a potential to wipe out large populations, while Rinderpest, Anthrax and Rabies are highly infectious and lead to certain death.

Sharing the forest areas with disease-affected domestic animals often compromises health of the herbivore population. Outbreaks of contagious diseases like Foot and Mouth Disease drastically reduce the herbivore population.

Fire and habitat damage : Frequent fire damage the wildlife habitat, and animals become vulnerable to poaching. Similarly, habitat disturbances of different types create diverse kinds of stress having adverse impact on the wildlife.Fire are major culprit reducing food availability for the herbivores very drastically. Thus, wild animal habitats are very adversely affected due to recurrence of fire every year.

3.8: PROTECTION AND MANAGEMENT OF FAUNA :

For the protection and management of the wildlife of the Division, a series of steps were taken and proposed to be taken based on the threats as identified in the plan. These include the increased patrolling measures with proper Protection Plan to be updated every year.

History of the wildlife management :

Hunting in the Reserved Forests was regulated according to the hunting licenses issued for specific shooting blocks. The Zamindars used to regulate hunting in the ex-proprietary forests prior to the abolition of their rights, which was followed by the shooting block system and the licenses similar to the Reserved Forests. Presently, the law does not permit sport hunting of wild animals. The wildlife is threatened by habitat damage, caused by factors like increasing human and cattle population, encroachment for cultivation, poaching facilitated by the improved road network and efficient weapons. Poaching problem has attained a menacing proportion as evident from large seizures all over the country. Greater attention to the wildlife management, however, is a heartening trend. The wildlife and the territorial divisions at Jalgoan are co-coordinating their efforts including the eco-development programmes to ensure success of their protection measures.

A number of cattle kill by wild carnivores is reported in the division. Such cattle kills and occasional injuries to the villagers are promptly attended,and the loss is compensated in accordance with the prevailing policies.

However, after the enactment of the Wildlife (Protection) Act, 1972 and subsequent amendments in this act particularly those in 1991 and 2002, no permission for hunting of wild animals, as game or sport, can be granted. Hunting of wild animals however can be allowed for special purpose but only in exceptional circumstances. This act also enjoins on us the responsibility for wildlife conservation outside the protected areas.

Injuries due to Wildlife :-

The carnivores panthers particularly sometimes kill domestic cattle, grazing in the forests. There are also cases of human injury and even due to attacks from wild animals. The villagers sometimes indulge in poisoning the carcass to take revenge and cases of electrocution of wild animals by the villagers to kill the animal suspected to have killed the cattle have also been reported. In such cases the persons involved in illegal killings of the wild animals do not have any intention of poaching or trade but such activities on the part of local people pose grave danger to animal populations in the forests. (Revenge Killings). The govt. of Maharashtra therefore has evolved a policy of compensating for the

loss of livestock as well as for the injury to and loss of human life. This is summarized below:

Compensation for the loss of livestock :-

The scheme, which was introduced for the first time in 1971, covers the loss of Cow, Buffalo, Bullock, Sheep, Goat and other livestock (as per definition given under Section 2(1) due to attack of a Tiger, Panther or any other wild animal. The present rates of compensation as per the G.R. No.WLP-100S/C. No. 2702F-1 of 02/07/2010 are as follows and compensation is to be paid within 3 months.

Table No.3.4 The Present Rates of Compensation.

Particulars	Amount to be paid
Cow, Buffalo, Bullock	75% of the market price or Rs.60000/- whichever is less;
Sheep, Goat, other, livestock	75% of the market price or Rs.10000/- and whichever is less;
Cow, Buffalo, Bullock became permanently handicapped	50% of the market price or Rs.12000/-and whichever is less;
Injury to Cow, Buffalo, Bullock, Goat	Treatment cost. (Govt. or ZP Hospital) 25% of the market price or Rs.4000/- whichever is less.

The compensation to livestock damage has to be given as per the terms and condition mentioned in the Govt. Resolution No.WLP-0718/C.No.267/F-1 Dt.11/07/2018 Some of the conditions to be fulfilled are as under:

1. Death to be reported within 48 hours.
2. Carcass is not to be removed before case is made.
3. No death of any wild animal within 10 km radius area in the next 6 days.
4. Immediate investigation by forest officers as to the wild animal, which killed the cattle as well as Likely amount of compensation.
5. Compensation to be sanctioned by an officer not below the rank of DCF.
6. No compensation in case the livestock was grazing illegally.

Compensation for the injury to and loss of human life :

Introduced through GR dated 27.1.1986, the scheme covers death as well as injury including minor injury caused to any individual in an attack by a wild animal. Any such attack by Tiger, Panther, South Bear, Bison, Wild Pigs, Wolf, Hyena, Jackal and wild dogs is covered under the scheme. Present rates of compensation have been fixed through Govt. Resolution No.WLP-0718/CNo.267/F-1, dt.28.11.2018 and these are as follows.

Table No. 3.5 Compensation for the Injury and Loss of Human Life

Particulars	Amount to be paid
Death	Rs.15.00 Lakhs.
Permanent Disability	Rs.5.00 Lakhs.
Major injury	Rs.1.25 Lakhs.
Minor injury	Upto Rs.20000
Note : Cost of medication, preferably in govt. hospital, but in case of unavoidability, private medication.	

The compensation to injury & loss human life has to be given as per the terms and condition mentioned in the Govt. Resolution No.WLP-1008/C.No.270/F-1, Dated 02/07/2010 and Govt. Resolution No.WLP-2012/C.No.337/F-1, Dated 30/03/2013 and 16/01/2015. Some of the conditions for claiming and deciding above compensation are as under.

1. Such attack should not have occurred when the individual was indulging in violating the Wildlife (Protection) Act 1972.
2. Relative /Friend should report the attack within 36 hours.
3. Police / Forest officer to investigate within 3 days.
4. Death /injury due to wild animal is to be certified by the govt. medical officer.
5. Compensation due to death is to be given only to legal heir and compensation due to injury is to be given to individual concerned.
6. Compensation is to be sanctioned by the officer not below the rank of DCF/DFO.

Developments after 1972 :

At the national level, the Indian Board for wildlife was constituted in 1952. Its main object was to devise ways and means for conservation of wildlife through co-ordinate legislative and practical measures and sponsoring setting up of National Parks and Wildlife Sanctuaries. A comprehensive and unified National and State Park Act, 1971 was passed which provided for appointment of an Advisory Committee to advise in regard to the constitution and declaration of National Parks and Sanctuaries and formulation of policy for their administration and management. The Parliament then enacted the Wildlife (Protection) Act, 1972, which came into force in the State of Maharashtra with effect from 1st June 1973. With this, other acts relating to any matter contained in this Act and in force in the State stood repealed. This act as amended from time to time as well as the various regulations made under this act and guidelines issued by the central and the state govt. provide for establishment of a network of national parks and sanctuaries representing various habitats and for giving protection to all type of wildlife in the state. These provisions also address issues relating to the management of wildlife outside the protected areas. Following rules have so far been enacted under the relevant sections of this act.

1. The Wildlife (Stock Declaration) Rules, 1973 (became effective in Maharashtra with effect from 1.6.1973)
2. The Wildlife (Transactions and Taxidermy) Rules, 1973 (became effective III Maharashtra w.e.f. 16.1973).
3. Wildlife (Protection) (Maharashtra) Rules, 1975 (became effective from 6.3.1975).
4. The Wildlife (Protection) Rules and Licensing (Additional matters for consideration) Rules, 1983 (became effective w.f.13.4.1983).
5. Wildlife (Protection) Rules, 1995
6. Wildlife (Specified Plants-Condition for Possession by License) Rules, 1995.
7. Recognition of Zoos Rules, 1992.
8. Declaration of Wildlife Stock Rules, 2003.

Besides the above specific legal framework available for wildlife management, provisions contained in Indian Forest Act, 1927, Forest Conservation Act, 1980 and The Environment (Protection) Act, 1986 may go a long way in protecting and conserving the biodiversity of this division. Clearance under the Environment Protection Act, 1986 from environmental angle is required from the govt. of India for any project (other than those relating to improvement of forests and particularly the projects relating to industrial activities damaging the environment of these Protected Areas) including an industry located within 10 km from these protection areas.

Management of wildlife :

Wildlife and its management in Jalgoan Forest Division have been discussed in detailed in the part 2 of Volume I of this working plan, under chapter Wildlife management. The detail prescription for Special objectives of management for development & conservation of wildlife & its habitat, recommendations for future management, habitat development works, water hole development, protection measures for wildlife, other protection measures and eco-development, awareness generation and eco-tourism etc. has been given in chapter Wildlife management. in part 2 of this working plan.

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CHAPTER- 4

MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND VITALITY

4.1 : STATUS OF REGENERATION :

Data on regeneration status is collected along with enumeration of the crop in four 3m x 3m sub-plots in the enumeration plots. The seedlings are enumerated in the following three categories as given in the Table below. The data is analyzed and used to devise prescriptions for regeneration of forest areas by both the natural and artificial means. The focus is on tending of existing natural regeneration (NR) and rootedtock. Plantation is proposed only as a supplementary activity limited to the extent to fill the deficiency in Natural Regeneration on the degraded and blank areas.

The health and vitality of the forests depends on the availability of the regeneration as it ensures the capacity of the forests to rejuvenate in the event of any calamity. This is one of the best indicator of the health of the forests. Though the total number of seedlings across the ranges appears to be uniform, the absence of saplings in the higher size R3 is a matter of concern as it appears that the regeneration is not very encouraging. Incidences of fire, grazing and other human interferences are the root cause of the poor regeneration.

Table No.4.1 Seedlings and saplings per ha. in overall area :

Range	Total no of Enumeration plot (In Side Forest)	No of sub plot (Size 3X3)	R1	R2	R3	R1 R2	R2 R3	R1 R3	R1 R2 R3	R1, R2, R3 =0
			Hight up to 1 mt. (R2,R3=0)	Hight 1 to 3 mt. (R1,R3 =0)	Hight above 3 mt.(R1,R2= 0)					
Chalisgaon	193	772	158	88	47	85	80	30	31	253
Parola	136	544	97	66	50	73	20	23	15	200
Erandol	115	460	82	98	12	25	17	18	18	190
Pachora	111	444	80	80	32	45	17	7	10	173
Jamner	234	936	187	117	87	98	52	55	37	303
Jalgaon	157	628	113	90	74	85	40	15	9	202
Muktainagar	214	856	151	140	90	105	94	108	10	158
Vadoda	225	900	180	135	150	82	70	90	23	170
Total	**1385**	**5540**	**1048**	**814**	**542**	**598**	**390**	**346**	**153**	**1649**

Regeneration Plot:- Analysis : Analysis of the regeneration data of the Jalgoan Division, it is observed that the regeneration is fair.

The regeneration survey, as with the whole survey for the Division, was carried out as per the New Working Plan Code. Survey was carried out by SOFR unit Nashik and Staff of Jalgaon forest division.

The regeneration status of Jalgoan forests, i.e. number of seedlings, is low to be considered a healthy forest.

The probability of the plots falling in area of encroachment, cultivation and water bodies cannot be ruled out.

1649 plots were found regeneration is zero i.e. R1,R2,R3 = 0. If the area is properly represented in the sampling it can conclude that around 29.8 % of forests there is regeneration is zero.

Out of these 5540 plots, in 390 plots, the number of regeneration of R1 is Zero. This works out that 7 % of the forests does not have any form of regeneration upto 1mt height and out of 5540 plots in which 1048 plots where regeneration upto 1mt height this works out that 18.91 % of the forests has fair regeneration.

Out of these 5540 plots, in 346 plots, the number of regeneration of R2 is Zero.This works out that 6.2 % of the forests does not have any form of regeneration between 1mt to 3mt height.

Out of these 5540 plots, in 598 plots, the number of regeneration of R3 is Zero. This means that 10.8 % of the forests does not have any form of regeneration beyond 3mt. height .

The above figures clearly show that ;

Regeneration is not that much good.

Whatever little regeneration is available is not able to grow beyond the small to medium seedling stage.

Large number of seedlings either die out after attaining 1-2 m height or could not grow beyond 1-2m height.

One of the prime reasons for the lack of regeneration is fire. The menace of fire has been recognized by everyone, but the impact is yet to be fully analysed and understood. The seriousness with which the Department is taking on fire requires a rethink.

The soil condition in the forest of Jalgoan has been dealt with under the chapter Soil and Moisture Conservation. It is clearly seen that the soil depth in the division is less than 10cm in most of the areas. In fact most of the areas are exposed with rocks. Under these conditions, tender seedlings exposed to the rigors of heat and drought and fire are most unlikely to succeed to survive.

4.2: AREA AFFECTED BY FOREST FIRE :

The area affected by forest fire is given in the table below. During the last ten years there have been fire incidences and the figures show that the number of incidences fluctuates from year to year perhaps as per the climate condition prevailing on that year. An important step taken by the Government in 2012 involving the Tendu collectors and the Tendu contractors by linking fire incidences with the forfeiture of benefits under Tendu for the people and the contractors as well is said to be doing wonders in the field. Since it is a well known fact that the villagers and contractors have tendency to burn the area to facilitate fresh flush of Tendu leaves from the burnt area, the step taken by the Government will help improve the forest health immensely.

Table No. 4.2 Year-wise Forest Fire Cases

Year	No. of Cases	Area in Ha.	Estimated loss (Rs.)
2007-08	56	2017.00	1,14,925
2008-09	35	1121.90	41,400
2009-10	11	291.50	5,000
2010-11	31	418.10	12,245
2011-12	48	413.57	21,700
2012-13	43	382.66	26,210
2013-14	52	216.80	25,815
2014-15	23	136.25	10,300
2015-16	34	135.45	19,050
2016-17	104	1203.20	1,70,190
Total	**437**	**6336.43**	**4,46,835**

All across the country and globally, it is admitted that forest fire are under reported. A point to be noticed with concern, is also the way in which reporting is done, e.g. Leaf &

litter is burnt, no loss to government. This manner of reporting reflects ignorance of the damage, fire does to the regeneration, the carbon stored in the dead wood & litter, the soil organisms, food & cover of phasants, lizards & other lower life-forms of the forests. This manner of reporting should be dealt away with forthwith.

4.3: AREA DAMAGED BY NATURAL CALAMITIES

4.3.1: By frost : So far no severe frost is recorded in the area.

4.3.2: By drought : Damage due to drought is not common. However, some damage to the young plantation and young regeneration and coppice shoots is caused in the year in which the rainfall is scanty.

4.4: AREA PROTECTED FROM GRAZING

Grazing by animals of kathewadis in areas of Mukatinagar,Vadoda and Jalgoan and local migratory sheep in Parola, Chalisgaon & Jamner range has big problem during rainy season. Grazing has caused considerable damage to regeneration and other vegetal cover. All efforts are made by the field staff to prevent unauthorized or illegal grazing in the forest area.

Villages clubbed as above constituted a grazing zone. The clubbing of the villages was done in such a way that the villagers were not required to take cattle to a longer distance than what their cattle can easily cover in day. Within a specific zone all persons were at liberty to graze their cattle free until otherwise ordered by the appropriate authority.

The directives contained in the Madya Pradesh Land Reforms Department's memorandum no. 1290-1227-XXVIII, dated 4th September 1953 prohibited grazing by sheep and goats in forests meant for production of big timber and even in the forest areas where villagers generally exercise their nistar rights.This ban is because while grazing in the forests, these animals also uproot seedling regeneration of the important species. However, subsequent directives from the Government have allowed grazing by sheep in specified areas but continued complete prohibition on grazing by goats. Following norms of concessional grazing have been prescribed under the Protected Forests (Kahandesh Area) Rules, 1959.

Cultivators- two plough cattle per plough plus four others including one he-buffalo.

Agricultural artisans and labourers four cattle including one she-buffalo provided that a calf under one year shall not be counted.

Provided further that all animals in excess of those specified in clauses (a) and (b) shall be charged at such rates as the State Government may from time to time sanction in this behalf.

4.5: LOPPING PRACTICES :-

Lopping practices are carried out in the Jalgoan Divisoin. Anjan (*Hardwickia binata*) is the most sought after species for fodder in the peak summer season and is often lopped to certain extent.

4.6: AREA INFESTED BY INVASIVE WEED SPECIES IN FORESTS :-

4.6.1: By parasites: Bandh (*Loranthus longiflora*) is generally found on the branches of Achar, Hiwar, Salai and sometimes on Tendu, Ain and Dhavada .

4.6.2: By climbers and obnoxious weeds : Eruni, Chilati are the common climbers which do much damage to the tree growth all over the forest.Tarota and Rantulsi are common weeds. Rantulsi has invaded the grazing grounds and the grass beds, due to which, the grass growth has been badly affected. Undergrowth of Kharasi and kudu in Teak areas is a great impediment as it prevents Teak seedlings from getting overhead light. The climbers mentioned above coppice vigorously and are hardly affected by grazing or fire. The damage is caused by strangling of trees when they entwine a sapling or a tree. Usually the apical bud is destroyed. Lantana (*Lantana camara*) has also infested at many places. The thick cover of lantana prevents the regeneration of other trees.

4.7: INSIDENCES OF PEST AND DISEASES:

Most of the forest areas under Improvemnet and Anjan working circle have been worked in the past. Due to decrease in coppies vigour defects in the wood such as hollowness is noticed. However attack of pest and disease is negligible.

4.8: FOREST DEGRADATION AND ITS DRIVERS

These forests are liable to the following, injuries :

4.8.1: By man : The damage by man can be classified into the following two categories.

4.8.2: Illicit cutting :

Illicit cutting for firewood is observed in areas adjoining to thickly populated towns and villages Jalgaon, Parola, Pachora, Chalisgaon, Jamner and Mukatainagar. The demand for fuel wood has also increased tremendously, due to increase in population. Illicit cutting of fuel wood provides an easy employment to local villagers. All these factors have put tremendous pressure on the forests and have resulted in depletion of growing stock.

Twenty One permanent wireless base stations are in operation. Twenty one Handsets are distributed to RFO, Forester and FG. Vehicles are provided to all Nine Range forest officers. There are Two check posts operating in the division to prevent illegal transport of forest produce. The forest check post exist at Purna in Vadoda range & Bhusaval in Mukatinagar range. Smart phones are also provided to all RFO (Nine), Forester (Twenty Six) and FG (Ninety Seven), which was sanctioned vide PCCF, Maharashtra State, Nagpur Order dated 26.12.2007. Better control is being done due to various facilities made available to the field staff.

Table No.4.3 Statement about Illicit Cutting of Teak & Others Trees in Jalgoan Division.

Year	Type of trees illicitly cutted	No. of trees	Volume (cub met.)	Value of damaged in Rs.
2007	Teak	138	11.787	9925
	Others	872	37.306	63809
2008	Teak	397	12.66	28399
	Others	5281	241.316	313282
2009	Teak	420	8.544	23185
	Others	5214	180.84	238998
2010	Teak	658	18.488	62644
	Others	1854	93.40	136587
2011	Teak	369	12.356	28155
	Others	2196	105.082	114493
2012	Teak	222	7.389	20898
	Others	1950	88.834	124314
2013	Teak	127	5.444	23539
	Others	2317	92.793	294091
2014	Teak	212	6.246	40038
	Others	1553	76.388	249350
2015	Teak	136	14.22	24547
	Others	1483	66.525	232033

2016	Teak	163	6.461	31981
	Others	1209	61.239	169714
2017	Teak	91	4.817	32944
	Others	1010	60.338	207335

4.8.3: Encroachments : There have been large scale clearances of the forests in the past for encroachment with a view to obtain agricultural crops. The state government has issued orders vide GR Nos. LEN/1078/3483/G-1, dated 27.12.1978 and FLD/1079/1366/F-3, dated 12.09.1979 to regularize all encroachments on forest lands done during the period from 01.04.1972 to 31.03.1978. This has enhanced in the tendency of people to encroach upon the forest land with a hope that in future also such encroached lands will be regularized by the Government. The problem of encroachment is more on Protected Forests, as they are surrounded by cultivation and there is no proper demarcation at most of the places. as per GIS cell Nagpur satellite image data shows that total area of encroachment of Jalgaon forest division is 8643.08 ha. out of that 930.61 ha. encroachment comes in Bio conservation reserve so total 7713.03 ha. remains miscellaneous area management.

The prima facie area under encroachment is estimated to 7713.03 ha.

4.8.4: Damage by cattle : Damage caused by grazing is heavy in the forest of Jalgoan Division due to large cattle population. There are a lot of co-operative milk societies engaged in dairy on a large scale. The scattered patches of Protected Forests are vulnerable to grazing. Continuous and heavy incidence of grazing not only prevents regeneration of tree species but also the young regeneration obtained during the period of closure is lost soon after the areas are opened to grazing. In areas with clayey soils the trampling by cattle results in hardening of soil and reduction in the soil aeration. In sandy soils heavy grazing results in accelerated erosion and denudation.

4.8.6: By Insects : The attacks of Teak defoliator *(Hyblea purea)* and Teak skeletenizors *(Hapalia macharalis)* are common in Teak and occur almost each year during the period from July to October. Termite attack is also common. But in bigger trees it is confined to dead bark. The damage to weak young seedlings and planted seedlings is caused by the termite at the base of the collar.

4.8.7: By wind and hall storms : Strong winds cause uprooting of trees all over the forest especially in open patches. Occasionally hail storms damage the fruit crops of

moha and char. Hailstorm in the months of April and May, sometimes, damages Tendu leaves making them unfit for bidi manufacture.

4.8.8: By fire : Summers are hot and dry from March to June during which forests are vulnerable to fire. Fire taking place at the end of winter and beginning of summer are not severe. Whereas, a fire in the hot summer is very harmful as it kills the young seedlings and coppice shoots of all major species and plantations. Fire hardy species such as Teak, Salai, Mowai and Palas, escape slightly compared to other species. Severe fire causes considerable damage to the trees also by scorching their bases which ultimately leads to unsoundness and hollowness and renders them liable to attack by fungi and insects. Fire also indirectly cause soil erosion by destroying the soil cover as well as the organic matter.

Analysis of data of the last ten years reveals that, a total of 437 offence cases pertaining to fire have been registered in the division and the loss is shown as Rs.4.47 Lac.

Fire are mostly set with the motive to get fresh Tendu leaves. Fire are also set by the local villagers to facilitate the collection of Mahua flowers and also to get the new flush of grasses. Sometimes fires spread from the adjoining cultivated area of agricutlrual fields.

4.9: POLLUTION CONTROL AND PROTECTION OF ENVIRONMENT

Erondol having sugar cane industry runing on co-opreative basis which is said to be in the non-forest area. However their effect on the forest areas and on the water resources of the forest cannot be ruled out. There is always a tendency of industries to dump their waste/effluents into open scheduled spaces including forest areas.

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CHPATER - 5

CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES

5.1: AREA TREATED UNDER SOIL AND WATER CONSERVATION MEASURES:

5.1.1: Soil erosion :-

The effective rainfall and run-off during the South and West monsoon has important implications for the forests in the district. The effective rainfall for the south and west monsoon is computed to be around 692 mm and its distribution in Mukatainagar 771.11, 740.70, 625.24mm, are respectively, for the months of June, July. August, and September. On integrating the effective rainfall of the district with the water-holding capacity of the soils of the district, which is around 200 to 250mm per meter depth, the run-off water is estimated to be 250 mm or 2,550 cubic meter of rain water per hectare per annum. The run off takes away the fertile top soil, leading to severe soil erosion in the district. Soil erosion adversely affects the fertility status and land use.

Sheet erosion is noticed all over the forest areas of the division. The top layers of soil which store organic matter and nutrients, on which plants feed, are lost in this process. It decreases soil fertility, lowers sub-soil water level and water holding capacity of the soil. The Organic Carbon content of the soil is negatively affected due to soil erosion. Laboratory studies of soil samples collected from Jalgoan division has shown variation in Soil Carbon from 0.44 to 4.32 percentage.

The exact area treated under soil conservation cannot be assessed as no special work for soil conservation alone is carried out but SMC works form part of the plantations works. In the Division, in the last 10 years more than 7626.38 hectares area have been taken up for plantation and can safely be presumed that this area is treated for soil conservation. However, in the last four years, in view of the Jalyukt Shivar project, large areas are being treated specifically for soil and water conservation.

5.2 : DURATION OF WATER FLOW IN THE SELECTED SEASONAL STREAMS & WATER SUPPLY

The principal natural feature is the Tapi River. Unlike the rest of the Deccan, whose rivers rise in the Western Ghats and flow eastward to the Bay of Bengal, the Tapi flows westward from head waters in eastern Maharashtra to empty into the Arabian Sea. The Tapi receives thirteen principal tributaries in its course through Khandesh. None of the rivers is navigable. Most of Khandesh lies south of the Tapi, and is drained by its tributaries the Girna, Bori, Panjazra, Purna and Vaghur. The alluvial plain north of the Tapi contains some of the richest tracts in Khandesh, and the land rises towards the Satpuda hills, Tapi and Purna rivers.

Waghur (Taluka: Jamner), Hatnur (Taluka:Busawal), Mangrul (Taluka:Raver), irrigation projects/tanks which are main source of irrigation. The main source of water supply is through wells. In summer there is acute shortage of water leading to supply of drinking water to some villages by tankers and bullock carts.

5.3: WETLANDS IN FOREST AREAS:

That the some of the areas are known to be good habitat of birds and there are ample number of sites for water bodies. The division may engage field experts to document and indentify the habitat and the biodiversity of the area. for notifing the weltands in the forest area.

5.4: WATER LEVEL IN THE WELLS IN THE VICINITY (UP TO 5KM) OF FOREST AREA:

The Division has records of the water levels of wells of some villages within its jurisdiction. The information is valuable but insufficient as there are records of only Raver Taluka. It is also informed that the Division has records of the wells in the villages where JFM Committees have been established and those villages where special projects like Jalyukt Shivar, etc. are implemented for whose Micro plan, have been prepared. Records can also be obtained from the Groundwater Surveys Development Agency.

An abstract from the Ground Water Information brought out by Central Ground Water Board (CGWB), GOI, is reproduced below.

Table No. 5.1 Water Level Data with long Term Trend (1995-2005) Data as per GSDA Report

Well No.	Location	Toposheet & Quadrant		Water shed No.	Well Depth	Well Dia meter	Aquifer	DTWL (mbgl) (May 1995)	DTWL (mbgl) (April 2005)	Difference in DTWL (m)
12	Therole	55	C/4 1A	TE 2'	27.6	3.35	Alluvium	20.3	23.3	-3
13	Khanapur	55	C/3 3B	TE 2'	24.6	2	Alluvium	17.2	Dry	-ve
13b*	Knanapur	55	C/3 3B	TE 2'	30.25	3.7	W. basalt†	NA	12.5	NA
14	Padle Bk.	55	C/3 3B	TE 2'	15	3.4	Alluvium	8.3	10.21	-1.91
14b*	Padle Kh	55	C/3 3B	TE 2'	28	4.1	Alluvium	NA	18.27	NA
15	Mohgaon	55	C/3 3B	TE 2'	24.6	2.90* 2.90	Alluvium	23.35	Dry	-ve
15b*	Mohgaon	55 C/3 3B		TE 2'	38.65	4.4	Alluvium	NA	26.95	NA
16	Bhokri	55	C/3 3A	TE 2'	17.75	5.3	Alluvium	7.18	10.85	-3.67
17	Abhore Kh	55	C/3 3A	TE 2	14.2	3.2	W. basalt†	11.52	Dry	-ve
24	Raver	55	C/4 1A	TE 2	31.4	6	Alluvium	29.3	Dry	-ve
24b*	Raver	55 C/4 1A		TE 2	>30.00	3.2	Alluvium	NA	28.6	NA
25	Ainpur	55	C/4 1A	TE 2	13	2.4	Alluvium	4.8	7	-2.2
26	Kandwel	55	C/4 2A	TE 2	20.2	6.4	Alluvium	7.45	7.56	-0.11
27	Udhali Kh.	46	O/16 2C	TE 3	27.8	3.3	Alluvium	9.6	11	-1.4
28	Singat	46	O/16 2C	TE 3	31.5	3.1	Alluvium	24.2	29.0 (R)	-ve
29	Khirdi Kh.	46	O/16 2C	TE 3	49.3	3.3	Alluvium	44.5	46.87	-2.37
30	Vivre Kh.	46	O/16 1C	TE 3	49	3.1	Alluvium	42.85	Dry	-ve
30b*	Vivre Kh.	46	O/16 1C	TE 3	55	3.45	Alluvium	NA	51.21	NA
31	Lohara	46	O/16 1C	TE 3	36	3.50* 3.50	Alluvium	29.6	33.15	-3.55
32	Chinchati	46	O/16 3B	TE 7	25.7	5.2	Alluvium	22.45	NA	NA
32b*	Chinchati	46	O/16 3B	TE 7	33.5	3.77	Alluvium	NA	22.4	NA
33	Savkheda Kh.	46 O/16 1B		TE 7	39.85	3	Alluvium	28.7	NA	NA
33b*	Savkheda Kh.	46 O/16 3B		TE 7	53.85	3.45	Alluvium	NA	38.02	NA
34	Waghode Bk.	46	O/16 3C	TE 7	46.55	3.75	Alluvium	33.85	37	-3.15
35	Faizpur	46	O/16 2B	TE 7			Alluvium	58.15	61.2	-3.05

36	Virode	46 O/16 2B		TE 7	24.75	3.05	Alluvium	22.7	NA	NA
36b*	Virode	46 O/16 2B		TE 7	81.75	3.1	Alluvium	NA	49.83	NA
36	Sudgaon	46	O/16 3B	TE 7	17.6	2.6	Alluvium	6.8	5.36	-1.44
37	Marul	46	O/16 1A	TE 7	52	2.75	Alluvium	36.65	40.13	-3.48
38	Padalsa	46	O/16 2A	TE 7	31.5	1.85	Alluvium	23.1	Dry	NA

(**Note :-** DTWL = Depth of Water Level , mbgl = meter below ground level.)

As mentioned above, this data is an important information that the Division should make use of and monitor the hydrological status of the forest areas. It is important for the Deputy conservator of Forests to obtain the data from the authorities dealing with the subject and to also request the authorities CGWB, GSDA etc to impart training to the staff of the Division for the recording and monitoring of the water resources in our forest areas.

5.5: STATUS OF AQUIFERS :

Regarding the status of aquifers, an abstract from the document Report on the Dynamic Ground Water Resources of Maharashtra 2011-12 brought out by GSDA, Pune & CGWB, Central Region Nagpur is produced below.

Ground water is a natural resource with both ecological and economic value and is of vital importance for sustaining life, health and integrity of ecosystems. This resource is increasingly threatened by over-extraction which has insidious long-term effects. Scarcity and misuse of groundwater pose a serious threat to sustainable development and livelihood.

The groundwater flow cannot be measured like the flow through canals or pipe lines. The groundwater flows downward and spreads according to natural gradient and the permeability of the formations. Therefore, management of groundwater in facts, involves management of a dynamic, immeasurable and uncontrollable entity. While managing the groundwater resource, it is necessary to consider it to be a common property resource and is required to be controlled appropriately with the assistance of the community. Concepts like Village level Watershed, Water budget & Water Account, Village level Water Safety and Security, Basin / Sub-basin Water Auditing, Aquifer delineation and its management etc will have to be popularized and made a basis for equitable distribution of ground water.

5.5.1: Ground water recharge:

Compared to 2008-09, there is decrease in annual groundwater recharge. During the field visit it was observed that the water conservation structures are not being de-silted annually throughout the State. Thus there is dire need to carry out the de-silting of water conservation structures in programme on movement mode.

5.5.2: Reduction in cash crops :

In Jalgaon District the Banana, Wheat, Millet, Lime, Groundnut, Cotton, Sugar cane area has reduced drastically compared to 2005. This is because of depletion in the groundwater levels and drying up of the irrigation wells. Hence, there is reduction in groundwater draft in concerned watersheds. This is directly reflected into the hydrograph of the relevant watersheds.

Assessment of Dynamic Ground Water Resources of the Maharashtra.

Table No.5.2 Administrative Unit wise Categorization*2011-12*

Sr. No.	District	Admini-strative Unit	Stage of Ground Water Develop. %	Pre-monsoon		Post-monsoon		Category
				Water level Trend	Is there a significant decline ?	Water level Trend	Is there a significant decline?	
134	Jalgaon	Jalgoan	107.58	33.68	Yes	17.25	Yes	Over Exploited

5.5.3: Water Conservation And Artificial Recharge :

CCT, Nala bunding, Gabion structures, Vegetative bunds, Terracing etc., are the feasible water conservation structures in the hilly range. In the Basaltic area, the water conservation and artificial recharge structures feasible are check dams, gully plugs, percolation tanks, nala bunds, etc. Existing dugwells can also be used for artificial recharge; however, the source of water should be properly filtered before being put in the wells. The artificial recharge structures suitable for Alluvial areas are percolation tanks and recharge wells/shafts. The most feasible artificial recharge structure suitable for Alluvial areas, are shallow recharge wells / shafts on the river bed of the tributaries. These sites need to be located where the hydro geological conditions are favorable, i.e., where

sufficient thickness of de-saturated/unsaturated aquifer exists and water levels are more than 5 m deep.

5.5.4: Recommendations :

Further ground water development in Tapi alluvial plains is not feasible, keeping in view the overall ground water availability scenario.

Northern part of the district is underlain by Tapi Alluvium, which is about 450 m thick. However, upper 70-80 m of Alluvium, i.e., younger Alluvium comprises sand and gravel forming potential aquifer. The ground water in the Alluvium can be developed through dugwells and shallow tubewells.

Southern part of the district is occupied by Deccan Trap Basalt, where only dugwells are most feasible structures for ground water development. The sites for borewells need to be selected only after proper scientific investigation.

Bore-wells generally tap deeper fractures, which may not be sustainable. Besides, the borewells should only be used for drinking water supply and not for irrigation.

In parts of Amalner, Jalgaon, Bhusawal, Muktainagar , Jamner, Erandol, and Pachora talukas, the water levels are declining @ up to 20 cm/year. The aquifers are poor to moderately yielding with low storage capacity. Therefore, ground water development may be permitted very carefully in scarcity areas only.

The overall stage of ground water development for the district is about 70%, which is borderline high for “Semi-Critical” category. Therefore, proper planning should be done for further development of ground water resources.

Jalgaon taluka assessments indicate that it fall under “Over- Exploited” category while Bodwad, Pachora, and Parola talukas fall under “Semi-Critical” category. The scope exists for construction of suitable artificial recharge structures in the district. CCT, nala bunding, gabion structures, vegetative bunds, terracing etc and construction of minor and medium irrigation projects with lined or pipe canals may be feasible in the Satpuda hill range. The structures recommended for Basaltic areas are nala bunds, check dams and KT weirs.

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CHAPTER-6

MAINTENANCE AND ENHANCEMENT OF FOREST RESOURCE PRODUCTIVITY

First working plan was introduced between 1894 and 1908 and it was written for different regions. Jalgoan Forest Division was not a separate in this period and it was part of Jalgoan Forest Division. Prior to these plans, fellings were carried out unsystematic manner and fellings were done by government agencies, privilege holders and felling for fire wood by non privilege population on permit system. In general the fellings were confined to Teak and Anjan. The exploitation was confined to large and sound trees leaving crooked and diseased trees. The permit system led to malpractices and had deleterious effect on the forests, hence regeneration.

The revision of the working plan by P.R.Vaidya was taken up during the year 1962 and the plan came into operation from 1966-67. Protection, selection cum improvement, coppice with reserves, Anjan, plantation working circle and Bamboo, Kadai overlapping working circles were proscribed in this plan. For exploitation of timber for Teak the exploitation girth was kept at 110 cms and for other valuable non Teak species it was kept at 120cms. P.R.Vaidya working plan was continued. The objective of selection cum improvement working circle was to gradually increase the Teak reproduction. But vigorous under storey of bamboo and grass, rugged nature of the terrain, shortage of labour, frequent fire etc, came in the way of artificial regeneration. Artificial regeneration of the annual coupe with species such as Teak, Khair, Eucalyptus though prescribed could not be carried out to the desired extent. Illicit cutting for fire wood and overgrazing by cattle and sheep has further contributed to the deterioration of the growing stock. P.R. Vaidya's working plan was in operation during fifth five year plan period. It was aimed to increase the proportion of Teak and other valuable species in the crop and to build up higher dimensions were aimed. A part of the mature growing stock was to be removed. However, only 24 coupes in 4 felling series from 1966-1975 had been worked by Jalgoan division. The sudden opening of canopy threw out dense tall grass which came in the way of regeneration. The forests have become more vulnerable to fire. The P.R.Vaidya's working plan ended in the year 1980-81. In the absence of new working plan P.R.Vaidya's working plan prescriptions continued till 1989. Felling was completely banned as working plan was expired.

The S.D. Samant and P.C.Thomas working plan came into operation in the year 1989-90. Forestry in turn was benefited in implementation of plan prescriptions and regeneration. Revision of stock mapping of the forests was undertaken. Special improvement works like General Utility Timber(GUT), Bamboo, Plantation of Minor forest produce, Reforestation of degraded forests, Massive Afforestation Program(MAP), were implemented during this period.

A land mark decision in forestry was taken by Government of Maharashtra on 16th of March 1992 to involve the people by Joint Forest Management (JFM) for degraded forests. The tract dealt with was fairly rich in the number and varieties of Wild life once upon a time. But it stands in perilous state today. 6,355.19 ha. area of Chalisgaon taluka was included in Gautala Autram Ghat Wild Life Sanctuary declared by Govt. notification No. WLP-1085/CR75/F-5(vi), dt. 25-2-1986. The said area have been handed over to DCF, Wild Life Division, Aurangabad.

Mr.Vasudevan,Mr. Tiwari & Mr. Reddy's working plan was in operation from 2008-09 to 2017-18. No felling was proposed during that period also. Thus tree felling in this division was banned from 1986 to till the date. Thus forest resource productivity can't be explained from that point of view. Stem and stump analysis was not carried out as no felling is practiced in this division.

The Local Volume Table compiled in Vaidya's plan (1966-67 to 19888-89) for Teak IV-a quality is given below.

6.1: GROWING STOCK OF WOOD

Mostly site quality IV is found in Jalgoan Division. Vary few patches of site quality III are found.Felling was completely banned from 1986 on words. Thus forest resource productivity cant be explained from that point of view. Stem and stump analysis was not carried out as no felling is practiced in this division.

Working Cirlcle	Total Area in Ha.	Total Growing Stock (Tree Nos.)	Avg. growing stock (Tree) /ha
Protection W.C	8839.86	691100	78.18
Improvement W.C.	44202.43	4007302	90.66
Anjan W. C.	7366.49	497901	67.59

Fodder W.C.	12995.34	1018184	78.35
Babul W.C.	1209.93	66812	55.22
Afforestation W.C.	12300.00	537879	43.73
Total	**86914.05**	**6819178**	**413.73**

6.2: GROWING STOCK OF BAMBOO

Bamboo is observed in some compartments of this division. The distribution of the bamboo is sparse, having less than 100 clumps/ha.

6.3 : INCREMENT IN VOLUME OF IDENTIFIED TIMBER SPECIES:

Stem analysis of Teak and other species was not carried out as there was no tree felling from 1986 onwards. However in P.R. Vaidya's working plan exploitation girth for Teak was kept at 110 cm and for other valuable non Teak species it was kept at 120 cm.

6.3.1 : Local volume table :

From the data of outturn available from the coupes worked by forest Labour Co-operative Societies the (FLCS), local volume tables have been compiled from IIIrd quality and IV-a quality Teak trees. For selection of coupes under IIIrd and IVth quality Teak forests, use of the stock maps was made of and coupes falling in the respective qualities were only selected. The outturn of timber obtained from each tree was noted against a particular girth class in which that tree was falling. Actual breast height girth was also recorded against each reading. The volumes of such trees recorded in each girth class were totaled up. Also the actual girths at breast height were totaled up. The figures thus obtained were divided by the number of readings from each girth class. The average thus arrived at were plotted and a smooth curve was drawn. Then the volumes for the mean of each girth class was read from such curves and the local volume tables given below have been arrived at.

Table No. 6.1 Local volume table for Teak.

Girth class b.h. inches Cms.	Volume for III[rd] quality (50' to 70') Cft./ Cubic metre	Volume for IV-a quality (40' to 50') Cft./ Cubic metre
Up to 12'' 30Cms.	0.50 0.014	0.35 0.0098
12'' – 18'' 30 – 45 Cms	1.25 0.035	1.20 0.0336
18'' – 24'' 45-60 Cms	2.50 0.07	2.45 0.0686
24'' -30 '' 60-75 Cms	4.50 0.126	4.15 0.116
30'' – 36'' 75-90 Cms	6.75 0.189	6.50 0.182
36'' - 42''' 90 -105Cms	11.00 0.308	9.00 0.252
42'' - 48''' 105 - 129Cms	15.50 0.434	--------
48'' - 54''' 129-135 Cms	21.00 0.602	--------
54'' - 60''' 135- 150 Cms	28.75 0.805	------
60'' - 66''' 150-156Cms	37.50 1.05	-------

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

During the period of the Plan, there has been no special occasion where quality plantation activities other than the usual plantation carried out year on year. Plantations using the latest technology in terms of high-tech nurseries for raising quality planting material, drip irrigation, chain-linked fencing etc. must be tried for specific need-driven plantation in Jalgoan division.

6.4.1: Enumeration :- Dy.C.F. conducted the Enumeration work in Jalgoan forest division as per the procedure given in National working plan code, 2014. The enumeration data was analyzed to arrive at Basal area, Growing Stock etc. This data was correlated with Stock Maps prepared by field units and also compared with satellite imagery before the compartments were allotted to various working circles. The results of enumeration and regeneration in various compartment is given in Volume II.

6.4.2 : Stock mapping : Stock mapping was done during this plan preparation well in time carried out by Dy. Conservator of Forest Jalgoan Forest Division, and records compared with the enumeration data as well as satellite imageries.

6.5 : CARBON STOCK:

- Forest play an important role in combating climate change. In addition, it has the potential to provide ecosystem services, such as carbon storage. In forest ecosystem, enormous carbon is stored which is classified in five pools by 'IPCC GooPractices Guidance' (GPG, 2006).
- The living portion of the biomass carbon is classified in two pools: The '**above ground biomass**' (AGB) and '**below ground biomass**' (BGB) which are stores of significant amount of carbon. The dead organic matter (DOM) is also classified into two pools: '**dead wood**' and '**litter**'.
- The fifth pool is 'soil organic matter' (SOM) which contains substantial amount of organic carbon.

Year	Forest cover (sq.km.)	Above Ground Biomass (Million tonnes)	Below Ground Biomass (Million tonnes)	Dead wood (Million tonnes)	Litter (Million tonnes)	Soil Organic Carbon (Million tonnes)	Total (Million tonnes)
2017	**2,229**	**142.651 (28.15)**	**48.947 (9.66)**	**1.986 (0.39)**	**9.385 (1.85)**	**290.052 (57.23)**	**493.021 (97.28)**

Carbon sequestered in the forests of Jalgoan has been derived by extrapolation from the Growing Stock calculated from the Enumeration data. The Working circle wise estimation of Carbon Stock is given below.

Table No. 6.3 Working Circle Wise Carbon Stock

Working Cirlcle	Total Area in Ha.	Total Growing Stock (Tree Nos.)	Avg. growing stock (Tree) /ha	Total Carbon Stock (tons)/ ha.
Protection W.C	8839.86	691100	78.18	373.926
Improvement W.C.	44202.43	4007302	90.66	1869.76
Anjan W. C.	7366.49	497901	67.59	311.60
Fodder W.C.	12995.34	1018184	78.35	549.70
Babul W.C.	1209.93	66812	55.22	51.180
Afforestation W.C.	12300.00	537879	43.73	520.29
Total	**86914.05**	**6819178**	**413.73**	**3676.456**

6.5.1: Soil Carbon Analysis: Soil organic carbon is a measureable component of soil organic matter. Organic matter makes up just 2–10% of most soil's mass and has an important role in the physical, chemical and biological function of soil.Organic matter contributes to nutrient retention and turnover, soil structure, moisture retention and availability, degradation of pollutants, carbon sequestration and soil resilience. Soil organic carbon (SOC) refers only to the carbon component of organic compounds. Quantum of soil carbon is a good indicator of nutrient status of soil. During the enumeration exercise, collected soil samples and the were analysed for Soil Carbon. The range of Soil carbon varied from 0.44 % to 4.35 %.

$SOC = r_b \times d \times \%C$

where,

SOC = soil organic carbon stock per unit area (t/ha)

r_b = soil bulk density (g/cm^3) – Default value is 1.2

d = total depth at which sample was taken (cm)

% C = carbon concentration

6.6: CARBON SEQUESTRATION AND MITIGATION:

This plan has proposed to put minimum 3500 ha. under Afforestation WC and during the period in implementation of the Plan. It is expected that during the plan period an area of 2100 ha. per year would be treated/regenerated under natural regeneration. This will add to the forest cover of the District and contribute significantly to the carbon sequestration of the forest and forest plantations. Due to Protection natural regeneration will add biomass and carbon in the form of the vegetation. As the Plan prescribes for the controlled opening of the canopy under Improvement Working Circle, the growth of young crops will boost the Carbon sequestration from the atmosphere as young crop sequester more carbon.

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CHAPTER-7

OPTIMIZATION OF FOREST RESOURCE UTILIZATION

7.1: RECORDED REMOVAL OF TIMBER :

During the past Plan of the Division, no harvesting of coupe was carried out. This was as per the Working Plan prescriptions.

7.2: RECORDED REMOVAL OF FUEL WOOD :

During the past plan of the Division, no harvesting of coupe hence no removal of fuel wood.

7.3: RECORDED REMOVAL OF BAMBOO :

The activity extractioin of Bamboo was not done in this Division.

7.4: RECORDED REMOVAL OF LOCALLY IMPORTANT NTFP :

The important Non- timber forest produce removed and recorded from the forests, are Tendu, Gum and Grass. The other NTFP's, medicinal and aromatic plants are not recorded.

The biggest source of NTFP produce that the Division harvests is Tendu. During the past ten years the quantity of Tendu leaves collected is given below.

Table No. 7.1

Year	Yield (Std. Bags)	Royalty received Rs. Std.Bag (in Lac)
2008-09	2195.846	1098572
2009-10	1942.659	1256786
2010-11	2186.96	704111
2011-12	1820.305	1520358
2012-13	Unsold	0
2013-14	Unsold	0
2014-15	Unsold	0
2015-16	1462.450	1057100
2016-17	1527.185	1666050
2017-18	825.185	1021000
Total	**3814.820**	**83,23,977**

The other species of NTFP for the Division is the Gum tree which is mostly Dhavada, Babhul, Kadai, and Salai etc. The gum was collected by local people and this is one of the major source of income to the local population. But detailed record is not available.

7.4.1: Management of Tendu :

(i) Collection of Tendu Leaves : Tendu is the prominent revenue generating NTFP of this tract. Tendu leaves are used for manufacturing bidis. Tendu trade has been nationalized by the Govt. of Maharashtra Act No. LVII of 1969. Tendu leaves were collected by the department through agents till 1990 season. During the 1991 season Tendu units were sold on lump sum basis. The collection of Tendu leaves commences from the last week of April each year and continues up to first week of June. Quality of leaves is a major criteria for bidi manufacturers.

Tendu leaf collection is governed by the policy of the State Govt in conjunction with various Laws presently in force.

Pruning of young Tendu plants does help in increasing leaf yield. Saplings having more than 5 cm. collar diameter shall not be pruned. However, felling of Tendu trees or branch lopping for leaf collection should not be allowed.

(ii) Tendu Regeneration : In view of importance of Tendu to support the livelihood of forest dwelling communities and its economic value for the region, sustainable management and use of Tendu is prescribed to be given added focus..

Singling of shoots and soil working around Tendu seedlings is prescribed in the plantation and rootstock areas to promote growth of Tendu seedlings along with the annual coupes in area-specific working circles.

Tendu regenerates through root suckers. Hence, young root suckers should be identified and aided for creation of congenial growth conditions such as cleaning of bushes, protection from fire etc.

7.4.2: Mangement & Collection of Hirda, Beheda, Awala, Charoli, Mahua, Aamla, Bor and other NTFPs:

Fruits of Hirda, Beheda, Awala and Charoli are marketable items. Similarly, fruits, flowers and leaves of certain shrubs and trees are used for variety of purpose. Current

level of collection is quite erratic and, therefore, poor indicator of their potential in the tract.

Collection of species, which are not covered under the monopoly procurement by government agencies, should be allowed by the Joint Forest Management Committees or Village Panchayats for better protection of Hirda, Beheda, Awala, Charoli, Mahua, Bor trees and to increase its stock, few of the above trees be numbered and these trees be allotted to members of JFM committee. The members of committees who have been assigned with job of protection & nurture of above trees, should protect them from fire. Range Forest Officer is supposed to monitor this activity of JFM committee regularly and make proper documentation.

7.5: DEMAND AND SUPPLY OF TIMBER AND IMPORTANT NON-TIMBER FOREST PRODUCE :

7.5.1: Agriculture customs and wants of the population :

The economy of the district is primarily dependent on Agriculture, which is supported by the fact that the cultivators (30.02%) and agricultural laborers (44.32%) together constitute 74.34% of the total main workers in the district as against the state average of 59.62%. The agricultural sectors thus absorb nearly ¾th of total main workers. This is because there are not enough opportunities available in the non-agricultural sectors. The district is famous for production of bananas. Out of total area under Banana production in Maharashtra State, Jalgoan district alone contributes ¾th of area. Cotton, Sugar cane, oilseeds are other important cash crop grown in the district.

7.5.2: Population: The population of Jalgaon, Amalner, Bhadgaon, Bhusawal, Bodvad, Chalisgaon , Dharangaon , Erandol, Jamner, Muktainagar, Pachora, Parola Talukas as per 2011 census are as under:

Table No.7.2 Statement Showing Population, Density in Jalgaon Forest Division

Taluka	Area in sq. km.	Inhabited villages	Un-inhabited villages	cities	Population density per sq. km.	Population in thousand
Amalner	798.93	140	15	01	360	287.849
Bhadgaon	491.34	52	08	01	332	162.889
Bhusawal	453.43	51	03	04	793	359.461
Bodvad	372.91	42	11	--	247	91.799
Chalisgaon	1210.9	130	14	02	343	414.879
Dharangaon	501.98	87	03	01	346	173.447
Erandol	513.29	61	05	01	324	166.521
Jalgaon	822.25	79	09	01	822	676.041
Jamner	1349.8	142	18	01	259	349.957
Muktainagar	639.34	71	14	--	256	163.444
Pachora	812.78	111	18	02	356	289.628
Parola	784.22	105	12	01	251	196.863
Total	**8751.07**	**1071**	**130**	**15**	**4689**	**3332.778**

Local population consists of Tadvis, Bhils, Lewa Patils, Vanjaris,and Harijans etc.Out of these Lewa Patils are most successful and advanced cultivators.The area under Tribal Sub Planas per 2011census is as under.

Table No. 7.3 Statement Showing Area wise Population in Jalgaon Forest Division.

Taluka	Tribal sub plan area			
	Village	Area in sq. km.	Total Population in Lakh	Tribal Population in Lakh
Amalner	153	798.53	1.91	0.35
Bhadgaon	59	791.34	1.25	0.19
Bhusawal	50	453.43	1.12	0.13
Bodvad	51	372.31	0.91	0.06
Chalisgaon	142	1210.92	3.06	0.41
Dharangaon	88	501.98	1.38	0.27
Erandol	64	513.29	1.35	0.22
Jalgaon	86	822.22	2.15	0.43
Jamner	157	1349.68	3.03	0.34
Muktainagar	80	639.34	1.63	0.28
Pachora	126	812.78	2.29	0.26
Parola	114	784.22	1.59	0.26
Total	**1170**	**9050.04**	**21.67**	**3.20**

7.5.3 : Land use pattern:

Distribution of villages according to Land Use (in ha.)

Table No.7.4 Statement Showing Population Land Use in Jalgaon Forest Division

Taluka	No. of Inhabitated villages	Cultivated area	Irrigated area	Percentage of irrigated area to total cultivable area.
Amalner	153	66982.38	4816.03	7.19
Bhadgaon	59	34810.19	6666.15	19.15
Bhusawal	50	36334.79	2430.80	6.69
Bodvad	51	30730.40	1634.86	5.32
Chalisgaon	142	97284.55	4426.45	4.55
Dharangaon	88	44687.21	5451.84	12.20
Erandol	64	35019.32	5007.76	14.30
Jalgaon	86	63551.90	4556.67	7.17
Jamner	157	115803.60	1818.12	1.57
Muktainagar	80	32552.04	3919.27	12.04
Pachora	126	69200.77	3639.96	5.26
Parola	114	53733.75	4798.42	8.93
Total	**1170**	**680690.90**	**49166.33**	**-----**

For the district as a whole, total cultivated area is 77.78 % of the total area. The main requirements for which the people depend on the Forests are as under:

Timber: Over the years the dependency of people on timber has greatly reduced. This is because of non-availability of large size timber in the forest area. Also with the advent of modern agricultural tools and technology use in agricultural implement has also considerably reduced. In few cases species like Ain , Anjan , Neem, Babul are used for making agricultural implements and construction of huts and houses locally.

Firewood: The demand for fire wood for cocking purpose is still seen in area like Jamner, Fattepur and Bhusawal. It is mostly removed by head loads. To reduce pressure on forests, forest department has been supplying LPG connections to dependent communities.

Grazing: Local villages depend on the forests for grazing and there is great pressure on the forests.

Minor Forest Produce: Flowers and seeds of Mahuwa are collected on large scale by the local population for their consumption.Among other fruits collected are Tembhrun, Char, Bor, Aawla etc. Tebhrun leaves are collected through licensees appointed by the

Govt. There are four Tendu Units in the Division. Annual collection is approximately 5,000 std.Bags. The gums of Dhavada, Babul and Kadai are sold in open auction. Kadai gum is collected from forests areas of Jalgaon and sold in Madhya Pradesh.Thorn of Bor, Babul, Henkal, Hiwar etc.are used as fencing material to protect the crops from animals. Anjan leaves are lopped heavily to feed the cattle in the villages surrounding the Forests. Majority of villagers depend on the forests for their timber requirements for wooden plough & cart etc.

7.5.4: Markets And Marketable Produce

Markets for timber and firewood are in neighboring towns and villages, which are major consumers. The important timber market towns are Dharangaon, Jalgaon, Bhusawal, Jamner and Chalisgaon. However, considerable quantity of timber and firewood are also imported from the adjoining district. Only a small quantity of charcoal is manufactured locally

7.5.5: Occupation and Industries :

Besides agriculture, there are small occupation/industries in the villages and urban areas which are inter linked with forests; and few of them are given below:

Bamboo articles : Burads make baskets, mats, dholis, etc. from bamboos and sell them locality. However, there are very little natural bamboo areas to meet these demands. Mostly bamboo articles prepared by Burads come from adjoining dirstricts.

Saw mills : There are 137 saw mills in the Jalgaon Division.

Furniture industry : There are good numbers of furniture shops in rural and urban areas which use wood and timber from the forest area. Teak is the most prominent species used for the purpose. Furniture industry and carpentry, provide job opportunities to the hundreds of skilled carpenters engaged in furniture making, joinery works like house construction etc. In addition veneer and plywood board industry requires good quality Teak and other miscellaneous species from the forest areas of this division for their sustenance and balanced growth.

Collection of minor forest produce : The poor class of villagers when not engaged on agricultural works collect Tendu, gum, honey, bark, roots, leaves etc. and sell them locally

to supplement their income. Fuel and grass is also collected by these people for local selling.

7.6: IMPORT AND EXPORT OF WOOD AND WOOD PRODUCTS

There is no record of the import and export of wood and wood products into or from Jalgaon. The produce that is produced from Jalgaon is generally locally consumed.

7.7: IMPORT AND EXPORT OF NTFPS :

Nothing on record is available on the import and export of any of the non-timber forests produce from the District of Jalgaon. This is perhaps because the production of NTFPs in the district is insignificant.

7.8 : REMOVAL OF FODDER :

7.8.1: Cost of harvesting : All the coupe operations ranging from coupe marking to the transport of forest produce are carried out at the rates fixed by the Wage Board at Chief Conservator of forest office level committee constituted for this purpose. While fixing the wage rates for harvesting operations, wages sanctioned by the Government of Maharashtra and cost of living allowance (Rahniman Bhatta) are also taken into consideration.

7.8.2: Non wood forest produce (NWFP)

Grass : There is huge demand for fodder grass in most of the villages surrounding the forest area. In this division grass kurans are there which are generally auctioned every year. Due to non – working of these kurans over the years the palatable grasses have been replaced with non-palatable grasses and weeds. It is very much essential to take steps to revive these kurans to ensure proper supply of fodder for the villages. In 2017-18 in this division around 2330.50 tons grass is sold and 8.53/- Lakh Revenue is generated.

7.9 : VALUATION OF THE PRODUCTS :

As mentioned earlier, the main Non wood Forest products that the Division produces are Tendu, gum and fodder. It may be seen that the quantity of Tendu is collection is regular. From 2008-09 to 2017-18 around 83.24 Lkah royality received form Tendu collection.

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CHAPTER-8

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

8.1: NUMBER OF JFM COMMITTEES AND AREA(S) PROTECTED BY THEM.

Jalgaon Division along with the State has come to embrace the Joint Forest Management as one of the tools of forest management as early as the mid-nineties. Ever since, the people's/community's participation in conservation and management of forest & wildlife resources has been an integral part of management. The number of JFMCs formed are 254 and these Committees cover an area of 28168.31 ha. All the areas adjoining villages have been covered under JFM, which is 32.52 % of forest area of division. JFM micro plans are to be covered with broad prescriptions of approved working plan.

Maintenance of forest boundary, removal of encroachments, control over illicit cutting, illegal grazing, fire and wildlife offences shall receive priority apart from regularly undertaken works such as SMC & Plantations. Transparency in programme has to be ensured through transparent payment mechanisms. Villages which have not received funds should also be accorded importance.

8.2: STATUS OF EMPOWERMENT OF JFMCS :

JFM is guided by the Govt. Of Maharashtra Resolution dated 16th March 1992, 5th October 2011 and 10th July 2012. The number of villages adjoining to forests are 254 and all these villages are covered under JFM and JFM Committees are in place. The total number of members in the Committee are minimum 12 and a maximum of 24 and one-third of the members are to be from the Gram Panchayat. 50% of the members should be women and 2 members should be from SC/ST and OBC. The performance of the Committee in the Division has been adequate. The Forest Development Agency is well established and its working is satisfactory. Efforts to make the functioning and transaction of funds more and more transparent are going on in the FDA.

8.3: LABOUR WELFARE :

The JFM villagers have priority over others in all the activities of the Department for semi-skilled and unskilled labour. Works of plantations, natural regenerations and

boundary pillars repairs, fire line cuttings and all other works of the Department are involved through the JFM members wherever Committee exists.

8.4: USE OF INDIGENOUS KNOWLEDGE :

The Department has made its effort in documenting the indigenous technical knowledge of the people in the District. The Jalgaon Division had organized an important workshop regarding Medicinal Plants & their uses.

Apart from the medicinal practitioners, the presence of other indigenous knowledge can't be ruled out. It is a charge of the forest officers to tap all kinds of Indiginious technical knowlage from the locals, particularly those associated with forest and environment, and to document them for posterity.

8.5 : EXTENT OF CULTURAL /SACRED GROVES :

There are no sacred groves in the District. Three important sites of cultural significance in the forest areas of Jalgaon are Patnadevi Temple, Padmalya Temple & Landor khori respectively Chalisgaon, Erondol & Jalgon Range are located in forest areas. The flow of tourists and devotees to these areas are seasonal and days specific.

8.6: ECO-TOURISM AREAS AND ACTIVITIES :

The Division have identified important and potential area to be developed for eco-tourism in the Division. The following sites have been identified and listed below that have great potential and resourceful to make ecotourism a success in Jalgaon Forest Division.

- Padmalay (Ganesh) Temple in Erandol range.
- Muktai Bhavani conseravation reserve in Vadoda range.
- Landor Khori in Jalgaon Range.
- Patna Devi Mandir (Chalisgaon Range).
- Hatnur/Girna Dam In Vadoda Range

There is a need to develop these sites and to document the ecological, cultural, religious significance of each of the area and to formulate a plan by which these sites could become places for forestry extension in the future.

8.7: SOCIAL CUSTOMS :

Jalgaon Forest Division comes under Jalgaon, Amalner, Bhadgaon, Bhusawal, Bodvad, Chalisgaon, Dharangaon, Erandol, Jamner, Muktainagar, Pachora and Parola talukas according to the 2011 census, these 12 talukas have a population of 3332778 people with an average literacy rate of 78.20 %. Agriculture is the chief occupation in this area. These 12 talukas are from the region of Khandesh. It has several tribes and communities with a rich cultural heritage. Social customs relevant to the forest or its conservation are not noticed or known to forest department.

8.8. STATUS OF COMPLIANCE OF FOREST RIGHT ACT (FRA 2006)

The status of implementation of this Act (upto June 2018) is given in the table below. After commencement of this Act, large scale illicit tree felling for encroachment on forest land were done by local people and people from adjoining Madhya Pradesh State and pople from Dhule district. It is a matter of concern that most of the encroachments in the Jalgaon Division have taken place during the last ten years.

The status of assignment of forest rights to individual as per Sec. 3 (1) of Act, at the end of June 2016 is as under. Table No.8.1

Division	Claims approved for Agriculture & Residential Purpose		Claims pending for approval for Agriculture & Residential Purpose	
	No.of claims	Area (ha.)	No.of claims	Area (ha.)
Jalgaon	123	51.65	0	0

Under section 3 (2), in 12 cases, a total of 7.00 ha. land has been diverted for speicific purposes.

Updation of Area Registers :- The Divisional Area Register (Form No.1) shall contain the area vested with rights under FRA in the remarks column against each Compartment / Survey No./Gat No.

8.9: OTHER RIGHTS AND CONCESSIONS :

8.9.1: Rights and Concessions :

Change in Area :- Parliament has enacted a law of the Panchayat (Extension to the Scheduled Areas) Act. No. 40 of 1996). The said Act provides for endowing by the State, the Panchyats in the Scheduled areas, with such power and authority as may be necessary to enable them to function as institution of self Govt. Further it provided the Gram Sabha specifically with the ownership and marketing of minor forest produce.

Govt. of Maharashtra has enacted a law, the " Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas Act.1997 and has also amended Maharashtra Minor Forest Produce (Regulation of Trade) Act. 1969 (Act.No.45 of 1997) vide which ownership of 33 MFP specified in the Scheduled, found in the Govt. land has been transferred to the Panchyats. The Honorable Governor of Maharashtra had modified the existing Act and has given ownership of all MFP to Gram Sabha vide notification dated 19.08.2014.

Govt. of India vide enactment dated 2 December 2006, called The Scheduled Tribes and other Traditional Forest Dwellers (Recognisation of Forest rights) Act, 2006 to recognize and vest the forest rights and occupation in forest land in forest dwelling Scheduled tribes and other traditional forest dwellers who have been residing and occupied forest land before the 13th of December, 2005.

Total 2183.363 hectare of Reserved Forest Land was transferred to various project authorities under Forest Conservation Act 1980. However, the status of the land continues to be Reserved Forest. 2614.57 Total hectare land was received as compensatory land in lieu of diverted forest land.

8.10: DEPENDENCY OF LOCAL PEOPLE ON NTFP :

There are no significant no. of people / community dependent on the forest produce.

8.11: OTHER ASPECT :

There is no transhumant population of grazing community available in Jalgaon Forest division. However livelihood of local community depends upon forest for grazing of their

cattle. They have cows, buffalos on large scale with some ships and goats. The range wise grazing units have been formed. Every year the grazing passes are issued to local community people for grazing purpose.

The Grazing settlement of Jalgaon District was done By V.A. Date and the same was approved by the Govt. vide no. MFC 1371/66402/z(A) dt. 30/09/1997. According to the Grazing settlement, the number of grazing units in Jalgaon Division is 34. The forest has degraded over a period of 4 decades. There had been tremendous increase in the cattle population; hence the grazing settlement done earlier has become outdated.

Table No.8.2 Cattle population in Jalgaon Forest Division.

Changes in Livestock and Poultry Population in Rural Urban Areas						
Species	**2007**	**2012**	**% Change**	**2007**	**2012**	**% Change**
Cattle	1,90,297	1,83,736	-3.45	8,778	7,168	-18.34
Buffalo	99,916	1,04,095	4.18	5,427	4,607	-15.11
Yaks	83	76	-8.43	--	--	--
Mithuns	234	291	24.56	31	7	-78.10
Sheep	69,601	63,775	-8.37	1,957	1,294	-33.90
Goat	1,33,314	1,29,081	-3.18	7,224	6,092	-15.66
Horses & Poines	556	563	1.31	55	61	11.68
Mules	125	183	46.23	12	14	13.26
Donkeys	372	267	-28.09	66	51	-22.29
Camels	507	390	-22.99	10	10	-1.80
Pigs	9,960	9,226	-7.37	1,174	1,068	-9.06

Table No. 8.3 Details of grazing permits and passes issued and grazing fees collected 2009-10 to 2017-18

Year	**No. of grazing permits issued (Cattle units)**	**Grazing fees collected in Rs.**
2009-10	16231	32508
2010-11	28142	45934
2011-12	34107	53097
2012-13	28142	45934
2013-14	25088	45051
2014-15	25013	43933
2015-16	25088	45051
2016-17	21787	37260
2017-18	14230	69887
Total	**217828**	**418655**

Table No.8.4 Details about illegal grazing cases booked and penalty recovered from 2009-10 to 2017-18.

Year	No. of Grazing cases	No.of animals caught grazing without permit	Amount recoverd as penalty & auction of inpounded animals (Rs.)
2009-10	87	1462	321465
2010-11	75	1220	257228
2011-12	78	904	211060
2012-13	30	169	136500
2013-14	23	102	77400
2014-15	19	405	93600
2015-16	74	2186	1349200
206-17	33	716	455400
2017-18	29	381	260300
Total	**448**	**7545**	**3162153**

Similarly, local people also collect and store fodder grasses for summer season. Natural regeneration is found adversely affected in those areas, wherever rotational grazing system is not followed properly. Likewise, proportion of non-fodder grasses is slowly increasing in such area. Therefore grazing in such areas needs to be managed properly to avoid adverse effect on quantity and quality of fodder species.

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CHAPTER-9

ADEQUACY OF POLICY, LEGAL AND INSTITUTIONAL FRAME WORK

9.1: EXISTING POLICY AND LEGAL FRAMEWORK AND THEIR COMPLIANCE :

The existing policy and laws in the country and the State are invoked for the management of the forests of the Division. The National Forest Policy of 1988 is the basic guide for the management strategy of this Plan. The Indian Forest Act 1927 and its amendment is the Principal Law governing the administration of the forests in the Division. The Plan is further guided by guidelines like :

9.1.1: National wildlife action plan (2002-2016) :

Ministry of Environment and Forests, Govt. of India has formulated National Wildlife Action Plan (2002-2016), based upon the decision taken in the 21st meeting of the Indian Board of Wildlife held in January 2002. The plan had outlined the strategies and action points for wildlife conservation. The strategy for action is to be adopted under wildlife action plan include among others.

i. Restoration of Degraded Habitats outside Protected Areas

ii. Control of Poaching, Taxidermy and Illegal Trade in Wild Animal and Plant Species.

iii. Monitoring and Research

iv. Human Resource Development and Personnel Planning

v. Ensuring People Participation in Wildlife Conservation

vi. Conservation Awareness and Education

9.1.2: National forestry action plan :

Introduction : Having about 2.5% of world's geographic area, India at present is supporting 16% of world's human population and 18% of cattle population. About 41% of forest cover of the country has already been degraded and dense forests are losing its crown density and productivity continuously. A large number of India's livestock population graze in the forests causing damage to soil, ground flora, including

regeneration, and productivity of the forests. The use of forests beyond its carrying capacity and encroachments are the main cause of continuous degradation of forests.

To reverse the process of degradation and for sustainable development of forests, the Government of India has prepared National Forestry Action Plan (NFAP), a comprehensive strategic programme. These programmes are as follows :

i. Protect Existing Forest Resources

ii. Improve Forest Productivity

iii. Reduce Total Demand of Forest Produce

iv. Strengthen Policy and Insitutional Framework

v. Expand Forest Area

Strategies :-

i. For sustainability and productivity of forests, the production to be increased at least 3 to 5 m^3 per ha per year by promoting appropriate silvicultural treatments.

ii. Hygiene of forests to be improved through suitable silvicultural practices.

iii. 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.

iv. Plantations on non-forest wastelands to be done mostly with fuel wood species as 70% of the wood produced from forests are used as fuel wood. Species of pulpwood and other industrial wood may be encouraged in farm forestry.

9.1.3: Hon'ble orders of supreme court of India :

Hon'ble Supreme Court passed an Order in Writ petition (202 of 1995) in the matter of "Godavarm Thirumalkapd" V/s Union of India. The order speaks about the felling of trees in all forests is to remain suspended except in accordance with the working plans of the States government, as approved by Central government.

Hon'ble Supereme Court passed an order on 22.09.2000 in Inter-Locutary application No 424 saying that regeneration of forest should be commensurated with felling carried out under a working plan. To achieve this, it must be ensured that no felling be carried out without allocating necessary fund to regenerate the felled areas. 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.

Following the directions of Hon'ble apex court in their older dated 22.09.2000 in IA No.424; a core group was constituted to decide the extent of felling. As per these Orders, felling are to be carried out by the State Government only after obtaining the permission from core group constituted by the Ministry of Environment and Forest, New Delhi, which is complied with by the Department.

9.1.4: Forest rights act, 2006 :

After the enactment of this Act, the administration of the forest will be greatly influences, as this act recognizes several individual as well as the community rights over the forest land and its produce. All the provisions of this Act will have to be taken into consideration while managing the forest.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 was passed by the Parliament of India and the assent to this Act was received from the President of India on 29th December, 2006. The said Act was notified in the Gazette of India on 2nd January, 2008. These Rules were further amended by the Central Government vide notification dated 6th September, 2012.

The Jalgaon Division is in the process of digitizing the polygons of the areas handed over to the villagers under FRA. There is a need to guide and train the villagers on how best to use the forest land to meet all their needs.

9.1.5: Biological Diversity Act, 2002 :

This Act aims to provide for Conservation of biological diversity and sustainable use of biological resources. These issues are reflected in various Working Circles and the prescriptions made there under :

India is a party to the United Nations Convention on Biological Diversity signed at Rio de Janeiro on the 5th day of June, 1992. This Convention reaffirms the sovereign

rights of the states over their biological resources. Therefore, legislation was enacted by the Indian Parliament in 2002 to give effect to the United Nations Convention.

This Act aims to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto. The State Government has established the State Biodiversity Board and this body is looking into the various aspects of biodiversity conservation and benefit sharing, if any, arising out of the biodiversity. As of now Biodiversity Management Committee has been formed in the District of Jalgaon and at taluka level 15 and villege level 1050 committees have been formed.

9.2: STATUS OF APPROVED WORKING PLAN AND COMPLIANCE :

Working Plan sanctioned is implemented but not fully due to various reasons like lack of funds, unavailability of area, due to Eco-Sensitive Zone etc. No deviation proposals are received.

9.3: NUMBER OF FOREST OFFENCES :

The numbers of forest offences that have been registered under the different categories in the last ten years are given below :

Table No. 9.1 The Extent of damage due to fire, illicit cutting & other offences.

Year	Fire		Grazing		Illicit cutting	
	No.of Cases	Loss in Lakh	No. of Cases	Loss in Lakh	No.of Cases Teak and Non Teak	Loss in Lakh
2007-08	56	1.14	--	--	1010	0.73
2008-09	35	0.41	--	--	5678	3.41
2009-10	11	0.05	87	3.21	5454	2.62
2010-11	31	0.12	75	2.57	2512	1.99
2011-12	48	0.21	78	2.11	2565	1.42
2012-13	43	0.26	30	1.36	2172	1.45
2013-14	52	0.25	23	0.77	2444	3.17
2014-15	23	0.10	19	0.93	1765	2.89
2015-16	34	0.19	74	13.49	1619	2.56
2016-17	78	1.45	33	4.55	1372	2.01
2017-18	104	1.70	29	2.60	1101	2.40
TOTAL	**515**	**5.88**	**448**	**31.59**	**27692**	**24.65**

Table No. 9.2 No. of trees cut illegally with material seized from 06-07 to 15-16.

Year	No. Of Trees Cut Illegally	Amt. Of Material Seized (Rs)
2007-08	810	23936
2008-09	557	166888
2009-10	42	34657
2010-11	35	21556
2011-12	60	14138
2012-13	632	44288
2013-14	174	33774
2014-15	29	21378
2015-16	90	10402
2016-17	58	6226
2017-18	07	2518
TOTAL	**2494**	**379761**

9.4: STATUS OF RESEARCH AND DEVELOPMENT:-

Not much research or development work is being carried out in the Division.

9.5: HUMAN RESOURCE CAPACITY BUILDING EFFORTS :-

The staff of the Division is trained as per their rank-related training in the respective Forest Schools, Rangers Colleges etc. Apart from this regular training, they are also updated with the new technology and developments in the field particularly in GIS and IT related fields. The status of special training of the staff is as follows :

Status of trained staff :

1. Training for GIS & GPS - Surveyor 02, Forester 12 & Forest Guard 32 were trained.

2. Facilities of Personal Digital Assistants (123 PDAs) are given to all guards, foresters and RFOs with application for Offences cases, Fires, encroachment, grazing etc.

However, the feedback received from the field is that the PDA's are being used mostly as mobile phones. There are also problems related to the lack of coverage for the use of internet for immediate sending of information as required. There is a need to further train the guards in the use of the PDA's and to ensure full use of the technology.

9.6 : FOREST RESOURCE ACCOUNTING :-

In this Plan, all efforts have been made to place on record all the tangible benefits received from the forests. The accounting for the intangible benefits is a task that the Division is not in a position to make, nor is it possible to be done by the WPO with limited resources. However, the Net Present Value of the forests as calculated for the calculation of NPV by the Kanchan Chopra Committee and accepted by the Hon. Supreme Court order dated 28.03.2008 is taken as the basis for the calculation of the tangible and intangible benefits for accounting the forest values in the Division. The factor of benefits that have been taken while accounting forest area is as follows :

For calculating the average Net Present Value per ha. of forest in India the following monetary value of goods and services provided by the forest have been considered.

- Value of timber and fuel wood
- Value of Non Timber Forest Products (NTFP)
- Value of Fodder
- Value of Eco-Tourism
- Value of Bio-Prospecting
- Value of Ecological Services of Forest
- Value of Flagship Species
- Carbon Sequestration Value.

For the purpose of the valuation of the forest, the following Eco-classes of forests have been identified for the purpose of calculation and 16 major groups of forest types of India as classified by the Champion & Seth have been reduced into the following Eco-classes, namely :

Eco-Class I- Consisting of Tropical Wet Evergreen Forests, Tropical Semi Evergreen Forests and Tropical Moist Deciduous Forest

Eco-Class II- Consisting of Littoral and Swamp Forests

Eco-Class III- Consisting of Tropical Dry Deciduous Forests

Eco- Class IV- Consisting of Tropical Thorn Forest and Tropical Dry Evergreen Forests

Eco- Class V- Consisting of Sub-tropical Broad Leaved Hill Forests, Sub Tropical Pine Forests and Sub Tropical Dry Evergreen Forests .

Eco-Class VI- Consisting of Montane Wet Temperate Forests, Himalayan Moist Temperate Forests, Himalayan Dry Temperate Forests, Sub Alpine Forest, Moist Alpine Scrub and Dry Alpine Scrub.

The forests of Jalgaon come under the Eco Class III and the value attached to this Class area as given below as per the canopy density. The average value of the forests stands at Rs.6,26,000/- per ha. and varies with the type of forest and its attributes. This value has further been revised by the Indian Institute of Forest Management, Bhopal and is yet to be approved. The IIFM study is more comprehensive and takes into account all aspects of the intangible benefits that the forest eco-system provides.

Below is given the value of the forest of Jalgaon as per the current and proposed NPV value which takes into account the tangible and some components of the intangible benefits.

Table No. 9.3 Calculation of Forest Worth Based on NPV

Area of Jalgaon under different canopy density		**Current rate of NPV (Rs. Lakh/ha.)**	**Value of Forests as per current rate (Rs. Lakhs)**	**Proposed rate of NPV (Rs.Lakh/ha.)**	**Values of forest as per proposed rate Rs.Lakhs**
Category	Area (ha.)				
VDF	10392.00	8.03	83447.76	25.08	260631.36
MDF	32908.03	7.50	246810.23	18.62	612747.52
OF	43300.05	6.26	271058.31	11.17	483661.56
Total	**86914.41**	----	601316.30	---	1357040.44

The value of the forests of Jalgaon comes to Rs.601316.30 Lakh as per the current NPV rates and Rs. 1357040.44 Lakhs as per proposed NPV rates, which has taken in to account all the ecosystem services and functions of the forests.

Thus the value of the Forest when computed holistically taking into account its myriad tangible and intangible benefits that it provides, is far more than what can be gained through the traditionally viewed benefits of timber and other forest produce. Forest resource accounting will be more comprehensive, if we are in a position to decide all intangible benefits at the local level which may be taken up as one of the projects in due course of time.

9.7: BUDGETARY ALLOCATIONS TO THE FORESTRY SECTOR :-

Table No. 9.4 Statement Showing the Revenue & Expenditure :

Year (1)	Revenue Rs. in Lakhs (2)	Expenditure Rs. In Lakhs			Total Expenditure in Lakhs. (3+4+5)
		Non Plan (3)	Plan (4)	EGS (5)	
2008-09	10.98	0.00	138.124	29.17	167.294
2009-10	12.89	488.67	167.900	10.02	666.59
2010-11	75.00	545.47	530.278	0.00	1075.748
2011-12	15.73	784.23	454.651	0.00	1238.881
2012-13	0.46	917.13	679.549	0.00	1596.679
2013-14	0.45	942.02	934.040	0.00	1876.06
2014-15	0.44	917.56	1471.300	21.97	2410.83
2015-16	11.02	913.49	1892.510	21.85	2827.85
2016-17	17.03	1446.49	1816.600	22.36	3285.45
2017-18	10.90	1245.90	1924.540	92.15	3262.59
Total	**154.90**	**8200.96**	**10009.49**	**197.52**	**18407.97**

The department also has an independent Evaluation cell headed by an officer of the rank of C.C.F. at the Head Office. Annual evaluation reports on various activities of the department from Plantations SMCs, MPCAs, Building & Constructions are prepared and submitted to Government. The evaluations is guided by the evaluation code.

9.8: EXISTENCE OF MONITORING, ASSESSMENT AND REPORTING MECHANISM :-

Monitoring & assessment is done at Range Forest Officer, ACF & Dy.C.F. levels, CCF(T) & CF(WP) as per GR No. Sankirna-2011/F-N0.289/F-7, dt. 29/09/2011 also required to ensure proper implementation of WP.

9.9: PUBLIC AWARENESS AND EDUCATION : -

Public awareness is carried out by the Division and the Social Forestry Wing of the Department in the District. As per information from the Division Forest Officer of the SFD, a total of 120 school in Jalgaon have Eco-Clubs as part of the National Green Army Scheme of the Government of India. In each of the Club, there are at least 50 members. In these schools regular year round programmes are held and all important days related to

the Environment and Forests are celebrated enthusiastically. Regular field visits, projects etc are also taken up. Seed Banks are established in each of the Schools.

The Division also celebrates Van Mahotsav and Wildlife Week on a regular basis and various programmes like Essay /Drawing/ Extempore Speech Competitions are held at all levels upto the State level.

9.10: ADEQUATE MANPOWER IN FOREST DIVISION :-

9.10.1 :Staff : Jalgaon forest division is coterminous with the district boundary and is headquartered at Jalgaon. It is headed by an officer in the rank of the Deputy Conservator of Forests.

Further reorganization of the Forest Department was done & Jalgaon Forest Division was created in 1966 by bifurcating the Jalgaon Forest Division. For Satpuda Forest, first working plan was introduced in the year bet^{n}1894 to 1908.

Jalgaon Division has sanctioned strength of 258 posts in total, including 215 permanent posts and 43 temporary posts ranging from the Deputy Conservator of Forests to the Van Majoor. The details of the staff and the manpower, in the Division, as on date, are given in the table.

Table No. 9.5 Present staff position in the Jalgaon Division :

Sr. No.	Designation of the post	Permanent Posts	Temporary posts		EGS	Others	Total
			Plan	Non plan			
	Class-1						
1	Dy.C.F.	1	-	-	-	-	1
2	A.C.F.	1	-	1	1	-	3
	Total class-1	**2**	**-**	**1**	**1**	**-**	**4**
	Class-2						
3	R.F.O.	6	-	3	1	-	10
	Total Class-2	**7**	**-**	**2**	**1**	**-**	**10**
Sr. No.	**Designation of the post**	**Permanent Posts**	**Temporary posts**		**EGS**	**Others**	**Total**
			Plan	**Non plan**			
	Class-3						
4	Head Clerk	1	-	-	-	-	1
5	Accountant	3	-	8	-	-	11
6	Clerk	14	-	2	-	-	17
7	Steno typist	1	-	-	-	-	1
8	Forester	19	-	5	3	-	27
9	Forest Guard	81	-	8	5	-	94
10	Forest surveyor	2	-	-	-	-	2

11	Jeep Driver	2	-	1	-	-	3
	Total Class-3	**123**	**-**	**24**	**8**	**-**	**155**
	Class-4						
12	Naik	1	-	-	-	-	1
13	Peon	2	-	-	-	-	2
14	Mali	-	-	5	-	-	5
15	Forest laborers	81	-	-	-	-	81
	Total Class-4	**84**	**-**	**5**	**-**	**-**	**89**
	Total	**215**	**-**	**33**	**10**	**-**	**258**

9.10.2: Labour Supply :

There is acute shortage of labour especially during the planting season. The main reason for the non-availability of labour is, they more attached towards agricultural operations because of the comparatively lighter works, higher wages and other amenities.

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CHAPTER-10

FIVE YEAR PLANS

10.1: INTRODUCTION:

Since 1947, the Indian economy has been premised on the concept of planning. This has been carried through the Five-Year Plans, developed, executed, and monitored by the Planning Commission (NITI Aayog after 2014). With the Prime Minister as the ex-officer Chairman, the commission has a nominated Deputy Chairman, who holds the rank of a Cabinet Minister. Montek Singh Ahluwalia is the last Deputy Chairman of the Commission (resigned on 26 May 2014). The Eleventh Plan completed its term in March 2012 and the 12th Plan is completed its term in March 2017.There after 13th five year plan is in operation.

Revised versions of the formula have been used since then to determine the allocation of central assistance for state plans.

The new government led by Narendra Modi, elected in 2014, has announced the dissolution of the Planning Commission, and its replacement by a think tank called and NITI Aayog (an acronym for National Institution for Transforming India).

The first working plans were introduced between 1894 and 1908 and they were written for different regions. Jalgaon & Jalgaon Forest divisions are combined divisions in that period.

The first working plans were introduced between 1894 and 1908 and were written separately by regions or ranges, the distribution of which differed slightly from that of today. Following plans were written for various regions from time to time:-

(I) Working Plans for Satpuda Forests (Chopda, Jalgaon, Raver ranges).

1901 Plan by L.S.Osmaston.

1918 Plan by v.d.'P. Reberio

1952 Plan by S.H Korhalli and S.A Mundkur.

(II) Working Plan for Jamner Forests 1906 plan by Dodgson.

(III) Working plan for Scrub Forests of Jalgaon Dn.

1904 Provisional Scheme.

1905 Plan by A.G Edie.

1923 Plan by Miller.

Subsequently the plans for (II) and (III) were combined and following plans for Jamner.

Teak and Jalgaon scrub Forests were introduced-

1929 Plan by Pareira.

1949 Plan by D.R.Bharucha.

(IV) Working Plans for Edlabad Anjan and Scrub

1908 plan by Newman

1949 plan by R.R Chaudhari.

(V) Working Plans for Satmala Forests (Chalisgaon Range)

1894 Plan by L.S.Osmaston.

1912 Plan by Gonsalves.

1936 Plan by J.A Singh.

(VI) Woking Plan for Babul Forests of Edlabad and Jamner Ranges.

1902 Provisional plan for Edlabad babul forests.

1916 Plan for Edlabad babul forests.

1906 Plan for Jamner babul by Dodgson.

1946 Plan for Edlabad and Jamner babul forests by Bharucha.

Table No. 10.1: The following plans were written for Jalgaon Forest Division :

R.R.Chaudhari's Working Plan	1951-52 to 1955-56
R.R.Chaudhari's & Bharucha's Working Plan	1956-57 to 1965-66
P.R. Vaidya's Working Plan	1966-67 to 1989-90
Thomas and Samant's Working Plan	1989-90 to 2005-06
Vasudevan, T.S.K. Reddy and Tiwari's W.P.	2008-09 to 2017-18

10.1.1: As per 12th five year plan (2012-2017) document under environment, forestry & wildlife 209 following are the moniterable targets

1.Environment and Climate Change :

- ✓ Assess and remediate 12 identified contaminated sites (hazardous chemicals and wastes) with potential for ground water contamination by 2017.
- ✓ Clean 80 % of critically polluted stretches in rivers by 2017 and 100% by 2020.
- ✓ States to meet NAAQS in urban areas by 2017.
- ✓ To reduce emission intensity of our GDP in line with the target of 20 to 25% reduction over 2005 levels by 2020.

10.1.2: Forests and Live hood :

1) Greening 5 million ha under Green India Mission including 1.5 million ha of degraded lands, afforestation and eco-restoration of 0.9 million ha of ecologically sensitive areas.

2) Technology-based monitoring of forest cover, biodiversity and growing stock including change-monitoring on periodical basis through dedicated satellite by 2017 and establishment of open web-based National Forestry and Environmental Information system for research and public accessibility by 2015.

3) Engagement of Village Green Guards / Community Foresters for every Joint Forest Management (JFM) village by 2016.

4) Establish forestry seed bank in forest circles and Model Nursery in every district with information on public portal by 2014.

10.1.3: Wildlife, ecotourism and animal welfare :

1. Twenty per cent of veterinary professional in the country will be trainied in treating wildlife.

2. Interated Ecotourism District Palns covering 10 per cent of all potential Protected Areas (Pas) by 2017.

3. Promoting participation of private sector, civil societies, NGOs and philanthropists in animal welfare.

Wildlife, ecotourism and animal welfare :

- ✓ Reducing and managing human wildlife conflict.
- ✓ Commercialization of permissible marine products rich in poly unsaturated fatty acids (PUFAs), vitamin and so on.
- ✓ Promotion of ecotourism and participatory eco-development support livelihood of local population.

Ecosystem and Biodiversity :

Develop national targets and indicators related to biodiversity and support actions to strengthen implementation of Biological Diversity Act, 2002 and ensure bio-safety for economic and social development of local communities.

Assess coastal biodiversity resources, ensure sustainable management, restoration of mangroves, coral reefs and wetlands and support livelihood.

Development Under 12th Five Year Plan :

(i) The year 2015-16 was the fourth year of XIV the Five-Year Plan. An investment of Rs.1361 lakhs was made on various developmental programmes implemented under forestry and related sectors as stated below.

Activities :- A. Non tribal sub plan (STATE)

1. Strengthening of check Nakas

2. Strengthening of existing wireless network

3. Strengthening of Mobile Squad

4. Supply of cooking gas

5. Joint Forest Management

B. Centrally sponsored schemes

1.Modern forest fire control and management (IFPC)

2. National Afforestation Programme

C. Forestry and wildlife (tribal sub plan) (STATE)

1. Supply of cooking gas

D. Non tribal district scheme

1.Soil and Moisture Conservation on forests areas

2. Estt. Of central nursery

3. Forest protection from fire

4. Reforestation of degraded forest (RDF)

5. Development in Forest Tourism

6. Compensation to the farmers for losses caused by the wildlife

E. Forestry and wildlife (tsp) (DISTRICT)

1.Joint Forest Management (OTSP)

2. Plantation of General use

F. Forestry and wildlife (non tribl) (STATE)

1. Construction of Van Talao

2. Massive Afforestation

3. Afforestation for soil Conservation.

G. Forestry and wildlife (non tribal) (DISTRICT)

1. Forest Building (Repairs)

2. Soil and water conservation on forests areas

3. Forest roads & bridges (4406-4415)

4. Forest Protection from fire

5. Wild Life & Nature Conservation

6. Development of Forest Tourism

7. Compensation to the formers for doses caused by the Wildlife

Table No.10.2

Year	**Expenditure incurred on above activities under (plan/ Non plan /MREGS) funds in Lakhs**
2007-08	167.294
2008-09	666.59
2010-11	1075.748
2011-12	1238.881
2012-13	1596.679
2013-14	1876.06
2014-15	2410.83
2015-16	2827.85
2016-17	3285.45
2017-18	3262.59
Total	**18407.97**

It is observed that there is more than double increase in the expenditure in the Division, for various forestry activities. This is a very encouraging sign. With the implementation of the Working Plan in right earnest, the goals of the five year plan can be achievable.

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CHAPTER-11

PAST SYSTEMS OF MANAGEMENT

11.1: GENERAL HISTORY OF THE FORESTS :-

The forests of the Jalgaon division were constituted as reserved forests in 1881 and succeeding years prior to 1901, The felling were carried out in very unsystematic manner and were done through three agencies, viz. 1) Government Agecny; 2) privilege holders. 3) non- privileged population (on permit basis)

Prior to the year 1872, the respective Assistant Collectors (Bhil Agents) were in-charge of Forest areas. The Bhils and other Tribes used to cut whatever they wanted to, except Teak and Rosewood, for which the Principal Bhil Agent granted the permission. Forest Conservancy began in the Satpudas in the year1872.

Between the years 1872 to 1896, felling done by the Government Agency were of unregulated selection type. Areas where felling had carried were not demarcated and the girth limits, above which trees had to be felled, were not prescribed. In general the felling was confined to Teak in Jalgaon and Chopda ranges, and Anjan in Chalisgaon & Vadoda range. The annual output varies greatly and depended upon the demand labour available. Exploitation was confined to large and sound trees leaving crooked and diseased trees standing.

The felling done by privilege holders, which included Bhils, inhabitants of Forest Villages and other unsettled tribes had considerable adverse effects on the forests. Their activities extended over the whole forests and were confined to green and dead wood of all species except the reserved trees of Teak and Blackwood. Subsequently in the year 1884-85 the privileges defined and two species were reserved which were not to be felled. Although the privilege were defined, they were not firmly regulated and the malpractice and irregular felling continued.

The third Agency which included a variety of non-privilege holders such as liquor distillers, brick burners, bangle manufacturers and ginning factories were allowed to get firewood on permit system. Removal of dead timber including Teak on permit at fixed fee per cartload was allowed. This permit system led to malpractice and had a deterious effect on the forests, their regeneration and improvement.

11.1.1: Management Of The Forest And Tree Growth :

The first working plan was introduced in the year 1901. The following plans were written for Jalgaon Division.

With the introduction of working plan in 1901, cutting of greenwood by privilege holders was restricted to annual coupes. In 1911, the North Tapi Privilege Code was revised and the most harmful privilege of cutting of greenwood on fees for sale was abolished. The areas of Chopda, Jalgaon and Raver ranges of Satpuda forests were organized under the working plan prepared in 1901 by Osmaston. He prescribed a common system of working for the entire forests, irrespective of whether it was Anjan or Teak forests. The silvicultural system was felling with a rotation of 90 years for Teak and 45 years for misleouns species was prescribed. No operation for the improvement of growing stock was prescribed. Further, public were also allowed to remove material under permits. This practice proved to be unsound both silviculturally as well as economically.

Table No. 11.1 List of Working Plans for the Reserve Forests of Jalgaon Division:

Sr. No.	Working Plans in chronological order	Plan period
1	R.R.Chaudhari's Working Plan	1951-52 to 1955-56
2	R.R.Chaudhari's & Bhaurcha's Working Plan	1956-57 to 1965-66
3	P.R. Vaidya's Working Plan	1966-67 to 1989-90
4	Thomas and Samant's Working Plan	1989-90 to 2005-06
5	Vasudevan, T.S.K. Reddy and Tiwari's W.P.	2008-09 to 2017-18

11.2 PAST SYSTEM OF MANAGEMENT AND THEIR RESULTS.

The first Working Plan was introduced between 1894 and 1908 and was written separately by Regions or Ranges, the distribution of which differs slightly from that of today. Following Plans were written for various regions from time to time.

I) Working Plan for Jamner Forests.- 1906 Plan by Dodgson.

II) Working Plan for Scrub Forests for Jalgaon Division.

1904 Provisional scheme.

1905 Plan by A.G.Edie

1923 Plan by Miller

Subsequently the Plans for I & II were combined and following Plans for Jamner Teak and Jalgaon Scrub Forests were introduced-

1929 Plan by Pareira

1949 Plan by D.R.Bharucha

III) Working Plan for Edlabad Anjan and Scrub Forests

1908 Plan by Newman

1949 Plan by R.R.Chaudhari

IV) Working Plan for Satmala Forests (Chalisgaon Range)

1894 Plan by L.S.Osmaston

1912 Plan by Gonsalves

1936 Plan by J.A.Singh

V) Working Plan for Babool Forests of Edlabad and Jamner Ranges.

1902 Provisional Plan for Edlabad Babul Forests.

1916 Plan for Edlabad Babool Forests.

1906 Plan for Jamner Babool Forests by Dodgson

1946 Plan for Edlabad and Jamner Babool Forests by Bharucha

VI) P.A.Vaidya revised 1) Working Plan for Jamner Teak and Scrub Forests by D.R.Bharucha, 2) Working Plan for Edlabad Anjan and Scrub Forests by R.R.Chaudhari 3) Working Plan for Satmala Forests by J.A.Singh 4) Working Plan for Babool Forests of Edlabad and Jamner Ranges by D.R.Bharucha and prepared a comprehensive plan for Jalgaon district which were in operation between 1966-67 to 1980-81.

VII) Thomas and Samant revised the Working Plan of Vaidya and the revised Plan was in operation between the period 1989-90 to 1998-99. Past System of Management and their results are described separately for each Working Plans mentioned above.

Working plan for jamner Teak reserved and scrub forests:

(a) Jamner Teak: Systematic exploitation of forests began from the year 1898 by working one block annually. The operations were suspended upto 1902 to 1906, since many trees died due to drought. Only dead trees were exploited. The Teak reserves were depleted to a great extent. Dodgaon drew working plan for Jamner Teak Reserves in 1906. Coppice with Standards System was prescribed with a rotation of 30 years. Some trees upto 60 cm. girth were to be reserved. No cleaning or thinning were prescribed.

(b) Scrub Forests: Systematic management was attempted under a provisional plan prior to 1904. Some kurans were permanently closed and others were closed in rotation. In the year 1904 Edie drew a regular working plan. 16 Kurans only were permanently closed and in others a sort of rotational grazing was prescribed on a 4 years cycle. Later efforts were made to stimulate the grass growth by Bell and Miler. In the year 1929 Pereira brought Jamner Teak and Scrub Forests under one plan. For Teak, clearfelling of all tree growth except fruit trees and Anjan on a rotation of 40 years was prescribed. Coppice regeneration was mainly aimed at. The scrub forests were included in one grazing working circle under improvement felling system on a 20 years felling cycle. Bharucha's plan followed from 1949-50. He prescribed four working circle viz.

(c) The Teak Working Circle: This included all the Teak forests. Clearfelling with reservation of promising advance growth prescribed. Rotation fixed was 40 years. In good cultivable areas. Clearfelling and regeneration by argisilviculture was prescribed. Since the future crop was not tended and no artificial regeneration carried out, the forests were deteriorated.

(d) The Scrub Working Circle: The method of treatment was clearfelling of suitable areas and planting up under agrisilviculture and the remaining area under light improvement fellings. There was congestion in plantations due to no aftercare.

(e) Grass and Grazing Working Circle: It was an over lapping Working circle. Rotational grazing was prescribed but not practiced.

(f) The Kuran Working Circle: There were 60 kurans to be managed by selling on annual cutting terms. Only Anjan and fruit trees were to be retained and intensive improvement works suggested. Some kurans were wire fenced. But protection of kurans from fire and grazing was poor.

II) Working plan for Anjan and Scrub forests of edlabad:

Regular working plan was drawn in 1908 when Coppice with Standard system was prescribed for Anjan. R.R.Chaudhari's Plan came into existence from 1949-50. He prescribed:

The Plains Working Circle: Clearfelling with reservation of sound Anjan trees were prescribed. Regeneration of the area was to be done under agrisilviculture. The result of working was that the areas were further opened up. In the worked coupes, there was practically pure Anjan growing with scattered bushy Khair, Dhavda etc. Cultural operations were neglected.

The Hill working Circle: The method of treatment prescribed was improvement felling at 30-year cycle. All young and sound Anjan trees were to be reserved. But actually the areas were not worked. Areas suffered badly from fire. There was practically no regeneration.

III) Working plan for Satmala forests:

Selection fellings and Coppice with Standards were practiced upto 1923 drought season. The damage trees were cut back. The forests were then constituted to be managed for production of poles and firewood from 1937-38 according to J.A.Singh's Plan, with a working circles viz.

Anjan Working Circle:- Improvement cum clearfelling system was prescribed. Anjan fruit trees and sound Teak trees were to be retained. As a result of working, areas were further opened and deteriorated.

The exploitable Teak Working Circle:- This included accessible Teak areas. Clearfelling of all trees except fruit trees and Teak poles was prescribed. The forests happened to be deteriorated further.

The in-exploitable Teak Working Circle:- In the forests over rugged hills, only cultural operations were prescribed.

Working plan for the Babool forests:

A regular working plan was drawn up in 1917. In 1947-48 Babool Working Circle was formed. The system prescribed was clearfelling and regeneration of the area under agri-

silviculture.The plantations were successful. But cultural operations were neglected. It was also seen that Teak and bamboos also could be raised in this area.

During all these plans described above, no detailed stock mapping of the forests was undertaken. The felling series were also not properly demarcated. Cutting back operation immediately after the main felling was not prescribed at all. Further operations like cleaning and thinning were not carried out. As a result, there was congestion and valuable species were not properly tended. Plantations carried out were also dismal failure. Fire protection measures were not effective. There was uncontrolled grazing. Illicit cutting also was rampant. The process of soil erosion proceeded at an alarming pace. Clear or over felling without assuring restocking, and clearance in refractory areas impoverished the growing stock.

Vaidya's Plan:

The revision of the working plan by P.R.Vaidya was taken up during the year 1962 and this plan came in force from 1966-67 to 1980-81. During this revision stock mapping of the forests was undertaken and forest areas were divided into block and compartments for the first time. The following working circles were constituted:

Protection Working Circle: This working circle comprised of the protection of forests of Edlabad and Chalisgaon ranges. The total area covered by this working circle is 12,255.86 ha. The main object in formation of this working circle is to maintain and improve the existing soil cover in the vulnerable areas spread along the steep slopes on the ridges of Hatti hills and Satmala hills. Only removal of dead Teak trees and to improve the present stocking and its density by diffused plantations, if feasible had been prescribed. No silvicultural method of management was prescribed. Planting in pits wherever sufficient soil depth is available was proposed. Species recommended for planting were poly-pots of Hirda, Jambhul, Anjan, Bamboo and Khair. Due to the very steep nature of the terrain, it is emphasized to guard against any method of concentrated regeneration involving clear felling, which would accelerate the process of soil erosion. Weedings, cleaning and replacement of casualties till the area is considered as successfully reboised was prescribed to improve the stocking.

Coppice with Reserve Working Circle: In this working circle were included inferior Teak pole forests of Chalisgaon and Jamner ranges. The bulk of the forests were of IV-a

quality. This working circle corresponds to Teak Pole Working Circle of Mundkur's Plan. The total area covered by this working circle was 11,799.13 ha. The method of treatment was coppice with reserves with a rotation of 30 years. Yield was to be regulated by area. Areas liable to erosion, steep and precipitous slopes, strips of one chain width along nalas and under-stocked areas were to be excluded from felling. In patches of young pole crop thinning was expected to be carried out while in the areas of low density, improvement felling consisting of removal of dead, dying unsound and over mature trees were to be carried out. All healthy trees of edible flowers and fruits were to be reserved. One thinning in the 12th year and second thinning in the 15th year was prescribed.

Improvement Felling Working Circle: This working circle spread over 4,963.38 ha. in Chalisgaon range, included degraded Saigavan Teak forests which have been transferred from Jalgaon Division to Aurangabad Division during the year 1976, and as such no areas of this working circle is left out from the purview of the revision of this plan.

Anjan Working Circle:- This working circle comprised of all the forests, having predominantly Anjan as principal species. These forests are in Edlabad, range. The total area of this working circle was 6,234.69 ha. The method of treatment prescribed was improvement fellings on 30 years felling cycle. Artificial regeneration over 15 percent of coupe area was prescribed in order to improve the value of forests by planting Teak, Khair and Eucalyptus. Yield was regulated by area. All dead, over mature trees are to be marked for felling while healthy trees of species of Mahuwa, Tembrun, Char, Hirda, Behda, Kadai and Khair were to be reserved. In unworkable area, no felling of living trees was prescribed on steep slopes and in under-stocked eroded and in ;areas liable to serious erosion. While in workable areas all dead, dying and over mature and seriously diseased trees were prescribed for felling. Cleaning in the 6th year and one thinning in the 15th year, commencing from the year of main felling was prescribed to help the regrowth of valuable species.

Plantation Working Circle: This working circle included some of the areas of Edlabad range. The total area falling under this working circle was 975.26 ha. The silvicultural system prescribed for this working circle was clear-felling and planting with Teak. The chief object was to convert artificially as much as of the better quality mixed forests in to normal series of Teak plantations to enhance the capital value of the forests. Only

sequence of felling and a plantation programme was prescribed in this working circle. Cleaning in the 6th year and thinning in the 10th year was also prescribed.

Babul Plantation Working Circle:- This working circle comprised of all the areas known as babul reserves in Jamner and Edlabad ranges. The babul forests in Jamner range are situated on the banks of river Sur, while those in Edlabad and Vadoda ranges lie on both the banks of river Purna. The total area felling under this working circle was 1037.85 ha. The silvicultural system prescribed was clear felling and planting up the area with Babul, Bamboo and Teak with a rotation of 25 years for babul. Cleaning in the 5th Year and one thinning in the 12th year was laid down. Some of the areas of this working circle felling in Vadoda range have been recently clearfelled as the same fall under the submergence of Hatnur project, while some patches of babool forests of Jamner range have been encroached and thus area of this working circle is reduced to some extent.

Scrub Working Circle:- This working circle comprised of the bulk of the forests to the south of Tapi river and extends over Jamner, Edlabad, Jalgaon, Parola and Chalisgaon ranges. The total area covered by this working circle is 39,155.39 ha. The method of treatment was improvement felling on a rotation of 40 years. All the dead trees, all the trees of inferior species interfering with growth and development of valuable species were prescribed for marking for removal. Areas liable to erosion, steep and precipitous slopes, strips of one chain wide along the nalas and under-stocked areas, were to be excluded from felling. Healthy trees of economic importance and fruit bearing trees such as Mahuwa, Tembrun, Char, Kadai, Behada and Anjan are prescribed for reservation. Yield was regulated by area. The afforestation and anti-erosion works and simple form of rotational grazing of two coupe system were prescribed. Cleaning were prescribed as and when necessary.

Kuran Working Circle: The total area covered by this working circle was 11,063.40 ha. divided into 60 kurans, situated in Chalisgaon, Parola, Jalgaon, Jamner and Edlabad ranges. The method of treatment was intensive improvement works, introduction of better varieties of grasses, uprooting of obnoxious weeds and felling of bushes and shrubs and wire fencing of kurans and permanent closure to grazing. The kurans not covered under the intensive development works were to be subjected to 5 years bush cutting programme.

Kadai (Overlapping) Working Circle : This was an overlapping working circle which included Kadai forests of Chalisgaon and Jamner ranges. This working circle was

15,268.40 ha. in extent. Tapping of one coupe successively for 3 years while a rest of 3 years to other coupe was prescribed for this working circle.

Results of working under Vaidya's Plan

No operations like removal of dead trees, diffused planting in pits etc. were carried out. Biotic factors like fire, grazing and illicit felling continued and the forests started deteriorating.

All the Teak areas of IV-b quality of Jamner and Chalisgaon ranges were grouped together in Vaidya's Plan. The soil was poor, regeneration by coppice as well as seedlings coppice was adequate at places. The treatment prescribed was coppice with reserves with a rotation of 30 years, with the object of improving the condition, composition and density of the crop. In actual practice, however, it was found that the forests under this working circle had not been worked according to the prescriptions laid down in the plan. Much of the coppice growth of valuable species was found to have been suppressed by the species of comparatively less value. Many unsound trees also had been marked by reservation. In many cases inferior species dominated to the detriment of the valuable species. The main future crop was to be from the coppice growth, which was unfortunately neglected and did not receive subsequent cultural operations necessary for its development. No thinning of young pole crop in patches was carried out. Cleaning in the 6^{th} year and one thinning in the 12^{th} year and second in the 24^{th} year after main felling was prescribed in the plan were not carried out. Examination of the coupes worked in the past showed that cutting back operations had not been carried out and the Teak coppice shoots are growing congested with the coppice growth of valuable species. Thus the chief object of management of these forests was to supply on a sustained basis small and medium sized timber was vitiated.

In case of Anjan Working Circle, the object was to increase the proportion of valuable species and to free the existing reproduction of valuable species. Artificial regeneration to the extent of 15% of the annual coupe with the species such as Teak, Eucalyptus and Khair though prescribed was not carried out to the desires extent. No attempts were also made to take up artificial regeneration of Teak in suitable areas of not less than 2 hectare. The light crown thinning in the pole crop of Anjan was not carried. Trees of inferior species interfering with valuable species were also not removed. 6^{th} year cleaning and 15^{th} year thinning commencing from the year of main felling were not attended to any coupes

in Vadoda and Chalisgaon ranges have remained un-worked due to poor growth and density and to avoid further soil erosion. Illicit cutting for firewood and overgrazing by cattle and sheep has further contributed to the deterioration of the growing stock. These factors coupled with recurrent fires have accelerated soil erosion in this tract. Year after year, the areas remained un-worked but no large scale attempts to arrest these ill-effects were made and these areas once upon a time having good forests, have deteriorated to more and more xerophytic forests.

In plantation Working Circle, artificial regeneration to the extent of 10 hectare in annual coupes for converting artificially as much as of the better quality mixed forests into a normal series of Teak plantations, was not carried out to the desired extent. The success was not very satisfactory. The results of the attempts made for afforestation works are not also satisfactory because the sites selected were not suitable, the plantations were not effectively protected from fires, grazing and frequent illicit cutting and felling.

Vaidya's Plan was introduced in the year 1966-67 and Babool plantation Working Circle was found. The areas of Babool block occupied the banks of river Purna and Sur, in a narrow strip. The soil is deep alluvial and ideal for Babool. 16 out of 100 coupes were worked. 198.20 ha. area was planted up. The plantation was raised along the contour lines which were generally 6 meters apart. The lines sown with Babool are generally fully stocked and the plantations are successful.The area of this working circle has been decreased due to submergence under Hatnur dam project and on account of unauthorized encroachments. Babool plantation programme and cultural operations in the plantations raised in the past have been neglected in that the required operations were not carried out properly, planted lines are growing congested and fertile soil is not utilized fully for the planting programme rigidly. *Prosopis juliflora* has invaded most of the areas. The method prescribed for scrub forests in Vaidya's Plan was improvement fellings of suitable areas and planting in the remaining area. Intensive improvement works such as contour bunding, trenching and gully plugging and raising valuable species were to be carried out. Suitable areas from the annual coupes fit for afforestation and pasture development; were to be separated for afforestation and pasture development works. Afforestation have been carried out in 87 out of 280 coupes to the extent of 2364.50 ha., but the other improvement works have not been undertaken at all. Cleaning, thinning and anti-erosion measures prescribed in the plan under revision were not carried out to the desired extent.

Kuran Working Circle comprises the 60 kurans, which was permanently close to grazing. These were established under the old plan and continued in Vaidya's Plan as well. The grasses in these permanent Kurans were sold out annually on cutting basis. It was also prescribed that the tree growth in these kurans was to be clear-felled excepting Anjan and Fruit trees and intensive improvement works to be carried out wherever necessary. But these prescriptions have not been followed to the desired extent. Some of the Kurans have since been wire fenced and provided with cattle proof trench-cum-mounds particularly under the five year plan programs and under EGS. Intensive improvement works, introduction of better variety of grasses, fire protection and protecting Kuran's against grazing had been neglected and these regulations had not been strictly enforced. Improvement works were carried out only in 608 ha. out of 13,289.28 ha. Bush cutting were not done regularly.

Thomas and Samant's plan:

The area of Jalgaon division was distributed in the following working circles in the Working Plan of Shri. Thomas and Samant written for the period 1989-90 to 1998-99.

Working Circle.		**Area in ha.**
i)	Protection Working Circle.	11,080.22
ii)	Copice with Reserve Working Circle.	11,448.84
iii)	Anjan Working Circle.	7,096.56
iv)	Babool Working Circle.	1,038.00
v)	Afforestation Working Circle.	38,052.60
vi)	Kuran Working Circle.	13,289.28
vii)	Miscellaneous Working Circle	867.12
viii)	Minor Forest Produce (Overlapping) Working Circle.	
	Total Area under Working Plan	**82,872.62**
	Area under Patnadevi Game Reserve	1,304.31
	Total Area	**84,176.93**

Protection Working Circle: This Working Circle included the protection forests from Vadoda and Chalisgaon ranges. 11,080.22 ha. area (Vadoda : 5,368.96 and Chalisgaon : 5,711.26) were covered under this Working Circle. In this Working Circle no felling was prescribed as the forests are on steep slopes. Dibbling of seeds was prescribed in the accessible areas, after carrying out regeneration survey. Results were to be recorded in compartment history file. Strict protection from grazing, fire and illicit felling was required to be done. Anti soil erosion works like nalla bunding, check dam was to be done. Each range were treated as one working series. Working cycle was fixed at 10 years. Subsidiary silvicultural operations such as cutting of woody climbers over 15 cm. girth were prescribed. No thinning of the crop was prescribed. Even dead trees were not to be felled. Removal of fallen wood was allowed, however, dragging was not allowed.

Prescription of the working plan was not followed.

Coppice with Reserve Working Circle: Inferior Teak Wood Forests of Jamner and Chalisgaon ranges are included in this Working Circle. A total of 11,448.84 ha. area (Jamner : 10,670.23 and Chalisgaon : 778.61) The object of management was to improve the condition, composition and density of the crop and ensure adequate regeneration by appropriate silvicultural treatment and to obtain maximum sustainable yield of small timber pole and fuel. In the inferior Teak forests, Teak is of poor quality (IV a). The common associates found are Salai, Khair, Dhawada, Anjan, Awala, Kakad, Tembrun etc. The density is extremely variable and the forests in general are open and poorly stocked. All the immature groups of poles are to be reserved in order to increase the proportion of non-Teak species like Bija, Semal, Haldu, Tiwas and Khair etc. Their proportion to be maintained is 50% amongst the tree reserved. The number of reserved per ha. was to be 150 vigorously growing poles/trees. The aim was to obtain a mixture of 50% Teak and 50% other species. Rotation of 30 years was adopted, there were 6 felling series in Jalgaon division. Yield was to be regulated by area. 30 coupes had been laid out in each felling series of Jamner and Chalisgaon Ranges. Area was to be divided in four categories.

Unworkable and Protection Area: No felling prescribed. The gap and open patches were proposed to be planted with species such as Teak, Khair, Anjan, Sisoo, Tiwas, Shiwan etc.

Patches of Young Pole crop of Teak having area more than one ha.: Thinning were proposed to be carried out, dead, dying and seriously diseased and damaged poles were to be removed. Thinning were to be carried out in such a manner that proportion of non Teak species is brought upto 50% of the total stocking in upper canopy.

Salai Forest of and over 0.4 density: Removal of dead trees were prescribed. No trees were to be removed unless its removal was for benefit of Teak and other valuable species. Teak trees over 60 cm. in IV A quality area, over 75 cm. in IV B areas were to be marked for felling. Thinning was to be done in favour of Teak and other important species.

Other areas: All trees over 15 cm. girth were to be marked for felling except Semal, Kadhai, trees of edible flowers and fruits such as Mahuwa, Char, Tembrun, Chinch, Jambhul and trees required for production of seeds. 150 Well grown poles/trees of Teak and other important species were to be retained per ha. Subsidiary cultural operations such as CBO, Cleaning and Thinning were also prescribed.

The coupes were not worked due to sparse tree growth.

Anjan Working Circle: All the Forests bearing predominantly Anjan as principal species spread over on 7,096.56 ha. (Chalisgaon: 1,955.83 ha. and Vadoda 5,140.73 ha.) area were included in this Working Circle. The object of management was to increase the proportion of economically important species and production of fuel, small timber and Anjan leaves fodder to meet the demand of local people to the extent possible. Anjan Forests are mostly of poor quality and are generally open. Hence improvement felling were proposed. As the object was to built up the growing stock, no rotation was prescribed. Felling cycle of 30 years were adopted. Anjan and Teak were the principal species prescribed for raising in the blank patches of poorly stocked areas. Also Khair, Sisoo and Siras etc. were also to be raised. Yield were to be regulated by area. Plantations were proposed in the open patches. For Moisture Conservation staggered contour trenches of size 4.0x0.45x0.45 mtr. Were prescribed @ 800 per ha. Sowing of seeds of local species were also to be done. In addition subsidiary cultural operations such as CBO, cleaning and thinning were prescribed.

The coupes were not worked due to sparse and poor tree growth.

Babul Working Circle: 1,038 ha. area of Jamner (84.57 ha.), Edlabad (307.15 ha.) and Vadoda (646.28 ha.) ranges were included in this Working Circle. The Babul forests

occur in a narrow strip along the banks of Purna river in Edlabad and Vadoda ranges and Sur river in Jamner range. The object of management was to meet the local demand of small timber and firewood and to derive maximum possible yield. Clear felling and planting of the areas mainly with Babul, Neem and Siras were prescribed. Rotation of 25 years was fixed and yield was to be regulated by area. Felling was to be carried out by digging a trench of 60 cm. deep around the tree and the roots were to be exposed, the trees were to be felled 60 cm. underground so as to enable ploughing of the area by tractor for artificial regeneration. Ridges of 45 cm. high were to be made at 4 mtr. Intervals and line sowing of Babul seeds were to be carried out on ridges. In unworkable areas along the river banks gap planting with polybag plants were proposed. Subsidiary silvicultural operations such as cleaning and thinning were proposed. The planted area was to be protected from grazing for 7 years.The coupes were not worked due to sparse and poor tree growth.

Afforestation Working Circle: 38,052.60 ha. area of Chalisgaon, Parola, Jalgaon, Jamner, Edlabad and Vadoda ranges were included in Afforestation Working Circle. Objectives of management were to rehabilitation of the area in shortest possible time and production of fuel small timber and fodder to meet local demands. Artificial regeneration by tree species, shrubs and grasses were proposed. Species suggested for plantation were Neem, Siras, Sisoo, Anjan, Karanj, Maharukh, Khair etc. Bush sowing of Sandal were also proposed. No rotation was fixed and no yield was expected during the plan period. Coupes were to be divided in unworkable area(A), workable area (B), area suitable for Afforestation (C) and area requiring soil and moisture conservation works (D) In category A removal of only dead trees were prescribed. In category B improvement felling were prescribed. In category C no felling was to be carried out, plantation works were prescribed as per standard afforestation technique. In category D gully plugging, nalla bunding etc. were prescribed. In areas having rainfall upto 800 mm. Sisoo, Shiras, Neem, Sitaphal, Vad Pimpal, Maurina, Bor, Babul, Agave were prescribed for plantation. In areas having rainfall between 800 to 1300 mm. Nilgiri, Glyricidia, Chinch, Khair, Patangi, Peru, Amla, Vad, Pimpal etc. were prescribed for plantation. In areas having rainfall between 1300 to 2000 mm. Sisoo, Nilgiri, Bamboo, Siras, Teak, Khair, Subabul, Vad, Pimpal etc. were prescribed for plantation. Subsidiary cultural operations such as cleaning were prescribed in the fifth year of plantation. The planted area were to be fire protected for the period of ten years and closed for grazing. Afforestations have been carried out on

large scale in the Division, but not strictly as per Working Plan prescription or in the order of working prescribed, under various schemes including Maharashtra Forestry Project. The results are however not very encouraging.

Kuran Working Circle: Area of 13,289.28 ha. spread over 58 Kurans in Chalisgaon, Parola, Jalgaon, Jamner and Edlabad ranges were included in this Working Circle. The object of management was to improve the quality of fodder grasses in Kurans by introduction of better variety of fodder grasses and to step up the yield by prescribing appropriate treatment. For protection of Kurans from illicit grazing and fire, fencing of Kurans were suggested in a phased manner by T.C.M. Improvement works such as introduction of better varieties of fodder grasses, removal of obnoxious weeds, soil conservation works etc. were prescribed. Inferior fodder grasses were to be given a light burn and soil was required to be lightly worked and broadcasting or sowing of seeds of Pavnya, Sheda and Marvel grasses were proposed. Wherever the soil depth permit staggered contour trenches were proposed to be dug and sowing of cenchrous seeds and also stylo santhas hemata were proposed. Uprooting of unwanted bushy growth interfering with the growth of grasses were proposed. Gully plugging and nalla bunding were also proposed as soil conservation measure. The area was required to be protected from fire and grazing. The prescriptions were not followed. However, plantations were carried out on an area of 626.50 hectare under fodder development schemes.

Miscellaneous Working Circle: This Working circle consisted of 867.12 ha. forest areas which were earmarked for disforestation for given to landless people and for executing various irrigation projects. 265.13 hectare area was diverted for non forestry purpose out of the earmarked area.

Minor Forest Produce (Overlapping) Working Circle: This working circle covered the whole area of Jalgaon Division. The object of management was to ensure scientific collection of various Minor Forest Produce and to take measures to increase or atleast maintain the yield of various MFPs. In this, method for collection of Kadai gum, Mahua fruits and flowers, Tendu leaves, Karanj fruits etc. were prescribed. Plantations of Khair, Moha and Hirda were done in the Division. The Minor Forest Produce such as grass, rosha grass, Charoli, Sitaphal and Gums were extracted from the forests.

Wild Life Working Circle: Area of Patna Devi Game Reserve (1304.31 ha.) were included in this Working Circle. It was proposed that management plan for this area will

be prepared by Chief Wild Life Warden and Director, Nature Conservation, Maharashtra State. Pending that works such as plantation of fruit trees along the banks of rivers and tanks, creation of waterholes, construction of watchtowers and strict protection of the area were proposed.

Gautala Autramghat Wildlife Sanctuary was declared in the year 1986 over an area of 6355.19 ha. of Jalgaon Forest Division which included 1304.31 hectare, area of Patna Devi Game Reserve. The area of Wildlife Sanctuary has been handed over to Wildlife Division, Aurangabad for management.

11.3 SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN

- Plantations were undertaken during the 1989-90 to 2000-01 (Annexure No. III) In Jalgaon Division under the following schemes:
- Afforestation for soil & moisture Conservation
- General Utility of Timber - Bamboo.
- Development of fodder resources.
- Plantation of minor forest products.
- Reafforestation of Degraded Forests.
- Massive Afforestation Programme.
- Maharashtra Forestry Project.
- Production Forestry – FP4.
- Reafforestation of Degraded Forests – RDF-2,3
- Afforestation of Wastelands – WA1, WA3.
- Fodder Development – FW1
- Joint Forest Management.
- Artificial Regeneration.
- Employment Guarantee Scheme.
- Compensatory Afforestation.
- Natural Regeneration.
- Drought Prone Area Development Programme.
- Assured Employment Scheme.
- Gram Vikas Scheme.
- Centrally Sponsored Sceheme.

Table No.11.2 The Year-wise plantations done in Jalgaon Division is given in the following table:

Year	Area planted
1989-90	2489.00
1990-91	3000.81
1991-92	3026.74
1992-93	3952.98
1993-94	2573.83
1994-95	4266.08
1995-96	2052.82
1996-97	1343.94
1997-98	1384.88
1998-99	919.00
1999-00	1273.09
2000-01	1040.97
2001-02	250.00
2002-03	91.00
2003-04	510.00
2004-05	411.54
Total	**27324.14**

The reasons attributed to the failure are:

- Wrong sites selection.
- Failure to protect plantations from fire and grazing.
- Biotic pressure.

Vasudevan, T.S.K. Reddy And Tiwari's Plan (2008-09 To 2017-18)

Formation Of Working Circles:

Following working circles were constituted

1. Protection Working Circle.

2. Improvement Working Circle.

3. Anjan Working Circle.

4. Fodder working Circle.

5. Babul Working Circle.

6. Afforestation Working Circle.

7. Plantation (Overlapping) Working Circle.

8. Joint Forest Management (Overlapping) Working Circle.

9. Forest Protection (Overlapping) Working Circle.

10. Joint Forest Management (Overlapping) Working Circle.

11. Wild life Management (Overlapping) Working Circle.

12. Eco Tourism (Overlapping) Working Circle.

(i) Protection Working Circle :

The area included in this circle was 8839.86 ha. This working circle comprised of areas the precipitous slopes of Satpudas of Muktainagar (Vadoda) range and Autram ghat of Chalisgaon Range. The area was to be protected intensively from fire, illicit felling, and grazing. Improvement works such as dibbling and broadcasting of seeds on precipitous slopes and gap planting on gentle slopes ($<25^0$) was to be taken up in this working circle along with soil and moisture conservation works for the betterment of the area. Wild life management works like water holes, salt licks are also provided in protection working circle area.

Special Objects Of Management :

a. To preserve and improve the existing vegetal cover in vulnerable areas with a view to maintain and improve microclimatic and micro-edaphic conditions of the site.

b. To improve the vegetation by seed dibbling on precipitous slopes ($>25^0$) and trench/pit planting on slopes ($<25^0$) along with soil and moisture conservation structures.

c. The compartments adjoining to wildlife sanctuary forms a buffer between sanctuary area and other forest areas where human activity starts.

Method Of Treatment :

felling were not carried out and the existing vegetation in the area shall be preserved, In areas already eroded soil conservation works, such as nala bunding and gully plugging and water conservation measures such as water absorption trenches (WATs) or will be taken up. The rain water that falls in the area will be arrested and allow to percolate to improve the water regime of the area in the under-stocked and blank areas seed sowing of locally found species will be done. The area will be closed for grazing and protected from fire.

Past Results :

No marking and no improvement felling were done as all the area of this working circle falls within a limit of Eco sensitive zone of Jalgaon Division. The works of improvement like plantation works, soil and moisture conservation, seed dibbling in blank areas have been taken.

Artificial Regeneration:

The details of plantation works carried out are as follows.

Table No. 11.3

Year	Coupe No.	Number of coupe	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2007-08	I	8	383.42	50	-
2008-09	II	8	383.33	45	-
2009-10	III	8	428.10	400	328.00
2010-11	IV	8	352.30	52	23.17
2011-12	V	8	399.25	100	21.00
2012-13	VI	8	393.26	75	-
2013-14	VII	8	345.45	150	50.00
2014-15	VIII	8	350.40	150	75.00
2015-16	IX	8	384.79	75	25.00
2016-17	X	8	324.5	80	50.00
Total		**10**	**3744.80**	**1177**	**572.17**

Total 1177 ha area was proposed for artificial regeneration but actually 572.17 ha. plantations are done. The achievement is 48.61 %. In felling proposal no plantations were Out of these plantations, 365 ha .(63.79%) plantations were found successful (Survival more than 60%), 208 ha. (36.35. %) plantations were found partially successful (Survival between 33% to 60%) and 61 ha. (10.66%) were found failure (Survival less than 33%).

Natural Regeneration:

No NR works were done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per the availability of funds through DPDC and Jalyukta Shiwar programme.

Table No. 11.4

Year	Coupe No	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	0	0	0	0
2010-11	IV	0	0	1	0
2011-12	V	0	0	0	0
2012-13	VI	0	0	0	0
2013-14	VII	0	1	2	2
2014-15	VIII	0	0	0	2
2015-16	IX	0	0	0	0
	Total	**0**	**1**	**3**	**4**

The works of CCT, Gully plugging was very effective in arresting the soil erosion and has increased the water regime of the soil which resulted in improving the biomass. Water is made available to the wildlife through Cement Nala Bandh.

Seed dibbling on precipitous slopes were not done however seed dibbling of neem, khair, karanj within plantation areas have been done giving good results.

(ii) Improvement Working Circle :

An area was of this working circle is 44202.43 ha. the Coppice with Reserves compartments of Jamner range and compartments having reasonably good vegetation of Jalgaon, Erandol, Pachora, Parola, Chalisgaon etc. ranges are included in this working

circle. Improvement works such as artificial regeneration in under stocked / blank areas with 50% Teak and rest with bio fuel trees like Karanj, Neem, Mahua, on CCT etc. or lac insect host trees like Kusum, Bor, Khair, Pimpal, Palas etc. or gum exudating root stock and soil and moisture conservation works were to be carried out in this working circle.

THE SPECIAL OBJECTS OF MANAGEMENT :

1. To improve the condition of the growing stock by tending existing rootstock.
2. There is a need to improve blank areas into well stock areas through artificial regeneration.
3. To safeguard the areas against soil erosion and thereby preserve and improve the site quality.
4. The upper reaches and steep slopes will be protected so that grasses can come up in these areas.
5. To increase the proportion of valuable species in the growing stock.
6. The upper reaches and steep slopes will be protected so that grasses can come up in these areas.

Method of Treatment :

No felling is prescribed in the entire area However, dead trees will be removed if economically viable. Only invasive climbers will be cut rest is retained. All live stools of illicit felling cut high above the ground level will be fashioned so that coppicing takes place. Soil & moisture conservation works will be carried out so as to prevent soil erosion and to allow percolation of rain water to the ground. The details of marking rules and subsidiary, silivicultural operation will be given in the draft plan.

Past Results :

Working plan was sanctioned on 10 December 2008, no marking and felling were done, however the works of improvement like plantation works, tending of rooted stock in plantation areas, soil and moisture conservation, seed dibbling in blank areas, have been taken up.

The details of plantation works carried out are as follows.

Table No. 11.5 Artificial Regeneration:

Year	Coupe No	Number of coupes	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2008-09	I	18	1724.11	1206.00	299
2009-10	II	18	1838.43	1102.00	771.2
2010-11	III	18	1964.73	1178.00	280
2011-12	IV	18	1909.22	1240.00	394
2012-13	V	18	1883.09	941.00	446.86
2013-14	VI	18	1877.99	1163.00	460.78
2014-15	VII	18	1946.67	1167.00	397.01
2015-16	VIII	18	1627.88	1025.00	462.76
2016-17	IX	18	1899.23	1329.00	355
2017-18	X	18	1887.23	1356.00	192
Total		**180**	**18558.58**	**11707**.00	**4058.61**

Total 11707.00 ha. area was proposed for artificial regeneration but 4058.61 ha. plantations were actually done. The achievement is 34.66 %. Out of these plantations, 1624.18 ha.(40.00 %) plantations were found successful (Survival more than 60%), 1842.2 ha. (45.00%) plantations were found partially successful (Survival between 33 % to 60%) and 395.58 ha. (9.7%) were found failure (Survival less than 33%).

The species includes Neem, Khair, Sisoo, Amla, Shiwan, Karanj, Anjan, Papda, Bamboo, Beheda, Moha and small proportion of Teak. Most successful species all over the division are Neem, Khair, Sisoo, Karanj. Bamboo has excellent growth in Deoziri range. Khair has attended girth up to 30 cm in fourth year.

Most of the planting was done on trenches. This becomes very much effective in conserving the soil. This has also resulted in to excellent growth of grasses and induced NR.

Natural Regeneration: In the year 2012-13 only 9.86 ha. area taken under NR.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per available funds through DPDC and Jalyukta Shiwar. The details are as below.

Table No. 11.6

Year of operation	CoupeNo	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	150	0	13	0
2010-11	IV	0	0	1	0
2011-12	V	0	0	0	0
2012-13	VI	25	1	9	6
2013-14	VII	0	1	5	6
2014-15	VIII	444	0	4	10
2015-16	IX	348	94	17	12
2016-17	X	0	0	0	0
Total	**10**	**967**	**96**	**46**	**34**

These works are done as per the working plan schedule. Objectives of this working circle were achieved to the greater extent within the availability of funds and through Shramdan.

(iii) Anjan Working Circle :-

An area was of this working circle is 7366.49 ha the predominantly Anjan forest areas of Chalisgaon and Vadoda ranges are included in this working circle. Improvement works such as artificial regeneration in under stocked / blank areas with 50 % Anjan and rest with trees like Karanj, Neem, Mahua, on CCT etc or lac insect host trees like Kusum, Bor, Khair, Pimpal, Palas, etc gum exudating trees like Kadai, Salai, Khair, Dhawada etc. along with tending operations of the existing rooted stock and soil and moisture conservation works were to be carried out in this working circle.

The special object of management are :

1. To meet the local demand of Anjan fodder leaves to the extent possible.

2. To safeguard the areas against soil erosion and thereby preserve and improve the site quality.

3. To improve the growing stock as well as to bring more area of Anjan under regeneration.

Past Results :-

No marking and felling were done however, the works of improvement like, plantation works, NR, soil and moisture conservation, seed dibbling in blank areas have been taken up.

Artificial Regeneration:

The details of plantation works carried out are as follows.

Table No. 11.7

Year	Coupe No	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2008-09	I	336.03	100.00	25
2009-10	II	341.10	110.00	95
2010-11	III	319.73	125.00	75
2011-12	IV	299.80	150.00	51
2012-13	V	413.95	250.00	105
2013-14	VI	414.02	150.00	55
2014-15	VII	342.02	180.00	1.42
2015-16	VIII	350.27	200.00	140
2016-17	IX	373.60	190.00	50
2017-18	X	396.39	100	80
Total		**3586.91**	**1555**	**652.42**

Total 1555 ha area was proposed for artificial regeneration but actually 652.42 ha plantations were done. The achievement is 43.56%.–Out of these plantations 125 ha.(18.4%) plantations were found successful (Survival more than 60%), 476.42 ha. (70.02 %) plantations were found partially successful (Survival between 33% to 60%) and 51 ha. (7.5 %) were found failure (Survival less than 33%).

The species planted includes Anjan Neem, Khair, Sisoo, Amla, Shiwan, Karanj, Papda, Bambbo, Behda, Moha and Teak.

Natural Regeneration: No NR works done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per availability of funds mainly through DPDC and Jalyukta Shiwar. The details of work carried are as below.

Table No. 11.8

Year of operation	Coupe No.	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	0	0	0	0
2010-11	IV	0	0	0	0
2011-12	V	0	0	1	1
2012-13	VI	0	0	0	0
2013-14	VII	0	0	0	0
2014-15	VIII	5.92	0	0	2
2015-16	IX	20	0	17	0
Total		**25.92**	**0**	**18**	**3**

During plan period, 25.92 ha. CCT, 3 works of gully plugging , and 18 earthen bunds works were taken. All these works were found very effective in conserving the soil and moisture. The works of CCT were also become very effective in removal of encroachment and rejuvenation of these areas with vegetal and grass cover.

(iv) Fodder Working Circle. :-

An area of 12995.34 ha. spread over all the ranges of the division are included here. The working circle comprises of areas which are subjected to heavy grazing and have very poor soil. Tree growth is rare and grasses commonly seen include Schima nervosum (pavanya), Schima sulcatum (sheda) and Heteropogon contourtus (kusali).

SPECIAL OBJECTS OF MANAGEMENT

- To conserve soil & moisture effectively.
- To improve the quality of fodder Grasses & vegetal cover of the area.
- To meet the Local demand of fodder & fuel wood.

METHOD OF TREATMENT

TREATMENTS PROPOSED:

The various treatments proposed are as under:

Demarcation of Coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of Treatment Map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

The area will be classified as follows:

TYPE A areas: -

These areas will be covered with soil & moisture conservation works like gulley plugging & Nala bunding. Seed sowing with the seeds of Anjan, Babul, Neem, Siras and other fodder species etc. will be done by Forest Guards & watchmen at suitable places.

Type B areas: -

These areas are unworkable areas the existing Euphorbias & other bushes in this areas will be protected properly seed of Neem, etc. will be sown in these bushes before onset of monsoon through forest guards & watchman.

Type C areas: -

All these areas will be covered with soil & moisture conservation works. All old successful plantations with crowded pole crop will be given light silvicultural thining favouring the growth of Neem, Anjan, Sissoo, Siras and other fodder species etc.

Type D areas:- Soil and moisture conservation works to be taken in these areas.

The following species given in the list below should be preferred.

Grasses

1. Dongari grass *Chrysopogon fulvas*

2. Motha Paunay (Sheda) *Sehima nervosum*

3. Anjan grass *Cenchrus cillaris*

4. Marvel *Dicanthium annulatum*

Past Results :- No marking and felling were done due to apprehension of encroachment however, the works of improvement like, plantation works, soil and moisture conservation, seed dibbling in blank areas have been taken.

Artificial Regeneration:

The details of plantation works carried are as follows. **Table No. 11.9**

Year	Coupe No	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2008-09	I	557.87	100.00	0.00
2009-10	II	514.72	200.00	126.00
2010-11	III	512.61	400.00	380.00
2011-12	IV	556.70	150.00	203.00
2012-13	V	532.40	135.00	29.32
2013-14	VI	583.33	120.00	203.98
2014-15	VII	532.40	125.00	100.00
2015-16	VIII	491.87	75.00	37.5
2016-17	IX	515.19	120.00	163.00
2017-18	X	495.91	180.00	113.00
Total		**5293**	**1605.00**	**1355.8**

Total 1605.00 ha area was proposed for artificial regeneration but actually 1655.80 ha plantations were done. The achievement is 84.47 Out of these plantations 821.82ha.(60.00%) plantations were found successful (Survival more than 60%), 348.98 ha. (21.07 %) plantations were found partially successful (Survival between 33 % to 60%) and 50 ha. 3.01 %) were found failure (Survival less than 33%).

Natural Regeneration: No NR works were done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per availability of funds mainly through DPDC and Jalyukta Shiwar. The details of work carried out are as below.

Table No. 11.10

Year of operation	Coupe No.	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	150	0	20	0
2010-11	IV	0	0	0	0
2011-12	V	0	0	0	0
2012-13	VI	0	0	1	1
2013-14	VII	0	1	0	0
2014-15	VIII	50	0	3	2
2015-16	IX	DCCT-90	3	1	0
Total-		**290**	**4**	**25**	**3**

During plan period, 290 ha. CCT, 4 CNB, 3 works of gully plugging , and 25 earthen bunds works were taken. All these works were found very effective in conserving the soil and moisture. The works of CCT were also become very effective in removal of encroachment and rejuvenation of these areas with vegetal and grass cover.

(v) Babul Working circle :-

This working circle comprises of all the forests predominantly babul (Acacia nilotica-telia babul), hiver and prosopis as the principal species. The forest along Purna river passing in Mukatainagar range are included in this working circle. Under this working circle, the blank areas along the river side were to be planted with babools major species along with arjun, khair, sisoo etc. The total under this working circle is 1209.93 ha.

Special Objects Of Management

The special objects of management will be

1. To meet the local demand of firewood to the extent possible.

2. To safeguard the areas against soil erosion and thereby preserve and improve the site quality.

Method of Treatment **Treatments Proposed**: The various treatments proposed are as under:

Demarcation of Coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of Treatment Map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

The area will be classified as follows:

Area 'A':

(i) The soil and moisture conservation treatment shall be as given in Miscellaneous Regulation.

(ii) Planting Arjun, Sissoo, Anjan and grasses along the nala and river bank.

Area 'B':

(i) Under stocked and blank forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetvera tussuks should be planted on the silted soil. On gentler slopes ($<15^0$) CCT works should be done seed of locally available species as per DCF's choice should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

(ii) Plantation of Babul, Hiver, Anjan, Arjun, Neem, Sissoo should be preferred in this working circle. Plus trees of these species should be identified in the division and the seed of these trees should be used for raising plants in nursery or seed sowing. All these are naturally found in the forests of Jalgaon forest division. These miscellaneous species should be raised in polypots or root trainer containers. pits or trenches as per suitability of site should be adopted. The DCF should choose the model with technical approval from CCF (T).

Area 'C': This area does not need any planting.

Type 'D': In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

Marking Rules For Babul W.C.

Marking For Type 'A' Area: No marking will be carried out.

Marking For Type 'B' Area:.

All Malformed advance growth of babul up to 30 cm. Shall be cut back

The undesirable under growth, which is preventing growth of natural regeneration of desired species, will be removed.

Marking For Type 'C' Area:

Thinning shall be carried out in these areas.

Marking for Type 'D' Areas:

All dead, dying, diseased and malformed trees, all live high stumps and all except one vigorously growing coppice shoot per stool will be marked for felling.

Malformed advance growth of babul tree should be cut and extra growth preventing the development of babul should be removed at the decretion of field officer.

No fruit bearing tree shall be marked for felling.

Past Results : - No marking and felling were done however, the works of improvement like, plantation works, NR, soil and moisture conservation, seed dibbling in blank areas have been taken.

Artificial Regeneration:

The details of plantation works carried are as follows.

Table No. 11.11

Year	Coupe No	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2007-08	I	115.51	25.00	0
2008-09	II	101.31	20.00	0
2009-10	III	108.16	15.00	0
2010-11	IV	109.18	45.00	0
2011-12	V	118.73	60.00	0
2012-13	VI	157.11	40.00	0
2013-14	VII	54.47	20.00	0
2014-15	VIII	118.11	25.00	0
2015-16	IX	110.23	25.00	25.00
2016-17	X	43.19	25.00	0
Total		**1036.00**	**300**	**25.00**

Total 300 ha area was proposed for artificial regeneration but actually 25 ha plantations were done. The achievement is 8.3 % Out of these plantations 25 ha.(8.33%) plantations were found successful (Survival more than 60%).

Natural Regeneration: No NR works were done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per availability of funds mainly through DPDC and Jalyukta Shiwar. The details of work carried out are as below.

Table No. 11.12

Year of operation	Coupe No.	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	0	0	0	0
2010-11	IV	0	0	0	0
2011-12	V	0	0	0	0
2012-13	VI	0	0	0	0
2013-14	VII	0	01	0	0
2014-15	VIII	0	0	0	0
2015-16	IX	0	0	0	0
Total		**00**	**01**	**00**	**00**

During plan period, 1 CNB works were taken. This works were found very effective in conserving the soil and moisture. The works of CCT were also become very effective in removal of encroachment and rejuvenation of these areas with vegetal and grass cover.

(vi) Afforestation Working circle:-

The forest areas having good soil depth and devoid of vegetation are included in this working circle. Intense planting and soil and moisture conservation works are prescribed in this working circle.

Special Objects Of Management

- To reclaim the area by intensive soil and moisture conservation works.
- To increase the percentage of vegetation growth.
- To increase the productivity of forest land.
- To maintain and preserve the biodiversity of the area by encouraging the plantation of indigenous speices. As well as fodder species etc.

METHOD OF TREATMENT

Treatments Proposed: The various treatments proposed are as under:

Demarcation of Coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of Treatment Map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

The area will be classified as follows:

Area 'A':

(i) The soil and moisture conservation treatment shall be as given.

(ii) Planting Bamboo, Jamun, Arjun And Grasses along the nala and river bank and fodder species too.

Area 'B':

(i) Under stocked and blank forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetvera tussuks should be planted on the silted soil. On gentler slopes ($<15^0$) CCT works should be done. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

(ii) **Area 'C':** This area does not need any planting.

Area 'D': In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

MARKING RULES FOR AWC

Marking For Type 'A' Area:

No marking will be carried out.

Marking For Type 'B' Area:

(i) All dead, dying and diseased trees after retaining 2 dead trees per ha. shall be marked for felling.

(ii) All live high stumps shall be cut as close to the ground as possible and dressed.

(iii) All Malformed advance growth up to 30 cm. shall be cut back.

(iv) The established multiple coppice shoots will be reduced to one per stool retaining the vigorous one which is closer to the ground.

(v) The undesirable under growth, which is preventing growth of natural regeneration of desired species will be removed.

Marking for Type 'C' Area:

Thinning should not be carried out in this area.

Marking for Type 'D' Area:

All dead, dying, diseased and malformed trees, all live high stumps and all except one vigorously growing coppice shoot per stool will be marked for felling.

Malformed advance growth upto 30c.m. in girth will be cutback. The over wood and inferior species likely to interfere with the coppice growth will be marked for felling.

No fruit bearing tree shall be marked for felling .

Past Results : - No marking and felling were done the works of improvement like, plantation works, NR, soil and moisture conservation, seed dibbling in blank areas have been taken.

Artificial Regeneration:

The details of plantation works carried are as follows.

Table No. 11.13

Year	Coupe No	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2008-09	I	567.04	125.00	50.00
2009-10	II	524.97	200.00	0.00
2010-11	III	514.20	175.00	215
2011-12	IV	468.71	100.00	121.33
2012-13	V	518.34	150.00	131.00
2013-14	VI	494.70	190.00	80.00
2014-15	VII	510.22	300.00	41.00
2015-16	VIII	500.14	270.00	79.70
2016-17	IX	445.88	160.00	250.00
2017-18	X	530.74	350.00	90.00
Total		**5074.94**	**2020.00**	**1078.03**

Total 2020.00 ha area was proposed for artificial regeneration but actually 1078.03 ha plantations were done. The achievement is 53.36 %. Out of these plantations 604.7 ha.(56.09%) plantations were found successful (Survival more than 60%), 337.36 ha. (31.29 %) plantations were found partially successful (Survival between 33% to 60%) and 101.0 ha. 9.36 %) were found failure (Survival less than 33%).

Natural Regeneration: No NR works done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried out as per availability of funds mainly through DPDC and Jalyukta Shiwar. The details of work carried out are as below.

Table No. 11.14

Year of operation	Coupe No.	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	00	00	00	00
2008-09	II	00	00	00	00
2009-10	III	50.00	00	03	00
2010-11	IV	00	00	00	00
2011-12	V	00	00	00	00
2012-13	VI	00	01	01	01
2013-14	VII	00	01	00	01
2014-15	VIII	75.00	00	01	00
2015-16	IX	140.00	04	08	00
Total		**365.00**	**06**	**13**	**02**

During plan period, 365 ha. CCT, 06 CNB, 02 works of gully plugging , and 13 earthen bunds works were taken. All these works were found very effective in conserving the soil and moisture. The works of CCT were also become very effective in removal of encroachment and rejuvenation of these areas with vegetal and grass cover.

(vii) Plantation Management (Overlapping) Working Circle :

This is an overlapping working circle. The division area is covered in previous three working circles and in all three working circle, blank fillings and soil and moisture conservation works were prescribed.

There are some successful plantations in the division, and these plantations are covered in this working circle. The old and successful plantations in the Division were included in this working circle. This is an overlapping working circle.

The special object of management are :

1. To improve the growing stock by tending of the existing Plantations.

2. To meet the local demand of fire wood and small timber to the extent possible.

As the object of management is improvement, only climber cutting, tending etc are proposed to be carried out in this working circle.

METHOD OF TREATMENT

From the list of plantations carried out in the division since division inception, DCF should prepare list of 2000 to 2500 hectares of old plantations and assess first its success or failure. The reasons for their present condition should be analyzed. The verification and assessment will be done by RFO and ACF and reported to DCF. DCF should verify 10% of failure plantations and hundred percent successful plantations, before preparing estimations for cultural operations. The list of all plantations should be circulated to CF working plan and DCF evaluation of the circle. These offices should verify failure plantations at random and hundred percent verification of successful plantations.

All three wings i.e. field, evaluation and working plan officer shall independently assess these plantations and come together at CF working plan office in the month of December for object analysis of these plantations and make a report to CCF (Territorial) by January 15th every year.

Cut Back Operation: The stumps of illicitly cut tree will be felled in slanting manner by saw. Dressing of the stool will be carried out. The area will be protected from fire.

First Year Operation: Two vigorous and straight coppices coming from the lower most side will be retained. Other coppices will be cut. Seed sowing will be carried out in the blank areas. Soil and moisture conservation works will also be taken up. Area will be protected from fire.

Second Year Operation: Singling operation will be carried out and only one vigorous and straight coppice coming from the ground level will be retained and other coppices will be cut. Area will be protected from fire.

Subsidiary Cultural Operation: All climbers will be cut. If some miscellaneous plants are having multiple leaders only the most vigorous shoots will be retained and others will be cut.

Thinning Methods: General considerations: When a plantation is made, silvicultural requirements, particularly, the restoration or creations of a tree cover to the soil. Dictate spacing plan would be adopted if economy is not the immediate cause and number of

plants required had alone to be considered. Many of the original number of planted have to be cut out when they are of little of no sale value to permit satisfactory development of those retained. Even so, the number of stems still standing after the first thinning of two, will be far greater than the final number at maturity, and somewhat irregular spacing is relatively unimportant as it can be adjusted in later thinning. The thinning operations should be carried out as prescribed in miscellaneous regulations.

Past Results :- No marking and felling were done the works of improvement like, plantation works, NR, soil and moisture conservation, seed dibbling in blank areas have been taken up.

Artificial Regeneration:

The details of plantation works carried are as follows.

Table No. 11.15

Year	Coupe No	Total Coupe area (Ha)	Area Proposed for treatment (Ha.)	Actual Plantation works taken (Ha.)
2008-09	I	336.03	100.00	25
2009-10	II	341.10	110.00	95
2010-11	III	319.73	125.00	75
2011-12	IV	299.80	150.00	51
2012-13	V	413.95	250.00	105
2013-14	VI	414.02	150.00	55
2014-15	VII	342.02	180.00	1.42
2015-16	VIII	350.27	200.00	140
2016-17	IX	373.60	190.00	50
2017-18	X	396.39	100	80
Total		**3586.91**	**1555**	**677.42**

Total 1555 ha area was proposed for artificial regeneration but actually 677.42 ha plantations were done. The achievement is 43.56%.

The species planted includes Anjan Neem, Khair, Sisoo, Amla, Shiwan, Karanj, Papda, Bambbo, Behda, Moha and Teak.

Natural Regeneration: No NR works were done in this division.

Soil and moisture conservation works:

Soil and moisture conservation works were carried as per availability of funds mainly through DPDC and Jalyukta Shiwar. The details of work carried are as below.

Table No. 11.16

Year of operation	Coupe No.	CCT (Ha)	CNB	ENB	Gully plugging (Ha)
2007-08	I	0	0	0	0
2008-09	II	0	0	0	0
2009-10	III	0	0	0	0
2010-11	IV	0	0	0	0
2011-12	V	0	0	1	1
2012-13	VI	0	0	0	0
2013-14	VII	0	0	0	0
2014-15	VIII	5.92	0	0	2
2015-16	IX	20	0	17	0
Total		**25.92**		**18**	**3**

During plan period, 25.92 ha. CCT, 3 works of gully plugging , and 18 earthen bunds works were taken. All these works were found very effective in conserving the soil and moisture. The works of CCT were also become very effective in removal of encroachment and rejuvenation of these areas with vegetal and grass cover.

(viii) Non Timber Forest Produce (Overlapping) Working Circle :

This was an overlapping working circle extends over the entire plan area.

Minor forest produce comprises all forest products other than timber and fuelwood and include medicinal plants, gums, resins oleoresins, essential oils, fatty oils, edible and wild plants, tanning acids, fodder and forage plants, colouring material, katha, oxalic acids, saponins, insecticides, green manures, beads, rubber plants, plants useful for paper baskets, wicker work including canes, beedi leaf, thatching material, broom material etc. Besides these plant products, animal products such as lac, honey and wild animal extracts like horns, hoover, ivory, hides, which are now banned from trade are included amongst minor forest produce or non timber forest produce.

Special Objects Of Management :

- To generate employment and improve the economic situation of the local rural people.
- To identify and assess different NTFP resources in the division.
- The local people should be taught about the collection / tapping technologies and sorting of the collected produce.
- Assessing the NTFP potential of the division.

Parliament has enacted a law "The Provisions of the Panchayat (Extension to the Scheduled Areas) Act, 1996 (Act No.40 of 1996)". The said Act provides for endowing by the States, the Panchayats in necessary to enable them to function as institution of self Govt. It further provided that a State Legislature should ensure inter-alia that the Panchayats at the appropriate level and the Gram sabhas are endowed specifically with the owenership of minor forest produce.

Govt. of Maharashtra has enacted a law "Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas Act. 1997 and has amended Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969 (Act No. 45 of 1997)". Vide which ownership of 33 MFP specified in the Schedule, found in the Govt. land has been transferred to the Panchayats.

Past Results :-

Another development is the 73rd Constitutional Amendment which gives right on minor forest produce to the Gram Sabha in PESA. The Honorable Governor of Maharashtra has modified existing Acts and has given the right of all minor forest produce (including Tendu, and Bamboo) to the Gram Sabha vide notification dated 19.8.2014.

Efforts were made to cultivate lac for which training were also imparted to the JFM members but it could not succeed. No systematic work of MFP collection is done except for Tendu by departmental collection. Gum has a tremendous potential. Training was also given to the people of village Bormali in Vaijapur range for enhancing the productivity of gum.

The collection of Tendu leaves is one of the income generating sources for local tribal's. The details of royalty received during plan period from Tendu collection are as below.

Table No. 11.17

Year	Yield (Std Bags)	Royalty received (Lakh)
2008-09	2195.846	1098572
2009-10	1942.659	1256786
2010-11	2186.96	704111
2011-12	1820.305	1520358
2012-13	Unsold	0
2013-14	Unsold	0
2014-15	Unsold	0
2015-16	1462.450	1057100
2016-17	1527.185	1666050
2017-18	825.185	1021000
Total	**3814.820**	**83,23,977**

Out of 164 JFMC's, almost in all JFMC's gum is collected but no proper record is kept. This is not a complete data and the gum collection was much more. Recently *Cassia tora* seeds were found collected by local peoples residing near forest. It is learnt that these seeds are to be used in tea and medicine. No data is available of its collection.

IX) Forest protection (overlapping) Working circle.

The forests suffer heavy biotic pressure, especially, uncontrolled grazing, resulting in trampled regeneration and compact soils, devoid of humus. Excessive grazing and uncontrolled fires are the main adverse factors causing degradation of forests in the division. The situation requires some bold measures to minimize these adverse influences. Boundary demarcation will be carried out in time bound manner for ensuring territorial integrity of forest. The Revenue and Forest Departments shall ensure maintaining forest boundaries, updating land records and reconciling revenue records in accordance to forest notifications.

This is an overlapping working circle covering the entire forest area of the tract dealt with. Thus the total area included in this working circle is 86914.13 ha. The forests are burdened with heavy biotic interferences, hence addressing of these problems in a systematic manner necessitated the constitution of this working circle. grazing, poaching and fires are the major causes of the damage of the forests. Wireless facilities have been provided in the Division. 20 wireless base stations and 1 repeater station have been established in the Division. Also wireless handsets were provided to the staff. However

they are now defunct and not in use. There were two check posts to prevent illegal transport of forest produce. The forest check post exists at Purna in Vadoda range and Bhusaval in Muktainagar range.

SPECIAL OBJECTS OF MANAGEMENT:

- To enforce the Indian Forest Act 1927, Wildlife Protection Act 1972 as amended till 2003 for the effective control of Illicit felling, grazing, encroachments poaching and fires.To develop the database to monitor various offence cases in a systematic manner.

Illicit Felling: Illicit felling is observed near areas adjoining to Madhya Pradesh. Mostly Teak trees are felled and carried away across the border after converting them to square logs or planks at site it self. Faster communication including vehicle facilities, adequate defense capabilities, frequent training and establishment of forest stations at strategic places are recommended to control illicit felling and wildlife offences. Establishing intelligence network for this purpose is strongly recommended.

In addition to addressing supply-side management by augmenting wood production on forest and other community land, the demand-side management should take up efficient wood utilization and energy efficient alternatives like Community Kitchens of Hindustan Petroleum, Biogas, solar cookers, etc. The following general principles are prescribed for the effective protection of the forest.

- Review the offence cases beat wise, every month.
- Review the *varas, bevaras* offence cases monthly, efforts be made to find out the offenders in each *bevaras* case.
- Every offence case having more than Rs.10,000/- worth forest produce/loss to the forest invariably be submitted to the court within the prescribed time.
- Delay in the submission of charge sheets in the courts be viewed seriously.
- Use IPC provisions, for the effective control of the illicit felling.
- The data related to offence cases shall be analyzed with the help of the computers using the available software.
- Monitor the occurrence of all the offence cases daily through wireless.
- Reorganize the beats in such a way so that the average beat area shall be 500 ha.
- Identify and list all the paths used for the transportation of illicit material.

- Place effective patrolling squads at all important routes to prevent the transportation of illicit material.
- Emphasis shall be made to arrest and prosecute the offenders rather than seizing the material.
- Use the provisions of rewards for gathering of information.
- Provide regular training to the staff in submitting the charge sheets, preparation of *panchanamas* etc.
- Plan in such a way to have young guards in the hyper sensitive areas.
- Patrolling squads shall be not less than 10 in number to over come the gang of offenders.
- History sheets of all the offenders along with their photo and bio-data be maintained at Round Level, Range and Division Level.
- Prepare the list of offenders, showing the offence cases involved by him, against the each offender.
- Use Cr. P. C. 110 provisions with respect to habitual offenders.
- Provisions of IPC 395 shall be used by registering the complaint in the police station for the offences wherein five or more than five offenders are involved. The DCF shall co-ordinate with the S.P. to see that stringent sections of IPC will be used in the F.I.R.
- The provisions of the G.R. dated 8/5/2003 shall be implemented. If any difficulties are there be communicated to the Govt. with supporting data.
- Sufficient funds for patrolling and honorarium of advocates be made available on top priority.
- Efforts be made to appoint the forest counsel as directed by PCCF office.
- Every stump in the forest be numbered with digit nail set both on the top of the stump as well as on the base.
- Every beat guard shall maintain a register of stumps in the following proforma. Every stump is registered by a serial number followed by/ and year, for example, if tree number is 198/05. Here 198- is tree no. and 05- is year.
- Every year from January 1, onwards start the new series.
- After one year all the high stumps be dressed to ground level to obtain good coppice.
- The supervisory officers, during the beat inspection, verify the registered stumps and unregistered stumps. The beat guard shall be held responsible for non-registering the illicit stumps.

- Every Range and Division office shall maintain the Xerox copies of the judgments of all forest cases for the guidance and improvement purposes.
- Sections of IPC having the trial jurisdiction of District Court be used in the complaints and in the FIR
- Court Guards duties be assigned to a special duty guard for each Range office and as well as Division office to monitor the dates and for timely communication to the witnesses.
- Proposals for the wireless network shall be prepared in such a way that every part of the division area becomes communicable.
- Inter state co-ordination meetings with the authorities of M.P. Govt. shall be made, to arrest and prosecute the offenders of M.P who are involved in the offences of Maharashtra state. .
- Obtain the support of the local villagers in catching the offenders (JFM Committees)
- The RFO shall collect the beat *khairiyat* report from each forest guard and Round officer monthly and shall submit Range *khairiyat* report to the DCF every month.

Fire Protection:

Fire adversely affects natural regeneration, forest growth, ground Flora, soil organisms and site productivity. Effective fire control as prescribed in the plan is essential for the forest development. The division officials and local people shall be sensitized about the need of effective fire control. All fire incidences must be meticulously recorded and investigated to assess the damage caused.

Fires are of common occurrence. Due to highly combustible undergrowth consisting of dense grasses and dry lantana, a tiny spark can trigger off a conflagration in a short time. Lantana, when dry, is extremely combustible. It throws up a huge flame, which scorches the leaves and bole of trees completely. The splinters of lantana go high up and are blown across wide area, which make fire fighting very difficult. The high speed of hot winds during summer, combined with the hilly configuration accelerates the spread of fire easily when it occurs and engulfs vast areas before it can be brought under control only by counter firing. Owing to lantana undergrowth the fires rise to a height of 4-6 m. The height of the flame, thick lantana undergrowth, steep slopes and distances of the village are the main impediments in putting off the fire. The fire spreads rapidly before the arrival of the staff. It would be dangerous to put off fire manually in such high-rise flames. With a

long standing fire protection measures and vigilance of the staff, the forests, in general, have been protected against fires in spite of the handicaps.

Classification of fire control

Class-I (Complete Fire Protection): The Class-I fire control areas include all felling coupes (six years) of SCI and Teak Plantation Working Circle, Improvement Working Circle, thinning coupes (six years), plantations (five year), the A-type areas (permanent), forest depots (permanent), forest nurseries (permanent), Special habitat areas (permanent) and any other areas of special importance decided as such by the CCF (T).

Class-II (General Fire Protection): The Class-II fire control areas include the remaining areas of the Selection-Cum-Improvement and the Improvement Working Circle as well as any other areas, which deserve the protection in the opinion of the CCF (T).

Class-III (General vigilance): The remaining forest areas (that is, areas not included in the above two classes) are identified as the Class-III fire control areas. Special measures for the fire protection are not undertaken, but deliberate setting of fire and burning the forest is prohibited.

Fire control measures:

A fire protection scheme for the entire division shall be prepared before November each year, identifying the watch points (including watch towers), strategic locations, and strength of fire watchers at each location, deployment of vehicles, use of wireless sets, supervisory forest staff and the co-ordination protocol.

Each location is proposed to have 5 to 10 persons including regular staff and fire watchers. The staff shall be trained in the application of modern fire-fighting tools. The fire prevention shall be trained as a high priority item. The scheme shall be implemented sincerely during the fire season.

Areas deliberately burnt for silvicultural reasons under the sanction of the Chief Conservator of Forests (T) shall be excluded from the fire protection scheme. Fire in such areas need not be reported unless spreads beyond such area.

All the Class-I and Class-II areas will have external fire lines and internal fire lines dividing the forest area into convenient blocks.

Fire Watchers and local forest staff shall constantly patrol the Class-I and Class-II fire control areas. The directives require that fire in the Class-I areas be reported to the Deputy Conservator of Forests immediately along with details of the area burnt and the damage inflicted to the forest crop.

The group of fire watchers shall immediately rush to the site and extinguish fire as soon the fire spot is located by upcoming smoke in their area of operation. Modern fire fighting tools shall be used for extinguishing the fire. The supervising officials should mobilize reinforcement in case of large fire. Utmost care will be taken to quench the smouldering material. Providing a thick layer of soil over such material is generally effective.

The fire lines shall be kept clear of all growth and combustible material during the season. Leaf litter and other dry material on the fire lines shall be collected periodically along the edge and burnt before the fire season starts.

The cutting of fire lines shall be completed by December. Fire tracing (burning) shall be completed by February15, and thereafter burning should require permission of the Deputy Conservator of Forests and physical presence of a gazetted officer.

The division office shall maintain a "Register of fire lines" showing the length and width of fire lines, and enter the period of cutting and burning of fire lines. The register will be kept up to date and checked every year, in March.

Negligence in the fire protection shall be taken as dereliction of duty. The supervisory officers shall extensively verify fire control measures.

Motivate the villagers to protect and control the fire by giving rewards to the community. The grant available for fire protection shall be given to the JFM/village committee for protection of forest from fire at the end of the fire season after making due verification by the officer in charge.

It was observed that the existing fire lines are not maintained in their prescribed width for its full length. Hence their efficacy could not be assessed in the absence of clearly laid fire lines. So the scheme submitted by CCF (T) shall be implemented for one year and its efficacy be assessed. The committee formed by PCCF will assess and based on its report the PCCF shall take decision for further implementation of the scheme.

Three rows of agave suckers in 1.5 m. wide strip along the contours shall be planted during the monsoon season at the foothills of steep slopes to prevent the spread of fire, as agave acts as a fire barrier. This activity shall be carried out along with regular coupe work.

Standard widths of fire lines are prescribed in the **Table 11.18 Standard widths of various types of fire lines-**

Sr. No.	Characteristics of the area	Width of fire line in meters
1	External boundaries of the forest	12
2	Naturally or artificially regenerated areas (For 5 years) (coupes)	6
3	Remaining coupe boundary	3
4	Both sides of road and cart tracks through the forests	6
5	Timber, bamboo and firewood depots	40

Grazing regulations

The entire forests are liable to damage from grazing except the interior areas, which are away from the villages. In fact, there is hardly any grass left in this block and they only serve as exercise grounds for the cattle. These areas are very undulating and the soil is very poor and are, therefore, even unfit for cultivation. The 'A' class forests adjoining the *Berar* plains are very hilly, and the upper slopes are steep. The grazing is, therefore, confined to the lower hills and the calculated incidence does not give the true picture of the grazing pressure here, while a large inaccessible area of the units remains un-grazed. A realistic calculation of grazing incidence is required.

The grazing incidence figures are misleading as the erstwhile forest village cattle are grazed in the immediate vicinity of the villages. The true grazing incidence in the areas adjoining the villages is therefore, heavier than estimated.

The animals, mostly buffaloes from local villages, and some cattle from kutch plains are grazed from cattle camps, locally known as *kathewadis* in the interior of forests in the hot season. During this hot weather grazing after the depletion of grasses, grazers start lopping green foliage, especially of Ain *(Terminalia tomentosa)*, Bhosa *(Bauhinia racemosa)*, Kusum *(Schleichera oleosa)*, Karkha *(Bridelia retusa)*, Dhaman *(Grewia tiliaefolia)*, Kahu *(Terminalia arjuna)*, Salai *(Boswellia serrata)*, Ghatbor *(Zyzypus xylocarpa) and*

Bamboo *(Dendrocalamus stictus).* The lopping and hacking of trees has led to degeneration of the forests. The seedlings are grazed and saplings of these fodder tree species have been hacked to provide fodder to the cattle. Continuous and heavy grazing not only prevents regeneration of tree species but also the young regeneration obtained during the period of closure, is lost soon after the area is opened for grazing. In areas with clayey soil, the trampling by cattle results in hardening of soil and reduction in the soil aeration. In sandy soils, heavy grazing results in accelerated erosion and denudation. The grazing on undulating lands loosens the soil, which results in the soil erosion. The problem of migrated cattle is severe Jalgaon division which needs utmost attention to control the grazing.

It is not uncommon to see goats grazing in timber forests. The goat grazing is prohibited because of their close level grazing in which the seedling or grass rhizome is uprooted.

The grazing shall be regulated as per guidelines of Grazing Policy 1968 of Maharashtra State issued vide Resolution No. MFP-1365/132211-Y dated December 6,1968 and Grazing Rules issued vide No. MFP-1371/237035-Z dated November3, 1973.

Heavy cattle pressure adversely affects the forest regeneration and soil condition. The statutory provisions regulated grazing are difficult to apply in the entirety. The present political economy of domestic animals in the area throws up strong challenge, and implementation of the grazing regulations in its current form.

The situation may be substantially improved by establishing effective communication with the local people, awareness generation and efficient animal husbandry program. The forest officers should take up these preventive measures in co-ordination with the Animal Husbandry Officers.

Maximum admissible grazing incidence according to the current policy has been shown for various working circles. A systematic survey of fodder availability is recommended during the plan period in each round.

The carrying capacity and period of closure should be calculated for the forest area adjoining each village. The grazing passes, free or otherwise to individual families are proposed to be distributed on the calculated carrying capacity basis. Village bodies should also be actively be engaged in the implementation of grazing regulations.

The surplus cattle should be kept under regular watch, and villagers should be encouraged to adopt stall-feeding or other means to address mismatch between cattle-heads and fodder availability.

Table no.11.19 Admissible grazing incidence in various working circles

Working Circle	Functional classification	Maximum grazing incidence (ha per cattle unit)	Period
Special areas(overlapping)			
Protection areas (A1 & A2) & Special habitat areas	Protection forest	Nil	Permanent
Annual coupes	Protection forest	Nil	Till six years
Plantations	Protection forest	Nil	Till fifth year
Other area (under Working Circles)			
Anjan working circle	Tree forest	1.2	
Babul working circle	Tree forest	1.2	
Fodder working circle	Pasture lands	0.4	
Improvement	Tree forest	1.2	
Afforestation	Open forest	0.8	After plantations
Protection	Protection forest	4.0	Permanent

Note: Area required for wildlife population should be calculated accordingly, and deducted from the available area for the domestic cattle. If relevant data is not available 20% area should be marked for the wildlife.

Fodder development on the community lands and translocation of surplus cattle may be encouraged.

Animal husbandry and Dairy Development Agencies should be motivated and influenced to take up breed improvement program. Fodder in the plantation areas should be made available free of cost on cut-and-carry basis.

The DCF shall carry out cattle census of each village during the winter season at the beginning of the plan period to find out the local cattle once for all and maintain record and passes shall be issued limited to those cattle subject to the availability of carrying capacity.

The passes shall show the compartment numbers meant for the grazing by writing clearly.

Hacking and felling of young plants and big trees be dealt seriously and offenders shall be prosecuted.

The misuse of transit passes of cattle for grazing be strictly checked and if found their passes be cancelled and be dealt according to law.

The Grazing Settlement Report for Jalgaon areas need revision since the reorganization of the divisions and wildlife areas led to the distribution/splitting of the then grazing units. Hence new Grazing Settlement Report shall be prepared as early as possible to avoid conflicts among the villages for grazing purpose.

Forest Encroachment:

In recent past tendency for encroaching forestland for cultivation has increased. The actual encroached area is higher than the recorded one. The eligible encroachers encroachment is yet to be finalized at the time of the preparation of the plan. The area under dispute is not clearly demarcated.

The causes of forest encroachment shall be examined thoroughly and addressed in a comprehensive manner. All the necessary support should be provided. And encroachment should be evicted as early as possible. The boundary management and standard administrative guidelines will help to control encroachment.

The state government should be urged to finalize and complete the land grant in all identified cases of encroachments to be regularized in accordance with the government resolutions issued before 1980. Renewed and concentrated efforts on the part of division staff for eviction of the encroachment is proposed on priority basis.

Small isolated patches of the forestland are often neglected and become vulnerable to encroachment. Special care shall be taken to ensure protection of such patches from encroachment.

The civil powers of eviction are entrusted with ACF and DCF by Govt. Resolution and should act as per GR. The procedures laid out in the Land Revenue Code shall be followed before the execution of eviction.

Habitual encroachers shall be prosecuted as per Indian Forest Act.

All external boundaries shall be demarcated with concrete pillars.

All sensitive and important boundaries and wherever disputes are there be surveyed with DILR and concrete pillars be laid immediately.

All encroachments be listed with their names, age, residence, profession whether belongs to SC, ST, OBC/NT, extent of encroachment, S.No. and location of encroachment village/block.

A Detailed report of the case be prepared for each encroacher and be submitted to ACF to obtain summary eviction orders, in a time bound program.

After the completion of due procedure of Land Revenue code and after giving a reasonable opportunity of being heard to the encroacher, the ACF shall pass a summary eviction order if he satisfies so, quoting the findings.

The concerned RFO shall execute the eviction order.

If the encroachments in a village are more in number police protection be obtained for the operation.

X) Joint Forest Management Working Circle :

National Forest Policy 1988 envisages the importance of involvement of local people in the protection of forests. It also emphasizes the importance of traditional rights of forests dwellers.

SPECIAL OBJECTS OF MANAGEMENT :

1. Reforestation of degraded forests with the participation of villages.
2. Plantation and its protection with the help of forest protection committee.
3. To let avail usufructs derived from such afforestation to the villagers.
4. To create awareness about importance of forest amongst the people.
5. To help in translating the 73rd Amendment in practice for Forest Conservation and Development.
6. To increase vegetal cover.
7. To check soil erosion.

8. To bring about soil and moisture conservation.

9. And Ultimately bring about the integrated development of the adjoining villages with the help of all other development agencies.

Past Results :- Joint forest management programme had been taken up as per the Govt. of Maharashtra Resolution dated 25th April 2003 and Resolution dated 5 October 2011. There are 254 JFM committees in Jalgoan Division. Total 28168.31 ha. area is assigned to these committees for protection and management purpose. Efforts have been made to motivate the villagers to take participatory management of forest including plantations on forest land near these villages under various schemes like FDA, State JFM etc. As per the Govt of Maharashtra Resolution Dated 28 Nov. 2014, RDF Plantation works under DPDC funds has to be taken through JFMC and the same is being implemented From 2015-16.

The details of plantations works allotted to these JFMC's during last five year is as under.Table No.11.20

Year	Number of JFMC's	Area assigned for plantations under various schemes (ha.)		
		JFM	FDA	Total
2009-10	4	90	0	90
2010-11	2	30	0	30
2011-12	2	60	00	60
2012-13	2	60	120	180
2013-14	1	25	25	50
2014-15	3	75	50	125
2015-16	0	0	0	0
2016-17	1	10	0	10
2017-18	2	50	0	50
Total	**17**	**280**	**195**	**475**

Gradatation of JFMC of Jalgoan Division is given below. Table No. 11.21

Range	No. of JFMC's	Area assigned to JFMC's (Ha.)	Categorization of JFMC's			
			A	B	C	D
Vadoda	30	3306.96	4	9	7	10
Muktainagar	44	4067.73	8	15	18	3
Jamner	39	5339.59	5	15	12	7
Jalgaon	27	1727	10	6	5	6

Erandol	21	1108.85	6	3	1	11
Parola	39	2425.07	15	8	12	4
Pachora	22	4178.68	6	8	6	2
Chalisgaon	32	6014.43	6	6	5	15
Total	254	28168.31	60	70	66	58

To minimize the pressure and dependency of local population on forest for fire wood, the villagers residing adjoining or in the vicinity of forest are provided with the LPG gas connection.

This has definitely saved 30 to 40 % of fuel wood and also saved the time of fuel wood collection.

The details of LPG provided since 2012-13 are as below Table No. 11.22

Sr. No	Year	LPG Gas			
		S.C	S.T	Others	Total
1	2012-13	0	179	0	179
2	2013-14	347	134	88	569
3	2014-15	298	0	376	674
4	2015-16	477	129	476	1082
5	2016-17	847	278	279	1404
6	2017-18	319	0	2328	2647
Total		**2288**	**720**	**3547**	**6555**

National Forest Policy 1988 aims at conservation of natural heritage of the country

XI) Wildlife Management (Overllaping) Working Circle :

Preserving the natural forests with the vast variety of flora and fauna which represents the remarkable biological diversity and genetic resources of the Country.

SPECIAL OBJECTS OF MANAGEMENT :

- To protect the existing wild life population both flora and faunal.
- To create ideal conditions for betterment of wildlife.
- To take steps of check all the destruction of wildlife.
- To preserve for all times, areas of biological importance, outside the protected areas, as a national heritage for the benefits, education and aesthetic value for the mankind.

METHOD OF TREATMENT :

The habitat will be protected from fire, grazing and other damages.

Access to Natural water sources will be provided.

Additional water sources will be created to draw the animals away from water near human settlement, thus reducing the conflict and risk of disease transmission from domestic stock. Check dams and small reservoirs may be created for additional sources of water.

Past Results :- Regular patrolling was done to protect both flora and fauna. Timely compensation were paid in cases of crop damage, cattle kill by wildlife to avoid any conflict. Illegal grazing was restricted to some extent by which better and conducive conditions are made available to wildlife. All care and preventive measures are taken to control any fire in wildlife rich area. Precautions are taken to avoid poaching incidences.

There are 7 Van bandaras made in this division, which has sufficient water through out the year. Nalla rejuvenation works were also done during summer as per the availability of funds. Various awareness programmers like celebration of wildlife week, rallies by students &trekking in forest areas were conducted.

Eco Tourism Working Circle :

Eco tourism management seeks to integrate and balance several potentially conflicting objectives, protection of natural and cultural resources, provision of recreation opportunities and generation of economic benefits. In the absence of effective planning and management, ecotourism can lead to significant negative impacts on vegetation, soil, water, wildlife, historical resources. Such impacts can be both ecologically and culturally significant and may negatively affect visitor satisfaction.

This was an overlapping working circle. The objective of this working circle was to disseminate information regarding flora and fauna and their significance to the people and to increase public support for conservation of Forest and Wildlife by creating, understanding and fostering awareness and concern for conservation needs.

Sustainable Forest Management :

With rapidly increasing human and livestock population there is immense biotic pressure on our forests. In order to solve the predominant human-forest conflicts, the

concepts of people's participation and Joint Forest Management have been evolved and separate working circle was proposed for this purpose.

Eco-tourism is the best way in which the public can be made aware of the pivotal and difficult role that played by the forest department in conserving India's forests. This would in turn lead to much greater appreciation of Forest department and increase the importance that is attached to it.

The following sites have been identified to make ecotourism a success in Jalgoan Forest Division.

The following sites have been identified and listed below that have great potential and resourceful to make ecotourism a success in Jalgaon Forest Division.

1. Padmalay (Ganesh) Temple in Erandol range.

2. Muktai Bhavani conseravation reserve in Vadoda range.

3. Landor Khori in Jalgaon Range.

4. Patna Devi Mandir (Chalisgaon Range).

5. Hatnur/Girna Dam In Vadoda Range

SPECIAL OBJECTS OF MANAGEMENT :-

- To disseminate information regarding flora and fauna and their significance to the people.
- To increase public support for conservation of Forest and Wildlife by creating understanding and fostering awareness and concern for conservation needs.

11.4 PAST YIELD, REVENUE & EXPENDITURE

The forests were not worked as per the prescriptions of the Working Plan. The details of actual yield and royalty received from Tendu leaves are given in the following table:

Table No. 11.23

Year	Yield (Std Bags)	Royalty received (Lakh)
2008-09	2195.846	1098572
2009-10	1942.659	1256786
2010-11	2186.96	704111
2011-12	1820.305	1520358

2012-13	Unsold	0
2013-14	Unsold	0
2014-15	Unsold	0
2015-16	1462.450	1057100
2016-17	1527.185	1666050
2017-18	825.185	1021000
Total	**3814.820**	**83,23,977**

The Minor Forest Produce harvested from the Forests during the period 1990-91 to 2000-01 is given.

The statement showing the figures of Revenue and expenditure for the year 2008-09 to 2017-18 are given below.

Table No. 11.24

Year	Revenue Rs. in lakhs.	Expenditure Rs. In Lakhs.		
		Non-Plan	Plan	Egs
2008-09	10.98	0.00	138.124	29.17
2009-10	12.89	488.67	167.900	10.02
2010-11	75.00	545.47	530.278	0.00
2011-12	15.73	784.23	454.651	0.00
2012-13	0.46	917.13	679.549	0.00
2013-14	0.45	942.02	934.040	0.00
2014-15	0.44	917.56	1471.300	21.97
2015-16	11.02	913.49	1892.510	21.85
2016-17	17.03	1446.49	1816.600	22.36
2017-18	10.90	1245.90	1924.540	92.15
Total	**154.90**	**8200.96**	**10009.49**	**197.52**

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CHAPTER-12

STATISTICS OF GROWTH AND YIELD

12.1: INTRODUCTION:

In Korhalli and Mundkur's Plan the growth data for Teak was compiled from the Teak Pole Working Circle from different places by carrying out stem analysis. In Vaidya's Plan stem analysis of Teak trees were carried out from IV-quality areas of Chopda range and stump analysis of Teak trees were carried out from quality III forest of Jalgaon range.

12.1.1: Enumeration:

Enumeration after Reddy's plan was a joint effort by the survey of forest resourses Nashik, territorial Division and the Working Plan Division. "Systematic Line Plot Sampling with Random Start" was resorted to with square plot 31.62 X 31.62 meters (each plot size is 0.1 ha.) roughly at interval of 750 meters. The sampling intensity was 0.1%.The Statistical design and overall technical guidance was given by Chief Forest Statistician, M.S., Nagpur. The period of enumeration was from Jan 2019 to March 2019 Analysis of the data was done by the Chief Forest Statistician. On scrutiny of data following results are obtained.

Statement I :Estimated Growing Stock- No. of Sound Trees in population area.

Statement II :Estimated Growing Stock- No. Of Sound Trees per ha.

Statement III :Percentage Distribution of Total stock to the Species Overall Girth Classes.

Statemnet IV :Percentage of Stock of Species in Girth Classes to the Total Stock in that Particular Girth Classes.

Statement V :Estimated Growing Stock –Volume in Cubic Meter per ha.Some noteworthy results of comparison of past and current numeration is described in statement below.

Comparision between Two Enumerations. Table No. 12.1

Past Enumeration (November 2003 to Feb 2004)		**Current Enumeration (Jan 2019 to March 2019)**	
Name of Working Circle	**No.of trees per hectare**	**Name ofWorking Circle**	**No.of trees per ha.**
SMC W.C	107.98	AWC	43.73
IWC	238.47	Improvement W.C.	90.66
PWC	84.08	Anjan Working Circle	67.59
Kuran W.C.	126.89	Babul W.C.	55.12
		Fodder W.C.	78.35
		Protection W.C.	78.18
Weighted Average	**130.04**	**Weighted Average**	**78.46**

It is observed that the total estimated no. of trees per ha. in current enumeration (Jan./18 to April /18) is decreased as compared to previous (Sept./03 to Nov./03) tree enumeration.

12.1.2: Following reasons are enlisted for decrease in number of trees / ha. in current enumeration (Jan 2018 to April 2018)

1. Encrochment on the Forest areas due to provision of the forest right Act.

2. Heavy grazing resulting in great damage to natural regeneration & vegetal cover.

3. Occurance of regular forest fires in forest areas causing maximam damage to the forest.

Table No. 12.2 As per current Enumeration (Jan 2019 to March 2019).

Working Circle wise No. of sound trees per ha.

Sr. No.	**Name of Working Circle**	**Total**	**General utility species**	**Special utility species**	**Minor forest produce species**	**Other species**
1	2	3	4	5	6	7
1	Afforestation.W.C	43.73	1.72	19.00	17.46	5.55
	% of stock to total stock	100	3.94	43.44	39.93	12.69
2	Improvement W.C.	90.66	23.04	35.14	23.12	9.36
	% of stock to total stock	100	25.42	38.76	25.50	10.32

3	Anjan W.C	67.59	8.44	19.57	10.50	29.08
	% of stock to total stock	100	12.49	28.96	15.53	43.02
4	Babul W.C	55.22	0	23.48	2.61	29.13
	% of stock to total stock	100	0	42.52	4.72	52.76
5	Fodder W.C.	78.35	12.35	25.77	30.72	9.51
	% of stock to total stock	100	15.77	32.89	39.21	12.13
6	Protection W.C.	78.18	12.80	31.51	6.14	27.73
	% of stock to total stock	100	16.37	40.31	7.85	35.47
Total weighted average		**78.49**	**16.17**	**29.39**	**21.98**	**10.95**
% of stock to total stock		**100**	**20.60**	**37.44**	**28.01**	**13.95**

Table No. 12.3 As per current Enumeration (Jan 2019 to March 2019).

Working Circle wise Volume in cum. per ha

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	Afforestation.W.C	47.12	0.15	1.44	1.91	43.62
	% of stock to total stock	100	0.33	3.05	4.05	92.57
2	Improvement W.C.	11.81	2.89	4.91	2.68	1.33
	% of stock to total stock	100	24.49	41.55	22.69	11.27
3	Anjan W.C.	18.40	0.85	4.91	1.54	11.10
	% of stock to total stock	100	4.62	26.68	8.38	60.32
4	Babul W.C	7.33	0	2.22	0.09	5.02
	% of stock to total stock	100	0	30.35	1.24	68.41
5	Fodder W.C	8.52	1.24	3.43	2.86	0.99
	% of stock to total stock	100	14.56	40.26	33.57	11.61
6	Protection W.C.	85.76	1.71	7.86	0.81	75.38

	% of stock to total stock	100	2.00	9.17	0.94	87.89
Total weighted average		24.32	1.92	4.46	2.27	15.67
% of stock to total stock		**100**	**7.91**	**18.32**	**9.35**	**64.42**

Result of tree enumeration -

A. Afforestation Working Circle-

It is observed that species of General Utility viz. Ain is 0.33 % to the total growing stock.. The species of special utility viz. Dhavada, Hiwar, Khair, Moin & Salai are 3.05 % to the total growing stock. The Minor Forest Produce species viz. Apta, Neem, Beheda, Bel, Bor, Moha, Palas and Tembhurni are 4.05% to the total growing stock, Rest of the species are 92.57% to the total growing stock..

B. Improvement Working Circle :-

It is observed that species of General Utility viz. Ain, Shisam, Bondara, & Teak are 24.49 % to the total growing stock. The species of special utility viz. Dhavada,Kalam, Moin, Khair, & Salai are 41.55 % to the total growing stock. The Minor Forest Produce species viz. jambhul, Apta, Behada, Bel, Bor, Moha, Nirgudi, Palas, Neem and Tembhurni are 22.69 % to the total growing stock. Rest of the species are 11.27 % to the total growing stock.

C. Protection Working Circle :-

It is observed that species of General Utility viz. Ain, Bondra Shisam and Teak, are 2.00 % to the total growing stock. The species of special utility viz. Dhavada, Hiwar, Salai, Moin, Kudai and Khair, are 9.17 % to the total growing stock. The Minor forest produce species viz. Apata, Awala, Moha, Palas and Tembhurni are 0.94 % to the total growing stock. Rest of species are 87.89 % to the total growing stock.

D. Babul working circle :-

It is observed that species of General Utility no species found. So it is 0.00 % to the total growing stock. The species of special utility viz. Dhavada, Hiwar, and Khair, are 30.35 % to the total growing stock. The Minor forest produce species viz. Apata, Awala, Moha,

Palas and Tembhurni are 1.24 % to the total growing stock. Rest of species are 68.41 % to the total growing stock.

E. Anjan Working Circle-

It is observed that species of General Utility viz. , Ain, Bondra and Teak are 4.62 % to the total growing stock.. The species of special utility viz. Dhavada, Hiwar, Kalamb, Khair, Moin & Salai are 26.68 % to the total growing stock. The Minor Forest Produce species viz. Apta, Awala, Beheda, Bel, Bor, Moha, Palas and Tembhurni are 8.38 % to the total growing stock, Rest of the species are 60.32 % to the total growing stock.

F. Fodder Working Circle-

It is observed that species of General Utility viz. , Ain, Bondra and Teak are 14.56 % to the total growing stock.. The species of special utility viz. Dhavada, Hiwar, Kalamb, Khair, Moin & Salai are 40.26 % to the total growing stock. The Minor Forest Produce species viz. Apta, Awala, Beheda, Bel, Bor, Moha, Palas and Tembhurni are 33.57 % to the total growing stock, Rest of the species are 11.61 % to the total growing stock..

No.of Trees per Ha. Table No.12.4 (Period of Enumeration Nov.2003 to Feb. 2004)

Name of Working Circle	Total Growing stock per ha.	Teak Per ha.	%of stock of Teak to total stock
SMC W.C.	107.98	0.19	0.18
Kuran W.C.	126.89	16.39	12.92
IWC	238.47	84.98	35.64
PWC	84.08	11.26	13.39
Total weighted percentage	**130.05**	**3.63**	**2.79**

No.of Trees per Ha. Table No.12.5 (Period of Enumeration Jan.2019 to March 2018)

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of Teak trees to the total stock
1	**2**	**3**	**4**	**5**
1	A.W.C.	43.73	0	0
2	I.W.C.	90.66	20.44	22.55
3	ANJAN W.C.	67.59	7.59	11.23

4	BABUL W.C.	55.21	0	0
5	FODDER W.C.	78.35	7.60	9.70
6	PROTECTION W.C.	78.18	10.53	13.47
Total (Weighted Average)		**78.49**	**13.55**	**9.79**

Comparative Statement of the Survey 2003 & 2019.Table No. 12.6

Year of Survey	General Utility species		Special Utility Species	Minor Forest Produce species	Other species	Total
	Teak	NonTeak				
March 2003 to Novmber 2003	17.95	5.12	18.897	42.14	45.93	130.04
Jan.2019 to March 2019	13.55.	2.62	29.39	21.98	10.95	78.49
% of stock of Jan. 2019 to March 2019 to the stock of survey 2003	75.48	51.17	155.58	52.15	23.84	60.35

From the above Table No.12.6 it is seen that the overall stock is decreased to 60.35 % as compared to survey carried out in 2018.

Table no. 12.7 Comparative statement of percentage distribution to total stock of species overall girth classes.

Sr.No.	Working Circle	Girth class-wise estimated percentage of number of trees			
		15 U 30	31U45	Remaining Girth Classes	Total estimated No. of trees
1	AFFORESTATION W. C.	0	64.33	35.67	100
2	IMPROVEMENT W.C.	0	51.54	48.46	100
3	ANJAN W.C.	0	32.53	67.47	100
4	BABUL W.C.	0	61.42	38.58	100
5	FODDER W.C.	0	58.78	41.22	100
6	PROTECTION W.C.	0	29.07	70.93	100
Weighted Average		**0**	**50.67**	**49.33**	100

12.1.3: Local Volume Table

The Local Volume Table compiled in Vaidya's plan for Teak IV-a quality is available.

Local volume table for Teak & Non Teak species.

Table No. 12.8

Girth class b.h. in inches Cms.	Volume for III[rd] quality (50' to 70') Cft./ Cubic metre	Volume for IV-a quality (40' to 50') Cft./ Cubic metre	Volume for IV-a quality for Non Teak (40' to 50') Cft./ Cubic metre
Up to 12'' 30Cms.	0.50 0.014	0.35 0.0098	0.134
12'' – 18'' 30 – 45 Cms	1.25 0.035	1.20 0.0336	0.272
18'' – 24'' 45-60 Cms	2.50 0.07	2.45 0.0686	0.627
24'' -30 '' 60-75 Cms	4.50 0.126	4.15 0.116	0.1186
30'' – 36'' 75-90 Cms	6.75 0.189	6.50 0.182	0.1950
36'' - 42''' 90 -105Cms	11.00 0.308	9.00 0.252	0.2917
42'' - 48''' 105 - 129Cms	15.50 0.434	--------	0.4089
48'' - 54''' 129-135 Cms	21.00 0.602	--------	0.5465
54'' - 60''' 135- 150 Cms	28.75 0.805	------	0.7045
60'' - 66''' 150-156Cms	37.50 1.05	-------	0.8829

12.2: STATISTICS OF FOREST CARBON STOCK

Carbon Stock Estimation: Forests play an important role in combating climate change. In addition, it has the potential to provide ecosystem services, such as carbon storage. Carbon sequestered in the forests of Jalgaon has been derived by extrapolating from the Growing Stock calculated from the Enumeration data. The Working circle wise estimation of Carbon Stock is given below.

Table No. 12.9: Working Circle Wise Carbon Stock

Working Cirlcle	Total Area in Ha.	Total Growing Stock (Tree Nos.)	Avg. growing stock (Tree) /ha	Total Carbon Stock (tons)/ha.
Protection W.C	8839.86	691100	78.18	373.926
Improvement W.C.	44202.43	4007302	90.66	1869.76
Anjan W. C.	7366.49	497901	67.59	311.60
Fodder W.C.	12995.34	1018184	78.35	549.70
Babul W.C.	1209.93	66812	55.22	51.180
Afforestation W.C.	12300.00	537879	43.73	520.29
Total	**86914.05**	**6819178**	**413.73**	**3676.456**

12.2.1 : Soil Carbon Analysis:

Quantum of soil carbon is a good indicator of nutrient status of soil. During the enumeration exercise, SOFR unit collected soil samples (60) and they were analysed for Soil Carbon. The range of soil carbon varied from 0.4% to 4%.

The above efforts have been made but it is apparently inadequate. With the current manpower and the level of expertise available with the Department, it will not be possible to immediately come up with definite figures of Carbon Stock taking into consideration the different pool of Carbon, as is expected to be estimated.

Considering the fact that the Forest of Survey of India, Dehra Dun has already come up with the calculation of the current Carbon Stock of India in its publication ‘Carbon Stocks of India’ this Working Plan has taken advantage of the same. The excerpts from this publication are produced below and a calculation for the carbon stock of Jalgaon District taking the C-values of the Tropical Dry Deciduous Forests for the state of Maharashtra were extrapolated for this calculation.

12.2.2:Excerpts from FSl's publication 'Carbon Stock in India's Forests':

Introduction:

Carbon is an element commonly found on earth in various forms. It is an essential element of all forms of life. The bodies of living organisms contain a substantial portion of carbon. Carbon is also found in large quantities in non-living things like oil, nature gas, coal, rocks and air. Globally carbon is held in a variety of different stocks as oceans, fossil fuel deposits, terrestrial system and the atmosphere. In the terrestrial system, carbon is stored in rocks, sediments, swamps, wetlands, forests, forest soil, grassland and agricultural area. About two thirds of global terrestrial carbon is contained in forests and forest soil. In addition, there are some non-natural human-created carbon stocks as wood products and waste dumps.

The exchange of carbon among its various forms from the atmosphere, oceans and land is called the carbon cycle. The most significant form of carbon exchange is by the plant. Plants draw in carbon dioxide (CO_2) from the atmosphere through the process of photosynthesis and turn it into biomass (wood, leaves, fruits etc.). A part of the CO_2 taken

in by plants is returned to the atmosphere through respiration. Thus, the carbon cycle is renewed and continues interminably.

12.2.3 : Carbon and Forest Eco-System

Forests play an important role in mitigation and adaptation of climate change. Forests sequester and store more carbon than any other terrestrial ecosystem and are an important natural 'brake' on climate change. Carbon sequestration by forests has attracted much interest as a mitigation approach, as it has been considered a relatively inexpensive means of addressing climate change immediately. In India, the varied climate regimes, the large geographical area, varied topography, long coastline and the possession of the oceanic island have endowed it with a diversity of natural biomass from desert to alpine meadows, from tropical rain forests to temperate pine forests, from mangroves to coral reefs and from marshland to high altitude lakes.

Research it still in progress to understand the effect of climate change on life forms and ecosystem. It has been suggested that the increased proportion of carbon dioxide in the atmosphere increase fertilization effect and enhances growth in plants. In that case warming and an increase in atmosphere CO_2 should productivity and increase the sink potential of vegetation (assuming nutrient supply is adequate and enough moisture is available). A study on the effects CO_2 fertilization on vegetation and soil in temperate forest ecosystem suggests that plant C increase in response to excess atmospheric CO_2 (Downing et al., 1992).

While living trees are growing, they continued to store carbon and therefore acted as carbon sinks. Consequently, mature forests are huge storehouses of carbon. The young trees which grow faster rates also work as carbon sinks. The bigger (and older) the trees, the higher is their ability to cycle and sequester carbon (Morris Bishop, 1998). Though, it is important to consider the annual rate of carbon uptake, one should not ignore the carbon holding capacity within a forest which is a more critical factor (Harmon et al., 1990). In India, a more effective management practice is selective felling of those trees which have already attained a matured age and no more work as sink. On felling such trees, younger trees are planted which sequester more carbon.

12.2.4 : Methodology for the assessment of Forest Carbon

The 'Good Practices Guidance' (GPG) developed by Intergovernmental Panel on Climate Change (IPCC) is universally accepted source book for concepts, definitions, various pools, methods, defaults values, various required equations etc. for preparing account of forest carbon stocks (FCS). Since the subject has been developing in last two decades, many new concepts and methods have emerged but still many challenges remain. The GPG uses the term "Categories" to refer specific sources of emissions/ removals of greenhouse gases. As per the IPCC GPG 2003, the categories are: Forest land, Cropland, Grassland, Wetlands, Settlements and other land. Each land-use category is further subdivided. The following subcategories are considered for the sector:

Forest land remaining Forest land: An increase in the carbon stocks of Forest Land remaining Forest Land would mean improvement in canopy density and growing stock of forest. A decrease in the carbon stock of Forest Land remaining Forest Land is generally considered as degradation of forest resources.

12.2.5: Land Converted to Forest land:

Any non-forest land converted to Forest land would generally be considered as afforestation. According to GPG, the calculation of GHG inventories require information on extent of area (in case of LULUCF) of an emission/removal category termed as 'Activity data' and emission or removal of GHG per unit of area (removal of CO_2 per ha. of added forest area) termed as 'Emission factors. The main aim is to estimate these factors for the reporting unit. Once these are estimated, the emission or removal, can be ascertained using the change in carbon stocks.

The different approaches are given in the GPG to present the activity data (the change in area of different land categories). **Approach 1** identifies the total area for each land category; it only provides "net" area. **Approach 2** identifies the land conversion between categories by tracking and provides tabular information about land-use conversion. **Approach** 3 involves, in addition, the spatial tracking of land-use conversion.

The total carbon which is stocked in the forests is divided into several pools and the emission factors are derived from assessments of the changes in carbon stocks in these carbon pools. These factor are developed using estimates which are used at different

levels; global, national and sub-national and based on the level the 'Tier levels' (Table 12.1) are defined which are independent of the approach being followed.

In general, moving to higher tiers improves the accuracy of the inventory and reduces uncertainty, but the complexity and resources needed for conducting inventories also increases with higher tiers.

The Tier 1 approach employs the basic method and default emission factors provided in the 1PCC Guidelines (Workbook), Tier 1 methodologies usually use activity data that are spatially coarse, such as nationally or globally available estimates of deforestation rates, agricultural production statistic and global land cover maps.

The Tier 2 approach applies emission factors and activity data which are defined by the country. Tier 2 can also apply stock change methodologies based on country-specific data. Country-defined emission factors/activity data are more appropriates for the climatic regions and land use systems in the country.

At Tier 3, higher order methods including models and inventory measurement are repeated over time and supported by high-resolution activity data and disaggregated at sub-national level. Such systems may use Remote Sensing and GIS tools for tracking land-use change over time.

In Forest ecosystem, enormous carbon is stored which is classified in five pools by GPG. The living portion of biomass carbon is classified in two approaches to emission accounting: the inventory approach and the activity based approach, which are outlined below. Both approaches are supported under IPCC guidance (IPCC, 2003) and are based on the underlying assumption that the flows of GHGs to or from the atmosphere are equal to changes in carbon stocks in the biomass and soils.

Table No. 12.10: Different Forest Carbon Pools

Pools		Description
Living Biomass	Abover ground biomass (AGB)	All living biomass above the soil including stem, stump, branches, bark, seeds and foliage.
	Below ground biomass (BGB)	All living biomass of live roots. Fine roots of less than 2 mm diameter (country Specific) are often excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead	Litter	Includes all non-living biomass with a diameter

Organic Matter		less than a minimum diameter chosen by the country (for FSI 5 cm.), laying dead, in various states of decomposition above the mineral or organic soil.
Soil	Soil organic matter	Include organic carbon in mineral and organic soil (including peat) to a specific depth chosen by the country (for FSI 30 cm) and applied consistently through the time series.

12.2.5 : Data Acquisition for Forest Carbon Accounting

(i) Collating existing forest data

Forest carbon accounting can make use of existing national, regional or global data. Sources will vary between territories, as will the reliability and uncertainty of the source. However, good quality secondary data reduces. However, good quality secondary data reduces both time and cost requirement for accounting.

At a national level, forest inventories, woody biomass assessments, agricultural surveys, land registry information and scientific research can prove useful for land classification and model parameters. Data on temperature, rainfall, soil type and topography should also be sources at smaller scales. In particular, data sources will include national statistical agencies, sectoral experts and universities.

(ii) Using remote sensing

Remote sensing is useful in forest carbon accounting for measurement of total forest area, forest types and canopy cover.

(iii) Data from field sampling

Actual field data is preferable to default data for forest carbon accounting and is required to verify remotely sensed information and generalised data sets. Gathering field measurements for forest carbon accounting requires sampling as completer enumerations are neither practical nor efficient. By definition, sampling infers information about an entire population by observing only a fraction of it. In order to confidently scale up this data to the required geographical level, proper sampling design is vital.

Stratified random sampling is generally used for forest land carbon inventory as mostly forest areas are heterogeneous. Under stratified sampling, forest area are stratified into homogenous strata and samples are selected from each strata randomly. This provides precise estimates for different strata and also population. Once sample sites have been selected, established methods of biomass inventory are employedfor different pools.

12.2.6 : Accounting for Forest Carbon Stocks (i) Above-Ground Biomass (AGB):

The AGB carbon pools consists of all living vegetation above the soil, inclusive of stems, stumps, branches, bark, seeds and foliage. For accounting purposes, it can be broadly divided into two parts viz. trees and understory. The most comprehensive method to establish the biomass of this carbon pool is destructive sampling, whereby vegetation is harvested, dried to a constant mass and the dry to-wet biomass ratio established. Destructive sampling of trees, however, is both expensive and somewhat counter-productive in the context of promoting carbon sequestration. Two further approaches for estimating the biomass density of tree biomass exist and are more commonly applied. The first directly estimates biomass density through biomass regression equations. The second converts wood volume estimates to biomass density using biomass expansion factors (Brown, 1997).

12.2.7 : Below-Ground Biomass (BGB):

The BGB carbon pool consists of the biomass contained within live roots.

As with AGB, although less data exists, regression equation from root biomass data have been formulated which predict root biomass data have been formulated which predict root biomass based on above-ground biomass carbon (Brown, 2002; Cairns et al., 1997)

12.2.8 Dead Organic Matter (wood):

The DOM wood carbon pools includes all non-living woody biomass and includes standing and fallen trees, roots and stumps with diameter over 10 em.

12.2.9: Dead Organic Matter (Litter):

The DOM litter carbon pool includes all non-living biomass with a size greater than the limitfor soil organic matter (SOM), commonly 2 mm, and smaller than that of DOM

wood, 10 em. diameter. This pool comprises biomass in various states of decomposition prior to complete fragmentation and decomposition where it is transformed to SOM.

Soil Organic Matter (SOM):

SOM includes carbon in both mineral and organic soil and is a major reserve of terrestrial carbon (Lal et al., 2001). Inorganic forms of carbon are also found in soil; however, forest management hag greater impact on organic carbon and so inorganic carbon impact is largely unaccounted. SOM is influenced through land use and management activities that effect the litter input. In SOM accounting, factors affecting the estimates include the depth of which carbon is accounted, commonly 30 em. and the time lag until the equilibrium stock is reached after a land use change, commonly 20 years.

Forest Carbon Stock under different carbon pools in the Tropical Dry Deciduous forest type area in Maharashtra State as calculated by the FSI is reproduced as under:

(Table No.12.11)

Forest Carbon Stock Of Tropical Dry Deciduous Forests in Maharashtra.

Forest type stratum	**Density**	**Area in Sq.Km.**	**AGB**	**BGB**	**Dead Wood**	**Litter**	**SOM**	**Total**	**C Stock /ha. (tons)**
Tropical Dry Deciduous	VDF	4707.9	29331.3	11517.2	215.7	3134.0	27713.2	71911.5	152.75
	MDF	10351.4	61047.4	23970.9	152.6	773.5	57679.5	143623.9	138.75
	OF	10804.3	12816.5	5032.5	142.1	343.0	49471.8	67805.9	62.76
Total		**25863.6**	**103195.0**	**40521.0**	**510.4**	**4250.5**	**134865.0**	**283341.3**	**109.55**

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Part-II

FUTURE MANAGEMENT

CHAPTER-1

BASIS OF PROPOSALS

1.1: OBJECTIVES OF MANAGEMENT

1.1.1 : Introduction :-

This Working Plan is prepared for the scientific management of the Forests and Wildlife of Jalgoan forest division, which is co-terminus with Twelve talukas i.e. Jalgoan, Chalisagoan, Bhusaval, Jamner, Pachora, Amalner, Parola, Dharangaon, Erandol, Muktainagar, Bhadgaon & Bodvad talukas of Jalgaon district. The primary management objective for the Forests of Jalgoan Division is to treat forests as per the requirement of site so as to optimize Growing Stock and in a manner as mentioned in the Introduction.

1.1.2 Factors influencing the general objectives of management :

Working Plans are technical documents prepared to manage a particular area of forest land on a sustainable basis, with a objective to conserve the bio-diversity, soil and water regime, optimize production of forest products to meet the market needs and also bonafide needs of local people. Various standard scientific treatments, suitable for a particular area, are prescribed to conserve and improve the quality and productivity of the forest to meet the national and global needs in general and the bona fide needs of the local people in particular. While preparing and implementing the plan, it is necessary to examine the National Forest Policy and all relevant Laws, Rules, Court orders and various administrative orders issued by the Government of India and Maharashtra, so that all the prescriptions are brought under the umbrella of existing policy framework.

1.1.3: The national forest policy: The National Forest policy was first enunciated in 1894 and was revised in 1952, after independence. It was again revised in shape of the National Forest Policy 1988, which is, presently, in force.

1.1.4: The Basic objectives and thrust areas enshrined in the National Forest Policy 1988 are given as under:

- Maintenance of environmental stability through preservation and where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of forests.
- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biodiversity and genetic resources of the country.
- Checking the soil erosion and denudation in the catchment area of the rivers, lakes and reservoirs in the interest of soil and water conservation for mitigating flood and droughts and for retardation of siltation of reservoirs.
- Checking the extension of sand dunes in the desert areas and along the coastal tracts.
- Increasing the forest/tree cover in the country through massive afforestation and social forestry programs, especially, on all denuded, degraded and unproductive lands.
- Meeting the requirements of fuel wood, fodder, minor forest produce and small timber of the rural and tribal populations.
- Increasing productivity of forests to meet essential national needs.
- Encouraging efficient utilization of forest produce and maximizing substitution of wood.
- Creating a massive peoples movement with the involvement of women, for achieving this objectives and to minimize pressure on the existing forests.
- The Principal aim of the Forest Policy is to ensure environmental stability and maintained of ecological balance including atmospheric equilibrium which is vital for sustenance of all life forms, human, animals and plants. The derivation of direct economic benefit is secondary to this principal aim.

1.1.5 : Essentials of Forest Management embodied in the National Forest Policy 1988 are mentioned below:

- ❖ Existing Forest and forest lands should be fully protected and their productivity improved. Forests and vegetative cover should be increased rapidly on hill slopes, in catchments of the rivers, lakes, reservoirs, ocean shores, on semi arid, arid and desert tracts.

- For conservation of biodiversity, network of national parks. Sanctuaries, biosphere reserves and other protected areas should be strengthened and extended adequately.
- Provision of sufficient fodder, fuel and pasture, especially, in areas adjoining to forest is necessary in order to prevent depletion of forests beyond sustainable limit.
- Minor forest produce provides sustenance to the tribal population and other indigenous population residing in the around the forests. Such produce should be protected, improved and their production should be enhanced with due regard to generation of employment and income.
- Schemes and projects which interfere with forest on the steep lopes, catchments of rivers, lakes and reservoirs, geologically unstable terrain and other ecologically sensitive areas should be severely restricted.
- No forest should be permitted to be worked without the approved working plan which should be in keeping with the national Forest Policy and direction of the Hon' able Apex court.
- The rights and concessions enjoyed by the tribal and other rural poor living within and near the forests should be fully protected. Their domestic requirements of fuel wood, Fodder, Minor forest produce and construction timber should be the first charge on forest produce.
- Inculcate in the people, a direct interests in forests and make them conscious of the value of forester, wildlife and nature in general through forest extension, education and training.

1.2 : METHOD OF TREATMENT TO BE ADOPTED

1.2.1: Functional classification of forests:

The broad principles of classification of forests on functional basis have been guided by the Gove. Resolution No MRF/1365/132211-Y dated December, 6, 1968 issued by the Government of Maharashtra. The following functional classes have been recognized by the state:-

Protection Forests: It include forests on steep slopes (25^0 and above), along river banks and the forests that have become depleted through maltreatment and further

exploitation of which will accentuate soil erosion and adversely affect the productivity of agricultural lands in the region. The management should aim at conserving these forests, through soil and moisture conservation measures, so that they may exert beneficial influence on the soil, water regime and the physical and climatic factors of the locality.

Tree Forests: These forests are situated in remote tracts that are mainly capable of growing large sized timber and other products of commercial value.

Minor Forests : It includes forests that are interspersed with cultivated lands and are capable of producing small timber and fuel wood and providing grazing which are indispensable needs of adjoining agricultural population.

Pasture Lands: These are openly stocked forests or scrub lands that have ceased to yield even the small timber but the conveniently situated for providing grazing to the cattle used for agricultural works.

Miscellaneous Forests:

Grass Reserves: These are small blocks of forests situated amidst cultivated tracts carrying scrubby growth and capable of producing good fodder grasses.

Remaining Areas needed for other purposes.

Based on the functional classification of Forests, the various types of forests will be treated as follows.

Protection Forests: This type of Forests includes the forest found on Steep slopes (More than 25^0 slope), areas along the water courses and in the Catchments of big water bodies. It generally includes good quality forests. They will be managed to protect the area from soil erosion and to minimize the siltation of water bodies. Soil and Moisture Conservation measures will be taken to protect the erosion prone lands and to improve the underground water table. The commercial felling will not be the priority in these areas. These prescriptions have been included for treatment of A-1 type areas of different Working Circles.

Tree Forest: This type of forest includes the better quality forests, especially of good site quality, capable of producing medium to large-sized timber, which are

comparatively away from local habitations. They will be managed to produce medium to large sized timber. Steep slopes will be excluded from harvesting operations, but will be covered for soil and moisture conservation work. The natural regeneration will be tended and areas having inadequate natural regeneration will be planted with suitable valuable species. These areas have been included to be worked under SCI Working Circle.

Minor Forest: These areas will be managed to meet the local need of small timber, poles and fuel wood. The growing stock is mainly of site quality IVA and IVB. The density varies from 0 to 0.4 and natural regeneration is deficient in open areas. These forests have been worked under A forestation Working Circle, where only hygienic fallings are prescribed.

Pasture Land: This area includes forests which are adjoining to villages with heavy biotic interference. They are not capable of producing even small timber and fire wood to any appreciable quantity. These areas will primarily be managed to provide fodder by introducing fodder trees species and superior grasses. Rotational grazing is prescribed. Soil and moisture conservation works will be taken along with planting and sowing of grass seeds. These areas are included in the Grass & Fodder Resources Management Working Circle.

1.2.2: Treatments prescribed:

i. Management treatments will depend upon requirements of environmental stability, protection of topography, biodiversity conservation, and characteristics of growing stock in the forest and the objectives of management.

ii. Existing protection forests will be preserved. Soil and moisture conservation works should improve the moisture content and prevent soil erosion and siltation of the water bodies.

iii. Suitable tending and soil working operations will be carried out to stimulate the growth of the naturally regenerated seeding and rootstock.

iv. Timber, if silviculturally available, will be extracted from the dense tree forests capable of producing medium to large-sized timber and poles on sustained basis.

v. Open forest areas and traditional pastures will be managed with active participation of tribal and village communities for improving the productivity of the land to meet the local domestic needs of fodder and fire wood.

vi. Uncontrolled grazing, fire, poaching, illicit cutting and uncontrolled encroachment, the major threats for sustainable growth for forest, shall be curbed.

1.2.3: The General Approach of the Treatments:

- The entire forests on steep and precipitous slopes will be protected from harvesting. 20 meter wide strips on either sides of streams and watercourses will also be protected from harvesting in the similar manner.
- Special habitat management for wildlife conservation will receive high priority. Riparian zones and mesic sites, important for wildlife management, will receive added protection and treatment. Adequate buffer will be provided to such sites while preparing treatment maps for coupe extraction. Snag, den trees and down longs shall be sufficiently protected, to meet the habitat requirement of birds and small animals. Wildlife requirements shall be the most important consideration for water body management in forest areas.
- The forests of Jalgoan Division are extremely important from wildlife management point of view.
- Preference will be accorded to natural regeneration and rootstock management. Natural regeneration and promising coppice growth will receive suitable tending and soil working to stimulate growth and development. Areas treated under natural regeneration shall be protected from fire and grazing, at places where natural regenerations is inadequate or is not likely to succeed.
- Management of forests close to villages will be given priority for meeting demands of local people for small timber, poles, firewood fodder, non-wood forest produce, etc. Local people will be actively involved in forest management, forest protections, plantations and development of natural resources in the village. Management of forest close to villages shall primarily be done through JFM committees.
- Non-Timber forest Produce (NTFP) has great potential for sustainable economic development of local communities with conservation of forest

resources. Sustainable NTFP production will be given high priority in the forest management.

- Sustainable use of forest resources will remain the guiding principle for managing the demands of forest produce and services. Various government and non-government agencies will be engaged in identification and promotion of ecologically sound and economically feasible alternatives like wood saving technology, stall-feeding, population control of cattle and livestock improvement.
- Involving local people in managing forests and generating awareness in rural and tribal areas is considered indispensable for the forest conservation.
- Reducing biotic pressure on forests, particularly, illicit felling, unsustainable grazing, fire and encroachment near villages will be considered on priority basis.
- Boundary demarcation will be carried out in time-bound manner for ensuring territorial integrity of forests.

1.3: CONSTITUTIONS OF WORKING CIRCLES / CHAPTERS

1.3.1: Analysis and Valuation of the Crops:

The analysis of forest crop is carried out after enumeration of the crop. The species and tree girth distribution from the enumeration data and density distribution from satellite imageries and Stock Maps prepared by the Staff of Jalgoan Division has been used for preparing this Working Plan.

Areas having spares tree crops, open areas without tree growth and isolated small forest patches are included in the Afforestation Working Circle (AWC). In such areas the focus would be upon tending of existing NR and rootstock; in natural regeneration management, the seedling of seed origin of desirable species will be given preference over the coppice. If NR is insufficient then it will be supplemented by seedling plantations, wherever necessary. Involvement of the local community is considered focal for management of such areas as well as afforestation of open areas and isolated patches.

1.3.2: Working Circles and Their Distribution:

For the scientific management of forests, a compartment has been used as a unit for distribution. The allocation of compartments is based on preponderance of suitability to specific working circle.

Following working circles are prescribed for Jalgoan Forest Division.

Protection Working Circle :- Area having high Altitude, steep slope and valleys not suitable for working is allotted to the Protection Working Circle (PWC). This Working circle is expected to protect from illicit cutting, encroachment, Fire. No felling activities are proposed in this working circle.

Improvement Working Circle :- Areas having sparse tree crops, open areas without tree growth and isolated small forest patches are included in this Working circle (IWC.) In such areas the focus would be upon tending of existing NR and rootstock. In natural regeneration management, the seedlings of seed origin of desirable species will be given preference over the coppice. If NR is insufficient or absent then it will be supplemented by seedling plantations, wherever necessary. Involvement of the local community is considered focal for management of such areas as well as Afforestation on open areas and isolated patches. CCT and Deep CCT works are recommended on areas with gentle slope as this will provide barrier to soil erosion.

Anjan working circle :- Comprises of all areas being predominately Anjan as Principal species on some particular area. In this area SMC works including plantation of Anjan Bamboo, MFP, Medicinal plants and locally found suitable species is proposed.

Fodder Working Circle:- The working circle comprises of area which are subjected to heavy grazing, have very poor soil and are adjoining to villages where grass is in demand. These are poor, open low forest having generally shallow soil and in which the growing stock is stunted and malformed. Tree growth is very rare and consist of Anjan, Khair, Hiwar, Babul, Dhawda, Salai, Model etc.

Afforestation working circle:- All blank areas which is suitable for plantation are included in this working circle. SMC works, seed sowing of Neem, Khair, Moha, other local sps. and plantation of locally found suitable sps. including Bamboo, MFP

and Medicinal plants will be done. In addition to this, dressing of all illicitly cut trees and cutting of all dead, dying and malformed trees wiil be done.

Chapter :- Non-Timber Forest Produce :- This overlapping area extends over the entire plan area. Presently Tendu, Moha, Gum is the major source of revenue. The main objective management of this working circle is to generate employment & improve the economic condition of Rural people.

Chapter:- Forest protection:- To enforce the Indian Forest Act 1927 and Wildlife Protection Act 1972 for the effective control of illicit felling, encroachments, poaching and fires. To develop the database to monitor various to offence cases in systematic manner.

Chapter:- Joint Forest Management :- This chapter extends to the entire area of the Jalgoan forest division. Villages that are adjoining to the forest areas, are the focal areas for practicing Joint Forest Management. JFM Committees should be involved in plantation activities, protection, NTFP collection and eco-tourism.

Chapter :- Wildlife Management :- The area extends over entire area of Jalgoan Division. Wild life rich area in the Division should be identified & focus must be given in this area for improving wild life habitat suggesting rejuvenation & improvement work.

Chapter :- Eco Tourism:- Ecotourism management seeks to integrate and balance potentially conflicting objectives of protection of natural and cultural resources and provision of recreation opportunities and generation of economic benefits.

The allocation of forest areas under various working circles of the current working plan has been given in following table. Area Allocation to Different Working Circle.

Table No.1.1

Name of Working Circle	Area Allocated (Ha.)
Protection Working Circle	3038.35
Improvement Working Circle	40017.9
Anjan working circle	952.60
Fodder Working Circle	12131.90
Afforestation Working Circle	10786.3
Misc. area Mangt.	7713.03

Chapter : Non-Timber Forest Produce	Entire
Chapter : Forest protection	Entire
Chapter : Joint Forest Management	28168.31
Chapter : Wild life	Entire
Chapter :Eco Tourism	Entire

Table No.1.2 :- Statement showing working circle wise comparison between Earlier and Proposed working plan.

Working Circle as per old plan	**Total Area (Ha.)**	**Working Circle as per proposed plan**	**Total area (Ha.)**
Protection working Circle	8839.86	Protection Working Circle	3038.35
Improvement Working Circle	44202.43	Improvement Working Circle	40017.9
Anjan Working Circle.	7366.49	Anjan working circle	952.60
Fodder Working Circle	12995.34	Fodder Working Circle	12131.90
Babul Working Circle	1209.93	--	--
Afforestation Working Circle	12300	Afforestation Working Circle	10786.3
Plantation (Overlapping) Working Circle	Entire	--	--
Non-timber Forest Produce (Overlapping) Working Circle	Entire	Chapter - Non-timber Forest Produce	Entire
Forest Protection (Overlapping) Working Circle.	Entire	Chapter - Forest protection	Entire
Joint Forest Management (Overlapping) Working Circle	28168.31	Chapter - Joint Forest Management	28168.31
Wild life management (Overlapping) Working Circle.	Entire	Chapter - Wild life management	Entire
Eco-tourism (Overlapping) Working Circle.	Entire	Chapter - Eco-tourism	Entire
		Misc.area Mangt.	7713.03
Total	**86914.13**	**Total**	**74640.10**

The plan for is Sanctioned wild notification no. WLP-0214/CR-62/F-1 dated 3 may 2014. The area 12274.063 is invole in this plan which is not included in this working plan.

Proposed working plan Area - 74640.10 ha.

Area for Muktai Bhavani Conservation researve plan - 12274.063 ha.

Total area of Jalgaon division - 86914.13 ha.

1.4 : PERIOD OF WORKING PLAN AND NECESSITY FOR INTERMEDIATE REVISION

Period of Plan the plan:-

This plan will be implemented for a period of 10 years from the year 2019-20 to 2028-29. However, the midterm review shall be carried out.

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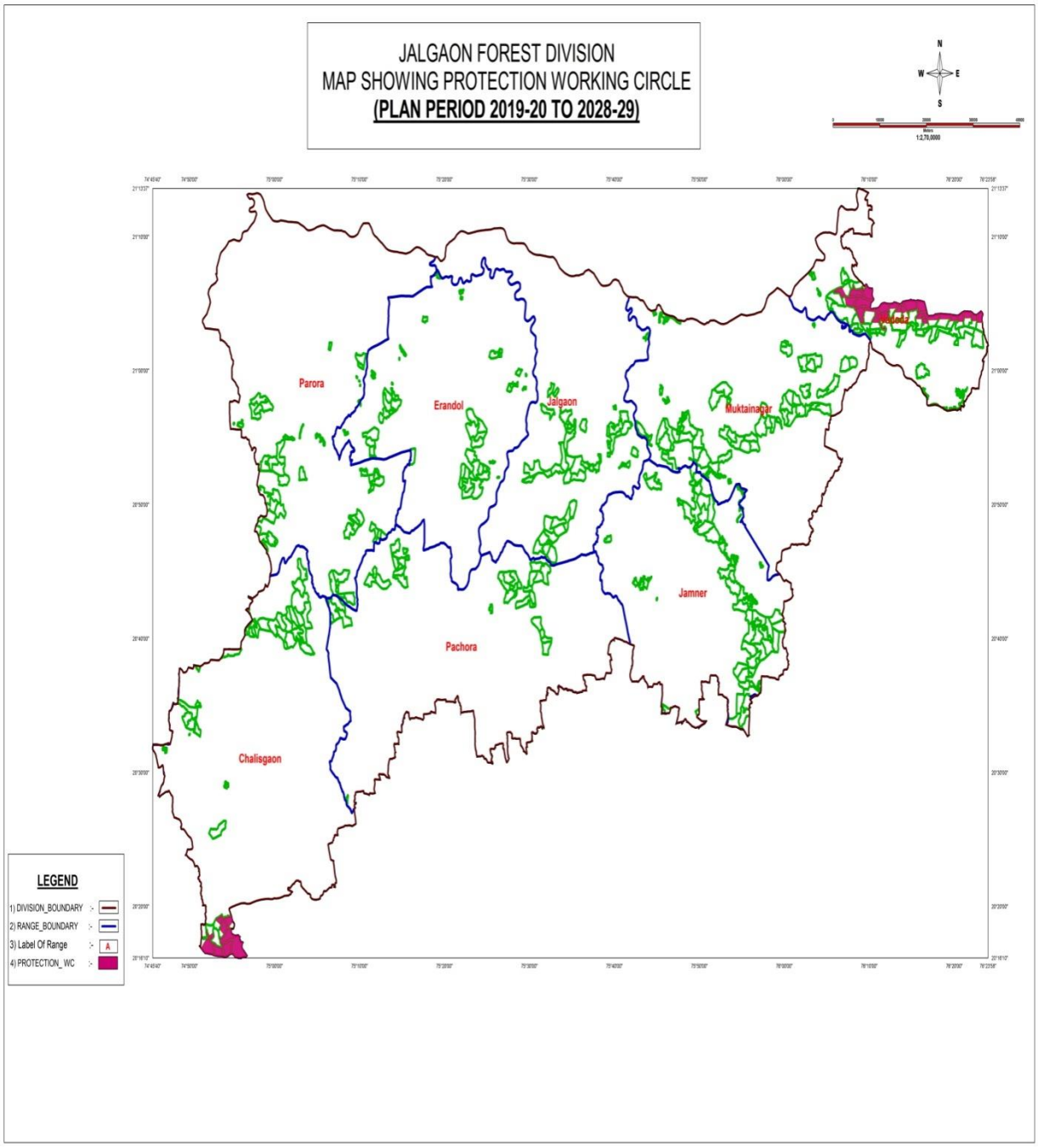
Map of Jalgoan Forest Division

Protection Working Circle



CHAPTER - 2

FORMATION OF WORKING CIRCLES

PROTECTION WORKING CIRCLE

2.1: NAME OF WORKING CIRCLE CLEARLY MARKED ON GIS BASED MAPS (1:50,000)

The area of this working circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

2.2: GENERAL CONSTITUTION

This Working Circle includes 3038.35 hectare forest area. This working Circle comprised of areas the precipitous slopes of Satpurdas of Muktainagar and Vadoda ranges and Autram ghat of Chalisgaon Range. These areas belonged to the Protection cum improvement, Improvement & Anjan Working Circles of the previous plan. The main objective of this working circle is to maintain and improve the existing soil tree cover and to conserve and enhance the existing tree growth. This working circle compartments of Chalisgaon range are adjoining to Gautala wild life sanctuary and acts as an additional support base to the wild life.

2.3: GENERAL CHARACTERISTICS OF VEGETATION

A mixture of large number of species characterizes the growing stock. As these forests are situated on steep hill slopes, with shallow and murumy soil, Anjan, Teak, Salai along with its common associate Dhawada are more frequent. Dhawada trees are found in abundance and dhawada forms main regeneration crop in these forests. The other common species are Khair, Hiver, Chandan, neem, Bor, Tembhrun and Mahua. At places, exposed sheet rocks, vertical cliffs and grassy blanks are found. The crop is mostly young and middle aged, close to 60% of the crop is less than 45cms in girth. At present the natural regeneration is Khair, Bor, Dhawada etc. Anjan germinates profusely but dies back due to repeated fires in the forest. The crop is IV-b quality and damaged due to repeated fires.

2.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS

The area of this working circle is divided in to Eight treatment series with 3038.35 ha. area. Each series is further divided into 10 coups.

2.5: BLOCKS, COMPARTMENTS AND JFM AREAS :-

The details of compartments in this working circle have been provided in the Appendix no. XXIX of vol II.

2.6: SPECIAL OBJECTIVES OF MANAGEMENT

- To preserve and improve the existing vegetal cover in vulnerable areas with a view to maintain and improve microclimatic and micro-edaphic conditions of the site.
- To improve the vegetation by seed dribbling on precipitous slopes(>25^0) and trench/ pit planting on slopes < 25^0 along with soil and moisture conservation structures.
- To protect the compartments adjoining to wild life sanctuary and forms a buffer between sanctuary area and other forest areas where human activity starts.
- The special object of management of Protection Working Circle areas is the protection of fragile forest sites and to prevent the siltation of the dams and water bodies by checking the soil erosion in the forest catchments through soil and water conservation measures.

2.6.1: Analysis and valuation of the crop

i) Stock mapping: Classified forest density maps from Forest Survey of India for the year 1998 have been procured and compartment boundaries have been over laid on these maps and satellite image density maps are generated and will be given to the field staff.

ii) Quality and Age Class: These forests are having a crown density of 0.4 to 0.5. Nearly 90% of the crop is less than 75 cms girth class and about 60% of the crop is less than 45 cms girth size. The tree growth wherever occurring is mostly malformed because of lopping, fires and grazing. In some compartments no appreciable natural regeneration of any tree species is observed. Soil depth is sufficient in most of the areas but due to grazing pressure adjoining to revenue areas the soil has become compact.

Range wise allocation of compartment and area for Protection w.c.(Area in ha.)

Table No. 2.1

Range	No.of compt.	Area
Chalisgaon	10	**3038.35**
Parola	..	..
Erandol	..	..
Pachora	..	..
Jamner	..	..
Jalgaon	..	..
Muktainagar	..	..
Vadoda	**..**	**..**
Total	**10**	**3038.35**

Table No. 2.2

Type of area	Area in ha.	% of area w.r.t WC area %	Remarks
Well stocked , Density >0.4	104.83	3.17	The forest area of the working circle has steep slopes and forms buffer zone to wild life sanctuary
Open forest, Density <0.4	1713.13	51.81	
Blanks	1242.09	37.56	
Scrub Forest	240.78	3.28	
Water bodies	5.3	0.16	
Total area	**3306.13**	**100.00**	

3.17% of forest area is well stock and 51.81 % area of this working circle is under stock with 37.56% area is blank.

2.6.2: Silvicultural System:

1. Silvicultural system is proposed on the pattern of watershed management viz.ridge to valley treatment approach.

2. Harvesting of green trees is prohibited. However, removal of dead trees by retaining two dead trees per hectare as snags is permitted. These areas are proposed to receive strict protection from grazing and fire.

3.Most vulnerable areas to be identified and protection be strengthan.

4. Offence seen valued above Rs.2000 be put in the court of low.

5. For affective protection of forest the IFA 1927 and wildlife protection Act 1972 be enforced meticulously.

2.6.3 : Rotation period :

The rotation of 10 years is fixed to tackle the whole area. This working circle is divided into five working series and each working series has been divided into 10 coupes.

2.6.4 : Harvestable diameter: Not applicable

2.6.5 : Reducing factors:- Not applicable

2.6.6 : Felling cycle: Not applicable

2.6.7 : Divisions into periods and allotment to periodic blocks: Not applicable.

2.6.8 : Calculation of yield : Not applicable

2.6.9 : Table of felling : Not applicable

2.6.10: Method of executing the felling : Not applicable

2.6.11: Subsidiary silvicultural operations cleaning and thinning:

2.6.11.1 .Method of treatment:

i) Cutting back operations: Cutting Back Operations will be carried out in the area.
ii) **Cleaning**: Damaged and malformed poles will be cut back.

Preparation of treatment map:

After demarcation of the coupe, Range Forest Officer will inspect the area and prepare a treatment map for the same and it shall be thoroughly verified by the Assistant Conservator of Forests. The treatment maps will show the following areas.

Type A - Protection areas: It will include following areas:

i. The area having steep slopes i.e. more than 25º.
ii. Eroded areas or areas liable to erosion.
iii. 20 meter wide strip on either side of water courses.

Type B-Under stocked Areas:

The forest areas having less than 0.4 density are included in this category.

Type C- Old plantation areas: include areas under old plantations.

Type 'D' - Well stocked areas: include areas with crop density more than 0.4.

The **various treatments** proposed for the above mentioned areas are as follows:

1) Area 'A':

i. The SMC works including LBS, gabion and gully plugging will be carried out wherever essential. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'. While undertaking SMC works, raking of soil or SMC works requiring excavation should not be done as this may accelerate soil erosion.

ii. Soil binders like Agave sp., local grasses etc. shall be planted as per the site requirement.

iii. In the accessible under stocked areas having good soil depth, seed-dibbling of local species shall be done to suitably the area.

iv. Bamboo and other suitable species shall be planted in accessible under stocked areas, within 20 meters wide strip on either side of water courses.

v. Artificial regeneration by plantation should be strictly avoided on steep slopes and high altitude plateaus**.**

vi. Felling is not prescribed.

2) Area 'B':

i. The SMC works like Van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

ii. All existing natural regeneration of Hirda, Aonla, Ain, Tendu, Jambhul, etc. will be tended, interfering undergrowth will be cleared and seedlings will be freed of suppression if any, by judicious removal of some over wood under strict guidance of RFO.

iii. In this area if number of seedlings/saplings is less than 400, then DCF should take up Aided Natural Regeneration by planting local species. 625 seedlings are prescribed to be raised by ANR in such areas. As the number of regeneration varies from 0 to 350 or more, the treatment should be such that the total number of naturally occurring seedlings and ANR seedlings should be 625 in numbers..

This is an important step to help the forest regain its health and vitality which has been under much stress from biotic interference and managerial neglect. Reference to the Planning Department GR No.2011/ CNO.130 /EGS-10A dated 28.12.2011 for carrying out ANR in the forest areas may be made for preparing estimates.

iv. Wherever soil depth is less than 15 centimeter and slope is gentle, instead of planting tree species, grass seedlings raised in polythene bags may be tried. Kala Dhaman, Dongri, Ginni grass species are recommended. In such areas medicinal plants, wild edible plants, which normally don't require more soil depth may be tried.

3) Area 'C' :

This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area..

4) Area 'D':

i. The SMC works like bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

ii. No planting shall be done in these areas.

iii. Felling is not prescribed.

Bamboo under planting shall be undertaken in the areas -B, Area -C, to facilitate putting up of desired increment to growing stock and improve production capacity of the growing stock, including older plantation.

As NR is the principal method of regeneration, only shortfall left after considering available quantity of NR should be planted by gap planting. However this cannot be quantified.

MARKING RULES:

Marking will be done in the same year along with demarcation. The marking technique is described in detail in the chapter Miscellaneous Regulations. Following marking rules are laid down:

1. 2 dead trees per hectare will be retained for snag and den of wildlife.
2. In this working circle, felling of any kind of tree is totally prohibited and the existing vegetation in the area shall be preserved.

The marking rules for each type of area will be as follows:

Type A - Protection Area: Only dead trees will be marked for felling provided their removal will not cause soil erosion.

Type B - Understocked Area: All edible fruit and flower yielding trees will be reserved from felling. The following trees will be marked for felling:

1. All dead and malformed trees after retaining two dead trees/ha.
2. All but one vigorously growing coppice shoot per stool provided seedling regeneration of any tree species is absent.

Type C-Groups Of Young Poles: All edible fruit and flower yielding trees such as Moha, Char, Tendu, Aonla, Chinch, Bel, Sitafal, and trees of Kulu will be reserved from felling. No pole crop removal is recommended in these areas. The following trees will be marked for felling.

1. All stumps of illicitly cut trees will be dressed to produce strong coppice shoot provided seedling regeneration of any tree species is absent in the surrounding.
2. 2 dead trees per hectare will be retained for snag and den of wildlife.

Type D – Mark the tree which is silviculturally available.

Objectives of Management : -

The main object of the management is to maintain and improve the adequate vegetative cover and to preserve the soil on the slopes. Intensive fire protection works and essential cultural operations like removal of dead, dying shall be carried out. The slopes of these forests are very steep and it is very difficult to regenerate artificially on these steep slopes. Hence live tree removal from these forests is completely prohibited. Collection of minor forest produce like Mahua flower and fruit, Char, Bel, Tendu, Gum etc is permitted to the local tribes/villagers for their bonafide use.

1. The forests areas under this working circle need special treatment in the form of soil and moisture conservation works. Where ever the slopes are steep, no cct or dct is stipulated. Slopes being extremely steep, during rains the time of concentration is very low and rain water run off attains high velocities with in no time. In these areas the following soil and moisture conservation works are prescribed. Forest areas with steep slopes($>25^0$) cement check dams at regular intervals on the nalas, with gabian structures on the upstream side of the check dam as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam.

2. Forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam. To check the soil erosion and enhance the moisture regime, vegetal cover of the tract is to be increased through bush sowing and dibbling of Lendi Jambhul, Neem, Kusum seeds in the under stocked and blank forest areas. It shall be carried out on regular basis through the concerned *vanmajoors,* Beat Guards. Where soil depth is poor, grass seeds shall be broadcasted followed by closure for grazing.

2.6.11.2 : Demarcation of coupes and preparation of treatment map:

Except for 1st coupe in the sequence of working of this draft plan period, coupes will be demarcated one year in advance, But 1st coupe will be demarcated in the first year of operation and main working will be in the same year where as in other coupes it will be in following year.

Eco Sensitive Zone:-

Eco Sensitive Zone Should also be the part of management of this working Circle. Eco Sensitive Zone is declared vide notification of the Government of India. Ministry of Environment, Forest and Climate Change. New Delhi 9th Dec, 2016.

Where in Compartments and Gut number are given list in appended in the Notification.

Prescription :-

1. For habitat improvement the plantation of Arjun, Ain, Haldu, Tiwas, Anjan, Neem, Kusum, Dhawada, Jamun, Khair, Salai, Mowai, Pimpal, Awala, Karanj, Bor, Teak, Behada, Shivan, Shisu, Char, Papda, Bamboo etc.be planted.

2. The Zonal Master Plan for the Eco-sensitive Zone shall be prepared in such manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.

3. The activities prohibited, regulated or promoted in the eco sensitive zone area shall be governed by the provision of Environment (Protection) act. 1986 (29 of 1986) and the rules made there under, and be regulated in the manner specified in the notification.

4. The central Govt. constitutes a monitoring committee, for effective monitoring of the provisions of this notification and shall monitor the compliances of the provisions of this notification.

5. The Member-Secretary of monitoring shall be competent to file complaints under section 19 of the Environment (Protection) act 1986. Against any person who contraveres the provisions of this notification.

6. The Central Government and State Government may specify additional Measures, if any, for giving effect to provisions of this notification.

2.6.12 : Regeneration:

The NR is the best source for getting growing stock, provided available NR is well protected and tended. The NR has grazing, fire and weed growth as its worst enemies amongst many such things. In this area of forests where NR can be secured only by means of systematic weeding commenced in first rainy season and continued there after until the plants are free from the risks of suppression.

NR is most promising means of regeneration. The area shows good regeneration of Teak, khair, dhawla and in some areas Anjan also. Singling, tending, weeding and soil working should be done till it gets established and developed. These works should be continued at least for three years.

In these forest areas, NR of Teak and Anjan have suffered from fire as observed by die-back phenomenon depending upon incidences and extent of fire occurrences. In deciduous forests, Teak seedling suffer from desication, which needs mulching individually to reduce this effect.

Inducement of natural regeneration:

(i) Identified NR will be rigidly protected from grazing, trampling and fire incidences, by resorting to rigid grazing control fire protection measures applicable to current coupe of working.

(ii) Abundant natural reproduction, from Teak seed lying dormant on the ground, could be induced by opening canopy, cutting and burning undergrowth completely. The seedlings, which spring up in abundance as a result of clearing and burning, are to be weeded from beginning itself and weeding requires to be continued for three years, till the plants are established. Hence, the weeding out of lantana will be carried out in favour of NR successively up to third year.

Even after the above operations, if NR is not satisfactory, on the slopes saucer shaped pits of 30 cm x 30 cm x 30 cm will be prepared wherever light is available on the ground. Pits will have a baffle wall on the down hill side to support the soil. Treated seeds of Teak, germinated ain seeds and other misc. species will be sown and will be weeded thrice and mulched twice in a year until they get established. This work will

be carried out during the CBO period and sowing will be done just before the onset of rains.

Coppice shoots interfering with NR when established should be removed.

The NR should be cleared off weeds within the diameter of 1 meter. The mulching should be done by spreading the twigs and debris to the extent of six inches layer, followed by a layer of leaves, burnt up material and a sufficient earth over it (about a ghamela). This will facilitate protection from fire, drips from the nearby overgrowth and leading to mulching.

In the case of NR of valuable miscellaneous species like Arjun, Ain, Haldu, Tiwas, etc. also protection, weeding and soil working shall be carried out.

Artificial Regeneration:

Planting Techniques: - In earlier working plan forest blank and under stocked areas where slopes are less than 25 degrees and Teak is predominant, 50%Teak will be planted by stump and where ever Anjan is predominant, 50% Anjan should be planted with seedlings raised in polypots/root trainers and other 50% should comprise of trees like Karanj, Neem, Mahua on CCT etc, or lac insect host trees like Kusum, Bor, Khair, Palas, Pimpal etc., or gum exudating trees like Kadai, Salai, Khair, Dhavada, movai etc. should be planted, was mentioned. As Anjan does not show promising results, it becomes very difficult to maintain ratio of these species. Plantation of locally found suitable species including 10 % Bamboo, 20% MFP and medicinal plants should be done. Most suitable species found for regeneration by seed are Neem, Khair, Karanj while that for poly pot planting, suitable species are Neem, Khair, Awala, Papda, Bamboo, Shiwan and Sisoo. Plus trees of these species should be identified in the division and the seed of these trees should be used for raising plants in nursery or seed sowing. All these miscellaneous species which have tremendous NTFP value, are naturally found in the forests of Jalgaon forest division. These miscellaneous species should be raised in polypots or root trainer containers.

2.6.13: Associated regulations and measures.

Fire Protection: Main-working coupes will be fire traced and rigidly fire protected for a period of Five years from the year of working. In the month of October /

November after the demarcation is over all the undergrowth will be uprooted. The cut material will be spread over the area to be planted in such a way that the cut material remains sufficiently away from the stems of the trees and burning does not harm the trees. The dry and cut bushes of unwanted species shall be burnt before the end of February to avoid fire hazards to the forests.

Since the area of this working circle is sensitive to fire hazard, fire lines of 12 meter at the interval of 0.5 km across the contour should be maintained by fire tracing at higher altitude.

The NR needs to be protected from the hazards of fire so that the regeneration becomes future growing stock. Hence the main thrust should be on protection of regeneration.

To ensure effective protection from fire, the workable schemes of fire protection should be carried out in which the due share to people's participation shall be given. For meaningful participation, modalities shall be worked out to impart benefit to the people so that they come forward. The village forest protection committees will be formed & fire protection will be done through the village protection committee.

As such the area being prone to fire hazard and NR of species being the first and the biggest causality, this economic source of regeneration should be rigidly protected from fire. It causes damage to productive crop also. The comprehensive Fire Fighting Scheme should be chalked out so that effective Fire Fighting force is created for, for the period 15 th February to 15 th June on 24 hour duty on suitable area basis.

The techniques of fire protection should be as per the paragraphs given in Miscellaneous Regulations.

Grazing Control: No grazing shall be allowed in protection forests. In case of emergent situation, the rotational grazing may be allowed. The grazing will be regulated as per Govt. policy of the Govt. of Maharashtra dt.6th Dec.1968 according to which the grazing incidence in protected forests should not exceed one cattle unit for 10 acres.

Soil and moisture conservation works:

In eroded areas, soil and moisture conservation works, such as nala bunding, gully plugging and water conservation measures such as water absorption trenches (WATs) & LBS will be taken.

On the steep slopes, neither CCT nor DCT works be carried out to prevent soil erosion. Slopes being extremely steep, during rains the time of concentration is very low and rain water runoff attains high velocities with in no time. In these areas the following soil and moisture conservation works are prescribed.

Forest areas with steep slopes($>25^0$) cement check dams at regular intervals on the nalas, with gabion structures on the upstream side of the check dam as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam.

Forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam.

To check the soil erosion and enhance the moisture regime, vegetal cover of the tract is to be increased through bush sowing and dibbling of seed. On gentler slopes ($<25^0$) CCT works should be done and fresh seed of forestry species should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

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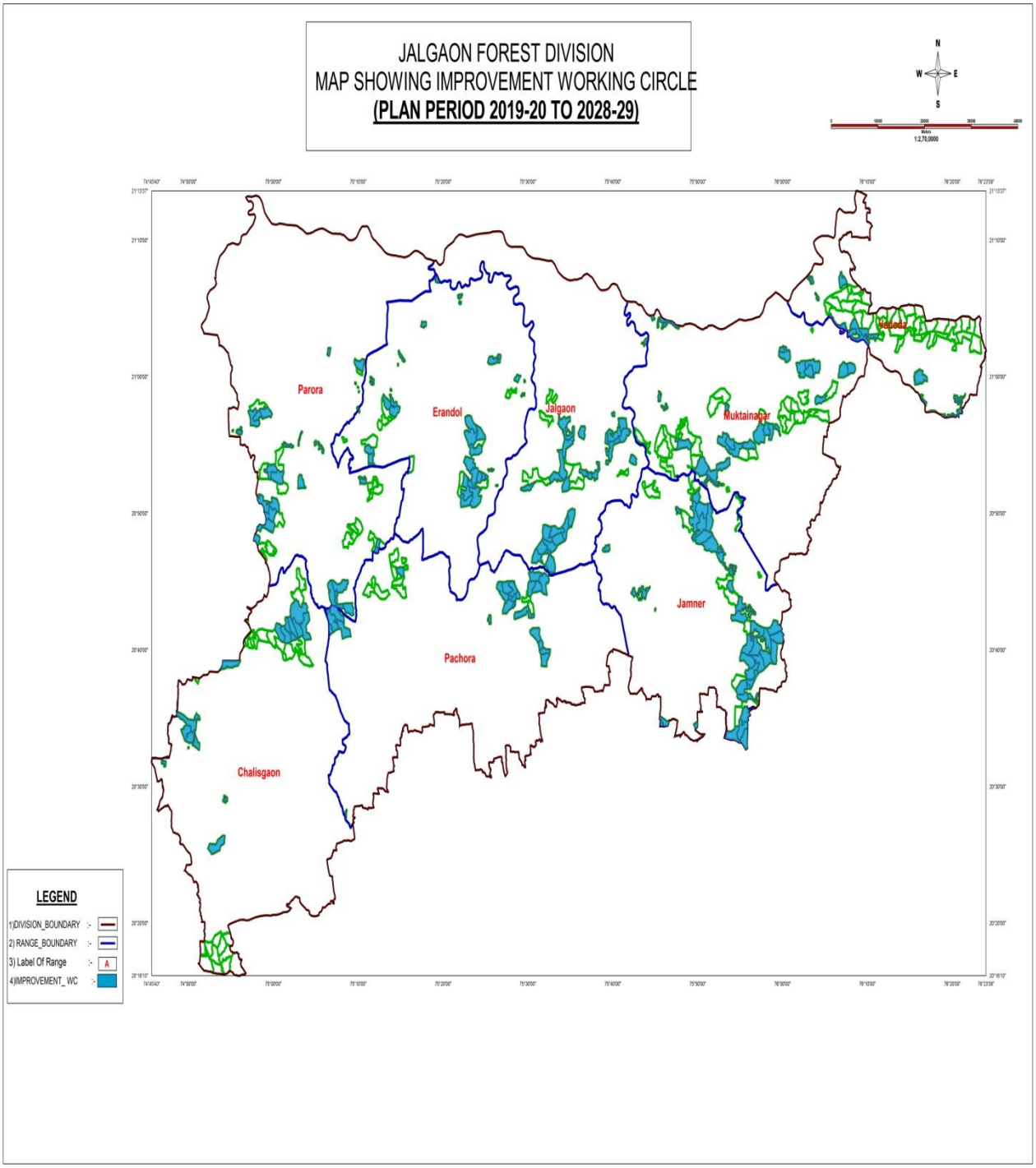
Map of Jalgoan Forest Division

Improvement Working Circle



CHAPTER-3

IMPROVEMENT WORKING CIRCLE

3.1: NAME OF WORKING CIRCLE CLEARLY MARKED ON GIS BASED MAPS (1:50,000)

The area of this working circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

3.2 : GENERAL CONSTITUTION OF THE WORKING CIRCLE

The working circle includes 40017.9 ha. areas, which require improvement through Silvicultural operations and artificial regeneration, have been included in this working circle. This working circle comprises of some areas from earlier Anjan working circle having good Anjan growth. This working circle also includes old plantation areas of earlier plantation management overlapping working circle for treatment. The main aim is to improve the status of the crop and land. Therefore obtaining produce of any kind is neither expected nor regulated. This Working circle also includes the areas belonging to the upper precipitous and very steep slopes. As far as possible a continuous blocks of such forests have been included.

The Coppice with Reserves compartments of Jamner range and compartments having reasonably good vegetation of Jalgaon, Erandol, Pachora, Parola, & Chalisgaon etc are ranges are included in this woring circle. Imporvement works such as artificial regeneration in understocked / blank areas with 50% Teak and rest with trees like Karanj, Neem, Mahua etc. on CCT etc. or lac insect host trees like Kusum, Bor, Khair, Palas, Pimpal etc or gum exudating trees like Kadai, Salai, Khair, Dhawads, Mowai etc. along with tending operations of the existing root stock and soil and moisture conservation works were to be carried out in this working circle.

COPARMENT ALLOCATION

Range wise allocation of compartment and area for Improvement w.c. **Table No.3.1**

(Area in ha.)

Range	No.of compt.	Area
Chalisgaon	22	4325.48
Parola	29	4011.04
Erandol	31	10269.16
Pachora	21	5366.41
Jamner	39	6055.65
Jalgaon	27	4348.41
Muktainagar	22	4305.84
Vadoda	17	1335.909
Total	**208**	**40017.9**

3.3: GENERAL CHARACTERS OF THE VEGETATION

Teak is the principal species with Bija, Anjan, Salai, Shisham and Tembhrun, Awala etc. as the associates. The forests are also well stocked in general and with certain open and blank patches. In higher hill slopes and plateaus with poor soil, Salai is predominantly found. Occurrence of bamboo is seen in this forest area The crop is generally young and middle aged. Nearly 60 to 70% of the crop is less than 45 cms girth size. Quality is generally IV-a.

3.4 : FELLING SERIES,CUTTING SECTIONS AND JFM AREAS

The area of this working circle is divided in to Nineteen treatment series with area of 40017.9 ha. Each series is further divided into 10 coups.

3.5: BLOCKS, COMPARTMENTS AND JFM AREAS :-

The details of compartments in this working circle have been provided in the Appendix no XXVII of vol II.

3.6: SPECIAL OBJECTIVES OF MANEGAMENT

- To improve the condition of the growing stock by tending existing rootstock.
- There is a need to improve blank areas in to well stocked areas through artificial regeneration.

- To safeguard the areas against soil erosion and thereby preserve and improve the site quality.
- The upper reaches and steep slopes will be protected so that grasses can come up in these areas.
- To increase the proportion of valuable species in the growing stock.
- The upper reaches and steep slopes will be protected so that grasses can come up in these areas.

3.6.1: Analysis and valuation of the crop

The site qualities of the area are IV-a and IV-b. Teak forms the major species of the growing stock. The growing stock predominantly contains middle-aged crop and trees of inferior injayali species are only found in mature classes. The stock mapping of the compartments is done by procuring Forest Density Classified Satellite Images from Forest Survey of India, Dehradun, The Images procured belong to the year 1998. Compartment boundaries are overlaid on these images and density maps are prepared.

Soil depth is sufficient in most of the areas but in areas close to revenue areas soil got compact due to biotic interference.

Table No.3.2

Type of area	Area in hectares	% of area w.r.t WC area	Remarks
Well stocked, Density >0.4	3080.50	6.97	The forest area of the working circle has Teak& Anjan as dominant species
Open forest, Density <0.4	17568.70	39.75	
Blanks	14187.49	31.60	
Scrub Forest	8756.32	19.81	
Water bodies	826.41	1.87	
Total area	**44419.42**	**100**	

Nearly 6.97% of the forest area of this working circle is well stocked forest and 39.75% of the forest is under stocked and blanks constitute only 53.28 % of the working circle area.

3.6.2: Silvicultural system:

All advance growth will be nurtured along with gap filling by artificial regeneration. Fellings will be purely on Silvicultural considerations aiming at improvement of the growing stock.

Forest areas containing dense pole crops will be thinned along with coupe working. Growth of naturally regenerated pole crop will be encouraged by the tending, cleaning operations and improvement felling as well as protection form fire and grazing.

3.6.3 : Rotation period :

A rotation of 10 years is kept to tackle the whole area. The working circle has been divided into 10 working series and each working series is divided into 10 coupes.

3.6.4 : Harvestable diameter:- No harvestable diameter is decided as no harvesting is involved in this working circle.

3.6.5 : Reducing factors:- Not applicable.

3.6.6 : Felling cycle: Tretment cycle is fixed at Ten years.

3.6.7 : Divisions into periods and allotment to periodic blocks: Not applicable.

3.6.8 : Calculation of yeild : Not Applicable

3.6.9 : Table of felling : Not Applicable

3.6.10: Method of executing the felling:

Coupe Demarcation & Treatment Map

Demarcation of Coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of Treatment Map : It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like *nala*, streams, old plantation, etc.

Treatment Prescribed :- The treatment proposed for various treatment type areas marked on treatment map shall be as follows: -

Area 'A' - Protection areas: include following areas

Areas with steep slopes i.e. more than $25^{0.}$

Eroded areas or areas liable to erosion.

Twenty meters wide strip on either side of the water courses.

Area 'B' - Under stocked areas:

Area with root stock as well as without root stock, suitable for taking up afforestation shall be marked on it.

The areas which were earlier planted but the plantations have failed.

Area 'C' - Old plantation areas: include areas under old plantations.

Area 'D' - Well stocked areas: include areas with crop density more than 0.4.

Treatments proposed: The various treatments proposed are as under:

Area 'A': (i) The soil and moisture conservation treatment shall be as given in Miscellaneous Regulation.

(ii) Planting Bamboo, Jamun, Arjun and grasses along the nala and river bank.

Area 'B': (i) Under stocked and blank forest areas where slopes are $<25^{0}$, cement check dams/ earthern dams at regular intervals on the nalas, with loose boulder structures on the upstream of these dams should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetivera grass slips should be planted on the silted soil. On gentler slopes ($<25^{0}$) CCT works should be done locally available should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

(ii) In earlier working plan plantation of 50% Teak with stumps and other 50% should comprise of bio fuel trees like Karanj, Neem, Mahua on CCT etc, or lac insect host trees like Kusum, Bor, Khair, Palas, Pimpal etc, or gum exudating trees like Kadai, Salai, Khair, Dhavada, Movai etc was proposed. This prescriptions and proportion of species could not be followed as these are not practicable. Plantations of locally found

suitable species including 10 % Bamboo, 20% MFP and medicinal plants should be done.

All these miscellaneous species which have tremendous NTFP value are naturally found in the forests of Jalgaon forest division. These miscellaneous species should be raised in polypots or root trainer containers. pits or trenches as per suitability of site should be adopted. The DCF should choose the model with technical approval from CCF(T).

Area 'C': In areas where there is adequate regeneration, these areas does not need any planting. But in areas where the regeneration is not seen or the field officer felt it is inadequate 625 plants per hectare should be supplemented with artificial regeneration.

Area 'D': The SMC works like van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

i. No planting shall be done in these areas.

ii. Felling is not prescribed.

Marking rules for improvement working circle:-

Marking for type 'A' Area:

No marking will be carried out.

Marking for type 'B' Area:

(i) All dead, dying and diseased trees after retaining 2 dead trees per ha. shall be marked for felling.

(ii) All live high stumps shall be cut as close to the ground as possible and dressed.

(iii) All malformed advance growth of Teak up to 30 cm. shall be cut back

(iv) The established multiple coppice shoots will be reduced to one per stool retaining the vigorous one which is closer to the ground.

The undesirable under growth, which is preventing growth of natural regeneration of desired species will be removed.

Marking for type 'C' Area:

All dead, dying, diseased and malformed trees, all live high stumps and all except one vigorously growing coppice shoot per stool will be marked for felling.

Marking for type 'D' Area: Mark the tree which is silviculturally available.

i. The existing established Teak reproduction upto 20c.m. in girth at breast height will be freed by marking overwood for removal
ii. Malformed advance growth of Teak upto 30c.m. in girth will be cutback. The overwood and inferior species likely to interfere with the coppice growth will be marked for felling.
iii. Thinning, marking will be carried out in favour of Teak and other valuable species. No fruit bearing tree shall be marked for felling .
iv. The pole crop patches of not less than one hectare shall be identified having advance growth of any species and it shall be spaced out to one third of the top height, while retaining the vigorous and straight poles. Silvicultural thinning shall be done as per yield table. The thinning shall be done in such a manner that epicormic branches do not come up. Thinning in old Teak plantation will be carried out as given in the miscellaneous regulations.

3.6.11: Subsidiary silvicultural operations Cleaning and Thinnings.

The Subsidiary Silvicultural operations includes (1) Cleaning (2) Thinnings.

Cleaning: A cleaning operation will be carried out in the 5th year commencing from the year of main felling.

Maximum five common climber species such as 1. Chilar *(Caesalpinia sepiaria)* 2. kadu-karand *(dioscorea bulbifera*) 3. Kuhli *(Mucuna pruriens)* 4.Sagargota *(Caesalpinia bonducella*) 5.Vasan *(Cocculus villosus) s*hould be cut and other climbers speaies should be retained.

i. Damaged, malformed saplings, and coppice shoots will be cutback.

ii. Multiple coppice shoots will be reduced to one promising shoot per stool provided no other seed origin sapling is available at that place.

iii. Fast growing inferior species and bamboo interfering or likely to interfere with reproduction of Teak & other valuable species will be cut.

In thick patches of Teak, advance growth & established regeneration of other valuable species a spacing between sapling to be retained, should vary from 2 meter to 2.59 meter depending on the height of the sapling.

Cleaning in plantation areas should be carried out as & when required depending upon the crop condition.

Thinning: Thinning in plantation areas will be carried out if the plants are silviculturally available.

Choice Of Species: In earlier working plan, plantation of 50% Teak with stumps and other 50% should comprise of trees like Karanj, Neem, Mahua on CCT etc, or lac insect host trees like Kusum, Bor, Khair, Palas, Pimpal etc. or gum exudating trees like Kadai, Salai, Khair, Dhavada, Movai etc was proposed. This prescriptions and proportion of species could not be followed as these are not practicable. Plantations of locally found suitable species including 10 % Bamboo, 20% MFP and medicinal plants should be done.

All these miscellaneous species which have tremendous NTFP value are naturally found in the forests of Jalgaon forest division. These miscellaneous species should be raised in polypots or root trainer containers. pits or trenches as per suitability of site should be adopted. The DCF should choose the model with technical approval from CCF(T).

The planting model approved by the competent authority shall be implemented from time to time.

3.6.12 : Regeneration:

Natural regeneration: The NR will be protected against fire and animals. TCM or other kind of fencing may be established.

Artificial regeneration and choice of species:-

PPO+PYO operations:- As approved by the competent authority.

Method of planting: -

The planting model approved by the competent authority will be implemented and C.C.F. (Territorial) will provide guidance from time to time.

Pre-planting and planting operations:

The pre-planting and planting operations as approved by the competent authority shall be carried out.

3.6.13 : Associated regulations and measures

Protection from Fire: Main-felling coupes will be fire traced and rigidly fire protected for a period of **Five years** from the year of felling. In the month of October / November after the demarcation is over all the undergrowth of lantana will be uprooted. The cut material will be spread over the area to be planted in such a way that the cut material remain sufficiently away from the stems of the trees and burning does not harm the trees. The dry and cut bushes of unwanted species shall be burnt before the end of February to avoid fire hazards to the forests.

The NR needs to be protected from the hazards of fire so that the regeneration becomes future growing stock. Hence the main thrust should be on protection of regeneration.

To ensure effective protection from fire the workable schemes of fire protection should be carried out in which the due share to people's participation shall be given. For meaningful participation modalities shall be worked out to impart benefit to the people so that they come forward. The village forest protection committees will be formed & fire protection will be done through the village protection committee.

The techniques of fire protection should be as per the paragraphs given in Miscellaneous Regulations.

As such the area being prone to fire hazard and NR of species being the first and the biggest causality, this economic source of regeneration should be rigidly protected

from fire. It causes damage to productive crop also. The comprehensive Fire Fighting Scheme should be chalked out so that effective Fire Fighting force is created for, for the period 15 th February to 15 th June on 24 hour duty on suitable area basis.

Irrigated plantations: Where ever there is a water body (dams) in the forest or on the fringe of forest irrigated plantation should be taken. Depending on the situation. **Grazing control: -** The areas of main working shall remain closed to grazing for a period of 5 years. The grazing will be regulated as per Govt. policy of the Govt. of Maharashtra dt.6th Dec.1968 Further, in the area of adjoining but with sufficient lag for working of coupe, seeds of palatable grasses be sown and villagers be motivated to harvest the fodder. The method of rotational grazing be followed. As per functional classification this working circle can mainly be classified as minor forests and the maximum grazing incidence prescribed for it is 1.2 ha per cattle unit. This will facilitate opening of area on rotational basis. The closed areas should be specifically mentioned in the grazing licenses and villagers be communicated of such closures by suitable means such as drum-beating, notices on prominent places, village Panchayat officers etc. and by binding grass pullies or stacks along the boundaries of closed coupes.

Soil conservation works:

Intensive soil and moisture conservation works like gully plugging, nala bunding, nala rejunivation, LBS should be taken for preservation of water regime for longer period. CCT and Deep CCT works are recommended on areas with gentle slope as this will provide barrier to soil erosion. This work will also induce the NR. Cement plugs or Earthen *Bandhara* be taken up to preserve moisture for a longer period simultaneously in the catchments areas cement plugs/ earthen *Bandhara* be treated so as to prevent siltation in the dams. On gentler slopes ($<25^0$) CCT works should be done and site specific local species seed should be sown at 0.5m intervals. Charoli being native to Jalgaon division and has very good NTFP value should be collected during season and sown on trenches. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

People's participation: The people's participation is the need of the hour, to protect the forest from fire, grazing, illicit cutting etc. Unless the villagers living nearby are made aware of the material benefit from the forest, they would not feel associated with the well being of the forest and may not visualize the distinct valuable utility of forests for their material benefit they get or likely to get. Therefore it should be expedited through viable measures like. Motivation efforts for making them aware about natural benefits of the forests for providing them pure drinking water, bringing rain conserving top soil for boosting their agricultural production and providing fodder for their milch cattle. By ensuring regular employment to the FPC members on preference basis as they associate themselves in protection, development and regeneration of forests. Grazing and fodder as well as fuel wood should be related with their efforts for protection and management of forests.

Incentives to FPC/Village committees in terms of cash awards/ free grants on annual basis would be formalized. These measures would help actively involve people in the forest management and should benefit them in the longer run. The people should be made aware of their responsibilities so that long lasting relations get strengthened and well being and sustenance of forests along with people is ensured.

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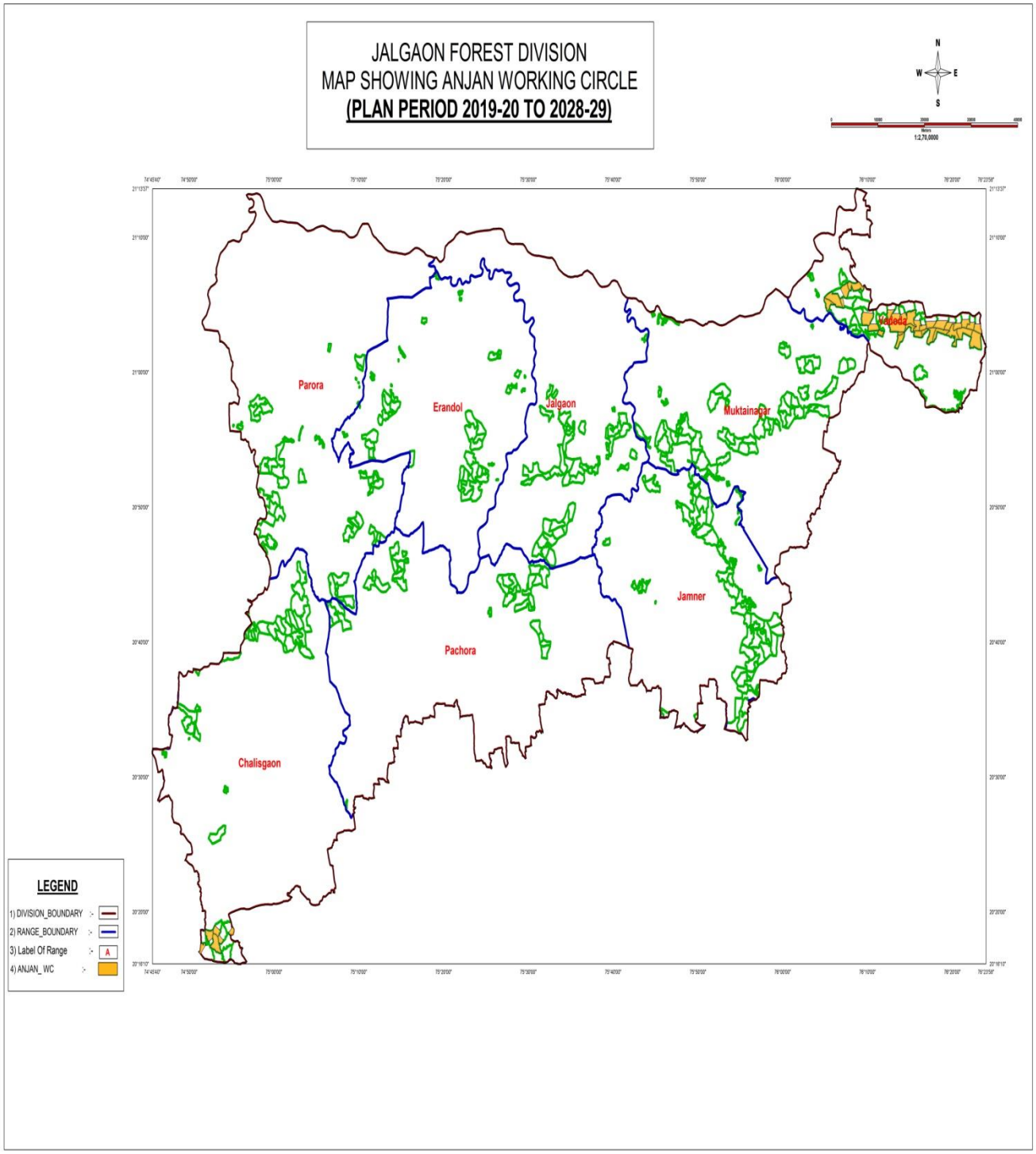
Map of Jalgaon Forest Division

Anjan Working Circle



CHAPTER-4

WORKING PLAN FOR THE ANJAN WORKING CIRCLE

4.1: NAME OF WORKING CIRCLE CLEARLY MARKED ON GIS BASED MAPS (1:50,000)

The area of this working circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

4.2 GENERAL CONSTITUTION OF WORKING CIRCLE :-

The working circle includes 952.60 ha. this working circle comprises of all the forests bearing predominantly Anjan as the principal species. These areas carry a better percentage of Anjan than other species and hence it is necessary to give separate treatment to these areas. This working circle comparises of areas from protection cum improvement, improvement and Anjan working circle of Mr.Reddy's working plan. The predominantly Anjan forest areas of Chalisgaon and Vadoda ranges are included in this working circle. Imporvment works such as artificial regeneration in understocked / blank areas with 50% Anjan and rest with other species.

4.3 : GENERAL CHARACTERISTICS OF VEGETATION :-

The forests corresponds to the dry deciduous mixed forests, Hardwickia type i.e. 5E4 of revised classification of forest types of Champion and Seth. The forests are predominantly Anjan bearing and it occurs in varying proportion but in Chalisgaon and Muktainagar ranges, it is often gregarious. Anjan predominance is seen in the extreme North-east and extreme South-west corners of the division, the composition of the crop varies from almost pure crop of Anjan on level and undulating ground to the mixed one on the slopes of the hills having mainly Salai.

4.4: FELLING SERIES,CUTTING SECTIONS ANF JFM AREAS:-

The area of this working circle is divided in to Eight treatment series with area 952.60 ha. Each series is further divided into 10 coups.

4.5: BLOCKS, COMPARTMENTS AND JFM AREAS :-

The details of compartments in this working circle have been provided in the Appendix XXXI of vol II.

4.6 : SPECIAL OBJECTS OF MANAGEMENT :-

- To meet the local demand of Anjan fodder leaves to the extent possible
- To safeguard the areas against soil erosion and thereby preserve and improve the site quality.
- To improve the growing stock as well as to bring more area of Anjan under regeneration.

4.6.1 : ANALYSIS AND VALUATION OF THE CROP :-

The crop over bulk of the areas is quality IV-b .The crop is mainly young and middle-aged with a few scattered mature and over mature trees. Nearly 32.53 % of the crop of is in 31 to 45 cms girth class, remaining 67.47 % of the crop of is in above 50 cm girth class. The stock mapping of the compartments is done by Jalgoan forest division.

(Table No.4.1)Range wise allocation of compartment and area for Anjan w.c. (Area in ha.)

Range	No.of compt.	Area
Chalisgaon	06	645.42
Parola	..	0
Erandol	..	0
Pachora	..	0
Jamner	..	0
Jalgaon	..	0
Muktainagar	..	0
Vadoda	3	307.18
Total	**9**	952.60

Soil depth is sufficient in most of the areas but in areas close revenue areas soil got compact due to biotic interference.

(Table No.4.2)

Type of area	Area in hectares	% of area wrt WC	Remarks
Well stocked , Density >0.4	83.54	5.16	The forest area of the working circle has Anjan a dominant species
Open forest, Density <0.4	766.80	47.36	
Blanks	706.73	43.65	
Scrub Forest	28.98	1.79	
Water bodies	33.02	2.04	
Total area	**1619.097**	**100**	

The above table shows that this working circle has about 47 % blank areas and dense forest is about 5.16 %. About 47.36 % of the area is open forest i.e. forest having less than 0.4 density.

4.6.2 : SILVICULTURAL SYSTEM

In view of the fact that Anjan is a good but erratic coppicer and its natural regeneration is unreliable, removal of any live Anjan is totally prohibited. As the density of the existing crop varies considerably depending upon the soil and other factors and is generally low. As there is paucity of natural regeneration Anjan will be raised through artificial means. As the object is to build up the growing stock, it is proposed to continue with the improvement works in this working circle.

4.6.3 : ROTATION PERIOD

A rotation of 10 years is kept to tackle the whole area. The working circle has been divided into 11 working series and each working series is divided into 10 coupes.

Implementing agency

The annual coupes will be worked on departmental basis. In the working of annual coupes, works like demarcation, preparation of treatment map, preparation of estimates will be carried out by the forest staff under technical supervision of concerned A.C.F.

An important aspect that is often conveniently ignored is the fact that all the forestry operations that are to be carried out are time bound. One of the basic causes of failure of plantations is that planting operations are carried out as and when time or funds permit. Here it is emphasised that allocation of funds be obtained well in time and working of the coupe is properly executed. All forestry operations will preferably be carried out through J.F.M. committee members, wherever formed. A short term training programme will be arranged for forest staff and J.F.M. committee members by involving Forest Training School.

4.6.4 : Harvestable diameter:- No harvestable diameter is decided as no harvesting is involved in this working circle.

4.6.5 : Reducing factors:- Not applicable.

4.6.6 : Felling cycle: Not applicable.

4.6.7 : Divisions into periods and allotment to periodic blocks: Not applicable.

4.6.8 : Calculation of yeild : Not Applicable

4.6.9 : Table of felling : Not Applicable

4.6.10: Method of executing the felling:

Subsidiary Silvicultural operations Cleaning And Thinning:

i) Cutting back operations: Cutting Back Operations will be carried out.

ii) Cleaning:- Maximum five common climber species such as 1. Chilar *(Caesalpinia sepiaria)* 2. Kadu-Karand *(dioscorea bulbifera*) 3. Kuhli *(Mucuna pruriens)* 4.Sagargota *(Caesalpinia bonducella*) 5.Vasan *(Cocculus villosus)* should be cut and other climbers speaies should be retained.

Demarcation of coupes and preparation of treatment map:

Except for 1st coupe in the sequence of working of this draft plan period, coupes will be demarcated one year in advance, But 1st coupe will be demarcated in the first year of operation and main working will be in the same year where as in other coupes it will be in following year.

Preparation of treatment map:

After demarcation of the coupe, Range Forest Officer will inspect the area and prepare a treatment map for the same and it shall be thoroughly verified by the Assistant Conservator of Forests. The treatment maps will show the following areas.

Method of treatment

Treatments proposed: The various treatments proposed are as under:

Area 'A': (i) The soil and moisture conservation treatment shall be as given in Miscellaneous Regulation.

(ii) Planting Bamboo, Jamun, Arjun and grasses along the nala and river bank.

Area 'B':

(i) Under stocked and blank forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetvera tussuks should be planted on the silted soil. On gentler slopes ($<25^0$) CCT works should be done and locally available species as per DCF's choice should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

A certain percentage of native fruit and medicinal species like Charoli, Awala and Arjun should also be raised and planted in the nursery. Plus trees of these species should be identified in the division and the seed of these trees should be used for raising plants in nursery or seed sowing. All these miscellaneous species which have tremendous NTFP value are naturally found in the forests of Jalgaon forest division. These miscellaneous species should be raised in polypots or root trainer containers. pits or trenches as per suitability of site should be adopted. The DCF should choose the model with technical approval from CCF(T).

Area 'C': This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

Marking rules for Anjan working circle

Marking For Type 'A' Area: No marking will be carried out.

Marking for type 'B' Area:

(i) The undesirable under growth, which is preventing growth of natural regeneration of desired species will be removed.

Marking for type 'C' Area:

Thinning shall be carried out in pole crop areas. If the plants ara available. Silviculturally.

No fruit bearing tree shall be marked for felling .

4.6.11: Subsidiary silvicultural operations Cleaning and Thining

The Subsidiary Silvicultural operations includes (1) Cleaning

Cleaning: Maximum five common climber species should be cut other species should be retained over entire area of the coupe, if necessary.

i. Damaged saplings, and coppice shoots will be cutback.
ii. Multiple coppice shoots will be reduced to one promising shoot per stool provided no other seed origin sapling is available at that place.
iii. Cleaning in plantation areas should be carried out as & when required depending upon the crop condition.

4.6.12 : Regeneration:

Natural Regeneration: The NR will be protected against fire and animals. TCM or other kind of fencing may be established.

Artificial regeneration and choice of species:-

PPO+PYO operations:- As approved by the competent authority.

Method of planting: -

The planting model approved by the competent authority will be implemented and C.C.F. (Territorial) will provide guidance from time to time.

Pre-planting and planting operations:

The pre-planting and planting operations as approved by the competent authority shall be carried out.

Irrigated plantation :-

Where ever there is a water body (dams) in the forest or on the fringe of forest, in the coupe to be treated for that year, irrigated plantation should taken. Depending on the situation.

Choice of species: In earlier working plan plantation of 50% Anjan and other 50% should comprise of bio fuel trees like Karanj, Neem, Mahua on CCT etc, or lac insect host trees like Kusum, Bor, Khair, Palas, Pimpal etc, or gum exudating trees like Kadai, Salai, Khair, Dhawada, Movai etc should be planted, was mentioned. This proportion is very rigid and could not be followed. Moreover 9 months old Anjan plants do not show promising results and hence 18 month plants of Anjan planting are recommended. Plantation of 30 % Anjan and 50 % locally found suitable species including 10% Bamboo and 20% MFP and medicinal plants should be done. A certain percentage of native fruit and medicinal species like Charoli, Awala and Arjun should also be raised and planted in the nursery. All these miscellaneous species which have tremendous NTFP value are naturally found in the forests of Jalgaon forest division.

Seed germination of Anjan is tremendous but it does not results into formation of seedling as it needs soil working and protection from fire. After seed germination, all such area should be identified and marked on ground and soil working, and intensive care from grazing and fire should be done, at least for three years till it gets established.

The planting model approved by the competent authority shall be implemented from time to time.

4.6.13 : Associated regulations and measures

Pollarding of Anjan for fodder and illegal cutting of trees for use of its heart wood for manufacturing *belan* is observed. This should be controlled by involving the JFMC's in forest protection and development works. Regular awareness programme should be conducted and peoples should be convinced about the importance of forest.

Protection from Fire: Main-felling coupes will be fire traced and rigidly fire protected for a period of Five years from the year of felling. In the month of October / November after the demarcation is over all the undergrowth of lantana will be uprooted. The cut material will be spread over the area to be planted in such a way that the cut material remain sufficiently away from the stems of the trees and burning does not harm the trees. The dry and cut bushes of unwanted species shall be burnt before the end of February to avoid fire hazards to the forests.

The NR needs to be protected from the hazards of fire so that the regeneration becomes future growing stock. Hence the main thrust should be on protection of regeneration.

To ensure effective protection from fire the workable schemes of fire protection should be carried out in which the due share to people's participation shall be given. For meaningful participation modalities shall be worked out to impart benefit to the people so that they come forward. The village forest protection committees will be formed & fire protection will be done through the village protection committee.

The techniques of fire protection should be as per the paragraphs given in Miscellaneous Regulations.

As such the area being prone to fire hazard and NR of species being the first and the biggest causality, this economic source of regeneration should be rigidly protected from fire. It causes damage to productive crop also. The comprehensive Fire Fighting Scheme should be chalked out so that effective Fire Fighting force is created for, for the period 15 th February to 15 th June on 24 hour duty on suitable area basis.

Grazing control: -

The areas of main working shall remain closed to grazing for a period of 5 years. The grazing will be regulated as per Govt. policy of the Govt. of Maharashtra dt.6th

Dec.1968 Further, in the area of adjoining but with sufficient lag for working of coupe, seeds of palatable grasses be sown and villagers be motivated to harvest the fodder. The method of rotational grazing be followed. As per functional classification this working circle can mainly be classified as minor forests and pasture lands and the maximum grazing incidence prescribed for it is 1.2 ha per cattle unit. This will facilitate opening of area on rotational basis. The closed areas should be specifically mentioned in the grazing licenses and villagers be communicated of such closures by suitable means such as drum-beating, notices on prominent places, village Panchayat officers etc. and by binding grass pullies or stacks along the boundaries of closed coupes**.**

Soil and moisture conservation measures :-

Gully plugging and *nala* bunding works will be taken up. Cement plugs or earthen *bandhara* should be taken up on a large scale to preserve moisture for a longer period, simultaneously the catchment areas of the cement plugs/ earthen *bandhara* should be treated with loose boulder structures, so as to prevent siltation in the dams. On gentler slopes ($< 25^0$) CCT works should be done and site specific suitable local species should be sown at 0.5m intervals. Charoli being an important NTFP of Jalgaon division, the seed should be collected in the season and sown on CCT's. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Seed showing works shall be completed before the onset of Monsoon. Quantum of seed will depend upon the site requirement.

People's participation:

The people's participation is the need of the hour, to protect the forest from fire, grazing, illicit cutting etc. Unless the villagers living nearby are made aware of the material benefit from the forest, they would not feel associated with the well being of the forest and may not visualize the distinct valuable utility of forests for their material benefit they get or likely to get. Therefore it should be expedited through viable measures like.

Motivation efforts for making them aware about natural benefits of the forests for providing them pure drinking water, bringing rain conserving top soil for boosting their agricultural production and providing fodder for their milch cattle.

By ensuring regular employment to the FPC members on preference basis as they associate themselves in protection, development and regeneration of forests.

Grazing and fodder as well as fuel wood should be related with their efforts for protection and management of forests.

Incentives to FPC/Village committees in terms of cash awards/ free grants on annual basis would be formalized. These measures would help actively involve people in the forest management and should benefit them in the longer run. The people should be made aware of their responsibilities so that long lasting relations get strengthened and well being and sustenance of forests along with people is ensured.

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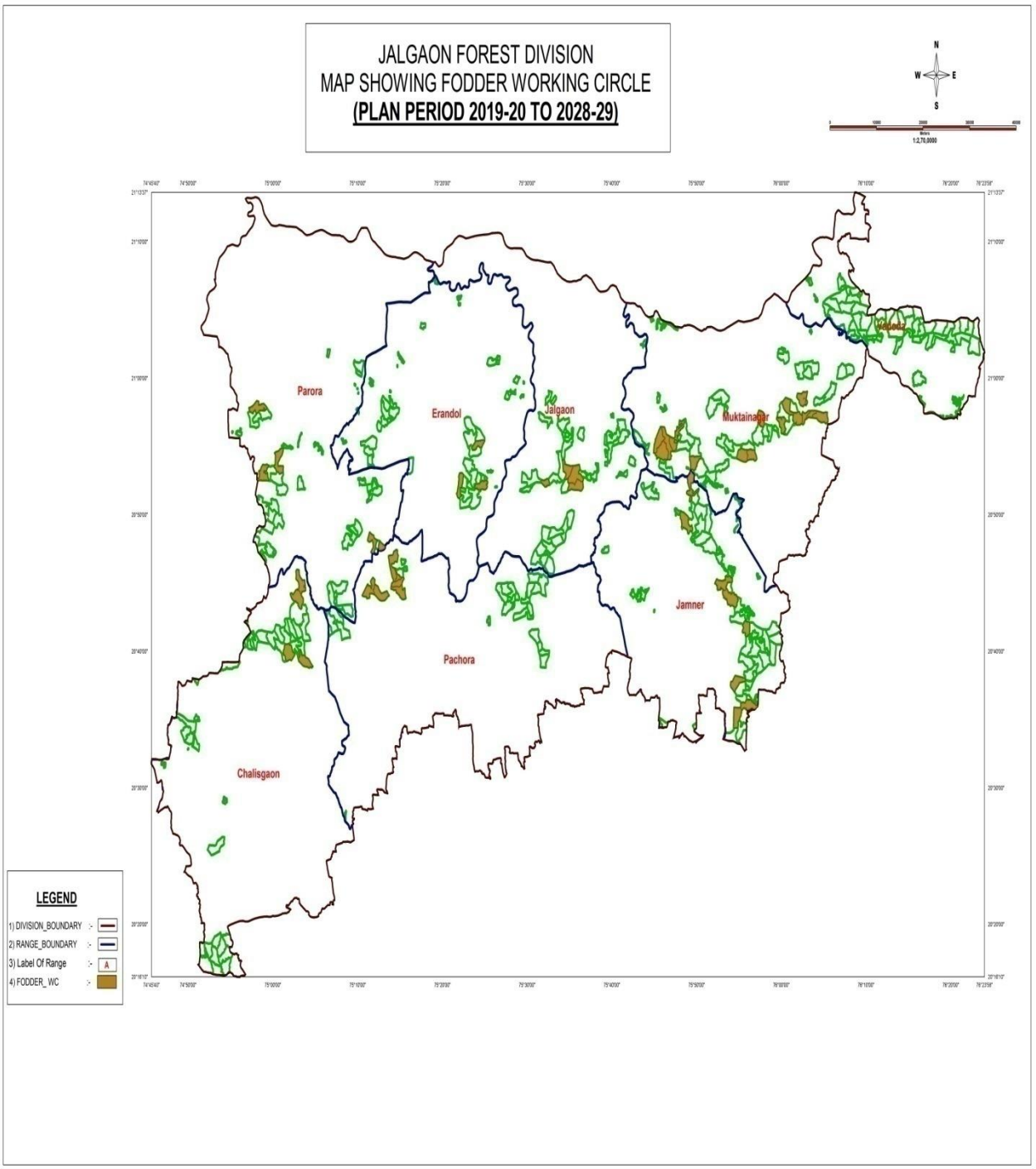
Map of Jalgaon Forest Division

Fodder Working Circle



CHAPTER- 5

WORKING PLAN FOR THE FODDER WORKING CIRCLE

5.1: NAME OF WORKING CIRCLE CLEARLY MARKED ON GIS BASED MAPS (1:50,000)

The area of this working circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

5.2 GENERAL CONSTITUTION

The woking circle comprises of areas which are subjected to heavy grazing & have very poor soil. This working circle comprises of all the forests with limited soil depth and adjoining to villages where grass is in demand, are alloted to this working circle. These areas belonged to kuran, CWR and afforestation Working Circle of Thomas and Samant's Working Plan. The total area under this working circle is 12131.90 hectare spread over whole division.

5.3 GENERAL CHARACTERS OF THE VEGETATION

The vegetation is of low quality and the forests belongs to southern Thorn Forests type i.e. 6 A C-I. All areas are open & understocked. Artificial regeneration has shown good results at places. Soil erosion is common. These are poor, open low forests having generally shallow soil and have a pronounced xerophytic ecological association in which the growing stock is stunted and malformed. Tree growth is very rare & consists of Anjan *(Hardwickia binata),* Khair *(Acacia catehu),* Hiwar (*Acacia leucophloea),* Babul (Acacia nilotica), Dhawda *(Anogeissus latifolia),* Salai *(Boswallia serrata),* Kakad *(Garuga Pinnata)* Modal *(Lannea coromandelica*) etc.

The grasses commonly seen and which have fodder value are Pavanya (*Schima nervosum*), Sheda (*Schima sulcatum*), Tambadgota (*Andropogon pumilus*) and Kusali (*Heteropogon contortus*). The other grasses having comparatively less fodder value are Kunda (Ischaemum pilogum), Phulora (*Themeda quadrivaluvis*) etc. At few places pure patches of Anjan forests which are considered to be edaphic climaxes (type 5A/E4) are observed.

5.4 FELLING SERIES, CUTTING SECTIONS ANF JFM AREAS

The area of this working circle is divided in to Nine treatment series with area 12131.90 ha. Each series is further divided into 10 coups.

5.5 BLOCKS, COMPARTMENTS AND JFM AREAS :-

The details of compartments in this working circle have been provided in the Appendix XXIX of vol. II

5.6 SPECIAL OBJECTS OF MANAGEMENT

- To conserve soil & moisture effectively.
- To improve the quality of fodder Grasses & vegetal cover of the area.
- To meet the demand of fodder.

5.6.1 Analysis and valuation of the crop

Most of the areas are open, in the natural tree growth is sparse, stunted & malformed. The plantations done over the years have shown mixed results. The crop over bulk of the areas is quality IV-b . The enumeration data shows that about 87.23% of the crop is less than 60 cm girth class of which 45.49% of crop is in 15-30 cm girth class, 25.48% of the crop is in 30-45cms girth class and 16.23% of the crop is in 45-60 cms girth class. The stock mapping of the compartments is done by procuring Forest Density Classified Satellite Images from Forest Survey of India, Dehradun, The Images procured belong to the year 2003. Compartment boundaries are overlaid on these images and density maps are prepared. The results of stock mapping are indicated in Annexure I.

Soil depth is sufficient in most of the areas but in areas close to revenue areas soil got compact due to biotic interference.

Range wise allocation of compartment and area for Fodder W.C. **Table No.5.1**

(Area in ha.)

Range	No.of compt.	Area
Chalisgaon	4	992.19
Parola	5	890.991
Erandol	3	2347.66
Pachora	6	1303.39

Jamner	8	3919.47
Jalgaon	4	1421.33
Muktainagar	13	1256.79
Vadoda	--	0
Total	**43**	**12131.9**

Type of area	Area in hectares	% of area wrt WC	Remarks
Well stocked , Density >0.4	310.15	2.38	The forest area of the working circle has Anjan as dominant species
Open forest, Density <0.4	2000.40	15.39	
Blanks	9950.70	76.57	
Scrub Forest	674.09	5.18	
Water bodies	60.00	0.46	
Total area	**12995.34**	**100%**	

Source: Forest Survey of India's forest density classified data-2003SF

The above table shows that this working circle has about 76.57% blank areas and dense forest is only about 2.38%. About 15.39% of the area is open forest i.e. forest having less than 0.4 density.

5.6.2 Silvicultural system

The area will be tackled by artificial regeneration of grasses & legumes with fodder tree species who also provides small timber/firewood.

5.6.3 Rotation period :-

A working cycle of 25 years is kept to tackle the whole area. The working circle has been divided into 9 working series and each working series is divided into 25 coupes.

5.6.4: Harvestable diameter:- Not applicable.

5.6.5: Reducing factors:- Not applicable.

5.6.6: Felling cycle: Not applicable

5.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

5.6.8: Calculation of yeild : Not applicable

5.6.9: Table of felling : Not applicable

5.6.10: Method of executing the felling :-

Treatments proposed:

The various treatments proposed are as under:

Demarcation of coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of treatment map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

Treatment:

The various treatments proposed for the above mentioned areas are as follows:

Area 'A':

i. Poly bag planting on 'V' shape furrows- species, distance between two furrows, two plants etc should be fixed as per recommendations of Research Wing.

ii. The SMC works including LBS, gabion and gully plugging will be carried out wherever essential.

Area 'B' In area, which are having better soil depth and are fit for raising trees, fodder species like Anjan, Neem, Ber, Apta will be planted along with the standard soil and moisture conservation works of gully plugging and nalla bunding.

Area 'C' The SMC works like Van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability.

Type D areas:- Soil and moisture conservation works to be taken in these areas

The following species given in the list below should be preferred.

Grasses-

1.	Dongari grass	*Chrysopogon fulvas*
2.	Motha Paunay (Sheda)	*Sehima nervosum*
3.	Anjan grass	*Cenchrus cillaris*
4.	Marvel	*Dicanthium annulatum*

Legumes-

1.	Stylosanthus species viz.	Hamata, scabra
2.	Wild tur	*Atylosia scaraboides*

5.6.11 : Subsidiary silvicultural operations cleaning and thinning :

Throughout the site 250 seedlings of fodder species (Neem, Sisso, Anjan etc.) mentioned above will be planted at 8 x 5m. spacing.

Weeding:

In the first year, it is proposed to carry out three weeding to remove undesirable grass species, interfering with growth of grasses and legumes sown in the plantation.

The first weeding will be done in the second/third week of July and the second weeding the middle of September. During the weeding where line sowing is done all undesirable grasses will be removed. In case of G.S.B. the grasses other than sown will be removed. In case of pit method, weeding around the pit up to a distance of 30cm. On either side will be carried out.

Weeding and seedling:

Three weeding and two soil working of 250 seedling planted on trenches during first year. Soil working with two weeding during 2nd year and weeding and one soil working during 3rd year should be carried out.

Fertilizer application:

In the formation year, it is proposed to give fertilizer dose to get better results.

As per the Dr.Bhatnagars formula soil is to be examined for N,P,K accourdingly the doses of N,P and K would be given.

Protection:

The plantation of grasses needs to be protected effectively from grazing and fire. It is proposed to provide one watchman for 25 ha. Area. In the first year watchman will be provided for 9 months and from S.Y.O. to fifth year he will work all round the year. Fire line of 5mts. Width will be taken around the plantation from F.Y.O. to fifth year.

Harvesting: In the first year, the grass will be ready for harvest by November. Its seed should be collected from November onwards, till January and afterwards the grass will be allowed to be cut or it may be disposed off by any other method in force in the division, such as by auction etc. Only the cutting to be done in first year and two cuttings in subsequent years, may be taken.

Similarly the fodder tree species may be allowed to be lopped for green fodder from 4^{th} year onwards.

In subsequent years the grass again come up from existing rhizomes and will need casuality replacement only in a few failure patches.

Re-establishment of the Coupes:

Grasses establish in a short time and start giving produce within a year. This production increases up to fourth year but after that period a plateau is reached and productivity gradually falls. It therefore, becomes desirable to undertake operation necessary for reestablishing the grass. It is proposed to carry out these operations after 10^{th} year. The operations will be as mentioned in preceding paragraphs.

5.6.12 : Regeneration :

All the sites are undulating and drought prone. However the steepness of the slopes in different sites and also within a site varies. As the rainfall and soil factors generally remain unchanged, the gradient becomes a determining factor for the treatment proposed. Therefore, following tree types of area will be demarcated on the treatment map.

Category 1: - Flat areas or areas with a gentle slope (Up to 5°)

Category 2: - Areas with gentle to moderate slopes (From 5° to 15°)

Category 3: - Areas with moderate to steep slopes (Over 15° slopes)

Following operations will be common for all the above mentioned areas:

Eradication of bushes and weeds by uprooting and manual cutting. After cutting their stumps will be treated with weedicides viz.2,4,5-T (0.4% solution). However, fodder trees of old plantations should be retained.

Soil treatment and seed sowing:

Category 1 areas:

Water absorption trenches of 60cms.width and 30cm. Depth will be dug up throughout the workable area at a spacing of 8m. Trench should be aligned along the contours. Soil and moisture conservation works like gully plugging and nala bunds will be under taken in the area. Van Bandharas or cement check dams should be taken extensively to improve the moisture in the area. A tractor or a country plough will be used to drip area between the trenches. These works shall be completed by 15th of May of the planting year. In the last week of May or first week of June, the grass seeds and legume seeds will be sown in alternate rows at a spacing of 50cms. Apart, Seeds must be sown at not more than 0.8cm. depth, otherwise the germination will be affected. 6kg. Grass seed will be sufficient for one Ha. Similarly following quantities of legume seeds will be required.

a) Stylo hamata 4kg/ha.

b) Wild Tur 10 kg/ha.

In case of grasses, pelleting of seeds is found beneficial for better establishment. Seed is processed in small pellets which are easy to handle and less vulnerable to be blown by wind or washed off by water. A homogenous thick paste is prepared by incorporating seeds in the mixture of sand, clay, cow dung manure and water in the proporation. The pellets are prepared in such a size that each pellets consists of up to 5 seeds. The pellets are dried and can be stored for 4-6 months before sowing. On

the onset of monsoon these may be sown in the field. Pellets can be made manually or by using a machine.

Category 2 areas:

WATs of 60 cm. Width and 30cm. Depth will be dug up throughout the workable area at a spacing of 8m. Trench should be aligned along the contours. Soil and moisture conservation works like gully plugging and nala bunds will be under taken in the area . Van Bandharas or cement check dams should be taken extensively to improve the moisture in the area. 50 grass seed beds of size 8m. x 1.75cm x 15cm. Will be prepared in between these trenches. The grass and legume seeds will be sown in alternate lines on grass seed beds and trenches about 4.5 kg. Seed of grass will be required. Requirement of legume seeds is similar to that for category 1 areas. Timing and method of sowing is as given for category 1 areas.

Category 3 areas:

WATs of 60 cm. Width and 30cm. Depth will be dug up throughout the workable area at a spacing of 8m. along the contours. Small pits of size 10 cm. X 10 cm. X 10 cm. Will be dug up through out the site at 1m. x 1m. spacing. These pits will provide better conditions for germination than ordinary dibbing. Soil and moisture conservation works like gully plugging and nala bunds will be under taken in the area. Van Bandharas or cement check dams should be taken extensively to improve the moisture in the area. Grass and legume seeds will be sown in alternate lines on these pits and also on trenches. The depth of seeds sown will not be more than 0.8 cm. The timing of sowing will be as per category 1 areas.

5.6.13 : Associated regulations and measures:

Fire Protection: Main-working coupes will be fire traced and rigidly fire protected for a period of **Five years** from the year of working. In the month of October / November after the demarcation is over all the undergrowth will be uprooted. The cut material will be spread over the area to be planted in such a way that the cut material remain sufficiently away from the stems of the trees and burning does not harm the trees. The dry and cut bushes of unwanted species shall be burnt before the end of February to avoid fire hazards to the forests.

The NR needs to be protected from the hazards of fire so that the regeneration becomes future growing stock. Hence the main thrust should be on protection of regeneration.

To ensure effective protection from fire the workable schemes of fire protection should be carried out in which the due share to people's participation shall be given. For meaningful participation modalities shall be worked out to impart benefit to the people so that they come forward. The village forest protection committees will be formed & fire protection will be done through the village protection committee.

As such the area being prone to fire hazard and NR of species being the first and the biggest causality, this economic source of regeneration should be rigidly protected from fire. It causes damage to productive crop also. The comprehensive Fire Fighting Scheme should be chalked out so that effective Fire Fighting force is created for, for the period 15 th February to 15 th June on 24 hour duty on suitable area basis.

The techniques of fire protection should be as per the paragraphs given in Miscellaneous Regulations.

Grazing control: - The areas of main working shall remain closed to grazing for **a period of 5 years**. The grazing will be regulated as per Govt. policy of the Govt. of Maharashtra dt.6th Dec.1968 Further, in the area of adjoining but with sufficient lag for working of coupe, seeds of palatable grasses be sown and villagers be motivated to harvest the fodder. The method of rotational grazing be followed. As per functional classification this working circle can mainly be classified as minor forests and pasture lands and the maximum grazing incidence prescribed for it is 1.2 ha per cattle unit. This will facilitate opening of area on rotational basis. The closed areas should be specifically mentioned in the grazing licenses and villagers be communicated of such closures by suitable means such as drum-beating, notices on prominent places, village Panchayat officers etc. and by binding grass pullies or stacks along the boundaries of closed coupes.

Irrigation Plantaions: Where ever there is a water body(dams) in the forest or on the fringe of forest, in the coupe to be treated for that year, irrigated plantation should be taken.

Soil and moisture conservation

Gully plugging and *nala* bunding works will be taken up. Cement plugs or earthen *bandhara* should be taken up on a large scale to preserve moisture for a longer period, simultaneously the catchment areas of the cement plugs/ earthen *bandhara* should be treated with loose boulder structures, so as to prevent siltation in the dams. On gentler slopes ($<15^0$)CCT works should be done and site specific suitable local species seed should be sown at 0.5m intervals. Charoli being an important NTFP of Jalgaon division, the seed should be collected in the season and sown on CCT's. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Seed showing works shall be completed before the onset of Monsoon. Quantum of seed will depend upon the site requirement.

People's participation: The people's participation is the need of the hour, to protect the forest from fire, grazing, illicit cutting etc. Unless the villagers living nearby are made aware of the material benefit from the forest, they would not feel associated with the well being of the forest and may not visualize the distinct valuable utility of forests for their material benefit they get or likely to get. Therefore it should be expedited through viable measures like.

Motivation efforts for making them aware about natural benefits of the forests for providing them pure drinking water, bringing rain conserving top soil for boosting their agricultural production and providing fodder for their milch cattle.

By ensuring regular employment to the FPC members on preference basis as they associate themselves in protection, development and regeneration of forests.

Incentives to FPC/Village committees in terms of cash awards/ free grants on annual basis would be formalized. These measures would help actively involve people in the forest management and should benefit them in the longer run. The people should be made aware of their responsibilities so that long lasting relations get strengthened and well being and sustenance of forests along with people is ensured.

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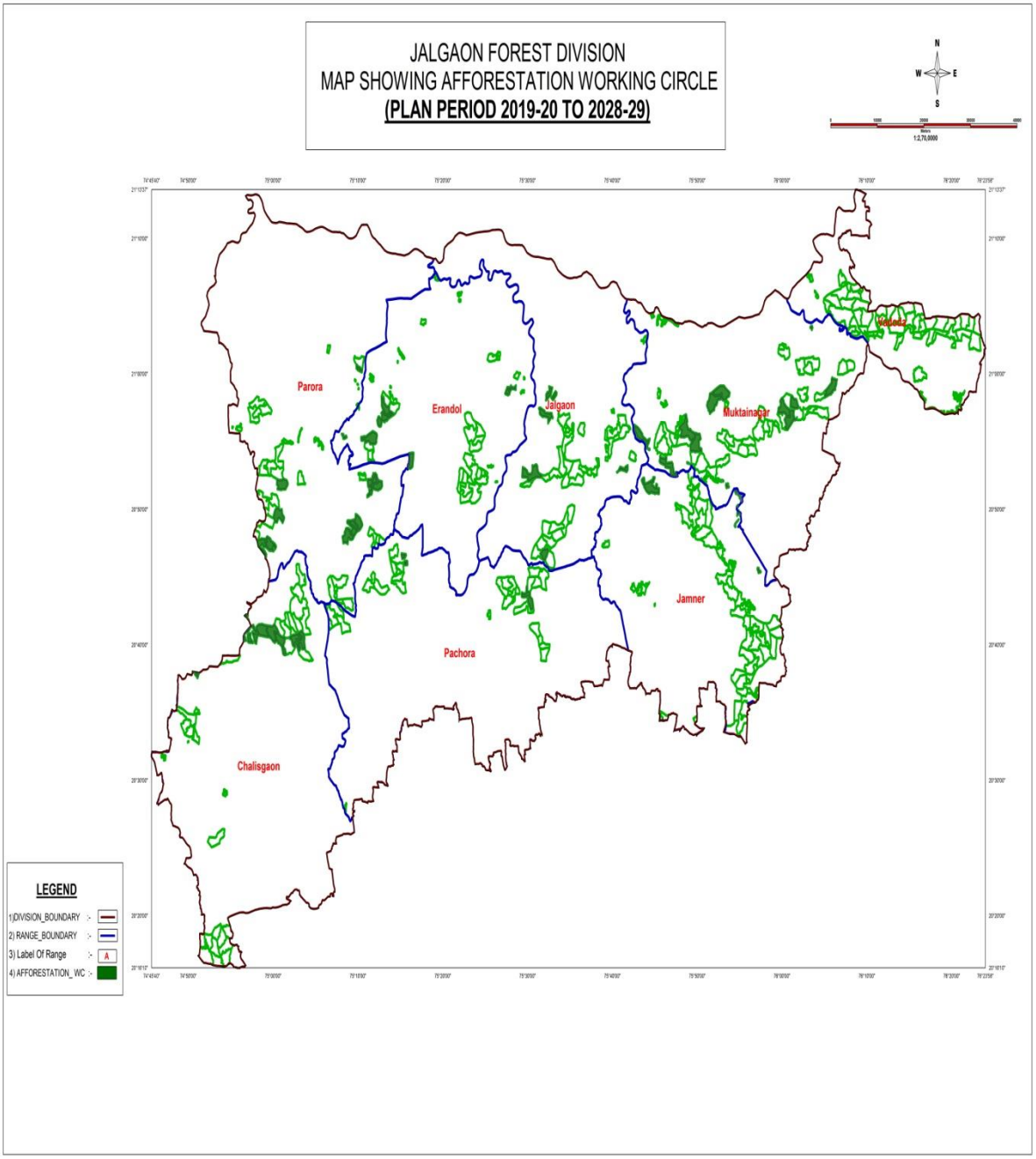
MAP OF JALGAON FOREST DIVISION

AFFORESTATION WORKING CIRCLE



CHAPTER- 6

AFFORESTATION WORKING CIRCLE

6.1: NAME OF WORKING CIRCLE CLEARLY MARKED ON GIS BASED MAPS (1:50,000)

The area of this working circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

6.2: GENARAL CONSTITUTION:

Blank areas which is suitable for plantations will be included in this working circle. The total area under this working circle is 10786.3 ha. spread over of all ranges in the Jalgoan Division.

Table No.6.1

Range	No.of campt.	Area
Chalisgaon	6	1744.09
Parola	7	1228.54
Erandol	5	370.87
Pachora	2	1088.64
Jamner	1	4166.75
Jalgaon	6	216.29
Muktainagar	14	1970.96
Vadoda	..	0
Total	**41**	**10786.3**

6.3: GENERAL CHARACTERISTICS OF VEGETATION

This working circle generally comprises of degraded open forest areas interspersed with forest blanks or brushwood. The blank areas have dominance of Khair and Palas.

The allotted areas in general are under stocked and open with crop density usually less thn 0.4, though patches of better stocked areas are also met with in some

compartments. The most of the PF areas allotted to this WC, especially, those near the villages are hightly degraded and lays bare without any significant tree crop**.**

6.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS

The area of this working circle is divided in to ten treatment series with area of 10783. ha. Each series is further divided into 10 coups.

6.5 : BLOCKS, COMPARTMENTS AND JFM AREAS :-

The details of compartments in this working circle have been provided in the Appendix XXVII of vol II .

6.6: SPECIAL OBJECTIVE OF MANAGEMENT:

- To cover the blank area with vegetative growth,
- To reclaim the area by soil and moisture conservation works,
- To increase the productivity of forest land
- To involve the local people in plantation activities.
- To maintain and preserve the biodiversity of the area by encouraging the plantation of indigenous speices.

General prescription for treatment.

1. Dressing of all illicitly cut trees and cutting of all dead, dying and malformed trees except retaining 2 dead treed per hectare should be done.

2. The undesirable under growth, preventing growth of natural regeneration of desired species will be removed.

3. Under stocked and blank forest areas where slopes are $<25^0$ should be treated by intensive soil and moisture conservation works like gully plugging, nala bunding, nala rejunivation, Loose Boulder Structures. CCT and Deep CCT works are recommended on areas with gentle slope as this will provide barrier to soil erosion.

4. Seed sowing of Neem , Khair, Moha, and other local fodder species should be done in bushes as per site suitability before the onset of Monsoon

5. Plantations of locally found suitable species including 10 % Bamboo, 20% MFP and medicinal plants and fodder species etc should be planted.

Table No 6.2

Type of area	Area in hectares	% of area w.r.t WC area
Well stocked, Density >0.4	105.15	**0.85**
Open forest, Density <0.4	1663.00	13.51
Blanks	9250.2	75.20
Scrub Forest	1142.00	9.28
Water bodies	140.00	1.14
Total area	**12300.35**	**100%**

Nearly 75.20% of the forest area of this working circle is blank and 13.51% area is under stock having density less than 0.4.

6.6.1 : Analysis of crop :- Not Applicable

6.6.2 : Silvicultural system :- Not Applicable

6.6.3 : Rotation period :

The rotation of 10 years is fixed to tackle the whole area. This working circle is divided into ten working series and each working series has been divided into 10 coupes.

6.6.4 : Harvestable diameter:-

No harvestable diameter is decided as no harvesting is involved in this working circle.

6.6.5: Reducing factors:- Not applicable.

6.6.6: Felling cycle: Not applicable.

6.6.7: Divisions into periods and allotment to periodic blocks: Not applicable

6.6.8: Calculation of yeild : Not applicable

6.6.9: Table of felling : Not applicable

6.6.10: Method of executing the felling :

Method of treatment :

Treatments proposed:

The various treatments proposed are as under:

Demarcation of coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of treatment map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

The proposed annual working coupes will be demarcated one year in advance of working. After demarcation of the area, a treatment map shall be prepared by the field staff and shall be verified by a ACF. Site specific treatment plan needs to be prepared giving due weightage to the site conditions.

The following areas shall be shown distinctively in the map:

I) Area 'A' – Protection areas : It shall include the following areas

i. Areas with steep slopes i.e. more than 25^0
ii. Eroded areas or areas liable to erosion.
iii. Twenty meters wide strip on either side of the water courses.

II) Area 'B'–Under stocked areas: include areas with crop density less than 0.4. Area suitable for taking up afforestation shall be marked on it and shall also show prominently the type and location of SMC works to be undertaken.

III) Area 'C'- Old plantation areas: include areas under old plantations.

IV) Area'D'–Well stocked areas: include areas with crop density more than 0.4.

All prominent nallahs, perennial sources of water, water bodies etc. shall also be shown in the TM and numbered. Laying of grids shall be done only in B and D type areas. In B areas where plantations are prescribed, grids of 0.5 (100X50 mtrs) hectare size while in D areas, grids of 1 ha. size (100 x100 mtrs) shall be laid. Grid wise record of operations eg. Planting of seedlings, tending of NR, root stock management, singling of coppice, weeding etc. shall also be maintained by the RFO.

The various treatments proposed for the above mentioned areas are as follows:

1) Area 'A':

i. The SMC works including LBS, gabion and gully plugging will be carried out wherever essential. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

ii. Soil binders like Sisal (Agave sp.); local grasses etc. shall be planted as per the site requirement.

iii. Cuttings of Ficus, bulbils of Agave, Euphorbia (*Sabar*) etc. shall be planted for binding the soil wherever possible.

iv. In the accessible under-stocked areas having good soil depth, seed-dibbling of local species shall be done to suitably clothe the area.

v. Bamboo and other suitable species shall be planted in accessible under-stocked areas within 20 meters wide strip on either side of water courses.

2) Area 'B' :

These areas shall be treated in following two stages:

a) Restorative phase: This phase will be of one year duration and will prepare the site for the planting activity by improving its soil moisture content. During this phase, soil and moisture conservation works shall be carried out. The area of the annual working unit shall be protected completely from biotic interference by digging a T.C.M./ stone walls/ live hedge.

During this phase various works will be taken up as under:

i. Preparation of the T.C.M. and/ or live hedge around the working area: Preparation for the live hedge should be started before the rains set in so that the seeds/ cuttings/ seedlings of suitable local species should be sown/ planted at the onset of the rains. TCM may be dug after the rains.

ii. Species like Sagargota, Agave, Euphorbia, Bamboo, Karvand and other suitable local species should be grown on the mound of TCM or as a live hedge.

iii. The SMC works like van tale, nalla-bunding, gully-plugging, contour trenches etc will be carried out as per the site suitability before the rains set in.

iv. Singling and cutting back of the rooted stock.

b. **Productive phase:** In the second year, the planting activity shall be taken in the same annual working unit only after ensuring that the area is fully protected and treated with SMC works.

i. Rooted stock shall be properly tended.

ii. Suitable local miscellaneous species including fuel wood, fodder tree species, NTFP and medicinal plant species will be planted in the under-stocked areas having good soil depth. In low rainfall areas for better moisture conservation, instead of pits, planting in contour trenches should be done.

iii. Economically important species that occur locally shall be planted. No exotic species shall be planted.

iv. As per draft National Forest Policy 2018, increasing productivity of the forest plantations is one of the essential principals of forest management. Therefore increasing forest productivity shall be given emphasis rather than creating mere green cover. This will be addressed by intensive scientific management of forest plantations of commercially important species Like Teak, Ain, Khair, Bamboo, etc. Teak plantations were taken in 1960s but for want of proper silvicultural operations expected growth was not achieved. For last many years Teak planting is not at all done, to increase productivity Teak plantations should be done in suitable areas. Teak plantation should be done on minimum 5 ha contiguous area patch.

v. Grass Plantation in Zone I / II area. In this type area, some areas are having soil depth less than 20 cm. In such patches tree species should not be planted, instead polythene bag grass seedlings/ tussocks should be planted. This will serve the purpose of soil and moisture conservation as well as provide fodder for wildlife and local villagers. In such areas medicinal plants, wild edible plants, which normally don’t require more soil depth may be tried.

vi. In every plantation, it shall be ensured that about 5 seedlings of Vad, Pimpal, *Kigelia pinnata*, Umbar, Karvand, Bor, Behada, Kawath, Jambhul,

Amba, Gorakh chinch, etc. are planted. These species provide food and shelter to birds.

vii. Polybag/ root trainer seedlings of superior fodder grasses like Anjan, Kala Dhaman, Dongri, Sheda, Pawanya, Marvel etc. should be planted on the freshly excavated and heaped soil bund on the lower side of the contour trenches/ old WATs in the suitable areas. Other suitable models for raising fodder grasses may also be used after getting prior approval from the CCF (T), Dhule.

Area 'C':

i) This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

Area 'D':

iii. The SMC works like van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

iv. No planting shall be done in these areas.

v. Felling is not prescribed.

Introduction of grasses:-

Area suitable for introducing fodder grasses should be identified. These type of areas should be well drained, plain to gentle slopping with 15 cm depth of soil not less than 2 ha. in extent at one place and such type of areas must be mostly under stocked or blank.

Along the counter, ploughing of strips and planting of tussocks grasses should be done. Plants of Sheda, Pavana & Marvel should be prepared in polypots & its planting on the site must be followed with due care. Nala-bunding and Gully plugging is also prescribed with uprooting of weeds and coppice shoots in 2^{nd} and 3^{rd} year of operation.

6.6.11: Subsidiary silvicultural operations cleaning and thinning : Not applicable

6.6.12: Regeneration:

Natural regeneration: The NR will be protected against fire and animals. TCM or other kind of fencing may be established.

6.6.13: Accociated regulations and measures

Soil and moisture conservation works :

The area gets heavy average annual rainfall ranging between 500 to 700 mm. but most of the valuable rain water goes waste as run-off into the streams of main Rivers. On the other hand gets a scanty average annual rainfall of about 550 to 650 mm. only. Therefore a large tract of the division faces an acute shortage of water during the summer months. The soil becomes compact during the pinch period resulting in poor drainage as well as poor aeration of the soil. Intensive SMC works viz. gully plugging, nalla-bunding, contour trenching, van-tale and other appropriate water harvesting structures shall be undertaken as per site requirement for helping young regeneration to establish easily. Ridge to valley concept shall be followed while treating the watershed. A village shall be taken as a unit of holistic development. For this purpose, it shall be endeavored to integrate forestry management interventions with development schemes of other departments.

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CHAPTER NO. 7

NON TIMBER FOREST PRODUCE

7.1: The area of this chapter covers the whole Division and hence not specifically marked on the GIS based map.

7.2: GENERAL CONSTITUTION

The area of this chapter extends over the entire plan area. Presently Tendu, Dhawda, gum are the major source of revenue to the division. The collection of Tendu leaf is one of the most important incomes generating activity in the division.

7.3: GENERAL CHARACTERISTICS OF VEGETATION:

A sizeable portion of the forests of this division are of Mixed Forest type, supporting species of great NTFP value, namely, Tendu, Mahua, Char, Kullu, Dhawda, Beheda, Mowai, Khair, Salai, Awala, Kusum, Palas, and Bor etc. These trees are found scattered in the entire division and will mixed with other species, NTFP collection also generate employment opportunities. The important NTFPs found and collected in this tract are Mahua flowers, Mahua seeds, Tendu leaves, Dhawda gum, Salai gum etc.

7.4: FELLING SERIES,CUTTING SECTIONS AND JFM AREAS :- Not Apllicable

7.5: BLOCKS, COMPARTMENTS AND JFM AREAS :- Not Apllicable

7.6 : SPECIAL OBJECTS OF MANAGEMENT

- The special objects of management of this chapter are as below:
- To generate employment for the Forest Protection Committee members and improve the economic situation of the local rural people.
- To identify and assess different NTFP resources in the division. That is girth class wise, beat wise, enumeration of commercially important NTFP species like

Anogeissus latifolia, Sterculia urens, Boswellia serrata, Schleichera oleosa, Butea monosperma etc.

- The local people should be taught about the collection/tapping technologies and storing of the collected produce.
- The department after assessing the NTFP potential of the division, should do market survey and assesses the market and find most competitive price for the produce collected by the local people.

7.6.1: Anyalysis of the crop: Not applicable.

7.6.2: Silvicultural system: Not applicable.

7.6.3: Rotation period:- Not applicable.

7.6.4: Harvestable diameter:- Not applicable.

7.6.5: Reducing factors:- Not applicable.

7.6.6: Felling cycle : Not applicable

7.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

7.6.8: Calculation of yeild : Not applicable

7.6.9: Table of felling : Not applicable

7.6.10: Method of executing the felling : Not applicable

7.6.11: Subsidiary silvicultural operations cleaning and thinning : Not applicable

7.6.12: Regeneration : Not applicable

7.6.13 : Associated regulation and meaures:

Ownership and monopoly procurement of the NTFP:

Parliament has enacted a law "The Provisions of the Panchayat (Extension to the Scheduled Areas) Act, 1996 (Act No.40 of 1996)". The said Act, provides for endowing by the States, the Panchayats in the Scheduled areas, with such powers and authority as may be necessary to enable them to function as institution of self Govt. It further provided that a State Legislature should ensure inter-alia, that the Panchayats

at the appropriate level and the Gram sabhas are endowed specifically with the ownership of minor forest produce.

Govt. of Maharashtra has enacted a law "Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas Act, 1997 and has amended Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969 (Act No.45 of 1997)", vide which ownership of 33 MFP specified in the Schedule, found in the Govt. land has been transferred to the Panchayats. The MFPS included in the Schedule are [1] Mahuwa flower [2] Mahuwa fruits [3] Gum [4] Hirda [5] Charoli [6]Awala [7] Baheda [8] Neem seeds [9] Karanj seeds [10] Amaltas seeds [11] Chinch [12] Tamarind seeds [13] Lac of Palas [14] Lac of Kusum [15] Seeds of *Jatropa* [16] Takda/ Pauda [17] Nirmali/ Kapi [18] Bapchi bee (seed) [19] Kunchala kari [20] Shikakai [21] Reetha [22] Biba [23] Gunj seed [24] Broom grass [25] Mango seed [26] Wavding [27] Baphali [28] Cut Grass and fodder [28] Honey [30] Palas leaves [31] Sitaphal [32] Cashew nuts.

Panchayats are to strictly adhere to the prescriptions contained in the Working Plan with regards to the harvest of minor forest produce. In the areas not covered under the Working Plan the Panchayats are to adhere to the rules made, with regard to the harvesting of minor forest produce, by the conservation of forests of the concerned circle.

The following Gram Panchayats of Jalgaon Talukas are included in Scheduled Area:

Jalgaon – Borkhede Kd., Parsale Bd., Gadrya, Malonda = 4

Agencies for collection:

The *Maharashtra Tribals'* Economic Condition (Improvement) Act, 1976 empowers the state government to enforce monopoly procurement of certain goods including the NTFP in the Tribal Sub-plan Areas. The Maharashtra Tribal Development Corporation (TDC) serves as the Chief Procurement Agent. List of items covered under the monopoly procurement vary among talukas and from year to year. This procurement provision is binding and therefore to be carried out accordingly.

The Deputy Conservator of Forests should take initiative to implement the Amendment 73rd in Scheduled areas. During the field study it is observed no body is

aware of the amendment and its benefits. Women Self Help Groups(SHGs) should be promoted to collect the NTFP produce and marketing facility should be provided by the forest department. This would avoid exploitation of poor tribal by middle men.

Method of treatment

The trade of minor forest procured is governed by Minor Forest Produce (Regulation of trade)Act 1969.

The trade of Tendu leaves in particular is governed by Maharashtra Forest Produce(Regulation of Tendu leaves) Rules 1969. In this regard Ordinance R&D.D. 10 Dec 1997 published in part IV of Maharashtra State Gazette 18 Dec 1997 (pp 682) should be considered by the Dy.C.F., Jalgaon.

Modifications according to legal provisions:

Since legal provisions are not very explicit, it is recommended that treatments prescribed in the following paragraphs be modified according to the legal directives issued by the state government from time to time.

Fire Protection measures:

Collection of NTFP is often associated with forest fire, because the villagers set fire around the NTFP-yielding trees for clearance of leaf litter and undergrowth. Fires are also caused by agents of *Tendu* contractors to get better flush of *Tendu* leaves. If left unattended such fires spread into forests as forest fires.

The village *panchayats* and JFMCs shall be involved in awareness generation program to control forest fires. Villagers should be encouraged to ensure that such cleaning do not end up as forest fire.

In case of forest fire, legal action should be taken against the defaulters. Strict vigilance is necessary during the months of March-April to check the spread of fires in time during *Tendu* season.

Documentation of NTFP collection:

The Beat Guards shall send monthly reports to the Range Forest Officer on the quantity of NTFP collected in their beats. The Range Forest Officer shall compile and

send the details to the division office. The division office shall compile the figures for each species for the division with a view to monitor their collection and harvest, to sustainable limit.

Non-destructive collection of NTFP: Unless detrimental to the wildlife conservation and site conditions, sustainable harvesting of herbs non-destructive removal of flower, fruit and other medicinal parts can be permitted.

Compartments having promising regeneration areas of NTFP species shall be identified and tended to remove congestion in the crop.

Considering site suitability and local needs; NTFP species like GUM, LAC, shall be given due importance in various plantation schemes.

Except dead, no NTFP tree shall be marked for felling during the coupe working under various working circles.

Management of *Tendu:*

Tendu leaves collection is monopoly of the state government under the Maharashtra Forest Produce (Regulation of Trade) Act, 1969. The *Tendu* leaf collection shall be carried out in the manner prescribed by the Principal Chief Conservator of Forests from time to time.

Collection of *Tendu* leaves: *Tendu* is the prominent revenue generating NTFP of this tract. *Tendu* leaves are used for manufacturing *bidis.* The collection season of *Tendu* leaves is short, and is hardly a month, from the last week of April to the last week of May.

Tendu is the only NTFP that has been quantified to certain extent. But it is necessary to estimate the exact quantity of Tendu leaves that the unit yields. Tendu contractor collection can not exactly provide the exact potential of the unit. The unit should be departmentally collected once in every five years. Necessary budget provisions should be made one year in advance.

Tendu leaves collection is an income generating activity for most local and tribal villages in the region. The local village communities shall be gainfully engaged in *Tendu* collection in the division to support their livelihood.

Pruning of young *Tendu* plants does help in increasing the leaf yield. Pruning in the compartments may be allowed at 3-year interval. However, felling of *Tendu* trees or branch lopping for leaf collection shall be dealt with firmly.

***Tendu* regeneration:** In view of the importance of *Tendu* to support the livelihood of forest dwelling communities and its economic value for the region, sustainable management and use of *Tendu* is prescribed..

Maintainance and improvement of *Tendu* in the forest crop composition is proposed by ensuring regeneration of *Tendu* and by protection.

Singling of shoots and soil working around *Tendu* seedlings is prescribed in the plantation and rootstock areas to promote the growth of *Tendu* seedlings along with the annual coupe working in the area-specific working circles.

It is proposed to ensure inclusion of *Tendu* in significant proportion in mixed plantations prescribed under various area specific working circles.

Soil Working for *Tendu* trees: Digging of 30 cm deep trench encircling *Tendu* trees of diameter matching tree crown has been found useful to regenerate the species from root suckers. By doing so roots are injured and from which profuse suckers come out. Singling and tending shall increase the population of this species. The practice is proposed to regenerate areas deficient of *Tendu* species in stocking.

Myrabolons:

Use: These NTFP are used in many ways. *Hirda, Beheda* and *Aonla* are most common amongst Myrobalans. These are of high medicinal value and are used in many Ayurvedic medicines. *Hirda* and *Beheda* are given to children in villages invariably for cold, cough and stomach disorder.

Yield: So far no study has been conducted to know the yield of fruits for trees of such species.

Formation of units and coupes: The range shall be the unit. Since working is annual and covers the entire area and so unit will also be the coupe.

Agency for harvesting: As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is with gram panchayat. The

collection and disposal of that is to be carried out by the gram panchayat as decided by the concerned gram sabha. Hence the collection and disposal of these minor forest produces will be governed by the panchayat concerned. In the non-scheduled areas, for large-scale operation, the units shall be given on lease. The lessee will collect the same as per the direction of the Deputy C.F. concerned. The lease period should be from 1st July to 30th June. Lease shall be given for one year by calling tender at division or circle level. On failure of tender, departmental harvesting can be thought of, provided marketing tieup is made with user industries.

Market: All probable industrial consumers shall be identified and quality grades be fixed and department shall act as a facilitator between JFMC and consumer.

Gum :

The forests of Jalgaon forest division has substantial gum yielding trees like Dhavada (*Anogeissus latifolia*), Salai (*Boswellia serrata*), Kadai (*Sterculi aurens*), Babul (*Acacia senegal*), Gum arabica (*Acacia arabica*) etc. These are used in medicines, chemicals, cosmetics and food industries. *Salai* gum is mostly used as incense and is said to be 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. Varnish and paints prepared from it have been found to be suitable. It may also be suitable in the manufacture of elastic adhesive, lacquers, oilcloth compositions, ink and perfumery. *Kulu* gum is the costliest gum and is having export potential. *Dhavada* gum is very good for the preparation of many food items. It is mostly used in the preparation of sweets. So it is in great demand before *Diwali*. *Jaipur, Udaipur* and *Jodhpur* are the big markets for consumption.

Regeneration of gum yielding trees: NR of **gum yielding trees** such as Kulu, Dhavada and Salai shall be provided soil working along with other planted seedlings during coupe operations of area specific working circles.

Soil working of gum yielding trees trees:

Digging of trench of 30 cm diameter encircling Kulu, Dhawada and Salai trees matching the tree crown has been found to be useful to regenerate the species from

roots; By doing so roots are injured and from which profuse shoots come out. Singling and tending will increase the population of this species. The practice is proposed to regenerate areas deficient Kulu, Dhawada and Salai stocking.

ii) Kulu, Dhawada and Salai prescribed to be included in the list of species prescribed in various area specific working circles.

Yield: 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 is a very potential field of employment generation and revenue earning. Besides, the regulations of the collection are very important from protection of forest from the fire point of view.

The DCF should exactly asses the total resource in his division. The resource survey should be girth class wise and beat wise. Each NTFP tree should be numbered and recorded properly by the beat guard. A study should be conducted by the DCF regarding the gum exudation from trees girth class wise and exactly asses the gum potential of the division. The methodology to carry out these activities should be devised by DCF with the approval of the CCF of the circle.

Tapping rules: The rules for tapping, 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 7^{th} 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 7.5 cm wide blade. The blaze is made 0.6 cm deep in the bark.

vi) Blaze may be made horizontally leaving approximately equal space between the blazes. The blazes should not have any loose fiber.

a) No fresh blaze will be made on the partially healed up surface or old wounds.

b) Each blaze will be in a shape of parabola with a 2.5 cm wide base. The curved side of the parabola will be upwards and of height not more than 7.50 cm and the depth of the blaze will not exceed 0.6 cm in the wood.

c) At the end of the session, the height of the blaze shall not be greater than 12.50 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.

d) 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.

e) In the second cycle i.e. in the 7^{th} year (after three years rest) new blazes will be made in the same way in the unblazed 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 operation will be repeated till unblazed portion is fully covered.

Grading: The collected gum is graded into three classes:

i) white, ii) yellowish, iii) Black coloured.

White coloured gum fetches higher price in the market compared to yellowish and black gum. Yellowish gum fetches less price as compared to white one. Black gum fetches the lowest price. When gum is collected it is a mixture of all the three grades. By grading the gum the trader is able to assess correctly and offers correct price. So skill for grading be provided to the people by organizing training to the gum collectors.

The colour of the gum is dependent upon the climatic conditions. It is said that clear sky in the night will exude white coloured gum.

Formation of units and coupes: Range is the unit.

Agency: As per latest amendment to *Panchayat Raj* Act, the ownership of the minor forest produces in schedule areas is with gram *panchayat*. The collection and disposal of that is to be carried out by the gram *panchayat* as decided by the concerned gram sabha. Hence the collection and disposal of these minor forest produces will be governed by the *panchayat* concerned. In the non-scheduled areas, for large-scale operation, collection may be done either by FLCS or other agency under terms and conditions as decided by the Government.

Market: There is monopoly purchase by TDC under the provisions of Monopoly Act. Besides, the export of raw or finished goods shall be explored. The Dhavada gum has been accorded GRAS(Generally Regarded As Safe) status by Food and Drug Administration of USA. The status for this gum has provided immense market in western world. These markets should be explored by the forest department for obtaining better price to the gum. Dhavada gum is an exclusive product of India and Sri Lanka.

Associated regulations and measures:

i) The compartment wise list of such trees shall be prepared and maintained at beat, round and range levels.

ii) Cleaning around the trees to facilitate gum collection and to avoid fire, shall be done.

iii) Gum producing trees shall be reserved from felling.

iv) A strict watch is necessary to enforce tapping rules and check unauthorized collection of gum and tapping during the period of rest.the blaze should be slightly slopping outwards to avoid lodging of guggul in the blazed pocket in case initial blazing is done by edge.

vii) The *guggul* starts oozing out soon after blazes are made and may be collected initially after a month i.e. by about December when the blazes may also be freshened. Subsequent collections and freshening may be done at fortnightly up to May. Thus 12 freshenings may be required to be made during the year.

viii) In each freshening, the lower surface is not to be freshened. The edges may be scraped so that only 3.8 cm is increased on either side in width at the end of 12^{th}

freshening. This means that about 0.3 cm should be scraped off either side in width in each freshening.

ix) The lowest row of blazes will be at one metre 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 metre 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.

x) The number of blazes to be made on each tree will depend on its girth at breast height as given below:

MOHA (*Madhuka indica* **):**

Moha collection: *Moha* trees were found all over Jalgaon forest division. The villagers in the tract have local system for allocation of collection rights of *moha* flowers and fruits. In view of traditional approach of allocation of collection rights by the local communities. It is advised to number the *moha* trees and document the trees allocated to each moha collector. Beat wise and girth class wise moha trees should be enumerated by the territorial staff both on forest and non forest lands.

Moha regeneration: NR of *moha* shall be provided by dibbling of moha seeds in the plantations and by carrying out weeding and soil working along with other planted seedlings during coupe operations of area specific working circles.

Soil working of *Moha* trees: Digging of 30cm deep trench encircling *moha* trees of diameter matching the tree crown has been found useful to regenerate the species from root suckers; by doing so roots are injured and from which profuse shoots come out. Singling and tending will increase the population of this species. The practice is proposed to regenerate areas deficient of *Moha* in stocking.

Moha is prescribed to be included in the list of species prescribed in various area specific working circles.

Moha flower:

i) Use And Nutritive Value: *Moha* flower is a rich source of sugar, vitamins and calcium. The flower, in its ripe form, has almost 73% sugar and is, therefore, even a

better medium for fermentation than grapes. Moha flower is eaten raw or cooked. This is eaten also after frying or baking into cakes. More usually, the corolla tubes, after removing the stamens, are boiled for about 6 hours and left to simmer until water evaporates completely. The odour disappears as a result of cooking and the material becomes soft and jelly like. It is eaten with rice, tamarind, grains or other food or as sweetmeat. Dried *Moha* flower is also boiled with rice and mixed with wheat flour and this provides a wholesome food. After drying, it becomes valuable food additive to diet. Moha flower is largely used in the preparation of distilled liquor also. This liquor is actually the beer of India having strong smoky foetid odour, which disappears on aging. It is reported to excite gastric irritation and produce other adverse effects. Redistilled and carefully prepared liquor is good quality without having adverse effects and closely resembles to Irish Whisky. The corollas were in the past, exported, to France for distillation of cheap brandy. However, the French Government in order to protect their home industry prohibited the import of the same. Subsequently, it was imported by Europe for feeding pigs.

ii) Moha spirit prepared by distillation of liquid containing fermented *Moha* flowers is the most important alcoholic drink in many of the areas. It makes a potent drink and efforts are required to be made to refine it in modern distilleries. The flower is also used for the preparation of certain kinds of non-alcoholic food drink by some tribes. The flower is also used for the preparation of vinegar. *Moha* having appreciable proteins and vitamins has valuable nutrition content.

iii) Syrup of good quality is prepared from the corollas by extraction with hot water clarification with activated charcoal and evaporation under vacuum. The syrup with very high sugar content (61%) has a golden yellow colour with the odour of fresh flower. It is a substitute for honey. Apart from human consumption, *Moha* flower offers an excellent food to the livestock and wild animals as well.

iv) Nutrition analysis of flower showed digestible crude protein 3.08 %, total digestible nutrients 73.7% and starch equivalent to 53.1 %. The flesh of animals particularly of pigs, fed on *Moha* flowers, acquires a delicate flavour.

Moha fruit:

i) Use And Nutritive Value: A ripe fruit has cream coloured epicarp, which is edible. Moha berries were eaten raw or cooked. Cattle, sheep, goats, monkey and parrots also eat them. They have medicinal value as well. Fruit fallen on the ground are easily attacked by insects and ants thus becomes unfit for human consumption.

ii) The *Moha* seed oil. A thick oil light yellow in colour and extracted from the seeds, is used by forest tribes for cooking purpose, as an illuminance and hair oil. It is also used in the manufacture of soaps, particularly, laundry chips. In many areas it is also used as an adulterant for 'Ghee' for which it is clarified with butter mark to mask the disagreeable colour. The oil finds use in medicines also.

iii) Crude oil has a deep colour, high acidity, unpleasant odour and bitter test. Refining and hydrogenation yield product similar to mutton tallow or cocoa butters. Oil having acid value below 13 may be refined by treatment with caustic soda and that with higher acid value is extracted with alcohol and further treatment with alkali. Refined oil finds use in the manufacture of lubricating grease and fatty alcohol. The oil is also used for candles, as batching oil in Jute Industry and as a raw material for the production of stearic acid.

iv) The yield of oil from the seeds depends on the efficiency of the equipment employed for crushing them. It is 20-30% of the weight of the kernels when crushed in *'ghanis'*, 34-37% in expellers and 40-48% when extracted by solvents.

v) Moha oil shall have a set of characteristics. For this purpose ISI standards have been prescribed which are as below:

Yield:

i) Moha trees starts bearing flowers and fruits between 10^{th} to 15^{th} years of planting.

Formation of units and coupes:

i) The range shall be the unit of working for the purpose of this working circle. Since operation is to be carried annually throughout the area and so the unit will be the coupe in this case.

ii) The collection of *Moha* flowers and seeds is presently being done by individuals. Normally they confine themselves around their village only to collect *Moha* flower and seeds. As per latest Amendment to *Panchayati Raj* Act, the ownership of the minor forest produce in schedule areas is vested with of gram *panchayat*. The collection and disposal of produce is to be carried out by the gram *panchayat* as decided by the concerned *gram sabha*. Most of the tract is under schedule areas. Hence the collection and disposal of these minor forest produces will be governed by the *panchayat* concerned. In the non-scheduled areas, for large-scale operation, collection may be done either by FLCS or any other agency under terms and conditions as decided by the Government.

Market: Moha flower and seed come under Monopoly Act and so the collection of *Moha* flower and seed is carried out by people and purchased by the TDC. If TDC is not operating in the division the forest department should take initiative to search the market all over the country and the trader who offers maximum price should be given the Transit Pass. This exercise is necessary by forest department because the price given to the produce should be uniform all over the division.

Associated regulations and measures:

i) Compartment wise list of Moha trees shall be prepared and maintained at beat, round and range levels.

ii) One of the important reasons of forest fire is the burning of leaf litter on ground under Moha trees by the people to collect *moha* flower. Therefore, before the start of flower falling, the ground under the *Moha* tree crown shall be cleaned with the cooperation of villagers and *chaukidars*. This may be treated, as one of the most important duties of the Beat Guard, failure in it and occurrence of fire shall be viewed seriously.

Karanj (*Pongamia pinnata*): -

This seed oil can also be used as biofuel and the oil can also be used for arthritis cure. The seed is also used for Brochoitis cure, The seed of this plant should be sown on CCTs, TCM and seedlings should also be raised to plant in plantations. Plus trees of Karanj should be identified, trees which yield 10 to 15 kgs of seed per square meter

of crown area should be identified as plus trees, and cleft grafing should be done for faster and better yield of karanj seed.

Also Neem, Moha seed also has oil content which can be used as biofuel. For lower end machines like diesel pump and diesel generator, expel the oil in a regular oil expeller, fine filter the oil and can be used directly in these diesel machines. It can also be blended with diesel to an extent of 10 to 15% and run the diesel vehicles.

The bio fuels have more viscosity compared to diesel. Hence a process called 'Trans-esterification' a simple chemical process would reduce the viscosity of biofuels. These technologies are available with Punjabrao Krishi Vidya peeth, Akola and Vishveshwarayya National Institute of Technology(formerly Regional Engineering College,REC), Nagpur (VIT). Forest Department should take initiative to first asses the resource i.e. number of Karanj, moha, neem trees in each and every beat (both forest and non forest land) and start collecting the seed for making biofuels.

During agricultural exhibitions diesel pumps running on biofuels should be demonstrated to the farmers to make common man aware of biofuel and popularize the biofuel.

Other non timber forest produce with potential in the division:

Apta leaves (*Bauhinia racemosa*) :-

These leaves are also used for making beedis .The trade is by and large confined to Gujarat state.

The Apta seedlings should be planted in plantation areas to increase their relative proportion.

Awla fruits (*Emblica officinalis*): -

These fruits are eaten raw and in pickled form. Being one of the richest sources of vitamin 'C' it also forms part of the ayurvedic system of medicine. It is one of the three ingredients of "Triphala", an important ayurvedic preparation. This species does well in afforestation areas, even in dry zones and should be made part of the plantation programme all over the area.

Agave leaves (*Agave sisilana, Agave americana*) :-

Agave leaves have demand because of it fibres. It is a good live-hedge and should be planted on the TCM and nallah bunds.

Tarwad bark (*Cassia auriculata*) :-

This shrub grows all over in open exposed forests especially in dry areas. It has demand in tanning industry. Production can be increased by broadcasting seed on T.C.M. nallah bunds, and spaces between the trenches in afforestation works.

Khair wood (katha) (*Acacia catechu*) :-

Khair has great demand in Katha industry and there was a "Khair Overlapping Working Circle" in the earlier plan. However there is a marked depletion of the stock of these trees and it needs to be built up by taking up plantations of this species in suitable areas and making this species a must in regular afforestation programmes. Besides katha this tree also exudates gum and is also a good lac insect host plant.

Tarota seed (*Cassia tora*) :-

The seed has demand as it is used in some beverages and cattle feed. The plant comes up naturally in blank areas. However its proportion can be increased by dibbling seed in blanks with shallow soil.

Honey :-Honey produced by honeybees is a very important product because of its medicinal and nutritional value. The extraction of honey should be done scientifically to get more yields. It can be a very good cottage industry for the people living in the midst of forests. The processing and marketing can be managed by forming co-operatives.

Ghat bor fruits (*Zizyphus xylopyra*) :-The fruits are in demand for tanning industry. The plants can be raised by dibbling seeds on the plantation T.C.M.s and also in 'Protection Working Circle' areas, where the slopes are steep. This tree is also a good host for lac insect and can be developed for lac cultivation.

Conservation of medicinal plants

Many valuable species of medicinal plants grow in this tract. The following measures should be adopted for the conservation of medicinal plants in the tract :

1. Forest Protection Committees/ JFM committees should be entrusted with the responsibility of protecting patches rich in medicinal plants from biotic interference.

2. Training programmes should be organized at regular intervals to familiarize members of FPCs /JFMCswith the medicinal plants, their sustainable management, non-destructive harvest and utility in treating various diseases.

3. The FPCs/JFMCs should be encouraged to prepare an exhaustive inventory of medicinal plants in their territory.

4. Efforts should be made to artificially propagate those species of rare medicinal plants categorized as “endangered”, “vulnerable” or “near-threatened”.

Research works:

There are so many Non Timber Forest Produce and Medicinal Plants in the forest which are unidentified and untapped. The efforts of the department shall be to explore them and manage them scientifically. The identification of medicinal plants in the field to be taken up for study immediately.

Other important principles and procedures:

The following are important principles and procedures:

1. The annual estimates for collection of Non Timber Forest Produce and Medicinal Plants shall be made based upon the experience.
2. The annual estimates for collection of NTFP shall be approved by the Chief Conservator of Forests.
3. The Range Forest Officer for the respective range shall issue the passes for collection of NTFP to the lessees and keep record of the collection etc.
4. The Non Timber Forest Produce and Medicinal Plants lease units shall have distinct boundaries.
5. NTFP collection estimates shall be based upon the inventories of forest resources.
6. Scheme shall be formulated for improving yield of Non Timber Forest Produce and Medicinal Plants e.g. plantations, protection against disease etc.

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CHAPTER-8

FOREST PROTECTION

8.1: The area of this Chapter covers the whole Division and hence not specifically marked on the GIS based map.

8.2 : GENERAL CONSTITUTION OF WORKING CIRCLE :

The area of this Chapter covering the entire forest area of the division. Thus the total forest area included in this working circle is 86914.13 ha.

8.3: GENERAL CHARACTERISTICS OF VEGETATION :

There are no major incidents of felling as such and most of the illicit felling cases observed are for fuel wood and sale of minor timber as livelihood. Forest fires are commonly observed in summer in grasslands consisting of a undergrowth of dense grasses and dry lantana and tarota. To counter this fire lines are regularly maintained, fire watchers are employed during the season and a fire protection scheme is implemented. The animals, mostly buffaloes from local villages and some cattle form plains are grazed form cattle camps, locally known as *kathewadis* in the forests in the rainy season. Also a major problem is the presence of migratory sheep in the division despite a complete prohibition on sheep and goat grazing in the division. The statutory provisions regulated grazing is difficult to apply in the entirety. The present political economy of domestic animals in the area throws up strong challenge, and implementation of the grazing regulations in its current form. The situation may be substantially improved by establishing effective communication with the local people, awareness generation and efficient animal husbandry programmes.

Encroachment on forest land is another issue to be addressed in the division. Small isolated patches of the forestland are often neglected and become vulnerable to encroachment. Special care shall be taken to ensure protection of such patches from encroachment.

8 .4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS:- Not Apllicable

8.5: BLOCKS, COMPARTMENTS AND JFM AREAS:- Entire area of division.

8.6: SPECIAL OBJECTIVES OF MANAGEMENT :

- To enforce the Indian Forest Act 1927 and Wildlife Protection Act 1972 for the effective control of illicit felling, grazing, encroachments, poaching and fires.
- To develop the database to monitor various offence cases in a systematic manner.
- To protect the forests from illicit felling, encroachment, fire and grazing.
- To sensitize local people about forest protection and involve them in preventing forest offences.
- To raise the moral of staff and strengthen their capabilities to deal with illicit felling, encroachment, poaching etc.
- To develop database to monitor various offence cases.

8.6.1: Anyalysis of the crop: Not apllicable

8.6.2: Silvicultural system: Not apllicable

8.6.3: Rotation period:- Not apllicable

8.6.4: Harvestable diameter:- Not applicable.

8.6.5: Reducing factors:- Not applicable.

8.6.6: Felling cycle : Not applicable

8.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

8.6.8: Calculation of yeild : Not applicable

8.6.9: Table of felling : Not applicable

8.6.10: Method of executing the felling : Not applicable

8.6.11: Subsidiary silvicultural operations cleaning and thinning : Not applicable

8.6.12: Regeneration : Not applicable

8.6.13 : Associated regulation and meaures: Strategy for forest protections :-

The strategy to be adopted to protect forest is of integrated approach and it shall be applied to various fronts by undertaking collective measures based on situation and time. The strategy shall be direct field oriented in a participatory

manner with active involvement and co-operation of local people specially members of JFM Committees. For effective protections there is a need to seek the Co-operation and involve local people in forest protection. Some of the effective measures are given below.

(1) Existing forest needs to be well protected and developmental vorks like soil and moisture conservation measures; natural and artificial regeneration works and other cultural operations shall be carried out in order to increases productivity of forests.

(2) Regulation of grazing and controlling fire.

(3) Seeking co-operation and active participation of local people in all operations of forest management and

(4) Employment generation to local people during lean period.

(5) Fulfilling the demands of local people for forest produce.

(6) Effective utilization of existing infrastructure, strengthen and updating infra-structural facilities.

(7) Improvement in communication facility and mobility of the forest staff.

(8) Installation of new Check Naks at hyper sensitive and sensitive points.

(9) Patrolling sensitive forest areas along with the local people/JFM Committee members.

(10) Introducing Rewards, Awards and informer system and making forest offences high risk low gain process.

Protection measures:

A Protection plan is to be prepared at division level at the start of new year in January for taking strict protection measures in pursuance of GR dated 8.5.2003. Protection plan will cover following issues.

1. Joint patrolling with JFM committee members and staff of adjoining range, round and beat.

2. Checking weekly markets for prevention of illegal trade of NTFP and wildlife parts and products.

3. Covering of furniture marts, private depots, small carpenter units etc. and monitoring through monthly returns, supervise checks and also prescribing registration and maintenance of records for such units.

4. Monitoring the activities of habitual offenders.

5. Armory and custody at every range headquarters. The personnel who have undergone arms training be provided with regular firing practice facilities with co-ordination of police department.

6. Empowering officers above the rank of RFO with magisterial powers such as grant of custody, remand and for preventation of offences on lines of revenue department.

7. Inspection and regular checking of water holes.

8. Creation of secret fund for reward to informers, creation of intelligences network etc.

9. Keeping round the clock vigilance in sensitive area through deployment of special protection force comprising of staff, ex-army personnel and laborers at the protection huts constructed at strategic points. Also outsourcing protection work to an independents agency such as security guards may be considered.

10. Joint patrolling and meetings for exchange of information about offenders and more effective co-ordination through Tiger-Cell.

11. Supply of mobile phone sets for easy access of information to Beat Guards, Round Offciers, and RFO in sensitive area.

12. In dealing with organized gangs if any engaged in illicit cutting and also in encroachment removal operations a special Task Force comprising, two Lady Constables be placed at the disposal of DCF for specific period during the year.

13. A legal cell constituted under the control of DCF with the engagement of prosecutor on contract basis on lines of Police Deparment.

14. Owing to the spurt of encroachments with the enforcement of the Scheduled Tribes and Forest Dwellers (Recognition of Forest Rights) Act 2006, the area under encroachment and those susceptible to encroachment needs to be dealt with on priority.

Inspection in transit : Illegal transportation of forest produce should be checked by concerned staff as well as Mobile Squad staff.

Special surprise checking and Nakabandi shall be organized on major district roads and known routes from Jungle to town through Mobile Squad and local staff once in Month.

Collection of intelligence and information : -

The RFO/ Round Officers should frequently interact with villagers to collect information regarding illicit felling, encroachment, poaching, illegal grazing etc. through its intelligence network and keep that information, suggestions in a register in his personal custody.

Disposal of petty offence cases : Many forest offences are petty in nature and these can be tried summarily for easy disposal as per the provisions of Indian Forest Act 1927. The petty offence cases had been pending for long time on large scale. These cases should be disposed off by taking special drive.

Creation of legal cell : In order to have speedy disposal of forest offences to file and pursue court cases, a legal cell headed by one Forest Prosecutor may be constituted with supporting staff at CCF (T.) office level.

Rewards : A secrete fund should be used to gather intelligence and information. The rewards to sub-ordinate staff for exemplary working detection and prevention of offence cases be rewarded as per the section 83 of the Maharashtra Van Niyamavali 2014.

Training : Training to field staff shall be organized by DCF form time to time on the issues of various Acts, preparation of offence cases, tackling assault on staff, framing charge sheets, filling court cases, recording evidence etc. For this purpose help of police officers, ex-army men, advocates, forest officers, NCC officers should be sought to train field staff especially Forest Guards and Round Officers.

Check nakas : Check Nakas are established at various strategic points to control the transportation of illicit forest produce and other illegal activity. The Check Naka must be duly notified by competent authority and published for the benefit of public as well as law enforcing authorities. The check nakas should be manned round the clock and provided with effective modern communication facilities.

Patrolling : To control the illegal activities regular patrolling is essential in sensitive and hyper sensitive beats. Separate day and night patrolling around the sensitive, highly sensitive areas and on roads leading form jungle to towns shall be carried out. In police department a station dairy register is maintain, likewise same kind of register with some modification may be followed and maintain at Range Office level. ACF should supervise this type of patrolling and also he should participate in such patrolling at least once in the month.

Inspection of area of illicit felling : The following time schedule has been prescribed for inspection of illicit felling area by the concerned officers vide Govt. Circular dated 8/5/2003.

Table No 8.1

The value of illicitly felled material	**Designation of inspecting officer**	**Period with in which inspection should be completed**
Up to Rs. 50,000	RFO	3 days from detection /receipt of intimation of detection
Above Rs.50,000 but not exceeding Rs.2,00,000	ACF	3 days from the receipt of information
Above Rs.2,00,000 but not exceeding Rs.5,00,000	DCF	3 days from the receipt of information
Above Rs.5,00,000	CF	7 days from the receipt of information

Government vide its letter No. TRS-1082/36/f-6, Dt.8th September 1982 directed the department to launch the offence cases above Rs.2,000/- in court of law for prosecution unless the prosecution is difficult to succeed.

1. **Beat checking** : In order to have stringent protection of forest it is necessary that the field staff required to carry out patrolling in their respective jurisdictions and the officers concern will exercise effective supervision and control at all levels. It is utmost necessary to report every forest offence promptly as per directions given in the standing order 37. The instructions issued for the guidance and strict compliance with a view to take effective measures in relation to efficient forest protection as given below.

(i) **Beat guard** : Every Beat Guard must carry out patrolling in his beat regularly. After thorough, inspection of entire forest area of his jurisdiction of every fortnight and issue POR for all the damages detected in his beat within the 1st instant.

(ii) **Round officer** : The Round Officer of a round is required to inspect each beat at least once 3 months and he should verify and enumerate the damage not reported by the concerned Beat Guard. His report must reach to the Dy .Conservator of Forest through Range Forest Officer after thorough inspection.

(iii) **Range officer** : The primary responsibility of the Range Forest officer is to verify whether the Round Officer and Forest Guards are carrying proper patrolling of forests of their jurisdiction or not. He should inspect a specific portion covering at lest 1/4th of the area of the Beat once in 6 months and the findings are required to submitted to Dy. Conservator of Forests and Chief Conservator of Forests punctually. In case of the quantum of illicit felling is more the Range Forest Officer will take appropriate measures to inspect Beat thoroughly.

(iv) **Supervisory officer** : The supervisory officer while on tours will inspect the specific areas of illicit felling. It is prescribed that the supervisory officer must spend one day for inspection of such vulnerable area within 15 days.

The forest Officers shall be reviewed regularly at various levels regarding the nature of offence, quantum of offence, whether the case is compoundable or required to launch in court of law, etc.

While dealing forest offences the offences not only booked under the provisions of Indian Forest Act 1927, Wild Life (Protection) Act 1972, Forest Conservation Act 1980 but also these cases shall be dealt in IPC, CRPC, etc for effectiveness of the case.

2. **Transit rules for Forest produce** : The regulation of transportation of forest produce is under Bombay Transit of Forest Rules 1960 published by the Agriculture and Forest Department under No. IFA-1057/2947-(VI), Dt.23rd April 1960. The Government of Maharashtra vide its notification Indian Forest Act 1927 making the law more stringent. Under this amendment some of the Assistant Conservator of Forests and above have been designated as Authorized officers for the purpose of this act who are competent to confiscate the vehicles, instruments, forest produces, etc. involve in forest offences related to the illicit removal of notified forest produce.

The provisions of Government vide letter no. TRS-1089/PK-27/89/F-6, Dt. May 14th 1990 stated that the transit pass shall be issued within 40 days from submission of application.

Prescription for protection of forest : For effective protection of forest the following prescriptions are made.

1. Review the offence cases beat wise, every month. Review the Varas, bevaras offence cases monthly.
2. The offence cases above Rs.2000/- shall be submitted in the court of low for prosumption.
3. Use IPC provisions for the effective control of the illicit felling.
4. Most vulnerable area be identified and protection be strengthen.
5. Place effective patrolling squad at all important routes to prevent the transportation of illicit material.
6. Beats of the division be divided into hypersensitive, sensitive and normal depending on illicit felling and most efficient beat guards be posted in hyper sensitive beats.
7. Plan in such a way to have young guards in the hyper sensitive areas.
8. History sheets of all the offenders along with their photo and bio-data are maintained at Round, Range and Division level.
9. Use Cr.P.C.110 provisions with respect to habitual offenders.
10. Provisions of IPC 395 shall be used by registering the complaint in the police station for the offences wherein five or more than five offenders are involved. The DCF shall co-ordinate with the Superintendent of Police to see that stringent sections of IPC will be used in the F.I.R.

11. Every beat guard shall maintain a register of stumps in the requisite proforma. Every stump is registered by a serial number followed by year, for example, if tree number is 129/08. Here 129 is tree number and 08- is year. Every year from January 1st , onwards start the new series. After one year all the high stumps be dressed to ground level to obtain good coppice. The supervisory officers, during the beat inspection, verify the registered stumps and unregistered stumps. The beat guard shall be held responsible for non-registering the illicit stumps.
12. For effective protection the JFMC's should be involued.
13. The RFO shall collect the beat khairiyat report from each Forest Guard and Round Officer monthly and shall submit Range Khairiyat report to the DCF every month and DCF should monitor the report for constant vigilance.

Prescription for SMC works :-

1. The forests areas under this working circle need special treatment in the form of soil and moisture conservation works. Where ever the slopes are steep, no cct or dct is stipulated. Slopes being extremely steep, during rains the time of concentration is very low and rain water run off attains high velocities with in no time. In these areas the following soil and moisture conservation works are prescribed. Forest areas with steep slopes($>25^0$) cement check dams at regular intervals on the nalas, with gabian structures on the upstream side of the check dam as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam.

2. Forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed as a support to reduce velocity of water flowing in the nala and also to prevent early siltation of the check dam.

Fire protection:

The area of Jalgoan Forest Division is prone to repeated fires due to heavy biotic pressure and due to deciduous nature and the dry climate. Fire caused extensive damage to the forest specially regeneration, forest growth, ground flora,soil organisms and the soil productivity, Prevention of fires and effective control of fires as prescribed in the plan is essential for forest development. The areas needed to be

protected from fire are classified into the following categories based on purpose of fire protection.

Class I : Forest completely protected. This area includes.

i. All main felling coupes, thinning coupes, all the forest area under Protection WC, Afforestation WC and Improvement WC and Fodder Improvement WC.

ii. All regenerated coupes of all WC till the young crop has attained the age of 10 years.

iii. All plantations.

iv. All forest nurseries.

v. All government timber depots.

vi. Special habitat areas or any other special important areas as specified by the concerned circle in charge.

vii. These areas are cleared with appropriate width of fire line as per the guide lines and patrolled by fire watchers.

Class II (General fire protection) :

i. All the other areas as specially directed by the CCF (T) of Dhule Circle on special grounds.

ii. These areas are separated from surrounding areas by means of external fire lines and will be divided into suitable blocks with interior fire lines and no trees shall be cut. Fire watchers may be engaged as sanctioned by the concerned circle in charge.

Class III (Forests protected by law only) : Those categories which are not included in class I and II are included in this class. Generally deliberate burning is prohibited and no special measures of fire protection will be undertaken. The following categories of fire lines will be maintained, kept clean of all growth and combustible material.

i. All external boundaries of reserved forests to the extent of width of 12 meters.

ii. 6 meter width around all the plantations up to 10th year form planting.

iii. 3 meter wide coupe lines up to 10 years of main felling.

iv. 6 meter wide lines on both side all along the roads and car tracts that are passing through forests.

v. 40 meter wide fire lines around timber and fuel wood depots.

To control and reduce fire the following operations shall be undertaken.

(1) The cutting and cleaning of fire lines shall be completed by end of December and controlled burning shall be completed by the end the February.

(2) Leaf litter on the fire lines shall be collected from time and burn before the fire season starts.

(3) No fire line shall be burnt after 15th February unless there is a special permission from the DCF.

Fire control measures :

(1) A consolidated fire protection scheme shall be prepared as per the prescription of WP with the provision of watch point, strategic location, fire watchers, deployment of vehicles and the supervisory staff.

(2) The fire watcher and the forest staff are required to be given training in the protection and handling of fire fighting tools.

(3) The fire watchers shall constantly patrol the areas of class - I and class – II.

(4) The fire watching towers shall be erected at strategic point where the fire watchers sit on tower and observe location of fire.

(5) After receiving information the fire watcher move in group to particular location and extinguish fire with help of fire fighting tools.

(6) The Division office shall maintain a register of fire lines showing length and width of fire lines, the period of cutting & burning and a consolidated map shall be prepared based on the actual position of fire lines

(7) The members of JFM committees and Eco-development committee shall be involved in the fire protection. The work of fire protection can be entrusted to these committees.

(8) Awareness creation in the villages through regular meetings, posters, etc.

(9) To prevent forest fire due to Tendu leaves collection, the Tendu collection centres of the village where forest fire had occurred should be closed for a year or two as per Government directives.

(10) The vehicles that are available will be deployed at strategic locations where the fire protection gangs can reach easily.

Responsibility of officers in fire protection:

The Range Forest Officer is personally responsible for efficient fire protection in his range. If there is a common boundary between 2 ranges, the responsibility of clearing fire line will be decided by the DCF. In case of common boundary between 2 divisions, the fire line cutting and maintenance will be decided by the CCF (T), Dhule Circle. The DCF is personally responsible for carrying out efficiently all protective measures. The DCF must satisfy himself that external fire lines and other fire lines are prepared before February by carrying out extensive tours in the area. He is required to move in his jurisdiction extensively. During fire season and during his tour, he must keep a strict watch on fire protection by means of interaction with local people and inspections. A constant watch should be kept on Tendu contractors and their agents who engage local labourers to put fire to forests to get good flush of Tendu leaves.

Fire reports:

If any fire incidence takes place the concerned RFO must inform DFO/DD at once. After fire is extinguished, RFO shall submit a detailed report to Division office on extent of area damaged, value of damage with detailed map within 15 days. The Division office shall submit monthly return in prescribed proforma to the Circle. A register of fire record shall be maintained at Division office giving details of length of fire line of Class I, and III. The fire incidents that take place in class I,II,III areas shall be indicated with different marks on map.

Grazing control:

Grazing causes lot of damage to regeneration due to trampling. To control grazing, grazing units are formed in the division. The number of cattle heads per unit is fixed as per the carrying capacity of the area. The incidence of grazing is high in and around the forest areas where the villages are situated and the impact of grazing, fire, encroachment is also tremendous around the villages. Therefore the forest area around villages are deprived of regeneration. In many places especially areas around villages, the ground story is completely missing Number of various offence cases is given in the following table.

Table No 8.2 Statement showing number of offence cases registered

Sr. No.	No.of offences registered					
	Year	Illicit felling	Grazing	Fire	Others	Total
1	20008-2009	661	1	119	40	821
2	2009-2010	647	2	120	59	828
3	2010-2011	610	1	125	43	779
4	2011-2012	576	0	182	45	803
5	2012-2013	421	2	53	51	527

Encroachment:

The problem of encroachment is common in almost all the areas specially the forest areas located adjoining human habitations. The problem of encroachment is mainly because of lack of survey and demarcation on the ground, the greed of people and apathy of local people towards government lands. Small isolated patches of forestland are often neglected and become vulnerable to encroachment. In order to mitigate the problem, it is essential to take up survey and demarcation works on top priority. Precast pillars of 1st and 2nd class type shall be erected after the survey is over which can be completed in a phased manner. The existing cairns shall be repaired and maintained under 1/5th boundary demarcation scheme. The powers vested with ACF and above rank officers under Section 53 and 54 of Land Revenue Code shall be effectively utilized. The encroachment if any can be tried summarily and evicted as early as possible. The following instructions shall be followed regarding encroachments.

(1) Special care shall be taken to ensure protection of such patches from encroachment. The civil powers of eviction are entrusted to ACF and DCF. The procedure laid out in the Land Revenue Code shall be followed before the execution of eviction.

(2) All external boundaries shall be demarcated with concrete pillars. All sensitive and important boundaries and wherever disputes are there, be surveyed and concrete pillars be laid immediately.

(3) All encroachments shall be listed with their names, age, residence, profession whether belongs to SC, ST, OBC/NT, extent of encroachment, s.no. and location of encroachment, village/block.

(4) A detailed report of the case be prepared for each encroacher and submitted to ACF to obtain summary eviction orders in a time bound programme.

(5) After the completion of due procedure of Land Revenue Code and after giving a reasonable opportunity of heard to the encroacher, ACF shall pass a summary eviction order if he satisfies so quoting the findings.

(6) The concerned RFO shall execute the eviction order.

(7) If the encroachments in a village are more in number, police protection be obtained for the operation. Use of Cr. P.C provisions like section 106 and 110 be used to smoothen the eviction operation as well as to prevent the tendency of future encroachments.

(8) For the encroachment on the un-classed forests (though 7/12 shows clear possession of the department) FIR shall be lodged In the concerned police station for the prosecution.

(9) Regularisation of the encroachment made earlier to 1980 be settled as early as possible and necessary proposals be submitted to Government.

(10) After the listing of all encroachment sample verification shall be carried out by all supervisory officers to detect unregistered encroachments.

(11) In the month of May, a drive for encroachment prevention be taken up in the villages by Dawandi and distribution of leaflets and posters.

In the recent past the tendency for encroaching forest land for cultivation has increased. The actual encroached area is higher than that of recorded one. The eligible encroached area is under enquiry by the District Magistrate committee in relation to regulation of the schedule Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 and Act 2008. The causes of forest encroachments shall be examined thoroughly and corrective measures be taken. All necessary support should be extended to evict the encroachments as early as possible. The boundary management and standard administrative guidelines will help to control the encroachment. RFO must inspect at least 50% of the boundary demarcation, ACF at least 10% of the boundary demarcation, DCF at least 2% of the boundary demarcation. RFO Mobile squad shall check 2% boundary demarcation.

Boundary maintenance

Boundry should be demarcated using DGPS method and precast reinforced cement concrete pillars be fixed to demarcate the boundaries of forests.

It is also recommended that demarcation of boundries shall be taken by digging TCM around the area in a phased manner be included in this WP under revision and old system of cairns be enforced strictly. It is necessary to take up the work of updating maps, updating entries in 7/12 record of rights, tallying the area by checking village maps, forest notifications, form 1A of village patwari/Talati etc. shall be taken up monthly review of progress of these works. All the maps be updates and supplied for better management. The update maps shall be provided to WPO. The damaged old loose stone cairns should be repaired and wherever necessary new cairns be made. Maintenance programme of $1/5^{th}$ boundary maintenance should continue as per the old practice of cutting of demarcation line 12 m wide and erection of loose boulder cairns.

Role of joint forest management :

JFM committees will contribute to a large extent in protection of the forest from illicit felling, encroachment fire, grazing, etc provided if the forest staff has a constant dialogue with the JFM committees and involve them for joint patrolling, management and development of the forests. The JFM committees shall be entrusted with specific area earmarked for the protection, management and development of the

area. The committee members need to be given training in technical matters of protection at the same time they should be provided with gainful employment by taking up management and developmental activities in the areas entrusted to them.

Poaching:

A programme for checking of weekly bazaar be chalked out to control the sale of wild animals and during festival season like Pola, Holi particularly tribal community ersort to hunting of wild animals and appropriate measures should be taken under Wildlife Protection Act 1972.

Contorl of unauthorised collection of NTFP: -

In this division a number of NTFP is available, out of these Tendu, Moha, Gums and Behada etc. are available in large quantity. To control unauthorized collection of NTFP apart form the patrolling in forests checking should be organized by RFO in some marketing places like weekly bazaar and other places regularly.

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CHAPTER NO. 9

JOINT FOREST MANAGEMENT

9.1: The area of this chapter covers the whole Division and hence not specifically marked on the GIS based map.

INTRODUCTION:

National Forest Policy 1988 envisages the importance of involvement of local people in the protection of forests. It also emphasizes the importance of traditional rights of forest dwellers. Priority for the use of forest produce is given to forest dwellers and the use of forests for industrial purpose is discouraged.

As a follow up action on this new forest policy, and the encouraging experiences from West Bengal in J.F.M., the Government of India issued a set of J.F.M., guidelines in 1990 encouraging forest departments to involve local people in the management of the forests. Over the past 9 years, most of the states have issued their own guidelines. Maharashtra Government has also issued the guidelines and passed Government Resolution no SLF-1091/CASE NO 119/91/F-11 to the effect on 16th March 1992, the JFM activity was adopted for degraded forest area of the state and new guidelines have been issued vide GR No. MSC/2000/C.No. 143/F-2, dated 25.4.03.

Villagers themselves are required to voluntarily participate in the program. Forest protection committee (FPC) is to be formed in each village. The members of the committee will help in protection and development of forests and they will receive in turn a share in the usufructs and output from the forest areas assigned to such committee. The JFM area will be managed according to the micro-plans prepared jointly by the Deputy Conservator of Forests and members of the FPC. These micro-plans shall contain the details of forest and village development. This has to be sustainable, should cater to aspirations of local communities and at the same time the silvicultural requirements of the forests are to be met properly.

Later, the government of India advised the state governments to take up the Joint Forest Management in well stocked forest areas on experimental basis and accordingly guidelines dated 25.4.03 cited above have authorized the forest department in the state in this respect. Summary of guidelines is as follows. good

forests within 2 km from a village are to be covered under the program on experimental basis and stage by stage other villages containing good forests are to be brought under it.

The program underlines conservation of forests and wildlife and therefore any activity/agreements etc. that is not consistent with Forest Conservation Act, 1980 should not be incorporated in the micro-plan.

9.2 : GENERAL CONSTITUTION

Joint Forest Management may be taken up in any village if the forests belong to the category as defined in the Government of Maharashtra Resolution dated 16th March1992. The total area under this chapter is **28168.31 ha**. spread over 254 villages where JFMC is active.

However with a view to afforest the degraded and denuded forests of Jalgoan Division and to improve some of the understocked areas closer the villages efforts shall be made to motivate the villagers to take up JFM in these villages.

A micro plan of a village where the degraded forest area is falling shall be considered. A.C.F .and R.F.O., shall prepare a detailed micro plan of the village after conducting a PRA exercise as per G.R. Dated 16-3-1992.

9.3: GENERAL CHARACTERISTICS OF VEGETATION:

The forests of Jalgoan Forest division belong to the sub-group 5-A, Southern Tropical Dry Deciduous Forests as per the revised classification of Forest types of India by Champion and Seth.

9.4 : FELLING SERIES, CUTTING SECTIONS AND JFM AREAS:- Not Applicable

9.5: BLOCKS, COMPARTMENTS AND JFM AREAS

It is proposed to an area of 28168.31 ha. in this chapter.

9.6: SPECIAL OBJECTS OF MANAGEMENT:

- Reforestation of degraded forests with the participation of villages.
- Plantation and its protection with the help of forest protection committee.

- To let avail usufructs derived from such Afforestation to the villagers.
- To create awareness about importance of forest amongst the people.
- To help in translating the 73rd Amendment in practice for Forest Conservation and Development.
- To increase vegetal cover.
- To check soil erosion.
- To bring about soil and moisture conservation.
- To utilize the land for the productive purpose according to its capability.
- And ultimately bring about the integrated development of the adjoining villages with help of all other development agencies.

9.6.1: Analysis of the crop : Not Applicable.

9.6.2: Silvicultural system: Not applicable

9.6.3: Rotation period :- Not applicable.

9.6.4: Harvestable diameter:- Not applicable

9.6.5: Reducing factors:- Not applicable.

9.6.6: Felling cycle: Not applicable

9.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

9.6.8: Calculation of yield : Not applicable

9.6.9: Table of felling : Not applicable

9.6.10: Method of executing the felling: Not applicable

9.6.11:Subsidiary silvicultural operations cleaning and thinning: Not applicable

9.6.12: Regeneration :

Regeneration and protection of NTFP areas and collections, Grading, value addition and marketability of various NTFPs in the division are proposed to be given focus for working under JFM programme.

9.6.13 : Associated regulation & measures:

Implementation: Implementation of the prescriptions under this chapter are totally dependent on the willingness of the villagers, neither the compartments are allotted nor the felling series are formed. But if some villagers do not show interest, the areas of those villages shall be tackled under the concerned working circle. Any other village may be tackled under J.F.M., from any range and any working circle if the D.C.F., deems them fit. The micro plan prepared under the overall frame work of the respective working circle of the working plan for that village shall supercede the working plan so far as that village is concerned. This shall not be considered as a deviation from the working plan prescription.

Following principles should be adhered to during the implementation of J.F.M. in any village.

- Eco system Protection.
- Participatory, Democratic structure.
- Open Communication.
- Management of Responsibility and Benefit sharing in Relation to Traditional usage.
- Gender Equity.
- Community Responsibility.
- Effective Conflict Resolution.
- Traditional Rights and use.
- Discrete Jurisdiction and Explicit Agreements and last but not the least.
- Effective Monitoring and Advocacy.

Joint forest management programme has been taken up as per the Govt. of Maharashtra Resolution dated 25th April 2003 and Resolution dated 5 October 2011. Efforts have been made to motivate the villagers to take participatory management of forest including plantations on forest land near these villages under various schemes like FDA, State JFM etc. As per the Govt of Maharashtra Resolution Dated 28 Nov. 2014, RDF Plantation works under DPDC funds has to be taken through JFMC and the same is being implemented From 2015-16. Twenty Four JFMC's were allowed 616 ha. of plantation during 2011-12 to 2015-16. The status of these plantations is

satisfactory.Sixty four JFMC's are working in Jalgoan Forest division, catagriszation of JFMCs is given below.

A grade	:-	60 JFMCs
B grade	:-	70 JFMCs
C grade	:-	66 JFMCs
D grade	:-	58 JFMCs

Method of treatment:

The areas shall be treated according to the J.F.M. Plan for the village to be prepared in consultation with the villagers as per the guidelines issued by the government vide G.R. No SLP/1091/C.N. 119/F-11, Mantralaya, Bombay dated 16th March 1992. Similarly, the guide lines issued by the central government in this connection vide its letter No 6-21/89, F.P. dated 01-06-1990 shall be considered. The Forest Development Agency(FDA) project sponsored by , Ministry of Environment and Forests, Government of India, is a wonderful opportunity for forest department for J.F.M implementation. This project gives lot of flexibility to plan as per local demands. The entry point activity provision helps in developing relationships with the villagers.

Micro plan to be prepared should be broadly based on the prescriptions given for the areas under consideration. Micro plan duly sanctioned by competent authority will not be considered as deviation to this plan prescriptions. The following activities should be tried in villages as per local situation

Conducting Medical Camps with local Medical Authorities/NGO's like Rotary/Lions clubs or Indian Medical Associations of the district. Medicines may be supplied free to the villagers from entry point activities.

Focus on Economic improvement activities like implementation of Amendment 73. The earmarked NTFP products in JFM/scheduled areas should be implemented. The awareness to this amendment is not seen in the villages. The local authorities should take initiative, conduct meetings in the villages and self help groups should be formed. The collection of NTFP like gums, lac moha flowers, honey, Natural dyes

(palas flowers, Bija, Dhavada, sal etc) should be done by SHG's and the marketing should be done by forest department by contacting traders all over the country. Who ever offers best price to the NTFP the Transit Pass should be issued. The departmental intervention is essential in the beginning, so that the villager is not cheated by the middle men. Once the awareness has set in the villages the department can become a silent regulator.

Electrify villages with generators running on biofuels like Karanj seed oil, Moha, Neem oil. The oil expelling facilities should be provided at a prominent place in the division. Even esterification facilities should also be made available near the oil expeller for effective use of bio fuels.

Regular training programs to the villagers regarding scientific lac cultivation(Indian Lac Research Institute ILRI, Ranchi), GUM grading techniques/ spray drying techniques for removing impurities in gum so that the villager can get better price for the NTFP collected.

NTFP theme plantations, like GUM yielding species plantations (Dhavada, Salai, Khair, Hiwar, Movai Babul etc), Lac insect host plant plantations (Kusum, Palas, Khair, Bor, Raintree, Pimpal etc), Bio fuel plant plantations (Karanj, Neem, Moha, Palas etc) should be taken around the JFM villages in consultaiton with the villagers. The program underlines conservation of forests and wildlife and therefore any activity/agreements etc. that is not consistent with Forest Conservation Act, 1980 should not be incorporated in the micro-plan.

General prescriptions

JFM Micro-plans will be prepared for each village through the process of participatory rural approach. Micro plans are to be dovetailed with the prescription of the approved Working Plan.

Silvicultural management, maintenance of forest boundary, removal of forest encroachment and control over illicit cutting, illicit grazing and fire should receive high priority.

Forest protection cannot be viewed in isolation. The works depicted in the Micro plans should be reflected in the planning process of the Gram Panchayat.

Whenever required, NGOs be involved for creating awareness programmes.

Documentation of successful initiatives under the JFM approach must receive importance at the Range and Division level. A compilation of work, undertaken in JFM villages in financial year should be done at division level and published. This work should be given wide publicity in print and electronic media.

JFM program should be implemented with complete transparency. The account of JFMCs shall be annually audited as per Govt. instructions and a copy of such audited statement shall be shared with Gram Panchayat. All payments to JFM members shall be made either through a/c payee cheques or RTGS transfer or depositing directly into respective bank accounts. Payments through cash shall be strictly discouraged.

As per as possible, all works are to be executed by JFM members only. Monitoring of JFM activities by supervisory cadres (ACF to CCF) is the key for effective implementation of JFM program. Periodic reviews at various levels will aid in good implementation.

Dedicated NGOs/Civil society groups can aid the village communities in strengthening JFM institution. Their services can be utilized by the FD in areas of capacity building of JFMCs in micro planning, community motivation, eco-tourism initiatives, evolving model for enhancing livelihoods.etc

Periodic evaluation of JFMCs should be done to identify Performers and Non-Performers. While Performing JFMCs should be rewarded, the Non-performers should be given opportunity for improvement.

One of the important reasons for forest degradation is dependence of local people for firewood from forest. Therefore, to reduce such dependence, GoM vide resolution of 10th July 2012 decided to distribute LPG connections to forest fringe villages. JFMCs have played a key role in implementing this scheme. Efforts should be made to expand this scheme of JFM villages.

The JFM villages should also be covered with other source of efficient fuel management like Improve Chulhas with help from the Maharashtra Biodiversity Board.

The division should make all efforts to ensure that all JFM Committees have Public Biodiversity Registers as part of the many records to be kept. The State Biodiversity Board should be consulted for the same.

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CHAPTER-10

WILD LIFE MANAGEMENT

10.1 : The area covers the whole Division and is therefore not specifically marked on GIS based map.

10.2: GENERAL CONSTITUTION OF WORKING CIRCLE:

National Forest Policy 1988 aims at conservation of natural heritage of the country preserving the remaining natural forests with the vast variety of flora and fauna. Which represents the remarkable biological diversity and genetic resources of the country.

Forest Management should take special care of the needs of wild life conservation and for the corridor linking the protected area in order to forest management plans should include prescriptions for this purpose. It is specially essential to provide maintain genetic continuity between artificially separated sub sections of migrant wild life.

Also the wild life (protection) Act 1972 emphasizes to protect wildlife.

For better management of wildlife and to preserve the bio diversity, creation of protected areas (PAs) and their specific management practices are in force in approximately 4% of the forest areas other than protected areas in varied proportion. These areas also the store house of bio-diversity. Hence there forest areas are also to be managed with specific focus on wild life both flora and fauna.

The area it extends over entire geographical area of Jalgaon forest division comprising of Two Tehsils namely Muktainagar, Chalisgaon of Jalgoan district. The Deputy Conservator of Forests, Jalgaon Forest Division stationed at Jalgaon is the ex-officio Deputy wild life warden who is responsible for protection, conservation and development of wildlife in the division. He is assisted by Assistant Chief Wild life warden and other staff under his control.

The tract dealt with was fairly rich in the number and varieties of Wild life once upon a time. But it stands in perilous state today. Wadoda range has been notified as a Muktai Bhawani Conservation Reserve vide notification no. WLP 0214/CR/-62/F-1 dated 3-5-2014. This has helped in the preservation of Wild Life to some extent in

large and continuous stretch in the division. The Conservation Reserve is also managed by Deputy Conservator of Forests.

10.3: GENERAL CHARACTERISTICS OF VEGETATION:

The forests of Jalgaon Forest division belong to the sub-group 5-A, Southern Tropical Dry Deciduous Forests as per the revised classification of Forest types of India by Champion and Seth.

10.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS:- Not Applicable

10.5: BLOCKS, COMPARTMENTS AND JFM AREAS: Entire forest area of the Division.

10.6: SPECIAL OBJECTS OF MANAGEMENT:

This overlapping working circle has been constituted to achieve the following objectives,

- To protect the existing wild life population both flora and faunal.
- To create ideal conditions for betterment of wild life.
- To take steps to check all the destruction of wildlife.
- To preserve for all times, areas of biological importance, outside the protected areas, as a national heritage for the benefits, education and asthetic value for the mankind.

10.6.1: Analysis of Crop:

a) **Carnivora :** (i) Panther (*Panthera pardus*) (ii) Hyaena (*Hyaena hyaena*) (iii) Wild Dog (*Cuon alpines*) (iv) Jackal (*Canis aureus*) (v) Common Fox (*Vulpes bengalensis*) (vi) Jungle Cat (*Felis chaus*)(vii) Tiger (*Panthera tigirs).*

Herbivora : (i) Sambhar (*Cervus unicolor*) (ii) Cheetal (*Axis axis*)(iii) Wild pig (*Suss crofa*) (iv) Nilgai (*Boselaphus tragocamelus*) (v) Barking Deer (*Muntiacus muntijak*) (vii) Sloth bear (*Melursus ursinus*) (viii) Black Buck (*Antilope cervicapra*) (ix) Four horned antelope (*Tetraceros quadricornis*) (x) Chinkara or Indian gazelle (*Gazella gazelle*)

Rodents : (i) Fivestriped Palm squirrel (*Funambulus pennanti*).

Reptillia : Snakes – Bamboo pit viper, slender coral snake, Bronze back snake.

Spiders- Giant wood spider, Signature spider, Camel spider, Lynx etc. ,

Frog – Skittering frog, Burrowing frog, Microhyla sp.

Birds : (i) Baya//Baya Weaver Bird/(*Ploceus philippinus*), (ii) Bharadwaj/Crow Pheasant of coucal/(*Centropus sinensis*), (iii) Chota basant/Crimson fronted Barbet or Coppersmith/(*Megalaima haemacephala*), (iv) Chimani/House Sparrow/(*Passer domesticus*), (v)Deshi Myna/Common Myna/(*Acridotheres tristis*), (vi)Ghar/Black shouldered kite/(*Elanus caeruleus*), (vii)Ghar/Parian Kite/(*Milvus migrans govinda*), (ix)Ghubad/Indian Screech Owl/(*Stri xjavanica*), (x)Ghubad or Pingla/Spotted Owlet/(*Athene brama*), (xi)Harial/Common green pigeon/ (*Teron phoenicoptera*), (xii)Holga/ Laughing Dove/(*Streptopelia senegalensis*),(xiv)Kabutar/Blue Rock Pigeon/(*Columba livia*), (xv) Kala Baza/Indian Black ibis/(*Pseudibis papillosa*), (xvi)Kala Teetar/ Grey partridge/(*Framcolinus pondiceranus*), (xvii)Khandya/Common or SmallBlue kingfisher/(*Alcedo atthis*), (xviii)Khandya/Pied kingfisher/(*Ceryler udis*), (xix)Kokila/Koel/(*Eudynamys scolopacea*), (xx)Kotwal/Black Dronga or king Crow/(*Dicrurus adsimillis*), (xxi) Kotwal/Greater Racket tailed/ Drongo/(*Dicrurus paradiseus*), (xxii)Lahuri/Jungle Bush Quail/(*Perdicular asiatica*), (xxiii) Lal Munia/Red Munia/(*Estrilda amandava*), (xxiv)Mor /Common peafowl/(*Pavo cristatus*), (xxv) Nilkanth/Indian Roller or Blue Jay/(*Coracias benghalensis*), (xxvi)Partringa/Little Green Bee Eater/(*Merops orientalis*), (xxvii)Peelak/Blackhooded Oriole/(*Oriolus xanthornus*), (xxviii)Peelak/Goldern Oriole /(*Oriolus orielolus*), (xxix)Popat/Rose ringed parakeet/(*Psittacul akrameri*), (xxx) Satbhai/Common Babbler/(*Turdoide scaudatus*),(xxxi)Satbhai/Jungle Babbler/(*Turdoides striatus*), (xxxii) Shikara/Shikara/(*Accipiter badius*), (xxxiii)Shimpi/Tailor Bird/(*Orthotomus sutorius*), (xxxiv) Sutar/Maharatta Woodpecker/(*Picoides mahrattensis*),(xxxv) Tambat/Hoopoe/(*Upupa epops*), (xxxvi) Gai Bagala/Cattle Egret/(*Bubulcu sibis*), (xxxvii)Bagala/Grey Heron /(*Ardea cinerea*), (xxxviii)Bagala/Pond Heron or Paddy Bird/(*Ardeola grayli*), (xxxix)Pan kawla/Little Cormorant/(*Phalacrocorax niger*), (xxxx)Pan Kombadi/White breasted waterhen/(*Amaurornis phoenicurus*), (xxxxi)Titavi/Red Wattled lapwing /(*Vanellus indicus*), (xxxxii)Kala Pidda/Pied

Bushchat/(*Saxicoli caprata*), (xxxxiii)Swargiy nartak/Asian Paradise Flycatcher/ (*Terpsiphone paradise*), (xxxxiv)Dhanesh/Common Grey Hornbill/(*Tockus birostris*), (xxxxv)Telia munia (*Sinewas sp.*)/Spotted Munia/ (*Lonchura punctulata*), (xxxxvi)Myna/Indian Night jar/(*Caprimulgus asiaticus*), (xxxxvii) Khandya/White Breastedkingfisher/(*Halcyon smyrnensis*) (xxxxviii) Chuvak/Indian Robin/ (*Sazicoloides fulicata*) (xxxxix) Dyal/Magpie Robin/ (*Copsychus saularis*) (xxxxx)Khatik/Bay backed shrike/(*Lanius vittatus*) (xxxxxi)Jambhal Surya Pakshi/Purple sunbird/(*Nectarinia asiatica*), (xxxxxii) Ababed Leishra/Swallow/ (*Hirundo rustica*) (xxxxxiii) Leishra/Wiretailed Swallow/(*Hirundo smithii*) (xxxxxiv)Myna/Tree Pie/(*Dendrocitta vagabunda*) (xxxxxv) Parit/Grey Wagatai/(*Motacilla capsica*).

10.6.2: Silvicultural system: Not applicable

10.6.3: Rotation period :- Not applicable.

10.6.4: Harvestable diameter:- Not applicable

10.6.5: Reducing factors:- Not applicable.

10.6.6: Felling cycle: Not applicable

10.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

10.6.8: Calculation of yield : Not applicable

10.6.9: Table of felling : Not applicable

10.6.10: Method of executing the felling: Not applicable

10.6.11: Subsidiary silvicultural operations cleaning and thinning: Not applicable

10.6.12: Regeneration : Not applicable

10.6.13: Associated regulation & measures:

Distribution Of Wildlife:

No demarcation of separate habitat improvement areas have been prescribed here. The prescription mentioned in the succeeding section will be followed for habitat improvement during their working. The forest areas can provide good habitat for

various wild animals. Now-a-days these forests areas are in proximity to human settlements and forest areas are close to agricultural areas and also the approaches to these forest areas have become more convenient due to network of roads both pucca and kachcha roads. The wild life in these areas are under the pressure of biotic interference.

Table No. 10.1 as per 2016 Census

Wild Animal	No. of animals as per 2016 census
Tiger	2
Panther	5
Chital Deer	505
Jackal	24
Neelgai	1152
Chinkara	89
Samber	181
Barking Deer	128
Wild boar	804
Sloth Bear	19
Rhesus macau	622
Black buck	46
Wolf	47
Total	**3624**

Injuries to the wild life

Fire and Poachers are mainly responsible for destruction of Wild Life in Satpuda forests. Forest fires which occur frequently in these forests destroy the natural habitat of the wildlife, also the scarcity of water forces the animals to migrate.

Incidences of attack by wild animals

The following table gives details of attack by wild animals on domestic animals and human beings

Table No. 10.2

Sr. no	Year	Wild Animal	Domestic Animal Killed		
			Type of Animal	Number	Compensation paid
1	2008	Leopard, Tiger and Wolf	Cow, Bullock, Buffalo, Goat and Sheep	66	389675
2	2009			17	113625
3	2010			75	433975
4	2011			45	266400
5	2013			57	423700
6	2014			27	188350
7	2014			47	357000
8	2015			172	780200
Sr. no	**Year**	**Wild Animal**	**Human Casualities**		
			People injured	**People killed**	**Compensation paid**
1	2008	Wild Boar, Wolf, Bear and Leopard	7	0	220000
2	2009		1	0	50000
3	2010		14	2	918303
4	2011		5	0	250000
5	2013		9	1	395000
6	2014		3	0	250000
7	2014		4	0	307500
8	2015		25	3	2584000

Compensations were given to domestic cattle owners and legal heir of the persons injured as per the norms provided in the Govt. Resolution.

Legal position:-

Wild life (Protection) Act,1972 is applicable for entire Maharashtra. Indian Forest Act 1927 also deals with wild life. Maharashtra Wildlife (Protection) Rules, 1975 are applicable. Hunting of wild life animals has been completely banned as per the amendments made to the Wild life (Protection) Act,1972 in the year 1991.

Areas under wildlfie manegment :-

Whole areas under of Jalgaon forest division is under Wildlfie management.

Prescriptions:

- These prescriptions are applicable to all forest areas and also to the whole civil district, where ever possible.
- Soil and moisture conservation works will be taken up, where ever possible, in all forest areas, additional measures to be taken to form water holes.
- Reorientation of people's awareness about wildlife through programs like wild life week celebrations in educational institutions and remote villages.
- Involving local student and general public for wild life census operations and counting of winter fowls at water bodies and wetlands during every winter.
- Wild life watch towers at suitable spots, if available, will be created.
- Shelter and hiding places, if not existing naturally, will be provided by artificial means.
- Inoculation of cattle permitted to graze in these forests is to be compulsorily resorted to protect the wild life from contagious diseases of cattle.
- Creating artificial barrier to restrict the wildlife not to raid the agricultural fields (which is increasing day by day)
- Estimation of wildlife will be carried out every third year during first week of May.

Special suggestions :-

- Wildlife rich area in the division should be identified and focus should be given on this area.
- For many migratory birds, many wildlife and nature lovers, teachers, students visit this area. Nature interpretation centre shall be constructed here.
- Vadoda and muktainagar ranges are Jalgaon Division are very rich in flora and fauna and home for many migratory birds. Many wildlife and nature lovers, teachers, students visit this area. Nature interpretation centre shall be constructed here.
- Special protection measures like protection from fire, grazing, destruction of habitat should be taken in wildlife rich area.
- Search of rare bird should be taken with the help of wildlife conservationist, Habitat rejunivation and improvement works should be taken. No felling should be done in this area.
- Works of water hole, check dam, nala rejunivation shall be taken at suitable places.

- At the border area of Jalgaon Division, fodder development scheme, solar bore well should be taken.
- Man animal conflicts related to Bear, Monkey are noticed. Training should be given to forest staff for handling the mob and rescuing the animals. Awareness camps like celebration of wildlife week, trekking, and bird identification camps should be organized.

General measures for protection:

- Areas should be strictly and effectively protected from fire.
- A vigilant watch should be kept on poachers by creating checking gates at strategic points vis-à-vis check post for checking the forest produces in transit.
- During summer, the scarcity of water leads to drive the animals to a few water pools exposing themselves as prey to poachers including local inhabitants. Such areas should be kept under constant vigilance.
- Compensation for cattle and human killings by wildlife should be made immediately as per law to create sympathy towards wildlife and to check any sorts of revenge to be taken by villagers.
- If there exists any cattle lifter or man eater that should be translocated safely to safe areas to have rapport with villagers.
- To have awareness for the wild life in the areas drive regarding wild animals should be taken from time to time.
- To have an orphanage to rear the ailing animals to recoup and then to set free in their natural home.

Water supply:

In the areas where there is an acute shortage of water required by wild life, construction of water holes will be made with provision to regular supply of water there. Creation of Vantalav to harvest water for purpose of wildlife, construction of anicuts, bunds on nalas at suitable sites should be made to provide permanent water holes to the wildlife.

WILD life tourism:

A wild life tourism centre would be developed at centrally located place. An ideal sites are Patana devi and Muktai Bhawani Conservation Reserve is the main spot for tourism.

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CHAPTER -11

ECO TOURISM

11.1: The area covers the some spot of whole Division and is therefore not specifically marked on GIS based map.

Eco tourism is the new buzzword in the realm of tourism throughout the world. Mr Hector Ceballos Lascurain is the father of Eco tourism who coined the word ECO TOURISM in 1983. He said that "Eco Tourism respects the environment, encourages and promotes the well being of local people. Nature tourism may or may not do this". A mechanical implementation with an over emphasis on physical and financial targets without making an attempt to understand the spirit of the program would end up in causing irreparable damage to the environment. It is more difficult to establish and run a successful eco tourism enterprise. A main difference is the need to take into account the environmental factors and successfully integrate them with business and social concerns in a carefully thought out and implemented plan. Eco tourism generates more employment and provides enormous opportunities for entrepreneurship.

11.2 GENERAL CONSTITUTION OF WORKING CIRCLE:-

Eco tourism management seeks to integrate and balance several potentially conflicting objectives, protection of natural and cultural resources, provision of recreation opportunities and generation of economic benefits. In the absence of effective planning and management, ecotourism can lead to significant negative impacts on vegetation, soil, water, wildlife and historic resources. Visitation may diminish along with the economic benefits and resource protection incentives. Eco tourism has been the fastest growing sector in tourism with an estimated annual growth rate of 10 to 15% over the last few years and it is expected to grow even more in future. The present government emphasis is on eco tourism, with proper planning. It is a onetime investment activity, which triggers enormous employment opportunities in various fields like transportation, restaurant, hotel, tourist guide, shopping, other entertainments like cinema halls etc.

11.3: GENERAL CHARECTRISTIC OF VEGETATION

Ecotourism is responsible travel to natural areas, which conserves the environment and improves the welfare of local people. (The ecotourism society 1993).

Tourism that involves travelling to relatively undisputed natural areas with the specified object of studying, admiring and enjoying the nature and its world of plants and animals as well as any existing cultural aspects found in these areas is defined as ecotourism.(World Tourism Organization).

Ecotourism is about creating satisfying a hunger for nature, about exploiting tourism's potential for conservation and development and about averting its negative impact on ecology, culture and asthetics.

11.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS:- Not Applicable

11.5: BLOCKS, COMPARTMENTS AND JFM AREAS: Entire forest area and that some identified spot of the Division.

11.6: SPECIAL OBJECTS OF MANAGEMENT:

- To providing the local people with alternative sources of income.
- Tourists and visitors numbers and tourism practices must allow nature to re-generate itself
- To Encourage use of appropriate local practices, materials, art, craft, architecture, food
- To increase the awareness tourists have about the social conditions surrounding a travel destination.

11.6.1: Analysis of Crop: Not applicable

11.6.2: Silvicultural system: Not applicable

11.6.3: Rotation period:- Not applicable.

11.6.4: Harvestable diameter:- Not applicable

11.6.5: Reducing factors and reduced areas:- Not applicable.

11.6.6: Felling cycle: Not applicable

11.6.7: Divisions into periods and allotment to periodic blocks: Not applicable.

11.6.8: Calculation of yield : Not applicable

11.6.9: Table of felling : Not applicable

11.6.10: Method of executing the felling: Not applicable

11.6.11: Subsidiary silvicultural operations cleaning and thinning: Not applicable

11.6.12: Regeneration : Not applicable

11.6.13: Associated regulation & measures:

Basic principles of eco tourism:

- Avoids negative impacts that can damage or destroy the integrity or character of the natural or cultural environment being visited.
- Educates the traveler on the importance of conservation
- Directs revenues to the conservation of natural areas and the management of protected areas.
- Brings economic benefits to local communities and directs revenues to local people living adjacent to protected areas.
- Emphasizes the need for planning and sustainable growth of tourism industry, and seeks to ensure that tourism development does not exceed the social and environmental "carrying capacity".
- Retains a high percentage of revenues in the host country by stressing the use of locally owned facilities and services.
- Increasingly relies on infrastructure that has been developed sensitively in harmony with the environment.

SUSTAINABLE FOREST MANAGEMENT-ECOTOURISM AS A TOOL

Forestry has traversed through various phases over the past century. During British rule the main focus was on production forestry and after independence the focus slowly shifted from production forestry to protection forestry. However with rapidly

increasing human and livestock population there is immense biotic pressure on our forests. In order to solve the predominant human-forest conflicts, the concepts of people's participation and Joint Forest Management have been evolved.

To maintain the forests sustainably over an indefinite period and its dependence on both government and foreign grants is to be reduced there is an immediate need to evolve a revenue-generating aspect of forestry that does not result in the extraction of any forest produce i.e. timber, firewood etc. The only way to bring this sort of revenue generation is through Ecotourism. It is in this sector that the future of forestry lies. In the new millennium, the time has come to move from merely conservation forestry to towards "Intellectual Forestry", the basis of which is Eco Tourism.

Greater awareness generation among the public: -

It is observed that whenever on talk of stake holders in forestry, the focus is always on forest dwelling communities, forest dependant communities, local NGO's and the forest department. The city and town dwelling urban forest independent communities are not at all considered as having any stake in the forestry. It is a matter of irony, however that almost all the decision makers and opinion-leaders of the country, be they top bureaucrats, judges, industrialists, famous personalities and even politicians, etc are all members of this community. Even though this segment comprises only a small percentage of country's population, its ability to influence decision making is much more significant.

Ecotourism is the best possible manner in which these forest independent communities can be made aware of forestry in India. Ecotourism could also expose school children, the future generation of policy makers to the relevance and importance of our forests. As people today are becoming increasingly aware about environmental issues, this is the right time to promote ecotourism.

Benefits for the local communities:-

Ecotourism can play a very significant role in reducing the dependence of local communities (both forest dwelling and forest dependent) on the forests. Setting up of an ecotourism unit would not only provide them with a means of employment at the unit itself, but would also make them stakeholders in the financial progress of such an enterprise. The Ecotourists would also constitute a ready made markets for NTFPs

such as honey, charoli,Dhavada, gum and other items such as embroidery products, local handicrafts etc, at their door steps. High quality micro enterprises such as poultry farming, vegetable supply units could also be set up and centered around the ecotourism unit. Such a Participatory Ecotourism Strategy (PES) would not only cut operational costs for the ecotourism unit but would at the same time reduce the traditional dependence of the local communities on the adjoining forests by providing an alternative source of livelihood. In addition to the above, ecotourism could be used as an effective communication and extension tool to convince the local communities and especially the children there in about the benefits of conserving the forests and natural ecosystems.

Local tribal youth will be selected and training will be given to them on ecotourism and related topics like identification of birds, animals, flora and other important features that are seen during the tour. The traditional knowledge of the tribal youth will also be utilized during the tour.

Benefits for the Forests and the Forest Department:

By providing the local people with alternative sources of income, ecotourism would drastically reduce the biotic pressure in the region which would automatically lead to greater habitat improvement. Other habitat improvement work such as clearing weeds for making view lines, creating salt pits for the wild life etc. would be mutually beneficial for both the forest and the ecotourists. The unit operates and the visiting ecotourists would also back up as eyes and ears of the forest department in curbing all illegal activities such as felling, poaching etc. The forest department would also get an opportunity to educate the city dwellers, villagers.

The forest department has hitherto largely been perceived as far removed from the general public. Ecotourism is the best way in which the public can be made aware of the pivotal and difficult role that is played by the forest department in conserving India’s forests. This would in turn lead to much greater appreciation of Forest department and increase the importance that is attached to it.

Ecotourism will be a successful industry only if natural resources are protected. And natural resources will be best protected of there is a strategy frame work in place and park staff and local communities understand the concept and take a lead role in the

process. One important measure of both the success and sustainability of ecotourism is the management of visitor impacts to ensure the long term protection of natural and cultural resources, as well as continued visitor enjoyment and use.

Pal in Raver range, Mor dam in Jalgaon East range, Manudevi in Jalgaon West range, Unapdeo in Karjana range, Sati Anushaya Kamaljadevi in Chopda range are the place of Eco tourism in the division. Various works have been taken during current working plan still there is lot of scope for improvement. Activities like play ground for children should not be taken.

Following works and activities will be taken.

All Forest parks will be completely fenced with chain link fencing.

Emphasis will be given on creating wood lots of medicinal plants, forest tree fruit garden, creeper garden, hedge garden, bamboo plantation etc.

Nature and cultural interpretation/ awareness centrewill be created. These should be fully utilized and should be open for the public.

Audio-visual aids and equipments shall be provided.

Improvement in eco-tourism infrastructure such as internal roads, view points, regulation of entry/exit at gates shall be done.

ECOTOURISM POTENTIAL OF JALGAON FOREST DIVISION:

Jalgaon Forest Division has ecotourism potential. The division has low tribal population, mainly Bhils and Tadivis.The division has about 86600.08 ha. of forest area mainly Teak and Anjan bearing forests. The following sites have been identified and listed below that have great potential and resourceful to make ecotourism a success in Jalgaon Forest Division.

- Padmalay (Ganesh) Temple in Erandol range.
- Muktai Bhavani conservation reserve in Vadoda range.
- Landor Khori in Jalgaon Range.
- Patna Devi Mandir (Chalisgaon Range).
- Hatnur/Girna Dam In Vadoda Range.

1. Padmalay temple: -Padmalaya (also known as "Prabhakshetra") is a village in the Indian state of Maharashtra. It lies 10 km from Erandol and 31.5 km from the district headquarters of Jalgaon . 'Padmalaya', a portmanteau word blending "Padmasya" and "Alaya", means "Home of Lotus" in Sanskrit. The name is derived from a large lotus pond that is believed to have existed adjacent to a local temple dedicated to Ganesha. Other places of interest in the village includes "Bhim Kunda", a peculiarly shaped pond, and the Anjani river - located around 1 km from Padmalaya. Two (Swayambhu) Ganesh idols are there. These idols consisted of Coral (Praval). One idol has its trunk (Sond) curving to the right and the other to the left.These idols were "Swayambhu" literally meaning "self-existed". The temple is built using stone. A large pond beside the temple. This pond used to be full of lotus flowers. Hence the place got the name of "Padmalaya".This temple is located at the top of a hill. Small temples are on all sides of the main temple. The padukas of Shree Govind Maharaj are located in front of the temple. A huge bell weighing 440 kg is next to the padukas.

2. : Muktai Bhavani conservation reserve

Its area is 122.74 sq.km., Mukati Bhavani conservation reserve in Jalgaon under Dhule circle. This is the third such reserve in the State after Kolamaka in Gadchiroli and Borgad in Nashik.

3. : Landor Khori

It is locate near Jalgoan Town.

a. To decimate information regarding flora and fauna and their significance to the people.

b. To increase public support for consercation of forest and Wildlife by creating, understanding and forestring awareness and concern for consercation needs.

The following developmental activities are proposed :

a. Nature trails and tracking routes to scenic view points are be created.
b. Picnic sites and play grounds for children to be developed. Amenties such as Dringking Water facility and Public Toilests are also proposed to be established.
c. Emphasis will be given on creation wood lots of medicinal plants, fruit garden, hedge plantations, Bamboo plantation etc.

In addition other developmental works which are in harmony with nature and not detrimental to forestry and wildlife can be taken up.

4 : Gavtala autoram ghat wild life sanctuary (Patna Devi) : It is located at a distance of 90 kilometres from Jalgaon town. The Sanctuary has very good forest area and the total extent of forest area is about 6500 hectares. The Sanctuary is home for wild animals like Panthers, Bears, Wild Boars, Neelghai,, black buck, Hyena, Jackels etc. The territorial division and wild life division should come together to chalk out a eco tour trail within the Sanctuary. A lucky visitor can sight some of these animals during eco tour trekking. Water Shed Development works like Continuous Contour Trenches (CCTs), Loose Boulder Structures, Cement Check dams, Percolation tanks, different plantation models should be developed at some location of eco tour to educate the ecotourist about the benefits of soil, moisture and water conservation works through display boards. Local tribal youth should be trained to act as ecotour guides. Wild Life division should create facilities to erect tents for visitors with in the forest.

Ecotourism complex – Objectives/purpose/functions.

To provide eco friendly infrastructure preferably on the fringes of wild life protected area which takes care of minimum lodging and boarding facilities in pucca houses, huts, machans and tents as per requirements of the tourists.

- To provide mini- libraries to enable visitors to spend their time usefully and elicit support for protection of wild life.
- To provide indoor games like carrom and chess for the entertainment of visitors.
- To earn revenue for the state government.
- To provide income to local people by employing them as guides, watchers etc.
- To facilitate sale of locally made crafts to tourists.
- To impart education on nature conservation.
- Lastly, to facilitate all round development.

5. : Hatnur/Girna Dam : Hatnur,Girnar dams are located close to Jalgaon town. These are excellent water bodies for attracting water birds and is an ideal location for bird watchers. Fruit bearing trees of different species(singapur cherry, bor, pimpal, umbar, peru etc.) should be planted around the dam area, so that fruits are available

for the birds round the year and the dam site can become major bird attracting place for both water and bush birds in large numbers. Shelters shall be developed for bird resting and nesting in the vicinity of the dam. Bird feeders and bird baths should be provided in good numbers for bird attraction around the dam.

RESOURCES REQUIRED FOR DEVELOPMENT OF ECOTOURISM/FUTURE COURSE OF ACTION:

The Deputy Conservator of Forest should take initiative to prepare plans and estimates for the developmental activities at these places of interest and submit the estimates to Forest Department, District Authorities or Maharashtra Tourism Development Corporation for resources. In eco tourism it is a one time capital investment provides platform or triggers multi dimensional activities like transportation, food industry, shops for locally made articles in these places of interest.

Unless the environment is safe guarded ecotourism is in danger of being a self destructive process, destroying the very resource upon which it is based. Therefore necessary safeguard should be sensitized about the protection of environment. The ecotourism should not be allowed to transform into eco terrorism by neglecting the principles of ecotourism at implementation phase. The aim of ecotourism is to utilize the natural beauty to the optimum while keeping up our social obligation and commitment to conserve and preserve the ecology and environment.

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CHAPTER -12

BIODIVERSITY CONSERVATION

12.1: STATUS OF BIODIVERSITY:

The area of this forest division is situated in biodiversity rich part of Maharashtra. Extreme seasonal variation, diverse topographical characters, undulating areas with many rich valleys and table lands watered by annual and perennial streams, in the catchment of Tapi, Girana, Waghur and Purna river & its tributaries creates diverse habitat with flora and fauna. Therefore different kinds of plants animals, harbor in these division. Primitive types like Bhil, & Tadavi are sharing common habitat with wildlife of this area as these tribal communities resides adjacent to the forest, it creates biotic pressure from both sides resulting in man & animal conflict situations frequently. Increasing encroachment is a major problem to be addressed.

This forest division is rich in floral diversity pertaining to this area. The Forests of Jalgaon Division of Jalgaon District, mainly belong to Dry Tropical Forests as per the "Revised Survey of the Forest Types of India" by Champion and Seth. The composition of the growing stock shows considerable local variations on account of various locality and biotic factors. The forests belong to sub group Dry Teak Forest (5A/Cib), Teak high forest, Superior Teak coppice forests, Salai forest, Anjan forests.

Teak (*Tectona grandis*), Sadada (*Terminalia tomentosa*), Shisam (*Dalbergia latifolia*), Dhavda (*Anogeissus latifolia*), Hed or Haldu (*Adina cordifolia*), Salai (*Boswellia serrata*), Bija (*Pterocarpus marsupium*), Dhaman (*Grewia tiliaefolia*), Tiwas (O*ugeiniao ojeinensis*), Bondara (*Lagerstroemia parviflora*), Kalam (*Mitragyna parvifolia*), Sawar (*Salmalia malabarica*), Tembhrun (*Diospyros melanoxylon*), Kusum (*Schleicher aoleosa*), Mahuwa (*Madhuca indica*), Phasi (*Dalbergia paniculata*), Humb (*Sacopetalum tomentosum*), Mokha (*Schreberas wietenioides*) Rohin (*Soymida febrifuga*), Umbar (*Ficusg lomerata*), Kadai (*Streculia urens*), Pangara (*Erythrina variegata*), Arjun sadada (*Terminalia arjuna*), Awala *(Emblica officinalis*) are the main species of general floristics.

The under-storey consists of Khair (*Acacia catechu*), Charoli (*Buchanania lanzan*), Modhal (*Lannea coromandelica*), Bor (*Zizyphus mauritiana)*, Bhutakes (*Cassine glauca*), Asana (*Bridelia retusa*), Palas (*Butea monosperma*), Bahava (*Cassia fistula*) and Bamboo (*Dendrocalamus strictus*).

The shrubby undergrowth consists of Kevani (*Helictere sisora*), Karvi (*Strobilanthes callosus*), Tarwad (*Cassia auriculata*), Nirgudi (*Vitex negundo*) and Tarota (*Cassia tora*). The grasses commonly met with are Horn (*Sorghum halepense*), Kunda (*Ischaemum pilosum*), Pavnya (*Sehima nervosum*) and rosha *(Cymbopogon martinii).* Ukshi *(Calycopteris floribunda)* and Chilhar (*Caesalpinia sepiaria)* are the climbers commonly met with.

Teak is the predominant species attaining pole size in its mature state. It is found on steep slopes and on flat ground. The soil depth, quality of soil and terrain determine the quality and composition of the crop. Teak occurs everywhere and its proportion varies from 20 to 30 percent. The quality of the crop mainly is IV. The quality goes down to IV-b in very shallow and overgrazed areas near habitations. The density varies from 0.4 to 0.6. The preponderance of Salai especially on the degraded hill slopes is noteworthy. The occurrence of bamboo is scanty.

This area is a very good habitat for Tiger, Panther, Hyaena, Wild dog, Jakal, Jangle cat and Sloth bear. The herbivores commonly found are Barking dear, Wild boar, Black buck ,Chinkara, Mungoose etc. The rodents found are Porcupine, Hare etc. The area is rich in Avifauna with more than 50 type of birds visiting to big water bodies adjoining to Narmada and Tapi River. Types of birds includes Bhaya, Popat, Shikara, Shimpi, Sutar, Bagala,Pankawala, Khandya Ghubad, Kotwal etc.

It is very essential to make inventory of the floral and faunal diversity of this rich and diverse habitat as no scientific study has been undertaken. To highlight the loss of habitat and to conserve genetic diversity, scientific interventions are the need of the time.

12.2: NEED TO CONSERVE BIODIVERSITY :

Biodiversity is essential for maintaining the ecological functions, including stabilizing of the water cycle, maintenance and replenishment of soil fertility, pollination and cross-fertilization of crops and other Vegetation, Protection against

soil erosion and stability of food producing and other ecosystems. Conservation of biological diversity leads to conservation of essential ecological diversity to preserve the continuity of food chains. Biodiversity provides the base for the livelihoods, cultures and economies of several hundred millions of people, including farmers, forest dwellers and artisans. It provides raw material for a diverse medicinal and health care systems. It also provides the genetic base for the continuous up Gradation of agriculture, fisheries, and for critical discoveries in scientific, industrial and other sectors. The rapid erosion of biodiversity in the last few decades has impacted on the health of the land, water bodies and people. Biodiversity is a wealth to which no value can be put. In the final analysis, the very survival of the human race is dependent on conservation of biodiversity. It is evident that this invaluable heritage is being destroyed at an alarming rate due to several reasons.

Conservation and sustainable use of biological resources based on local knowledge systems and practices is ingrained in Indian ethos. The country has a number of alternative medicines, like Ayurveda, Unani, Siddha and Homeopathic systems which are predominantly based on plant based raw materials in most of their preparations and formulations. Herbal preparations for various purposes including pharmaceutical and cosmetic form part of traditional biodiversity uses in India and in Jalgaon as well. The benefits that we derive from the biodiversity are many and a few of them are noted below:

12.2.1: Food provision :

Animals, plants, mushrooms, fruits, tubers, flowers etc., you name them and we find their use in some form of food by many people's groups. India food security, where we are able to have sufficient and surplus grains through the green revolution, was made possible because we were having wild varieties of rice, wheat etc apart from introduction of good irrigation and fertilizers.

12.2.2: Genes :

Wild animals and plants are sources of genes for hybridization and genetic engineering. New improved varieties of plants, particularly food grains, are essential to be developed and this would not be developed and this would not be possible without the presence of genetic diversity.

12.2.3: Biological control agents:

Some species of living things help us to control invasive species without the use of poisons. Epidemics in forests and agricultural and agricultural crop are perpetuated by monocultures and vast plantations. Diversity however, serves to balance nature on its own.

12.2.4: Natural Products:

Many of the medicines, fertilizers and pesticides we use are derived from plants from plants and animals. We also get products such as oils, adhesives & silk from natural sources.

12.2.5: Environmental Services:

We rely to plants and animals for important processes such as soil aeration, fertilization and pollination.

12.2.6: Enjoyment:

Biodiversity and wildlife is often the subject of aesthetic interest. In India and Jalgaon we can see the people are being more and more aware about the value and function of wildlife and biodiversity. The level of appreciation and interpretation of both has also increased for the better.

12.2.7 : Scientific interest:

The diversity of plants and animals inspires scientific inquiry in many different realms.

12.3 : PRESCRIPTION FOR THE MAINTENANCE & ENHANCEMENT OF BIODIVERSITY:

(i) Sustainable harvesting of Medicinal Plants should be strictly adhered to. As the division already has the list of local medicinal practitioners (LMP) and the species used by them, it shall be the duty of the Division to chalk out the ways and means of sustainable harvest, with or without the consultation with the LMPs, at its own discretion.

(ii) Sensitization of the Staff of Jalgaon division to the issues of biodiversity is of utmost importance. The Division shall involve such experts and institutions in consultation with the Maharashtra Biodiversity Board, Nagpur for such trainings and workshops. Our tendency to limit our management practice to only Teak and prominent wildlife species should be done away with.

(iii) The field functionaries of Jalgaon forest division shall identify areas of significant biodiversity value and take lead in in-situ conservation and Ex-situ conservation.

(iv) Identification of area of birds presence in the Division is a must. It is known to be rich in avi-fauna and needs to be studied for further protection. It should be the endeavor of the Division to explore potential sites/ areas that would qualify as IBAs.

(v) Identification and documentations of local practices, indigenous technical knowledge and other ethno-biological should be carried by the department.

(vi) Identification and Conservation of rare/ endangered indigenous species of plants in the division.

(vii) All efforts should be made to control fire and grazing in the forests as these are among the biggest enemies of biodiversity.

(viii) As per biodiversity Act 2002, Biodiversity Management Committee through the gram panchyat as per the norms decided by the Government needs to be established in all the JFMos villages. The local guard should provide all help and co-operation to the gram sabha for the establishment of the works as and when required.

(ix) Capacity building for local communities, forest personnel at all levels; elected representatives, decision makers, and bureaucrats needs ot include the provision of technical skills.

(x) All JFM Committees should have Public Biodiversity Registers as part of the many records to be kept. Members from the State Biodiversity Board should be consulted for the same. Necessary Workshops, training etc required for this should be carried out.

(xi) The forest division in consultation with the local Colleges, anthropological/Social science institutions and the Maharashtra State Biodiversity Board should carry out Biodiversity studies on the lesser known lower life forms of the flora and fauna. It may be seen that as the forest department has concentrated its working in the higher life form of trees and mammals/birds other species have been relegated to oblivion.

Documentation and studies of herbaceous plants,

Documentation and studies on the fungi, ferns, algae and Lichen and moss (If any).

Carry out entomological studies (Particularly butterflies),

Carry out herpetological studies.

In all the above studies, proper documentation with distribution of species, the abundance and threats to the species may be included.

12.4: LEGAL ENACTMENT

In view of above consideration, the Biological Diversity Act, 2002 has been enacted to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits. In pursuance of Biological Diversity Act, 2002, Rule 2004 farmed and came into force into 15th April 2001. The Act provides for statutory bodies like National Biodiversity Authority at the National level and State Biodiversity Boards at State levels, to regulate access to Biogical Diversity. Maharashtra Biological Diversity Rules 2008 was notified under section 63(1) of Biological Diversity Act 2002 on 10th December 2008. Government of Maharashtra vide their notification dated 2.1.2012 has created Maharashtra State Biological Diversity Board. Under the provision of Rule no.23 of Maharashtra Biological Diversity Rules 2008, District level, Taluka level & village level Biodiversity committees should be formed. The District level committee has been formed in Jalgaon District under the Chairmanship of the Collector.

At every local level, every local body shall constitute a Biodiversity Management Committee within its area of jurisdiction.

Function of the committee:- The main function of Biodiversity Management Committee (BMC) is to prepare people biodiversity register in consultation with local people. The register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or other use of any other traditional knowledge associated with them.

The other functions of the BMC are to advice on any matter referred to it by the State Biodiversity Board or Authority for granting approval, to maintain data about the local Vaidus and practitioners sing the biological resources.

The Authority shall take steps to specify the form of the People's Biodiversity Registers, and the particulars it shall contain and the format for electronic database.

The Authority and the State Biodiversity Boards shall provide guidance and technical support to the Biodiversity Management Committees for preparing Peoples Biodiversity Registers.

The People's Biodiversity Registers shall be maintained and validated by the Biodiversity Management committees.

The committee shall also maintain a Register giving information about the details of the access to biological resources and traditional knowledge granted, details of the collection fee imposed and details of the benefits derived and the mode of their sharing.

Three talukas namely Jalgaon, Chalisgaon, Bhusaval, Jamner, Pachora, Amalner, Parola, Dharangaon, Erandol, Muktainagar, Bhadgaon and Bodvad are comes under Jalgaon Division. Taluka level Biodiversity committees are not formed so far. The DCF should take initiative to form those committees as early as possible with help of Taluka Agriculture Officer and Block Development Officer.

These Twlve talukas comprises of 1186 villages. Out of that 254 villages are adjoining to forest areas having JFM committees. DCF Jalgaon should take immediate efforts to form Biodiversity committees in those villages. In remaining 932 villages which are not adjoining to forest areas, the DCF Jalgaon should contact Agricultural Officer and BDO to form Biodiversity committees in those villages. A time bound

progamme should be arranged by DCF to form Biodiversity committees in the villages of those talukas.

A Note On The Biodiversity Act 2002

Introduction:

India is party to the United Nation Convention on Biological Diversity signed at Rio de Janeiro on the 5 Day of June,1992. This conservation reaffirms the sovereign rights of the state over their biological resources. Therefore, legislation was enacted by the Indian Parliament in 2002 to give effect to the United Nation Convention.

This Act aims to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental there to.

Important provision of the Act :

Section 2 (a) defines the term Benefits Claimer so as; the conservers of biological resources, their byproducts, creators and holders of knowledge and information relating to the use of such biological resources, innovations and practices associated with such use and application.

Section 2(b) defines the terms biological diversity as; the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of eco-systems.

Section 2(c) defines the terms Biological resources as; plants animals and micro-organisms or parts there of their genetic material and by-product (excluding value added products) with actual or potential use or value, but does not include human genetic material.

Section 2(o) defines the terms sustainable use has the use of components of biological diversity in such manner and at such rate that does not lead to the long –terms decline of the biological diversity thereby manning its potential to meet the needs and aspirations of present and future generations.

Section 3(I) regulates the access to Biological diversity for persons mentioned in section 3 (2) who shall, without previous approval of the National Biodiversity Authority (NBA), obtain any biological resource occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization.

Section 3 (2) : The person who shall be required to take the approval of the NBA under section 3 (1) are the following, namely : (a) a person who is not a citizen of India; (b) a citizen of India who is non-resident as defined in clause (30) of section 2 of the Income-Tax Act,1961; (c) a corporate body, association or organization not registered in India or registered in India under any law for the time being force which has any non-India participation in its share capital or management.

Section 4 : No person shall, without the previous approval of the NBA ,transfer the results of any research relating to any biological resources occurring in, or obtained from, India monetary consideration or otherwise to any person who is not a citizen of India or citizen of India who is non- resident as defined in clause (30) of section 2 of the Income –tax Act, 1961 or a body corporate or organization which is not registered or incorporated in India or which has any non-Indian participation in its share capital or management.

Section 6 (1) : No person shall apply for any intellectual property right (IPR), by whatever name called, in or outside India for any invention based on any research or information on a biological resource obtained from India without obtaining the previous approval of the NBA before making such application.

Section 7 : No person, who is a citizen of India or a body corporate, association or organization which is registered in India, shall obtain any biological resource for commercial utilization, or bio-survey and bio-utilization for commercial utilization except after giving prior intimation to the state Biodiversity concerned.

Section 8 (1) : Central Government for the purposes of this Act, shall appoint a body called the National Biodiversity Authority (NBA).

Section 21(1) : The National Biodiversity Authority shall while granting approvals shall ensure that the terms and conditions subject to which approvals granted secures equitable sharing of benefits arising out of the use of accessed biological resources, their by-products, innovations and practices associated with their use and application and knowledge relating thereto in accordance with mutually agreed terms and condition between the person applying for such approval, local bodies concerned and the benefits claimers.

Section 21 (4) : NBA shall in consultation with the central Government frame guidelines for operational zing section 21(1).

Section 22 (1) : For the purposes of this Act, state Government may, by notification in the official Gazette, establish state Biodiversity Board.

Section 37 (1) : Without prejudice to any other law for the time being in force, the state Government may, from time in consultation with the local bodies, notify in the official Gazette, areas of biodiversity importance as biodiversity heritage sites under the Act .

Section 37 (2) : The state Government, in consultation with the Central Government, may frame rules for the management and conservation of all the heritage sites.

Section 38 : Without prejudice to the provisions of any other law for the time being in force, the central Government, in consultation with the concerned state Government may from time to time notify any species which is on the verge of extinction or likely to extinct in the near future as a threatened species and prohibits or regulate collection thereof for any purpose and take appropriate steps to rehabilitate and preserve those species.

Section 41 (1) : Every local body shall constitute a Biodiversity Management Committee (BMC) within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticates stocks breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity.

Section 41 (2) : The NBA and SBA shall consult the Biodiversity Management Committees (BMCs) while taking any decision relating to the use of biological resources and knowledge associated with such resources occurring within the territorial jurisdiction of the BMCs.

The BMCs may levy charges by way of collection fees from any person for accessing or colleting any biological resource for commercial purposes from areas falling within its territorial jurisdiction.

Section 55 (1) : Whoever contravenes or abets the contravention of the provision of sections 3,4 or 6 shall be punishable with imprisonment for a term which may extend to five years, or with fine which may extend to ten lakh rupees and where the damage caused exceeds ten lakh rupees such fine may commensurate with the damage caused, or with both.

Section 58 : The offences under this Act shall be cognizable and non-bailable.

Section 59 ; The provisions of this Act shall be in addition to, and not in derogation of the provisions in any other law, for the time being in force, relating to forests or wildlife.

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CHAPTER-13

MANAGEMENT OF FOREST HEALTH AND VITALITY

13.1: INTRODUCTION :

This chapter on maintenance and enhancement of Forest Health and vitality deals with the general condition of the health and vigor of the forest and steps that are needed to be taken in order to maintain and improve it.

Health forests are essential for sustainable forest management, yet forests, like other ecosystems, are subject to a number of threats that can cause tree mortality or reduce their ability to provide a full range of goods and services. The cause of the negative impacts on forest health and vitality vary from place to place, and the magnitude and duration of the impacts are not easy to assess. Causes include, but are not limited to, insects and diseases, over exploitation of wood and non-wood forest products, poor harvesting practices, poor management, uncontrolled grazing, invasive species, air pollution and extreme climatic events (e.g. drought, frost, storms and floods) The complexity and interrelationship of these factors and their impact on the health and vitality of forests are difficult to unravel, Indirect impacts may be far reaching and include social, economic and environmental dimensions.

13.2: GENERAL CONSTITUTION OF AREA:

Whole forest area of division.

13.3: GENERAL CHARACTERISTICS OF VEGETATION :

The forests of Jalgaon Forest Division belong to the sub-group 5-A, southern Tropical Dry Deciduous Forests as per the revised classification of forest types of India by Champion and Seth. Within this main type, local variation in the altitude are not much, it does not influence the distribution of various forest species, however, aspect plays an important part in determining the character of the vegetation in hilly area. Generally the western and northern slopes are better stocked than the drier eastern and southern slopes. The rocks throughout the Jalgaon Forest Division are Deccan trap, but the soil varies. Geology, soil varies. Geology, soil type and depth plays an important role in determining the composition and quality of the crop.

13.4: SPECIAL OBJECTIVE OF MANAGEMENT :

(A) To improve the overall health of trees by striving for better composition, normal age distribution sturdy structure high vigor of the forest which is achievable by.

- Improve the regeneration status of the forest by encouraging seedling origin new regeneration.
- Minimizing the occurrence and impact of forest fire on forest.
- Detecting and containing pests and diseases from defoliators and skeletenisers to all forms of parasites, fungal attacks.
- Ensuring grazing in forest is kept to a minimum.
- Reducing human interference of all forest, from illegal felling, grazing, hunting etc. by enforcing the law & changing moral perception.

(B) As the forest of Jalgaon have been worked for over 90 years under the coppice with Reserve and Coppice standard system, the presence of Teak in most part the forest is less than 34% & the Teak coppice has lost its vigor to revitalize the forest.

(1) Wherever, regeneration comes up priority for retention and nurturing, should be given to seedling –origin regeneration.

(2) The choice of species for Afforestation in Anjan working circle & Afforestation working circle should be of miscellaneous and fruit bearing species keeping in the barest minimum Teak seedling/stumps.

13.4.1: Analysis of the crop :

The analysis of forest crop of Jalgaon Forest Division is done in this plan in each working circle and part-I Chapter –VI. (Maintenance and Enhancement of Forest Resource Productivity.)

Biotic interference like excessive grazing, illicit felling, overdependence on forest for fuel wood weed infestation and frequent fire has resulted in the further degradation of the forests. The illegal felling are often concentrated on the species most valued for various purposes. Seedling stage are particularly exposed to

extermination due to excessive grazing and fires. The species surviving during degradation stage are resistant ones, which can stand ton grazing and fires. These species are often of low utility, tend to become gregarious and do much harm to forest health.

FACTS : As per this FSI report Inventory of Forest Resources of Jalgaon division shows the condition of the crop and health status in very poor condition. One can only presume that an area where the forests with little regeneration, overabundance of a single species and subjected to various biotic and abiotic pressure would be in poor health and vitality.

Dense forest is partially present in the division and the forest area is gradually converting into open and scrub forests due to heavy biotic pressure. Heavy grazing and erosion have been noticed in considerable area.

Regeneration is inadequate in 60% of forest area due to biotic interference. Proper steps should be taken to minimize such interference.

About 2500 ha. per year forest area requires to be planted/ afforested with suitable species to increase the vegetative cover.

In the light of the above and the observations made in the forest of Jalgaon it is seen that there is a great need for the restoration of the forests and the improvement of the health and vitality in the whole Division.

An improvement indicator the vitality of the forests is the presence of the regeneration as the status of regeneration in the forests represents its future crop. The regeneration of the Jalgaon Division is extremely poor. A detail analysis of the same is given in chapter 4 . In order to tackle this situation, special steps needs to be taken and among them is the carrying out of Aided Natural Regeneration in the coupes as prescribed in each working Circle.

13.5: REGULATION AND MEASURES:

The biotic factors which have resulted in the degradation of the forests are excessive grazing, frequent, fires, illicit felling, overdependence on forest for fuel wood and weed infestation. The illegal felling are often concentrated on the species most valued purposes. Seedling stages are particularly exposed to extermination due to excessive

grazing and fires. The species surviving during degradation stage, are resistant ones that can withstand to grazing and fires. These species are often of low utility, the following factors are discussed individually and special steps to combat reduce the effect of each factor are required.

1. **Grazing reduction:** Grazing not onlydestroys the regeneration which is vital for forest health but it also cause compaction of the soil. The presence of grazing also bring with it many menaces like compaction with the wild animals for food, destruction of the cover of bird and pheasants, weeds dispersal, possible infection etc. Hence it is essential to contain grazing through.

- Stall feeding.
- High milk yielding cows
- Discard unproductivecattle.
- The above cannot be achieved without the active participation of the people. The role of JFMCs and the rapport of the field officers/staff is very important for the success of controlled grazing.
- Closing of the area of nature Regeneration from grazing should be strictly followed. This is neglected part but with the compulsory Aided Nature Regeneration prescribed for post-harvest areas. DCF should take extra measures to ensure total closure of grazing.

2. Fire : A fire in the hot summer is very harmful as it kills the young seedling and coppice shoots of all major species and plantations. Fire hardy species such as Teak, Bhirra, Salai, Mowai, Palas escape slightly compared to other species. Severe fire cause considerable damage to the trees also by scorching their bases which ultimately leads to unsoundness and hollowness and renders them liable to attack by fungi and insects. Fire also indirectly cause soil erosion by destroying the soil cover as well as the organic matter. Scientific method for estimating loss due to forest fire needs to be evolved so that the frontline staff would take fire prevention more seriously.

(i) Firelines: The creation and maintenance of fire lines as traditionally done anddescribed here in detail under Miscellaneous Regulation, should be carried out. However there is a need to improve its effectiveness and the DCF should look for ways and means to do so with necessary improvement and modifications.

(ii) Fire Blower: Fire blower are very effective for the clearing the litter from the ground and breaking the spread of fire. The use of these blowers has proven very effective in labour intensiveness of firefighting and in containing the damage from fire. The blower should also be used for maintaining the fire lines, as over time the other dry material falling on the fire line area makes the fire line ineffective.

(iii) Fire alerts : Fire alerts are being sent to the concerned by the FSI Dehradun on registration. It shall be mandatory on the part of the DCF to register himself and the RFOs up to Beat guard for receiving these fire alerts from the FSI. Though there may be issues of positional accuracy, inability of detection of small fire and probability of false alarms, the systems will however keep the fighting machinery in alertness.

(iv) Cost estimation and reporting : Lack of knowledge on the harm of fire on the forests. No loss to government is to be done way with, considering the fact what fire does to regeneration, soil organism, water holding capacity, soil erosion, ground dwelling pheasants & small animal, no forest officer should say that there is no loss to the government.

(v) Fire- fighting squad: It is said that desperate times call for desperate measures. The critical condition of the forests of Jalgaon necessitates taking up radical steps to revitalize the forests. It is necessary for the DCF to erect fire watch towers and establish fire fighting squads to tackle fire menace in the Division whose duty shall be in line with the squads deployed in the wildlife areas. These squads shall be concentrated in areas where natural regeneration is being nurtured in the treated coupes and elsewhere in the Division. This measure is independent of the fire-watchers etc. that area engaged in plantation areas. The squads shall ensure that no fire incident occurs anywhere in the Division particularly in areas of NR.

(3) Aided nature regeneration : As it has been observed that there is hardly any regeneration in the forests of the Division, the norm of soil working in the forests of Jalgaon which provide for soil working on 400 seedling/ha in a coupe is being modified. In the forests of Jalgaon Aided Natural Regeneration is a must and a provision for the same is given.

Hence, wherever NR is prescribed and the number of seedling/sapling being less than 400, the DCF should take up aided Natural Regeneration by planting

miscellaneous species of associates of Teak in Teak areas and any miscellaneous species in non-Teak areas. 625 seedling are prescribed to be raised by ANR in such areas. As the number of regeneration varies from 0 to 350 or more, the treatment should be such that total number of naturally occurring seedling and ANR seedling should be 625 in numbers. It shall be necessary to ensure that the soil working and mulching be carried out meticulously to ensure that whatever natural regeneration exists is nurtured properly.

This is an important step to help forest regain its health and vitality which has been under much stress from biotic interference and managerial neglect. Reference to the planning Department GR.No.2011/CNO.130/EGS-10A Dated 28.12.2011 for carrying out ANR in the forest areas may be made for preparing estimates.

(4) Illegal felling :

Illicit cutting for wood including timber, poles and firewood is observed in the division. It is heavy areas adjoining to thickly populated towns and villages Due to increase in the roads, the protection of forests has become more difficult. The demand for fuel wood has also increased tremendously, due to increase in population. Illicit cutting of fuel wood provides an easy employment to local villagers. All these factor have put tremendous pressure on the forests and have resulted in depletion of growing stock and deterioration of forest health and vitality. All efforts should be made to reduce illegal felling from the forests.

(5) Encroachment :

There have been large scale clearances of the forests in the past for encroachment with a view to obtain agricultural crops. The state government has issued orders in 1978 and 1979 to regularize all encroachment on forest lands done during the period from 01.04.1972 to 31.03.1978. This increased in the tendency of people to encroach upon the forest land with a hope that in future also such encroached lands will be regularized by the Government. The enactment of the FRA 2006 has also further fragmented the forest land. Encroachment anywhere irrespective of size should be removed as per law.

(6) Improvement in diversity of forests:

To maintain the diversity of forest appropriate measures should be taken up. Teak wherever planted should be from certified seed and seedling of known source. As maximum area is under Teak the gap planning in such areas should be done with miscellaneous species only.

(7) Diseases and pest :

Tectona Grandis (Skeletonizer) and *Hyblea peur*a (Defoliator) are also commonly observed to affect the Teak plants of the Division. Considering that most of the area is dominated by Teak, it is necessary that the means of controlling these pests be done as mentioned above for hollowness.

General: Field staff should be made aware of the diseases and their remedial steps wherever possible. Any diseases or pest seem to have adverse impart on the forest, should be recorded and documented. Photograph of the pest, the affected tree/forest and other evidence should be kept. The sample of the pest (borer, Lepidoptera, fungus etc.) Should be collected and sent to institutions like BSI, FSI, ICFRE, etc. for further study and remedial step. The division should hold workshops to bring awareness among the staff on the importance and the means to maintain forest health and vitality.

NOTE on The Muktai Bhavani Conservation Reserve - It is located in Vadoda Range of Jalgaon Forest Division and comprises of a Reserved Forest Area of 12274.063 ha. (122.74 sq.km). The wildlife habitat in the area seems to be good niche for the tiger settle. Recently in the census work carried out in 2014, the camera trap photography, the cattle kills, the pug narks, the direct sighting and sporadic incidences of encounter do reveal the presence of tigers in the area.

Thus, there was constant demand of local villages and NGO's to declare this tract as a wildlife sanctuary in the Wildlife (Protection) Act 1972. As such the experiences of the Forest Department while undertaking the conservation works in this area found it more feasible to propose it as a conservation reserve for the betterment of tiger conservation.

. The proposal prepared by the department was accepted by the Govemment of Maharashtra and accordingly the Muktai Bhavani Conservation Resenre came into existence in 2014 with The Govt.of Maharashtra accordingiy notified the said area as

Muktai Bhavani Conservation Reserve" under Section 36 A of Wildlife (Protection) Act I9t2 as amended in 2002 as per G.R. No. WLP 02I41CF.-621F-1 dated 3-5-2014' The copy of the notification is enclosed in Annexure …of Vol II of working plan.

Objectives:

a. To protect the population of tiger and other wild airmails.

b. To protect the habitat of flora and fauna

c. To conserve and develop the area as an extension of tiger habitat from adjoining Melghat tiger reserve.

d. To undertake ecological and bio-diversity studies.

e. To undertake participatory role of local people in protection of wild animals and habitat.

f. To promote ecotourism in the area.

The forest area of Mulatai Bhavani Conservation Reserve is distributed in Charthana, Dolarkheda and kurhakakoda rounds and Charthana,Wayala, South Dolarkheda, Sukali, North Dolarkheda, Morzira and Vadoda beats of Vadoda range of the division. The forest area is contiguous, compact and in a linear strip.l-he total area is spread in 40 compartments.

The altitudinal variation is form MSL 369 mtr to 492 rntr. The aspect is North South and slope is gentle with some undulations. The tract is mostly plain and rises uphill gradually. The rainfall is in between 600 to 800 rnm.

The forest department has already surveyed the area and collected the socioeconomic details of the local population. The Eco-development plan for these villages have been prepared. Local people in this tract are mostly Leva Patil, koli, Maratha etc. They are mainly agriculturists. There are a few temporary settlements of Bhil, Pawara and Phasepardhi. These rnigrated tribal people are mostly engaged in labour work. The Phasepardhi people involve in black magic. The overall local population are religious minded, co-operative in nature.

They were helping in forest protection through JFMC's. Now these committee have been re-designed as EDC's. Out of 17 villages the major villages do have Eco development committees and forest department so for have prepared plans for 11 villages. The work of Eco-development in the sumounding villages is leading to the overall development of the local villagers andhelping in getting their support for the management of the Conser-vation Reserve'Distribution of LPG connections, Solar lamps etc. have been canied out in the tract through various schernes. The local

youths are to be trained as guides and helpers for the allied work in the Conservation Reserve.

The vegetation mostly consists of grasses, few shrubs, seasonal herbs and trees like Anjan, Babul, Apta, Sadada, Behada, Khair etc. (Detail are given in appendix no.. of Vol.II of working plan)

Threats to the Forest and the Wildlife

At present a multitude of threats prevail in the Conservation Reserve. The presence of 22 Villages surrounding the reserve pose a major challenge for the management of the reserve. The main problems facing the reserve include:

Grazing: One of the major problems, the Conservation Reserve is facing is problem of grazing by cattle & sheep. There are 17 villages adjoining the Resere and all these villages depend on the adjoining forests for their grazing needs.

Encroachment: Majority of the villages adjoining the Conservation Reserve are agricultural societies. Consequently there is heavy dernand for agricultural land and so threat of encroachment on forest land always exist and also a threat from the M.P. side is the pawara community who traditionally resort to encroachment for agriculture pulposes. This is problem all along the 35.3 km border in the division and should be a major focus area.

Fire: In the reserve heavy forest patches can be found in the central Dolarkheda, Wayali and Charthana forest area. Hence these areas are prone to damage by five.

Loss of Forest cover: Owing to intense grazing today most of the ground cover is lost and invasion of palatable weed species like tarota ,rantulas and lantana is seen. Also due to heavy loping and felling of trees in most areas tree cover is lost and only the central portion of the reserve has a dense vegetation. Also tiger is seen in this region. Rest of the areas have become degraded and show lot of open patches . This need to be addressed immediately.

Road through the Con. Reserve: The state highway no. 194 for total length of 6.8 km from Dolarkheda phata to Vayala phata passes through the Conservation Reserve. There is heavy traffic on the road which poses a threat to the wild life especially during night. In 2009 in an road accident a tiger cub was killed by passing vel-ricle . Therefore it is suggested that

a) Speed limit be prescribed for vehicles passing on this road.

b) There is one culvert where wild animals specially use to cross the road . This culvert being small only small animals use it and large animal cross the road at this

point. It is suggested to raise the road and increase the height and width of this culvert so that all animals can pass thus considerably reducing the road accidents.

Management Strategies

It is proposed to address the various challenges facing the conservation reserve in the following way.

A. Reducing cattle grazing- There are 17 villages adjoining the reserve and all these depend on the forest to fulfill their grazing needs. The following measures are being proposed to reduce grazing pressure.

a) Grass land development- In vicinity of each village about 30 ha of forest land should be identified and subject to grassland management as per wolfing plan prescription. Once established villagers should only be allowed to cut grass and take it. These grasslands will also benefit the local wildlife besides reducing grazing pressure on forests. The protection, exploitation and use of grass will be strictly monitored by the VEDC's.

b) Removal of scrub cattle and replacing them with Mitch cattle: Majority of the cattle here are scrub cattle yielding very little milk. In the long run it is advised that these scrub cattle be replaced with milch cattle. Also the grass cut from adjoining grasslands should as a priority be supplied the milch cattle owners

c) Control on sheep grazing- Under no circumstances should grazing by sheep/goat be allowed in the reserve. However today every year about 25000 Sheep/goats graze in the forests.

B. Protection measures: The major protection issues pertaining to this Conservation Reserve include

i) Protection against fire. ii) Protection against encroachment. iii) Protection from illicit cutting for fuel wood. iv) Protection from illicit grazing.

A single forest guard at all times cannot stay in these villages or monitor these activities regularly. Hence it is proposed that in each village one to two persons be designated as "Vanya prani mitra". Their duties are i) Daily patrolling of forest areas. ii) Report any direct or indirect wildlife sighting and document the same. iii) Inform the staff about any fire incidents. iv) inform the staff on grazing occuring in the forest. v) Help the guard in distribution of LPG connection rnilch cattle and other benefits under various govt. schemes. In two contexts it is essential that these "Vanya prani mitra" be trained in the use of GPS, camera traps and other equipment.

Annual fire line maintenance: The areas on the southern, East and west side is adjoining the villages and Roads, therefor there is much necessity of effective fire protection during dry season. In the past fire lines, fire watch' towers and patrolling by the forest department have minimized damages. As per working plan prescriptions annually 194.755 km of fire lines need to be maintained.

Encroachment: To address the problem of encroachment it is prescribed that RCC boundary pillars be erected all along the boundary of the Conservation reserve in regular interval as prescribed in the working plan.

Wildlife monitoring: Will be done in accordance with NTCA monitoring protocol.

(1) Protection Huts: In sensitive areas build protection huts for patrolling camps

(2) Maintaining daily patrolling log / chowlii registers.

(a) Each patrolling team sha1l be equipped with a GPS unit and a digital camera

(b) The date, time and GPS co-ordinates of the beginning of the patrol recorded. (Details are given in appex. No… of Vol. II of working plan.)

1. Habitat improvement
    a. Grass land management : Wherever there is presence of rantuals, tarola as under growth it is prescribed to introduce palatable grass species such as pawaya, shedya, morvel, gondhali, grass.
    b. Plantations : Except for the control portion of CR rest of the area are sparsely vegetated, Owing to lopping and felling trees over the years. Hence it is proposed that plantation be taken up in these areas to restock the area. Where water is available provisions may be made to provide water to the plants. 20 % fruit species like Amla, chinch, ber, jamun, etc should be planted in all plantations. Once developed this reserve can act a corridor between melgha tiger reserve to yawal sanctuary.
    c. Soil and moisture conservation measures : Wherever possible SMC works like check dams, van bandhare, Deep CCT, loose boulder structures, vantales etc. be taken up in the reserve.
    d. Ecotourism : The area also has a very good potential of Eco- tourism. Already forest park has been established in the vicinity of beautiful Charthana lake. There is a ancient temple of Bhavani Mata in the forest park. There is a good network of road surrounding the area. Similar worship place is at Vadoda named a Machindranath. There is another place of religious importance situared in a remote scenic and wooded land in

Madhya Pradesh i.e. Gorakshanath temple. Then place like shegaon, Muktainagar, Malkapur, Hartala, Verngaon etc. are in the vicinity.

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CHAPTER-14

CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES.

14.1: INTRODUCTION :

This chapter on conservation and Maintenance of soil and water resource focuses on the need to put soil and water on an important pedestal as that which is given to wildlife and forests. In the Department, soil and water conservation need necessary be tagged to the other conservation measures like plantations works etc but needs to be recognized as an important independent activity. Soil and water are two important natural resources that support the existence of all the being including human and forests.

14.2: GENERAL CONSTITUTION OF AREA:

Soil and moisture is important in the area of whole division.

14.3 : GENERAL CHARACTERISTICS OF SOIL AND WATER RESOURCES IN JALGAON :

The National Bureau of soil survey and land use planning. ICAR and Dept of agriculture, GOM etc have published the soil Resource Atlas, Jalgaon District in 2005.

Soil Type : soils are varied in nature. Their extent and development depends on the environmental setting in which they have been evolved. The knowledge on the kinds of soil and their extent is very essential for sustainable land use planning. Soil resources inventory provide this kind of information, obtained through a systematic interpretation of satellite imageries, aerial photographs, field survey, laboratory characterization.

Soil Depth :- The soil depth is of vital important for plant growth as it provides foothold to plant to drew the required water and nutrients from underground sources. As such the greater soil depth normally results in better growth. It takes about 500-1000 years to develop on inch thick soil from the hard basement/rock due to different action & inter of various soul forming factor and processes. However a very little

time is required to erode this soil if the canopy protection is removed. The depth of soil, therefore depends on the climate, lands use land cover and condition responsible for management practices.

The distribution of soil in different depth classes of 12 talukas of the Jalgaon district is given below.

Table No.14.1 : The soil depth class

Depth Class	Depth (cm.)	Area	
		Ha.	(%) TGA*
Extremely shallow	< 10	61787.70	20.50
Very shallow	10-25	40086.20	13.30
Shallow	25.50	50333.80	16.70
Slightly deep	50-75	22002.20	7.30
Moderately deep	75-100	22605.0	7.50
Deep	100-150	72938.80	24.20
Very deep	>150	31108.30	10.32
Water bodies	--	538.00	0.18
Total		**301400**	-----

Soil Erosion

The soil have been grouped into different erosion classes, their areal extent and expected soil loss is given below.

Different erosion classes Table No14.2.

Erosion class	Area		Expected soil loss (tones ha./ yr)
	Ha	(%)TGA*	
Very slight	249134	82.66	Less than 5
Slight	38154	12.66	5-10
Moderate	12056	04.06	10-15
Severe	1518	0.51	15-20
Water bodies	538	0.01	--
Total	**301400**	----	---

(Total geographical area)

Slope:

The slope can be defined as an element of the surface inclined to the horizon. A slope possesses a gradient, giving it a direction or orientation in space.

The gradient in the terrain is the result of several factors viz. relief, drainage, climate and geology operating in the area.

Class of Slope

Table No.14.3

Class	Slope(%)	Area	
		(ha)	(%)TGA*
Very gently sloping	1-3	65969	21.82
Gently sloping	3-5	1031188	43.90
Moderately sloping	5-10	71846	23.80
Steeply sloping	>15	31859	10.46
Water bodies	--	538	0.02
Total		**301400**	----

(*TGA:- Total geographical area)

It is seen that the area falling under forest are highly prone to erosion coming under severe category. The soil depth is very low and is seen to be in most places to be less than 10 centimeters. This makes soil and water conservation in the forest area very critical for the filtration of water, the prevention of siltation of dams, the longevity of the live streams, the supply of water, the survival of the dams and every aspect of water regime management.

14.4: SPECIAL OBJECTIVES OF MANAGEMENT:

- To protect, conserve and improve the forest land forming part of watershed for more efficient water retention and infiltration.
- To protect and enhance the water resource originating from forest lands.
- To check soil erosion and to reduce the effect of sediment yield on the watershed.
- To rehabilitate the deteriorating lands.
- To moderate the floods peaks at downstream areas.
- To increase infiltration of rainwater.
- To improve and increase the production of timbers, fodder and other forest resource.
- To enhance the ground water recharge, wherever applicable.

- Improvement and restoration of soil quality and thus, raising productivity rater.
- Supply and securing of clean and sufficient drinking water for the population.
- To minimize the risks of floods, droughts and landslides.

14.5: ASSOCIATED REGULATIONS AND MEASURES:

There are always strong links between measures for soil conservation and measures for water conservation. Many measures are directed primarily to one or the other, but most contain an element of both. Reduction of surface run-off by structures or by changes in land management will also help to reduce erosion. Similarly, reducing erosion will usually involve preventing splash erosion, or formation of crusts, or breakdown of structure, all of which will increase infiltration, and so help the water conservation (FAO).

The soil and moisture conservation works would start along with the marking of coupe and be completed before the onset of monsoon. Wherever feasible, the local stones obtained from the forests including other material from climber cutting, bamboo cleaning and shrub clearance should be used for brushwood check dams to arrest the soil loss.

The major activities to be taken up under this chapter are 1) Treatment of areas near the water bodies 2) Soil Conservation as part of Coupe Work.

(1) Treatment of the watershed area

It is prescribed to follow watershed management approach viz. the ridge-to-valley approach for carrying out soil and moisture conservation works. The contour trenching and gully plugging/check dams, as given under, have been prescribed to constitute the major component of these works.

As per the information received from the Division, the following are the major dams that are in or in the vicinity the forest areas of the Jalgaon Forest Division.

Major dams in or in the Vicinity of the Forest Areas. Table No.14.4

Sr. No	Name of Projects	Type of Projects	C.ca (Sq.km)
1	Girna Project	Major	1324.23
2	Upper Tapi Project (Hatnur)	Major	542.24
3	Waghur Project	Major	438.28

4	Abhora Project	Medium	18
5	Agnavati Project	Medium	11.27
6	Anjani Project	Medium	170.66
7	Bahula Project	Medium	72.96
8	Bhokarbari Project	Medium	28.93
9	Bhokar Project	Medium	28.19
10	Bori Project	Medium	109.28

While working on soil and moisture conservation works, the vulnerability of the forest areas to erosion should be kept in mind. Reckless implementation of Soil and Moisture conservation structures in the past has sometimes resulted in more erosion in the slope areas, which should be avoided.Maps of the above water bodies along with the area adjoining to the forests are shown. These areas should be given priority for the treatment of soil & water conservation.

Soil conservation as part of coupe work

(i) **Nala bunding and check dam:** The primary objective of nala bunding and check dam is to reduce the run-off water and to arrest the silt. They are prescribed to be made from the loose boulders found in and around the nala bed or from the dug up soil. No blasting shall be done for this purpose. Where sufficient boulders are not available brushwood may be used. In this plan check dams of both the loose rubble for arresting silt and soil loss and earthen gully plugging (nala bunds) for moisture conservation and water harvesting are prescribed.

The structure and quantum of work will depend upon various factors such as the erosion status, ground conditions, locally availability of suitable materials. However, to narrow the wide variations in implementation, the norms for gully plugging or nala bunding is proposed as 5 meter^3 /hectare of loose rubble filling or earthwork unless otherwise prescribed in the specific scheme.

The streambeds more than 8 meters in width shall not be covered under the nala bunding . Nala is more than 8 meters in width at the top should normally require elaborate engineering structures for bunding, and therefore, such bunds should not be considered as part of the quantity prescribed here. Each of such nalabundh, if required, should be treated as an independent project.

The forest tanks are proposed to be taken up in suitable sites without causing damage to the tree crop either during construction or due to submergence.

In the Twelve talukas i.e. Dharangaon, Amalner, Bhadgaon, Bhusawal, Bodwad, Chalisgaon, Erandol, Jalgaon, Jamner, Pachora, Parola and muktainagar comprising Jalgaon forest Division, there are 15 Projects have been constructed for the irrigation or other purposes. So maintenance of dams is very important. Most of the catchment areas of these dam covered by forest areas. In order to avoid siltation in the Dam, SMC work should be carried out in the catchment area to control the soil erosion, SMC structures like, Continuous Contour Trench (CCT), Loose Boulder Structure (LBS),Gabian Structure, Water Absorption Trench (WAT), Forest ponds, Wandona, Cement plug ,Earthen Nala Bund ets. can be taken as per site specification.

Details of CCT models as given below:Table No.14.5

Sr.	Model no.	Slope %	Distance Between CCT	Length Ha.CCT	CCT Ha.	Excess water Drain out from CCT(gap)	Length of CCT including Gap (Mtr)	Unit of peaching sqmt	Gully plugging (Unitm3)	Seed Kg	Agave
1	5	0 to 4	10	--	1000	--	1000	--	20	10	1200
2	6	4 to 8	8	50	1179	3	1250	--	20	11.79	1400
3	7	8 to15	6	30	1514	3	1666	--	20	15.14	1700
4	8	15 to 33	4	20	2174	3	2500	--	20	21.74	2400

* **Source** As per Maharashtra Govt. Water conservation Department ,No- 2013/F.N. 114/Water-7,and Dt.10 October,2013

(iii) Forestry measures: Afforestation of eroded lands is best method of erosion control. The standing vegetation and dried leaves on the floor intercept the rain and reduce the impact of rain drops, thus averting the erosion process. Moreover, decomposition of fallen dead plant part i.e. leaves and twigs not only increase the fertility of the soil but also improve the soil structure, which resist the soil erosion. Therefore, areas as prescribed in the various Working Circle for raising plantations should be taken in right earnest.

(iv) Other Measures: These include:

Gully control: To check the formation or widening of gullies by constructing bunds, dams, drains or diversions through which excess runoff water is channeled.

Stream bank protection : To grow vegetation alongside the river bank, to construction drains, concrete or stone pitching etc. For checking the cutting and caving of river banks.

(v) Implementation of other schemes: Soil & moisture conservation work under Jalayukta Shivar and other scheme may be taken up in the division. The norms as given in the above CCT models should be followed.

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CHAPTER-15

MANAGEMENT OF THE SPIRITUAL, CULTURAL ASPECT OF FORESTS AND ECOTOURISM

15.1: INTRODUCTION:

For the people of India, environmental conservation is not a new concept. Historically, the protection of nature and wildlife was an ardent article of faith, reflected in the daily lives of people, enshrined in myths, folklore, religion, arts, and culture. Some of the fundamental principles of ecology-the interrelationship and interdependence of all life-were conceptualized in the Indian ethos and reflected in the ancient scriptural text, the Isopanishad, over 2000 years ago. It says, This universe is the creation of the Supreme Power meant for the benefit of all his creation. Each individual life-forms must, therefore, learn to enjoy its benefits by forming a part of the system in close relation with other species. Let not anyone species encroach upon the other's rights.

15.2: ECOTOURISM:

Much attention has been paid to the question of what constitutes ecotourism, and numerous concepts and definitions exist (Ballantine and Eagles 1994; Blarney 1995; Bottrill and Pearce 1995; Buckley 1994). The Ecotourism Society, based in the USA and the most international of the ecotourism organization, defines ecotourism as responsible travel to natural areas that conserves the environment and improves the welfare of local people. The Australian National Ecotourism Strategy defines ecotourism as a natural environment and is managed to be ecologically sustainable. Numerous other definitions exist around the world. The FAO uses a definition that is more general as ´´ecotourism is tourism and recreation that is both nature-based and sustainable´´. Tourism is also now a day, a recognized industry all over word.

Ecotourism is also recognized, as important industry, by UNWTO (United Nations Word Tourism Organized). The Word Tourism Day celebration started by UNWTO since 1980 to aware the people about significant role of tourism in social, economic and cultural values.

Ecotourism is now defined as 'responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education ' (TIES, 2015). Education is meant to be inclusive of both staff and guest.

Principles of Ecotourism:

Ecotourism is about uniting conservation, communities, and sustainable travel. This means that those who implement, in and market ecotourism activities should adopt the following ecotourism principles:

- Minimize physical, social, behavioral, and psychological impacts.
- Build environmental and cultural awareness and respect.
- Provide positive experiences for both visitors and hosts.
- Provide direct financial benefits for conservation.
- Generate financial benefits for both local people and private industry.
- Deliver memorable interpretative experiences to visitors that help to raise sensitivity to the sites environmental and social importance.
- Design, construct and operate low-impact facilities.
- Recognize the rights and spiritual beliefs of the local /indigenous People in the community and work in partnership with them to create empowerment.

Ecotourism policy :

Ministry of Tourism, in Government of India has declared Eco-tourism in Indian Policy and guidelines, 1998. This policy has underlined the activities of tourism ought to be environment-friendly having no adverse impact on ecosystem.

The UNWTO came into force on 27 September 1970. To aware the people about the role and impact of tourism on society, the UNWTO started celebrating Word Tourism Day on 27 September every year since 1980. Every year a theme is launched on the eve of World tourism Day by UNWTO. Ecotourism, Environment Protection, Climate change, Biodiversity, Community development became theme of World Tourism Day in the year 2002, 2008,2010 and 2014 respectively.

Government of Maharashtra, in Tourism and cultural affair vide Resolution No. MTC-2005/2/CR-172/ Tourism, Mumbai dated-2006, declared Tourism Policy-2006 having tourism vision 2025. This policy has identified Ecotourism sector, Infrastructure development, public-private partnership, capacity building & creating awareness etc. are highlights of this policy.

Govt. of Maharashtra in Revenue and forest Department vide Resolution No. WLP 1002/C.R.53/F-1, Mumbai dated20.2.2008 has declared Eco-tourism Policy 2002. This policy illustrates the role of state holders, capacity building of state holders, Information, Education and communication, selection of eco-tourism centers and operationalization of it, formation of Maharashtra, Eco Tourism Promotion Board to promote ecotourism. This policy laid down principles of Eco tourism as below,

* The Ecotourism activity should be concise and small for operationalization.

* It should be proper in view of environmental, social and cultural aspects.

* It should be proven and worthy of adoption.

* Participation of local community.

* It should neither be degrading nor destructive.

* As per tourist demand but definitely with some restrictions.

This policy entrusts Forest Department to prepare management plan of eco-tourism centers in pursuance of Forest Conservation Act.1980, Wildlife Protection Act 1972, and guidelines by National Tiger Conservation Authority. The Maharashtra Eco Tourism Board has key role in co-ordination of line departments granting of permission for infrastructure development signing of MOU with Forest Department for development of infrastructure and revenue sharing.

The Govt. of Maharashtra in Revenue and Forest Department vide Resolution No.-M-2011/C.R. 174/F-5, Mumbai dated 24.11.2011 has issued guidelines for implementing eco tourism activities in forest areas. Identification of eco tourism places preparation, of management plan, involvement of stake holders & stay identification of various types of tourism etc. are important provisions in eco-tourism policy 2008.

15.3 : POTENTIAL ECO-TOURISM SITES IN JALGAON FOREST DIVISION.

Jalgaon Forest Division has its varied flora and fauna ranging from the grasslands the wetland to the thick forests and has quite few ecotourism sites of potential. They are not properly developed and require immediate attention.

The Division has identified the potential eco-tourism sites and the list is reproduced below.

- Padmalay (Ganesh) Temple in Erandol range.
- Muktai Bhavani conseravation reserve in Vadoda range.
- Landor Khori in Jalgaon Range.
- Patna Devi Mandir (Chalisgaon Range).
- Hatnur/Girna Dam In Vadoda Range

Not much has been developed in these sites. Some of the sites are actually not in the forest area but are included as they can form a circuit that would be linked with the eco-tourism sites for better packages whenever theses sites are developed with proper management plan.

The social aspect of forests in the context of ecotourism is very important as it provides the people with employment. The other important social contribution of ecotourism is the exposure to the other cultures and the chance to educate others about once own culture. It is generally observed that small projects in JFM villages and ecotourism sites not only provides employment to the youths but also gives a boost to their self-confidence.

The eco-sites identified also have lot of spiritual significance and religious sentiments attached to them.

It shall be the duty of the DCF to harness the spiritual and cultural sentiments of the people to woo them back to the traditional conservation values that every Indian is proud of.

Apart from keeping in mind the principles of eco-tourism the Division should take all care that the following area adhered to:

While developing above eco-tourism sites, it should be verified that the proposed activities must not attract nor violate provisions under Forest Conservation Act.1980

The Deputy Conservator of Forests shall prepare a Ecotourism Development Plan for the Division incorporating the above sites and any other potential sites.

Local people especially the JFM Committees and EDCs wherever are in existence, should be fully involved right from the planning stages.

Adequate training and capacity -building of the staff and locals should form part of the development plan.

The specialty and uniqueness of each site should be properly documented and should be brought up in attractive brochures keeping in mind the information that tourists would require and the Do's and Don'ts for such tourism.

Any local traditional product crafts, food items / local cuisine cultural display etc. should be encouraged as part of the eco-tourism package.

The development of the eco-tourism sites should go hand in hand with the conservation of the biodiversity, the nurture of environment and the appreciation of nature by the tourists.

While designing the plan the interests of the forests and wildlife should be of prime importance. The different factors / stakeholders like the community visitors, businesses NGO's should no doubt be taken into consideration.A common phenomenon is that ecotourism can generate both symbiosis and conflict between conservation (e.g. natural areas) and development (e.g. businesses) has been widely touted but the potential for conflict should not be ignored.

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CHAPTER-16

FINANCIAL FORECAST

16.1: INTRODUCATION:

There has been a steady increase in the funding to the Working Plan activities of the Forest Division in the past two years. This increase is a good sign and needs to be maintained. Looking into the prescriptions of the plan it is seen that the implementation of this plan will incur an average amount of Rs. 1087.62 lakh annually in the first three years and Rs 1456.67 Lakh annually for the next seven years that is from the fourth year onwards. The total expenditure will come to Rs. 1345.955 Lakh annually. The expenditure and revenue of the Division during the last ten years is given below:

Table No.16.1 Statement showing the Revenue, Expenditure

Year (1)	Revenue Rs. in Lakhs (2)	Expenditure Rs. In Lakhs			Total Expenditure in Lakhs. (3+4+5)
		Non Plan (3)	Plan (4)	EGS (5)	
2008-09	10.98	0.00	138.124	29.17	167.294
2009-10	12.89	488.67	167.900	10.02	666.59
2010-11	75.00	545.47	530.278	0.00	1075.748
2011-12	15.73	784.23	454.651	0.00	1238.881
2012-13	0.46	917.13	679.549	0.00	1596.679
2013-14	0.45	942.02	934.040	0.00	1876.06
2014-15	0.44	917.56	1471.300	21.97	2410.83
2015-16	11.02	913.49	1892.510	21.85	2827.85
2016-17	17.03	1446.49	1816.600	22.36	3285.45
2017-18	10.90	1245.90	1924.540	92.15	3262.59
Total	**154.90**	**8200.96**	**10009.49**	**197.52**	**18407.97**

Hidden among the cost is the Crop damage cost. In Jalgaon Division 4807 cases damaging agriculture crop and given compensation of Rs. 20.30 lakhs. Similarly there were 172 cases of wildlife attacks on domestic animals and a compensation of Rs 7.80 Lakhs & 25 injuries and 3 kill of human beings due to wildlife and compensating Rs. 25.84 Lakhs were given.

16.2: SOURCE OF FUNDS FOR THE IMPLEMETATION OF THE PLAN

The sources of funds during the last Plan were Plan Schemes, Non-Plan schemes,CAMPA, District Plan (DPDC), MNREGA, special Project Jalyukt Shivar,etc.

Plan funds: From the Plan expenditure statement, as provided by the DCF, the annual Plan funding is Rs 1000.9 lakh per year. Going by this average, the expenditure that would be required for the implementation of the Plan/Scheme needs to be enhanced.

Non plan : The amount received by the last three years under Non Plan averages approximately to Rs. 820.096 lakhs per year.

Campa: The CAMPA is an important source of funding. In the Jalgaon Division, the CAMPA fund between 2011-12 to 2013-14 was Rs. 7 lakhs. This can be increased for the core forestry operations for the implementation of the plan.

District plan: The District Plan funding for the up gradation of Nurseries, the development of Eco-Tourism sites, etc should be explored.

MNREGA: Labour intensive works that can be implemented through MNREGA should be thought of as a good source of funding. EGS, which is the original scheme started for employment guarantee as the first such scheme in the country by the Government of Maharashtra, should also be tapped into as done in the past.

NAP (FDA) : The National Afforestation Program implemented all over the country with emphasis on peoples participation should be made use of for the implementation of the Working Plan prescriptions.

Special projects: State specific and District-specific projects like Jalyukt Shivar and others should be taken up for the implementation of the Plan. However,it should be noted that the implementation of such projects should be as per the Working Plan and not in conflict with it. A point to be noted is that sometimes the DCF taking the opportunity of the funds available, takes up work on coupes not due even though such work could be carried out on the due coupes. This should be avoided.

16.3 : BENEFIT COST RATIO:

The cost of implementing this Working Plan is expected to be more than the benefit. This is the B.C. ratio of only those parts of the tangible benefits that would be directly extracted as per the tables placed below.

As discussed under the Chapter 9 in Para 9.6 Forest Resource Accounting, if the value of the benefits of the Forest including tangible and intangible is taken into account, the amount that is being derived as benefit far outweighs and exceeds the little investment that will be put in. The value of the benefits derived from the Forests is around Rs 601316.30 lakhs as per the current rate of NPV value for the Jalgaon Forest. As the NPV rate is taken for the benefits accruable over the period of 20 years the annual benefit comes to Rs. 30065.81 lakhs. This figure as per the new NPV rate proposed is Rs. 1357040.44 lakh but the annual period is variable for various forest types and situations. Hence it is difficult to find the annual benefits.

Regeneration

Natural regeneration

Projection of Expenditure in various working circleTable No.16.2

Working Circles	Area in ha.	Workable area per year in ha.	Exp. (Rs. in lakhs)	No. of man days to be generated
Protection	3038.35	500.00	42.05	9750
Improvement	40017.9	1700.00	142.98	33150
	Total	2100.00	**185.03**	**42900**

ABSTRACT (NR work) Table No.16.3

Year	Man days	Wages in Rs.	M.S. in Rs.	Labour welfare & contingency (7 %)	Total
First year operation	8.00	2720.00	453.00	190	3363.00
Second year operation	6.50	2210.00	257.00	154	2621.00
Third year operation	6.00	2040.00	245.00	142	2427.00
Total	**19.50**	**6770.00**	**955.00**	**446**	**8411.00**

ABSTRACT for Root stock and coppice shoot.Table No. 16.4

Year	Man days	Wages in Rs.	M.S. in Rs.	Labour welfare & contingency (7 %)	Total in Rs.
First year operation	11.50	3910.00	350.00	298	4558.00

Note :-

Natural regeneration.

In case area contains less number of natural regeneration than required (6.25 sapling per ha.) of important species of height 60cm, then man days per sapling /rooted should be used to prepare the estimate.

Treatment map should be prepared by concerned RFOs & it should be verified by ACF.

Treatment maps should be prepared as per approved working plan & the same.

GPS reading of all the four corners of the coupe / site for natural regeneration / rooted shoot & coppice shoot management works should be taken and the same should be recorded in the plantation register.

Daily wage rate should be used as per scheme & actual site.

Artificial regeneration.

Afforestation working circle

Projection of Expenditure for Afforestation working circleTable No.16.5

Working Circles	Area in ha.	Workable area per year in ha.	Exp. (Rs. in Lakh)	No. of man days to be generated
Afforestation W.C.	10786.3	350	11000.00	5.00 Lakh

Note:1250 staggered trenches of the size (2 m x 0.60m x 0.30 m) are considered for planting 2500 plants per ha.

ABSTRACT (A R)Table No. 16.6

Year	Man days	Wages in Rs.	M.S. in Rs.	Labour welfare & contingency (7%)	Total in Rs.
PPO / PYO	432.30	146982	16025	10289	173296
FYO	301.84	102626	26556	7184	136366
SYO	115.63	39314	3559	2752	45625
TYO	78.35	26639	---	1865	28504
4th year	38.50	13090	---	916	14006
5th year	34.00	11560	---	809	12369
Total	**1000**	**340000**	**46140**	**23815**	**410166**

Rs. 340/- per man-days is considered.

18.40 man-days per ha. for Gully plugging is considered.

Water holes

Wildlife Overlapping working Circle.Table No. 16.7

Working Circles	No. of water holes	Water holes Per year	Exp. (Rs. in lakhs)	No. of man days to be generated
Wildlife Overlapping W.C.	50	05	13.75	------

Note :- Rs.2.75 Lakh per water hole is considered.

D. Boundary demarcation:- projection of expenditure for boundary demarcation

Table No. 16.8

Particulars of work	Quantum of work	Man days per unit	Rate	Exp. in lakhs
Fixing boundary pillars	1538 km.	1	340	5.23
Preparation of pillars Class – I	5127 pillars	---	4100/ pillar	210.20
Preparation of pillars Class – II	10253 pillars	----	2500/ pillar	256.32
Total	-----	---	--	**471.75**

Abstract of year wise requirement of funds for implementation of working plan.

Table No.16.9 (Rs. in Lakhs)

Working Circle	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	Total
Protection	42.05	42.05	42.05	42.05	42.05	42.05	42.05	42.05	42.05	42.05	420.50
Improvement	142.98	142.98	142.98	142.98	142.98	142.98	142.98	142.98	142.98	142.98	1429.80
Afforestation	606	1081	1138	1236	1285	1236	1187	1138	1089	1004	11000.00
Wildlife	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	137.50
Boundary demarcation per year Class-I pillars 177 & Class-II pillars 4133	47.175	47.175	47.175	47.175	47.175	47.175	47.175	47.175	47.175	47.175	471.75
Total	851.955	1326.955	1383.955	1481.955	1530.955	1481.955	1432.955	1383.955	1334.955	1249.955	13459.55

Total funds required for Ten years - Grand Total 13459.55 Lakh.

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CHAPTER-17

MISCELLANEOUS REGULATION

17.1: BOUNDARY DEMARCATION:-

In order to keep the integrity of forest areas intact, strict vigilance over the forest boundary and periodic verification of the demarcation on the ground for the entire forest area has been prescribed. Areas which are un-demarcated should be attended on priority.

Objectives: 1. To Maintain territorial integrity of forest lands in the division by delineating their boundaries by permanent pillar marks to act as legal boundary marks.

2. To ensure effective protection of the forest resources of the entire division against adverse influences.

17.2: PETTY FELLING AND EXTRACTION

Petty Felling and Extraction for research and training needs should be allowed. It is necessary to emphasize the fact that experimental, preservation and sample plot, seed stand and their demarcated surrounds, etc. are excluded from all operation prescribed in the working plan. Special grants in exceptional circumstances for maintenance of these may be allowed, which do not cause much deviation.

17.3: RIGHTS AND CONCESSIONS

Parliament has enacted a law of the Panchayat (Extension to the Scheduled Areas) Act. No. 40 of 1996). The said Act provides for endowing by the State, the Panchyats in the Scheduled areas, with such power and authority as may be necessary to enable them to function as institution of self Govt. Further it provided the Gram Sabha specifically with the ownership and marketing of minor forest produce.

Govt. of Maharashtra has enacted a law, the " Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas Act.1997 and has also amended Maharashtra Minor Forest Produce (Regulation of Trade) Act. 1969 (Act.No.45 of 1997) vide which ownership of 33 MFP specified in the Scheduled, found in the Govt. land has been transferred to the Panchyats. The Honorable Governor of Maharashtra

had modified the existing Act and has given ownership of all MFP to Gram Sabha vide notification dated 19.08.2014.

Govt. of India vide enactment dated 2 December 2006, called The Scheduled Tribes and other Traditional Forest Dwellers (Recognisation of Forest rights) Act, 2006 to recognize and vest the forest rights and occupation in forest land in forest dwelling Scheduled tribes and other traditional forest dwellers who have been residing and occupied forest land before the 13th of December, 2005.

There are no significant no. of people / community dependent on the forest produce. There are some Buruad families in the division whose livelihood depend on bamboo's by acquiring from nearby forest area and selling them at concessional rates.

There is no transhumant population of grazing community available in Jalgaon Forest division. However livelihood of local community depends upon forest for grazing of their cattle. They have cows, buffalos on large scale with some ships and goats. The range wise grazing units have been formed. Every year the grazing passes are issued to local community people for grazing purpose.

17.4: APPROACH TO THE FOREST DEMARCATION:

1. Well-defined forest boundary is a prerequisite for effective forest protection and its sustainable management, therefore boundries are to be by using DGPS method. However, in some PF the forest boundary has not been demarcated as given by DCF and this need to be carried out in the first 3 year of the implementation of the Plan. Forest areas vulnerable to boundary obliteration need to be identified for survey and demarcation so that forest encroachment on the forest fringes could be detected, promptly. Presence of boundary marks also serves as psychological barrier against the forest encroachment. Forest boundaries adjoining private land shall receive the highest priority to ensure protection of these areas.

2. Fixing Boundary of the Erstwhile forest villages.

17.4.1: Boundary demarcation:-

Its is prescribed to work the entire boundary of Reserve Forest & Protected Forest in 5 years period. Details of the compartment boundary for the purpose are given in **Appendix No. XXXIII of Vol. II**

17.4.2: Routine boundary maintenance:

1. The Beat Guard after his personal inspection of the entire compartment must submit the compartment inspection certificates every month. The certificate must record forest encroachments, illicit cutting and condition of forest boundaries including pillar numbers and inter-pillar visibility conditions. Separate certificate should be submitted for each compartment.

2. The Round Officer should submit similar certificates for his inspections. Half of his certification should involve checking of the work done during the previous month by the Beat Guards in his jurisdictions, and the other half should involve checking of the compartments not reported by the Beat Guards during the months. He should also submit monthly report regarding the action taken on the forest offences recorded and the progress of forest enquiries entrusted to him.

3. The Range Forest Officer can allow the delay not exceeding 15 days for reasons recorded in writing. Default on this account for consecutive 2 months should be viewed as dereliction of duty and should attract disciplinary action.

4. The Range Forest Officer should check accuracy of the Compartment Inspection Certificates according to the prescribed norms covering each round. He should personally cheek in least 2 (two) vulnerable compartments other than those covered by the Beat Guards and the Foresters during the previous month.

5. The Range Forest Officer, Mobile Squad will co-ordinate cross-checking of Compartment Inspection Certificates.

6. These guidelines shall be applied along with other directives issued for the forest protection from time to time. Other field officers will carry out their field inspections according to these guidelines as modified from time to time. As per Maharashtra Forest Manual 2012, duties of forest Guard. Round Forest officers, Range Forest officer as will as ACFs shall be applied along with directives issued for the forest protection.

17.4.3 : Specification of boundary pillars:

The prescribed design must be followed to carry out the task of fixing the boundary pillars as prescribed. According to provision contained in the BFM Vol. III, Chief Conservator of Forests is empowered to give sanction to the design of the pillars.

However, may 2001 instructions referred to as above have given uniform specification for this purpose. Accordingly 1.40-meter long cement concrete pillars at roughly 50meters interval on the external forest boundaries will be erected. Wherever the external boundary is shared with other government land, the interval should be increased to 100-150 meters and intermediate pillars may be 0.90 meter long. Both types of pillars should be embedded to 0.40 meter depth in the cement-concrete base. The prescribed tapering cross-section of the 1.40 meter pillar is 0.10 x 0.15 meter at the top and 0.15 x 0.23 meter at the base. The 0.90- meter pillars are parallel pipe with 0.15 meter widths and thickness. As per review of forest staff work is very poor for cement concrete pillars. Most of the cement concrete pillars get broken for removal of steel bar by local people. Hence Protection for pillars becomes essential.

17.4.4: Specification of a boundary cairns:

Artificial boundaries should be marked with a series of boundary Cairns. A Cairn should be made of loose stones upon excavated foundation to a depth of 30 (thirty) centimetres and shaped like a truncated cone. Interspaces between the large stones should be filled in with small stones, and the outer stones will be wedged with stone chips. A cairn will be 1.20 meter high, and have 1.20 meter top diameter and 1.80 meter base diameter, as described in the Central Province and Berar Forest Manual. A slab stone (0.20 x 0.20 x 0.90 meter) of a timber stake projecting 1/2 (half) meter in the centre will be fixed firmly on the top of the cairn, and marked with cairn serial number. Each boundary marks (cairns) must be visible from its neighbouring ones on both sides. Distance between two consecutive boundary marks should not exceed 250 meters. The cairn stone or post should be colour washed white for the open forests and red for the closed forests. The cairn tops should have direction of boundary lines shown by the same colour lines radiating from the centre. Such Cairns can be made of earthen mass, where stone boulders are not available.

17.4.5: Recording locations of the boundary pillars or cairns:

The location of the boundary pillars and Cairns along with their numbers should be shown on the maps. The numbering will follow the convention communicated by the Chief Conservator of Forests in charge of the land matters. The numbers shown on the topo-sheets will be maintained unless warranted by the compelling reasons. Such reasons must be reduced in writing and entered as a note on the master set of the maps. This master set will be made available to the Working Plan

division for updating the working maps and the digital database with GPS reading. Also register for maintenance of boundary pillars be updated at range and division level.

17.4.6: Clearance for the boundary line:

Boundary line clearance on the artificial boundaries will follow the standard width as described in the directives on the subject. Tress should not be felled for the boundary line, but shrubby undergrowth should be cleared. Norm for the external boundary line is 12 meters. The internal compartment boundary lines should be 3 meter wide.

17.4.7: Compartment plates:

Metal plates on the boundary trees at a height of 2.0 to 3.0 meters will be fixed on the corners and roughly at half-kilometre interval on the side away from the compartment. The colour of the plate and lettering should agree with the state- level general guidelines. Till such guidelines are available, red letters on white plates will be used. Size of the plate and letters should not be less than 15 cm and 10 cm, respectively. Strokes should be at least 2 cm wide.

17.4.8: Colour wash on the boundary marks:

The Beat Guard will be responsible for annual freshening of the pillar numbers, the compartment plates and the colour-wash of the boundary pillars carried out in September-October. He must submit details for work done in each compartment in his Annual Colour- Wash Report. The Round officer will carry out sample checking of the report in the manner decided by the Range Forest officer. Only material cost should be admissible for the purpose.

17.4.9: Review and monitoring of boundary demarcation works:

Continuous review and monitoring of boundary demarcation works is absolutely necessary to ensure time bound implementation. Dy. CF Jalgaon shall get the annual work plan for boundary demarcation prepared from RFO_s well in advance and make suitable budgetary provisions. He shall review the implementation of works every month and report the progress to DCF, Working Plan on a quarterly basis. CCF (T), Jalgaon shall review the progress every quarter and instruct for course corrections.

Demarcation, preparation of treatment map and marking of coupe:

Demarcation of coupe:

1. The annual coupes for harvesting will be demarcated one year in advance, and each coupe, if so required, may be subdivided into four sections for effective management and control. The Range Forest officer will thoroughly inspect the coupe after demarcation and issue 'Coupe Demarcation Certificated' in the prescribed format, given in the following paragraph, which is to be verified by the concerned Assistant Conservator of Forests.

2. Format for the Coupe Demarcation Certificate is prescribed, as follows, in Form No.19.1:

Form No.17.1

I ----------R.F.O. ---------- ----------certify that I have personally inspected the demarcation of the coupe No.---------- ----------in Compartment No.----------of F.S.---------- -- of W.C.----------on dated----------and found that the coupe has been demarcated as prescribed in the working plan.The area of the coupe is---------- ----------hectares.

Date: Signature of the RFO

3. Demarcation Of Coupes : Annual coupes have been prescribed to be demarcated by cutting and clearing bushy undergrowth on 3 (three) meter wide line and by erecting pillars or posts up to 2 meter height in middle of the cut line at suitable intervals, so as one pillar shall be visible from the other one, except where the coupe boundary runs along streams, fire line or road. The pillars shall bear the coupe number, name of the felling series and the working circle on the side away from the coupe.

4. Selected trees, above 45 cm gbh at suitable intervals standing on the periphery of the coupe will be given two coal tar bands and a geru band in between after scrapping the loose dead bark. The lower coal tar band will be at B.H. and other coal tar band will be 15cm above it. Just below the lower coal tar band Tree serial number in Arabic will be given on the side away from the area of the coupe. The bands and

serial numbers of such trees will be maintained in the marking register in, the following, From No.19.2

Table No 17.2

List of trees on the coupe boundary

Sr.No.	Name of species	GBH(OB)	Remarks
1			
2			
3			

5. No tree, bearing the coupe demarcation bands, is proposed to be marked for felling.

6. Demarcation of Sections: For effective monitoring and control of the harvesting operations, each coupe marked for felling in each Working Circle will normally be divided into four approximately equal sections. Sections will be demarcated by 1.5 m. wide cut lines by clearing brushwood, unless the section line runs along a permanent feature.

7. Trees above 45cm girth, selected at suitable intervals on the inner edge of the 1.5m wide cleared section line will be given two coal tar bands 15cm 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 they would denote.

8. Demarcation of Other Areas Given in the Treatment Map: The other categories of areas shown in the treatment map will be marked by giving one geru band at B.H. and one coal tar band 5cm above it.

9. Assessment of Natural Regeneration: At the time of survey and demarcation the staff should also assess the number of Natural Regeneration in the coupe. The actual number obtained by total count or sampling, will decide the number of ANR seedlings that would be required at the time of NR operation as part of the post-harvest works in the coming year. The details in para 15.21 (iii) (v) should be followed.

Treatment map:

1. Immediately, after completion of demarcation of the coupe, Forester will prepare the Treatment map of the coupe under the close supervision of RFO by clearly showing the variousTreatment-type areas as prescribed in the chapter 9. The concerned ACF will verify the treatment map and make corrections, if necessary, before submission to the DCF Jalgaon for approval.

The treatment map will bear the date of preparation by the Range Forest Officer and verification by the Assistant Conservator of Forests.

2. Preparation of treatment map shall be done one year in advance of the coupe working . Timely preparation would facilitate necessary checking and corrections, if any in time.

3. Immediately after seeking approval of the treatment map, site-specific Work Plan for the entire coupe shall be prepared by RFO, incorporating all the prescribed activities under various treatment-type areas marked on the map, entailing quantum of work involved, estimated amount required and period of operation for each activity. The Work Plan is proposed to be verified by the ACF concerned and submitted for approval to the competent authority.

17.5 : MANAGEMENT OF PRIVATE ACQUIRED FORESTS:

Not Applicable.

17.6: MARKING OF TREES FOR HARVESTING.

1. After approval of treatment map, marking of trees for harvesting shall be carried out as per prescriptions given in respective working circles. Marking of trees for harvesting shall be done one year in advance of the coupe working and it shall be done departmentally. Timely marking would facilitate necessary checking and corrections, if any, in time.

2. Making is prescribed to be done by the forester concerned under the close supervision of RFO and constant guidance of ACF concerned. The DCF shall himself inspect majority of coupes to ascertain proper marking as per prescriptions of working plan as well as to guard against the excessive marking. To ensure this close supervision, a marking certificate in following format is prescribed.

Form 17.3

I----------RFO,---------- Personally inspected the marking of the coupe No.----------in compartment No----------of felling series ----------in---------- .Working circle---------- on dt----------and found that marking of trees for felling has been done as prescribed in the working plan.

Date : Signature of the RFO

These certificates shall be regularly and frequently checked and verified by ACF as Well as Deputy Conservator of Forests.

3. Trees marked for felling will be given geru bands at breast height and will bear marking hammer impression at the B.H. (breast height) as well as at the base on the blazes of sixes 10cm X 10cm. The blaze size should be strictly adhered to so as to aid in identification of marked trees at the time of felling.

4. Following trees in addition will bear digit serial number both at B.H.(Breast Height) and at the base.

a) All trees of Teak, Bija, Shisham, Ain, Tiwas, Haldu, Kalam, Dhaora and other timber yielding trees of 45 cm and above, girth at b.h.(o.b.)

b) Trees of all other species, of and above, 60cm girth at b.h.

5. The remaining trees marked will bear serial numbers, which will be given by coal tar. The digit and coal tar serial numbers will form separate series.

6. The number of the tree marked shall be written vertically on the blaze, shown as under:

For Tree no.195

XX (Hammer mark)
1
9
5

7. All trees bearing serial numbers will be individually

recorded in marking (recording) book in, the following, Form No.19.3 Serial number given in coal tar must be recorded in the marking book. Remarks column shall invariably mention about the deformities if any, such as Dead,

Top broken, Hollow, severe insect damage etc.

Form No.17.4 Format for Marking of Trees for Harvesting

Tree Digit No.	Serial No. Coal tar	Name of species	GBH(OB)	Remarks

8. Abstract of trees marked for felling will be made in 15 cm girth classes. Timber, poles and firewood trees will be shown, separately.

9. 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.

17.7: FOREST PROTECTION

17.7.1: Status of forest offence cases :

The Range Forest Officer, the Assistant Conservator of Forestsand the Deputy Conservator of Forests will take review of forest offence cases at least once, every month. Shifting of boundary marks along the forest boundary shall be viewed seriouly, and the adjoining landholders or encroachers would be charged in the court for omission or commission causing obliteration of the forest boundary. Charges regarding all cases of forest encroachments must be submitted before the Judicial Magistrates within 3months. Similar time-bound action is recommended in all cases of timber theft. All cases of violation of the Forest (Conservation) Act, 1980 shall be dealt with timely and firmly.

17.7.2: Routine monitoring :

The Deputy Conservator of Forest shall personally carry out routine checking of the Range Offence Register and the Round Enquiry Reports in at least 4 Ranges every year. Similarly, the Chief Conservator of Forests shall cheak these records in at least one Range every year, and circulate the inspection report to all the Ranges.

17.7.3: Regular training :

The Deputy Conservator of Forests and the Assistant Conservator of Forests will periodically call staff meeting to review and impart training for the boundary management and for effective disposal of offence cases.

17.7.4: Awards and rewards:

Staff who has performed exemplarily in forest protection should be nominated for State and National awards.

17.7.5: JFM activities :

JFM activities open up communication channel, discourage forest offences and provide village bodies an opportunity for direct involvement in forest protection. Therefore, JFM activites should be encouraged, and taken advantage of as a workable strategy for effective forest protection.

17.7.6 : Fire Protection

Fire adversely affects natural regeneration, forest growth, ground flora, soil organisms and site productivity. Effective fire control as prescribed in the plan is essential for the forest development. The division officials and local people should be sensitised about the need of effective fire control. All fire incidences must be meticulously recorded and investigated to assess the damage caused.

Classification of fire control

Class-I (complete fire protection) : The Class-I fire control areas include all felling coupes, thinning coupes (six years), plantation (five years), the A-type areas (peamanent), forest depots (permanent), forest nurseries (permanent), Special Wild life habitat areas (permanent) and any other areas of slpecial importance decided as such by the Chief Conservator of Forests (Territoral) Dhule.

Class- II (general fire protection): The Class-II fire cantrol areas include the remaining areas of the each Working Circle as well as any other areas, which deserve this protection in the opinion of the Chief Conservator of Forests (Territorial) Dhule.

Class- III (general vigilance): The remaining forest areas (that is, areas not included in the above two classes) and FRA areas are identified as the Class-III fire control

areas. Any special measure for the fire protection is not undertaken, but deliberate setting of fire and burning the forest is prohibited.

Fire control measures :

A fire protection scheme for the entire division shall be prepared before February each year, indentifying the watch points (including watch towers), strategic locations, strength of fire watchers at each location, deployment of vehicles, use of wireless sets, supervising of the forest staff and the co-ordination protocol.

Each location is proposed to have 5 to 10 persons (24 x7) including regular staff and fire watchers. The fire prevention should be treated as a high priority item. The scheme should be implemented sincerely during the fire season.

Areas deliberately burnt for silvicultural reasons under the sanction of the Chief Conservator of Forests (Territorial). Fire in such areas need not be reported unless spreads beyond unless spreads beyond such area.

All the Class-I and Class-II areas will have external fire lines and internal fire lines & to divide the forest area into convenient blocks. The Class II areas will have to cut and clear Guide-lines.

Fire Watchers and local forest staff will constantly patrol the Class-I and Class-II fire control areas. The directives require that fire in the Class-I areas be reported to the Deputy Conservator of Forests, immediately, along with details of the area burnt and the damage inflicted on the forest corp.

The group of fire watchers shall immediately rush to the site and extinguish fire as soon the fire spot is located by upcoming smoke in their area of operation. Modern firefighting tools should be used for extinguishing the fire. The supervising officials should mobilize reinforcement in case of large fire. Utmost care will be taken to quench the smoldering material. Providing a thick layer of soil over such material is generally effective.

The fire lines will be kept clear of all growth and combustible material during the fire season. Leaf litter and other dry material on the fire lines will be collected periodically along the edge and burnt before the fire season starts.

The cutting of fire lines should be completed in December. Fire tracing (burning) should be completed in February, and thereafter should re quire permission of the Deputy Conservator of Forrest and physical presence of gazette officer.

The division office shall maintain a Register of fire lines, and enter the period of cutting and burning of fire lines. The register will be kept up to date and checked every year, in March.

Standard widths of fire lines are prescribed in the Table 19.2. The supervising officer will decide the width unit for carrying out the fire line work on the shard boundary.

Establishment of 24*7 Control Room at Range and Division Office by pooling of resources in necessary to swiftly deploy the teams for dousing fires.

Fireline cutting and burning works are to be done with the close cooperation of JFMCs. This will instill a sense of direct responsibility on the JFMCs to protect forests from fire. This would act as a performance assessment tool for the department to assess the JFMCs. The funds for fire line cutting and burning shall be allotted by DCF to the JFMCs and the concerned RFO would get the works executed from them. This approach will bring a sense of ownership to the JFMCs.

Standard width of various types f fire lines Table No.17.5

Characteristics of the area	Width of fire line
External Reserved & Protected Forest Boundary	12 Meter
Naturally of artificially regenerated areas (For 5 Years)	6 Meter
Remaining coupe boundary	3 Meter
Both sides of roads and cart tracks passing through the forests	6 Meter
Timber, Bamboo and firewood depots	40 Meter

Negligence in the fire protection by the staff should be taken as dereliction of duties. The supervisory officers have been proposed to, extensively, verify the fire control measures.

Fire Blower: The Division has purchased 113 number of fire blowers for extinguishing fire. These blowers are very effective for the clearing the litter from the ground and breaking the spared of fire. The use of these blowers has proven very effective in reducing the labour intensiveness of firefighting and in containing the damage from fire. The blowers should also be used for maintaining the fire lines, as over time the litter and other dry material falling on the fire line area makes the fire

line ineffective. The staff should be trained in the application of other modern fire-fighting tools also.

Fire Alerts: Fire alerts are being sent to the concerned by the FSI Dehra Dun on registration. It shall be mandatory on the part of the DCF to register himself and the RFOs up to the Beat guards for receiving these fire alerts from the FSI. Though, there may be issues of positional accuracy, inability of detection of small fires and probability of false alarms, the system will however keep the fire fighting machinery in alertness.

Cost estimation and reporting: The practice of fire reporting is very vague lack of knowledge on the harm of fire on the forests. Only the Leaf, litter is burnt. No Loss on government is to be done away with. Considering the fact what fire does to regeneration, soil organisms, water holding capacity, soil erosion, ground dwelling pheasants & small animals, no forest officer should say that there is no loss the government.

Fire-fighting Squad: The critical condition of the forest of Jalgaon necessitates taking up radical steps to revitalize the forests. It is necessary for the DCF to erect fire watchtowers and establish fire-fighting squads to tackle fire menace in the Division whose duty shall be in line with be squads deployed in the wildlife areas. This is in line with what is given pts. 1,2,5,6 above but with a thrust on fire protection only. The squads shall ensure that no fire incident occurs anywhere in the Division particularly in areas of NR.

17.8: ILLICIT CUTTING:

Illicit felling in the forest area is growing at alarming rate. Since the subject is dealt separately according to the series of directives for the purpose, recommendations of this plan are of a little consequence. However, faster communication including vehicle facilities, adequate defense capabilities, frequent training and establishment of forest stations at strategic places are recommended to control illicit felling and wildlife offences. Establishing intelligence network for the purpose is strongly recommended. The Secret Service Fund scheme instituted by the Govt. of Maharashtra should be used to control illicit tree fallings. On addition to addressing supply-side management by augmenting wood production on forest and other community land, the demand-side management should take up efficient wood

utilization and energy efficient alternatives like smokeless chulhas, biogas, LPG connections, Solar cookers, etc.

17.9: FOREST ENCROACHMENT

The cause of forest encroachment should be examined thoroughly and addressed in a comprehensive manner. All the necessary support should be provided, and encroachment should be evicted as early as possible. The boundary management and standard administrative guidelines will help to control encroachment.

The forest areas under encroachment from 1978 onwards are 268.120 Ha. The efforts undertaken by the division lead to eviction of encroachment in 2.71 ha. The Balance area under encroachment after 1978 onwards is 266.41 Ha. Renewed and concerted efforts on the part of division staff for eviction of encroachment are proposed on priority basis and as per GIS cell Nagpur satellite image data shows that total area of encroachment of Jalgaon forest division is 8643.08 ha. out of that 930.61 ha. encroachment comes in Bio conservation reserve so total 7713.03 ha. area remains for miscellaneous area management.

Table no. 17.6 Range wise prima facie area under encroachment

Range	Area ha.	Encr. As per GIS
Chalisgaon	12642.03	1699.1088
Parola	8802.45	858.5803
Erandol	6826.01	662.2396
Pachora	6908.31	802.7069
Jalgaon	8949.05	1110.3899
Jamer	14565.23	1106.3112
Muktainagar	13973	1239.017
Vadoda	14248.05	235.14
Total	**86914.13**	**7713.03**

(*Source GIS cell Nagpur*)

Small isolated patches of the forestland and often neglected and become vulnerable to encroachment. Special care shall be taken to ensure protection of such patches from encroachment.

Protection from new encroachment: The area evicted will remain prone to fresh encroachment. The concerned beat guard will carry continuous petroling before premansoon to prevent any encroachment in these areas and mention about encroachment if any noticed in his fortnightly beat 'Khariyat' report. The Deputy Conservator of Forest Jalgaon will take regular review about encroachment on these areas in his monthly meetings.

17.10: SOIL AND MOISTURE CONSERVATION:

The areas adjoining the human habitations, especially, the Protected Forest have become devoid of vegetation by way of illicit cutting, heavy grazing and repeated fires. The compaction of soil reduces percolation of water and the water holding capacity of the soil. Due to these factors, NR of Teak and its associates die back before being established as part of future crop.

The soil and moisture conservation is crucial to maintain and improve the site conditions as well as water regime of a given tract. Moreover, extensive sivicultural works have been prescribed in the working plan to regenerate the forests primarily assisting and tending the existing NR and the available rootstock. To ensure the success of this operation in improving the forests, soil and moisture conservation works are of utmost importance.

The soil and moisture conservation works would start along with the marking of coupe and be completed before the onset of monsoon. Wherever feasible, the local material obtained from climber cutting, bamboo cleaning and shrub clearance should be used for brushwood check dams to arrest the soil loss.

It is prescribed to follow watershed management approach viz. the ridge-to-valley approach for carrying out soil and moisture conservation works. The contour trenching and gully plugging/check dams, as given under, have been prescribed to constitute the major component of these works.

A large proporation of area is adjoining to various protected areas. Hence, deep CCTs should be avoided to avoid damage to wildlife.

Nala bunding and check dams : The primary objective of nala bunding and check dams is to reduce the run off water and to arrest the slit. They are prescribed to be made from the loose boulders found in and around the nala bed or from the dug up

soil. No blasting shall be done for this purpose. Where sufficient boulders are not available brushwood may be used. In this plan check dams of both the loose rubble for arresting silt and soil loss and earthen gully plugging (nala bunds) for moisture conservation and water harvesting are prescribed.

The structure and quantum of work will depend upon various factors such as the erosion status, ground conditions, and local availability of suitable materials. However, to narrow the wide variations in implementation, the norm for gully

plugging or nala bunding is proposed as 5 meter^3 / hectare of loose rubble filling or earthwork unless otherwise prescribed in the specific scheme.

The streambeds more than 8 meters in width shall not be covered under the nala bunding. Nalas more than 8 meter wide at the top should normally require elaborate engineering structures for bunding, and therefore, such bunds should not be considered as part of the quantity prescribed here. Each of such nala bunds, if required, should be treated as an independence project.

The forest tanks are proposed to be taken up in suitable sites without causing damage to the tree crop either during construction or due to submergence.

17.11: REGENERATION

Plantations should be taken up on selective basis and only in the areas having good soil depth and which are well drained. Also the areas selected should have no or negligible grazing pressure. If the area was already planted and resulted in failure, the cause of failure shall be examined and only after eliminating such causal factors, the area be taken up for raising new plantations with the prior approval of CCF(T), Jalgaon. B2 type areas in the various woking circles. i.e the under-stocked areas with scanty natural regeneration are prescribed to be considered but such areas should specifically be put to above tests before taking up plantation there. In the rest of the under-stocked areas, attempts will be made to encourage natural regenerations.

Broad criteria for regeneration in general have been developed in the foregoing paragraphs.

JFMCs should be involved in all types of Afforestation activities.

Tending of natural regeneration : Wherever Natural Regeneration exists, it will be given preference to artificial regeneration. It is necessary to encourage natural regeneration considering the existence of sufficient rootstock in majority of areas and successful experience in its management in the past. Natural regeneration is proposed to be achieved in two ways;

Identifying seedling and saplings (those having attained a height of 60 cm. and occurring roughly at a spacement of 5 m, that is about 400 seedlings per ha.) of valuable species. Growth of these seedlings/ saplings shall be encouraged by way of weeding, singling, soil working and mulching in the same way as in case of plantations.

The aseas devoid of seedling/saplings of seed origin but containing sufficient rootstock shall be tended (stool dressing, singling, removal of congestion etc.) in favour of valuable species. While doing so, the species, which are less in number in stocking (as indicated by enumeration results) shall however be given preference.

As has been observed that there is hardly any regeneration in the forest of the Division, the norm of soil working in the forests of Jalgaon which provides for soil working on 400 seedlings/ha in a coupe is being modified. In the forests of Jalgaon.

Aided natural regeneration - Hence, wherever nr is prescribed (b1 or D areas) and the number of seedling/saplings being less than 400, the DCF should take up Aided Natural Regeneration by planting miscellaneous species in non-Teak areas. As the number of natural regeneration seedlings/saplings varies from 0 to 350 or more, the treatment should be such that the total number of naturally occurring seedlings and ANR seedlings should be 625 in numbers. It shall be necessary to ensure that the soil working and mulching be carried out meticulously to ensure that whatever natural regeneration exists is nurtured properly.

This is an important step to help the forest regain its health and vitality which has been under much stress from biotic interference and managerial neglect. Reference to the Planning Department GR No. 2011/CNO.130/EGS-10A DATED28.12.2011 for carrying out ANR in the forest areas may be made for preparing estimates in order to project cost calculation but actual estimate should be as per actual field condition decided after due survey and evaluation.

Artificial plantation: Only the areas neither having sufficient seedlings/saplings of seed origin nor sufficient root stock but are found to be suitable for plantation of suitable species shall be covered under the plantation programme. As far as possible, tall seedlings are to be used in plantations.

Choice of species in artificial regeneration: Naturally occurring local species will be preferred for the plantations.

Roads, cart tracks and culverts:

The forest areas of the division have a good network of roads and cart tracks. The Public Works Department of the state government or the Zilla Parishad maintains large number of roads passing through the forest area. Some stretches have been permanently transferred to the Department. The division is proposed to compile a comprehensive record for all roads passing through the forest area and the roads transferred to the division for maintenance, on priority basis.

The extent of forestry operations and gravity of forest protection concerns should determine the priority for maintenance of the forest roads.

Unwarranted up- gradation of the forest roads should be discouraged, but required culverts may be constructed in stretches useful for the forest protection. In no. case, provisions of Forest Conservation Act, 1980 be violated.

Irregular harvesting:

Restriction on irregular harvesting: irregular harvesting of timber, firewood and other NWFPs is prohibited, except in the following cases:

Felling for the haulage roads: The Deputy Conservator of Forests may permit felling of trees for the purpose of haulage roads that are temporary in nature, and should be aligned properly to ensure minimum possible felling of trees.

Harvesting in forest areas diverted for non-forestry purposes: Felling of trees on forest land required by the other departments such as Irrigation, PWD,etc., will only be undertaken after the proposals for the use of forest land for non-forest purpose are approved by the Government of India under the provisions of the Forest Conservation Act, 1980 and as per latest guidelines issued by GOI. from time to time for specific projects. The Deputy Conservator of Forests may permit felling of trees on forestland

diverted for the non-forestry purposes as approved under the provisions of the Forest (Conservation) Act, 1980. The material obtained from such harvesting will be brought to the depots and will be disposed as per departmental procedures.

17.12 : MAINTENANCE OF THE FOREST LAND RECORDS:

Maintenance of the land records and forest maps: The forestland records and the forest maps will be brought up to date, and maintained as such. A certificate to this affect will be recorded annually in the Form No 1- Register during the month of June.

Reconciliation of the revenue records: The revenue records will be reconciled on the basis of the forest notifications. The Collector and the Deputy Conservator of Forests will jointly ensure that the Revenue Records are brought up to date according to the forest notifications. Since the Divisional Commissioner issues the forest notifications, there is no apparent need to issue separate orders for the mutation entries. The Revenue Department will provide a certified copy of the Records of Rights to the Jalgaon Forest Division to mark completion of the process.

Along with the reconciliation, the details of land grants (patta) issued on the forestland will also be made available to the Jalgaon Division. The Collector and the Deputy Conservator of Forests shall send the details of all grants or occupancy rights issued since 1980 to the Nodal Officer at Jalgaon.

Management of Preservation Plots/Research Plots:

The Preservation Plots / Research Plots which are in existence are to be maintained as per the objectives of the ongoing studies and should not be interfered with during regular coupe working.

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CHAPTER-18

SCIENCE AND RESEARCH

During the process of writing of this Plan the following papers, articles, reports and documents were referred and used for the writing of the Plan.

Table No.18.1 list of papers, articles, reposts and documents

Sr. No.	Department	Subject
1	**FSI (Forest Survey of India)** i) SFR 2005 ii)SFR 2009 iii) SFR 2015 iv) Carbon Statistics of India	1) The condition of the forests & forest cover over the last decade during the implementation of the plan based on the FSI satellite data. 2) The Plantation Tree outside forest for the State of Maharashtra (SFR 2015) Carbon & Forest Eco-system Methodology for the assessment of Forest Carbon, accounting of Forest Carbon Stock. Net Present Value.
2	Indian Institute of Forest Management, Bhopal (IIFM)	1) Assessment of Dynamic Ground Water Resources of the Maharashtra & aquifer parameters.
3	Ground Water Survey & Development Agency (GSDA)	2) Taluka wise Ground Water Resources in Jalgaon District.
4	Control Ground Water Board (CGWB)	Water level data with the long term trend (2001 to 2010 Ground Water Recharge, Ground Water Development.
	IUCN red list. Org	IUCN Status of animals.
	Maharashtra AAR 2015	
5	Social Forestry Jalgoan	Scheme under the 12th Five Year Plan.
6	Supreme Court Orders	Information regarding Tree Cover outside forest area.
7	National Bureau of Soil Survey	
8	& Land use Planning (NBLSS)	Hon'ble supreme Court order in writ petition (202 of 1995) dated 12/9/2000 in interlocutory application No.424
9	Twelth Five year Plan document under Environment, Forestry &	Soil Erosion classes & their areal extent & expected Soil Loss.2
10	Wildlife 209	Slope, Soil erosion, soil texture maps.
	Geological Survey of India (GSI)	Five year Plan Target & Goals.
11	ACF, Silvicultural Scientist,	Rock Formation in Jalgoan District.
12	Jalna	Information regarding preservation plot in Jalgaon Division
13	Maharashtra Remote Sensing Application Centre (MRSAC)	Village boundary & Survey no. data of Jalgoan district.
14	An Account of preservation plots in Central India by B.N.Gupta & N.G. Totey, Tropical Forest Research Institute, Jabalpur.	Information on the Preservation plots in Maharashtra
15	Designing rural Technology Delivery Systems for mitigating agricultural distress:	Area of wastelands, crop pattern etc. and soil and moisture conservation related information.

18.1: RESEARCH GAPS:

Because of the lack of any research works/paper related to the Division, the many chapters that involve specific information onJalgaon Forest Division could not be written with accurate data. The research gap is in almost every aspect of the Working Plan as our writing of the Plans in early years has not looked into the new aspects that the need of our present times require, like Biodiversity and all its components, Climate change and Carbon sequestration\NTFP research, ITK, Trees outside forests, Social and cultural aspects of forests, Ecosystem services etc.

18.2: BIODIVERSITY:

Apart from a few mammals, trees and a few major herbs and shrubs, the Department does not have record of the whole gamut of biodiversity of the divisions. IN this Plan, information were taken from different sources for Birds, reptiles etc.

In highlighting the above, it is clear that a Biodiversity Assessment study is very much required for the documentation of the richness of our forests. This is also a prescription for the Biodiversity WC.

18.3 : CARBON SEQUESTRATION :

Carbon sequestration is an important aspect of the contribution of forest towards Climate Change. However, since we do not have base data, it would be difficult to monitor the increase/decrease in sequestration levels. Also, the methodology for the assessment of the different pools of Carbon should be very clear to the SOFR units so that information will be more accurate.

18.4: NTFP RESEARCH:

NTFP is integral to the health and productivity of the forests. Though we have data on the major NTFP tree species and few prominent medicinal plants, It is known that the people around forests use many more variety of species than we ever know. The list is appended in Introduction part of the Plan and the number of species used is far more that earlier known. There is need for research to be done for the documentation of all the species that are being used by the people and also to devise the best methods for the harvest of the species through experimentation.

18.5: PRESERVATION PLOTS:

The following are the excerpts from the paper an account of Preservation Plots in Central India by BN Gupta and NG Totey, Indian Forester, 1994 relevant for the subject in discussion.

Introduction:

Preservation plots, the miniature nature reserves, are demarcated forest areas set aside for the preservation of the forest in perpetuity permitting only such human interference as is necessary for their protection and maintenance. Following the recommendations of the IIIrd All India Silvicultural Conference (Anon, 1929), preservation plots in the representative areas of Chief Forest Types were marked. By 1939, about 112 preservation plots were established throughout the country, when concept of preservation of both climatic and aerial types was generated (Anon., 1939). In 1961 during the Xth all India Silvicultural Conference emphasis was laid for preservation of fine specimens of forests i.e. groups of out standing trees, rare types of forests of botanical curiosity and patches of relict vegetation, specimens of managed forest (Stable sub-climax stages) and climax forests.

Preservation plots in maharashtra

Preservation plots in Maharashtra have been established as early as 1955 and as of 1993, there are 23 preservation plots n Maharashtra covering an area of 517.32 ha. Out of these, 48-50% plots fall in dry deciduous forest, 30 % in moist deciduous forest and about 20-22% in subtropical hill forests. There are 36 forest types as per champion and Seth (1968) in Maharashtra spread over 44044 km2 (Anon. 1991) but preservation plots have been identified only 5-8 types like 3B/C1, 3B/C2, 5A/C1, 5A/C3, 8A/C2 etc. The remaining forest types though important from the point of view of biodiversity are not covered.

Table No.18.2 : Forest types of Jalgaon Forest Division

Type	Notation	Type description
Sub-group	5A	Southern Tropical Dry Deciduous Forests.
I. Climax types	5A/ci	Dry Teak bearing forests
	5A/cia	Very dry Teak forests
	5A/cib	Dry Teak forests
	5A/c_3	Southern dry mixed deciduous forests
II. General Edaphic types	5/E-2	Boswellia forests
	5/E-5	Butea forests

III. Degradation stages	5/D S1	Dry deciduous scrub,
IV. General serial type	5/ISI	Dry tropical rive rain forest

While as per the above research document and account of preservation plots in Central India by BN Gupta and NG Totey, In Indian Forester, 1994, the preservation Plots are found to have been established in the Sub- group 5-ASouthern tropical Dry deciduous forest.

There is need to have such plots also in the rest of the Forest types found in Jalgaon Division namely, 5/E-2 Bosewellia forests, 5/E-5 Butea forests ,5/D S1- Dry deciduous scrub and 5/ISI-Dry tropical Riverrain forest. The work for the identification, plots size, demarcation and data collection should be done with the help and collaboration with the silviculturiest, Pune and his subordinate office at Jalna.

1) The DCF Jalgaon should survey the area of the Division and identify the area under the above forest types namely, 5/E-2Boswellia forests, 5/E-5 Butea forests, 5/D S1-Dry deciduous scrub and 5/ISI-dry tropical riverrain forest.

2) In India, it is recorded that the size of the Preservation plot varies from 0.1 ha to 4000 ha. The DCF shall lay plots of the size of not less than 4.0 ha and to a maximum, of 20 ha. for each of the forest types mentioned above.

3) The plot should be well demarcated on the ground, geo-referenced and plotted on a GIS-based map. The trees on the border should be demarcated with such demarcation as were marked in the other Preservation Plots in the country/state.

4) These plots shall be protected from all human interference including harvesting operations, if prescribed in the Plan. Activities shall be limited to those that would ensure protection and maintenance.

5) A total enumeration of the plot shall be taken up taking into account all the tree species of the forests (Species, age-class distribution, height, etc).

6) The forest shall also be described in a proper manner as to its species composition, forest storeys, condition of the crop, health and vitality, presence of pests etc.

7) The shrubs and herbs present in the Plot should be well-documented. This shall include the lower life- forms.

8) The fauna available in the area should also be surveyed and documented.

Sample plots

For the preparation of this Working Plan a total of 1501 sample plots were laid and the relevant detailed information was recorded. These are distributed in different Working Circles under different ranges and are well-distributed throughout the division. A total of 50 number of representative plots were chosen taking 10 from each Working Circle and the details are shown below:

Selection of plots: As the forests of Jalgaon is of one single forest type of sub-group 5-A Southern Tropical Dry Deciduous forests, with a sprinkling of other types, the major variation in the forest is not in the type of the forests but in the attributes (like density, composition age distribution etc.) within the type. As the Working Circles were identified based on these attributes, each Working Circle stands as representative of the density and composition of the forest, hence the choice of 10 sample plots form each Working Circle. Secondly, the ten sample plots chosen are the most representative for each of the Working circle in terms of species distribution, age density and other factors.

Regeneration Plots:

Selection of Plots: The Sample Plots have been surveyed as per the New Working Plan Code 2014 and have in them the four numbers of 3 x 3 m sub-plots recorded for the regeneration too. These plots will also be the plots where regeneration will also be studied. This will make the monitoring and data collection easier as well.

Data to be collected: Regeneration plots are established to study the regeneration status of important species. Data should be collected on population dynamics of seedlings, saplings and young trees. Each seedling and sapling should be marked individually. The marked seedlings should be measured and monitored periodically.

The status of growth, their health and conditions should be measured in detail. The conditions of soil (depth, humus content etc), presence of litter, the canopy opening level, should be recorded properly. The incidences of pest should be recorded. Any threat and outside interference like fire, grazing etc should be removed. The

monitoring should be done periodically, the period of which should be decided in consultation with the SOFR unit and the Research wing. The role of mycorrhiza and litter cover management should be considered. The aim of the monitoring of the regeneration is to find out under what conditions the regeneration of a particular species comes up best and under what conditions they grow best. In knowing these, the next step would be to create those conditions that are most suitable ofr the regeneration of the forests.

NTFP Plots :-

As stated elsewhere in the Plan, the forest of Jalgaon have been worked for over hundred years under selective preference to Teak through the Coppice with Reserves and coppice with Standards. The presence of Teak is overwhelming as also mentioned by the FSI report.

As such, the richness in non-timber species in general and NTFP species in particular is not very encouraging. Due to the overabundance of Teak and the impact of fire over the years, the ground vegetation is also very poor in most areas. Under these circumstances, the yield of NTFP is negligible.

There is identified Medicinal Plant Conservation Area in the Division of Jalgaon as below.

Table No. 18.3

Range	Compartment No.	Medicinal Plants
Chalisgoan	290,293,294,2998,316,317,329, 330,331	Arjun, Chnadan,Biba,Haldu,Bor
Parola	347,353,354,356,357,361,366,3 69,370,371,372 to 378	Bor Behada, Tembhurni
Erandol	380,382,383,384,387,388,389,3 92,394,395 398,401 to 404	Ghat Bor
Pachora	429,430	Bor
Jalgoan	413,414,415,416,417,414,442,4 44,445,410,406,446,448,450	Bor, Medsing
Jamner	466,476,479,488,490,491,493,5 90	Bor ,Temburni

Muktainagar	492,494,495,496,497,498,499,504,507,510,521,526,589	Bor,Arjun, Tembhurni
Vadoda	515,516,517,552,562,	Bor, Medsing Bahava

Some of the medicinal plant species found in this plot are*: Cassia fistula, phyllanthus emblica, Aegle marmelos, Terminalia arjuna, Acacia nilotica, Semecarpus anacardium , Tamarindus indica, Anogeissus latifolia, Terminalia Chebula, Eugenia jambolana, Acasica catechu, Sterculia urnes, Madhuca indica, Azadirachta indica, Gmelina arborea, Moringa citrifolia, Wrightia tinatoria, Vitex negundo* etc.

Information available from the DCF Jalgaon, the process of documentation is going on and until such documentation and assessment of the medicinal plants is complete, it would not be wise to carry out any kind of experimentation .It may be worthwhile to mention the FAO website document (http://www.fao.org/docrep/ ARTICLE/ WFC/XII/0100-A1.HTML) dealing with medicinal plants that mention specifically about the harvest of medicinal plants thus:

The vital traditions of sustainability have been ingrained into societies through their emphasis in rituals and their mention in ancient scriptures. For example in Charak-sahita, one of the most important Ayurvedic texts of India, it has been mentioned that the branches and leaves of medicinal plants should be collected in rainy and spring seasons, roots in summer or late winter when the leaves have fallen down of fully matured, barks, tubers and latex in autumn, heartwood in early winter and flowers and fruits according to their season (Sharma, 1994). Further regarding the harvesting of Madana (*Randia dumetorum)* fruits, its has been mentioned.

"These should be collected during the period of transition between spring and summer in pusya, aswini or mrgasivas constellation and maitra muhurta. Those which are unripe, undamaged, non-green, pale colour, free from organisms, undecomposed, uneaten by animals, not too small (immature should be) taken"(Charak Sahita: Kalpsthanam, I.13)

In Fact the sustainable harvesting practices do not require any sophisticated or special efforts. Only awareness and certain precaution are required. A few examples may bring out the Point-

When the roots of Satavari *(Asparagus racemosus)* are dug out, the big and small roots are separated. The bigger roots are washed with water, dried and stored. The smaller roots are separated along with the disc and stored in sand in a cool place without washing. These very roots are used as planting material for the next season.

During harvesting of Safed musali *(Chlorophytum borivilianum)* one or two roots along with the disc are left in the soil. They lie dormant and sprout in the next rainy season, thus naturally propagating itself.

The roots of Nagarmotha *(Cyperus rotundus)* are dug out in Oct. Jan. But if only the black roots are taken out and the unripe red roots are allowed to remain in the soil, they sprout again in the next rainy season to produce another plant, thus ensuring sustainability. .

Data to be collected: The Completion of the documentation and assessment of the medicinal plants in the MPCA area is the first and foremost priority.

- Only after the completion of the above, the following experiment may be carried out in the area inside the MPCA.
- Permanent plots of suitable sizes may be laid for development of safe harvesting protocol and the optimum limit of the harvest should be standardized for assured regeneration of the species. The following harvesting regimes may be experimented to work out sage harvesting limit.
- 50 % harvest of the marketable parts (by leaving 50 % of the whole number).
- 25% harvest of the marketable parts (by leaving 75 % of the whole number).
- The plots should be laid in triplicate.
- The plots so treated shall be visited after a gap of one year to enumerate the number of new recruits and the effect of above removal shall be calculated using standard mathematical formulae.
- The above experiment shall be done through the Management Commmittee of te MPCA.

Other research and experimental plot

It is necessary to emphasize the fact that experimental and sample plots and their demarcated surrounds are under the complete control of the Silviculturist and are thus excluded from all operations prescribed in the Working Plan.

Research division, Jalna, has established seed orchard plots at Parola & Erandol Range of Jalgaon Forest Divison. Anjan plot was established in the year 1997-98 and another plot of mix plantation was established in the year 2000-01 in compartment no 391 and a Teak seed orchard in compartment no 391. (Source DFO, Silviculture Division,Jalna).

In order to generate superior quality seeds/ seedlings and planting stock, the Division should also ensure the use of certified source and from known source from known source from the forest Department.

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CHAPTER-19

SUMMARY OF PRESCRIPTIONS

19.1: INTRODUCTION:

The Jalgon Working Plan covers the Reserved, Protected and Un-classed Forests (Non-Forest Areas) in the Jalgon talukas of Jalgaon, Bhusawal, Bodwad, Muktainagar, Jamner, Bhadgaon, Amalner, Pachora, Parola, Chalisgaon and Erandol District. The area is situated between 21^0-03'-28" and 21^0-24'-53" north latitude and 75^0-00'-31" and 76^0-09'-33" east longitude(lat-long extracted from GIS)

The state boundary of Madhya Pradesh constitutes the northern and eastern boundary. Tapi river forms the Southern boundary. Aner river constitute the Western boundary.

Forests of Jalgon division are under scientific management since 1901 when the first working plan of Osmaston's was implemented. This Plan replaces the working plan written by Mr. Vasudevan, Mr. T.S.K.Reddy & Mr. Tiwari. For administrative convenience the ranges, rounds and beats were reorganized in year 2006 and the entire division has been divided into 8 Ranges, 22 Rounds and 61 Beats.

Table No.19.1

Sr. No.	Name of Range	No. of Round	No. of Beat	Legal status wise area (ha)			
				Reserved Forest area	Under Section-4 area in ha	Unclassed Forest	Total Forest area
1	Chalisgaon	2	7	11760.11	264.92	--	12025.63
2	Parola	3	7	7621.01	626.56	94.54	8342.14
3	Erandol	2	5	6398.73	257.28	58	6713.26
4	Pachora	2	5	5851.47	204.99	513.85	6569.33
5	Jamner	4	11	13417.23	456	--	13874.1
6	Jalgaon	2	6	8894.59	54.46	--	8948.82
7	Muktainagar	4	10	15037.64	535.36	--	15573.88
8	Vadoda	3	10	14652.05	215	--	14866.97
Total		**22**	**61**	**83633.17**	**2614.57**	**666.39**	**86914.13**

19.2: DISTRIBUTION OF AREA TO VARIOUS WORKING CIRCLES:

The Allocation of forest areas under various working circles of the proposed working plan is as under.

Area Allocation to Different Working Circle. Table No.19.2

Sr.No.	Name of Working Circle	Area allocated (Ha.)
1.	Protection Working Circle	3038.35
2.	Improvement Working Circle	40017.9
3.	Anjan Working Circle	952.60
4.	Fodder Working Circle	12131.90
5.	Afforestation Working Circle	10786.3
6.	Misc. Area Mangt	7713.03
Total Area of Division		**74640.10**
Sr.No.	**Name of Working Circle**	**Area allocated (Ha.)**
6	Chapter Non-timber Forest Produce.	Entire
7	Chapter Forest Protection	Entire
8	Chapter Joint Forest Management	28168.21
9	Chapter Wildlife Management	Entire
10	Chapter Eco- Tourism	Entire

The Working Circle wise summary of prescriptions:

I . PROTECTION WORKING CIRCLE:

Demarcation of Coupes and preparation of Treatment map

Demarcations and marking one year in advance .

Preparation of Treatment map.

A type : Protection area. a) Area having steep slop.b) Eroded areas or areas liable to erosion. c) 20 mt wide strip on either side of water course.

B type : Under stock areas (density< .4)

C type : Old plantation areas: include areas under old plantations.

D type : Well stocked areas: include areas with crop density more than 0.4.

various treatments proposed for the above mentioned areas are as follows:

1) Area ‘A’:

I. The SMC works including LBS, gabion and gully plugging will be carried out wherever essential. Sites with perennial sources of water should be tackled appropriately as explained under ‘general prescriptions’. While undertaking SMC works, raking of soil or SMC works requiring excavation should not be done as this may accelerate soil erosion.

2) Area ‘B’:

I. The SMC works like Van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under ‘general prescriptions’.

II. species. 625 seedlings are prescribed to be raised by ANR in such areas. As the number of regeneration varies from 0 to 350 or more, the treatment should be such that the total number of naturally occurring seedlings and ANR seedlings should be 625 in numbers..

III. This is an important step to help the forest regain its health and vitality which has been under much stress from biotic interference and managerial neglect. Reference to the Planning Department GR No.2011/ CNO.130 /EGS-10A dated 28.12.2011 for carrying out ANR in the forest areas may be made for preparing estimates.

3) Area 'C' :

I. This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area..

4) Area ‘D’:

I. The SMC works like bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under ‘general prescriptions’.

II. No planting shall be done in these areas.

III. Felling is not prescribed.

Marking rules

A type - Protection Area: Only dead trees will be marked for felling provided their removal will not cause soil erosion.

B type – Under stocked 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 after retaining two dead trees/ha.

ii) All but one vigorously growing coppice shoot per stool provided seedling regeneration of any tree species is absent.

iii) All high stumps will be cut.

C type - Groups Of Young Poles: All edible fruit and flower yielding trees such as Moha, Char, Tendu, Awala, Chinch, Bel, Sitafal, and trees of Kulu will be reserved from felling. No pole crop removal is recommended in these areas. The following trees will be marked for felling .

D type - Mark the tree which is silviculturally available.

II. IMPROVEMENT WORKING CIRCLE:

Demarcation of Coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of Treatment Map : It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like *Nala*, Streams, old plantation, etc.

Type 'A'- Protection Areas: The areas consisting of patches over 25^0 slope or more and 20 meter strip on both sides of the rivers or *Nalas*.

Type 'B'- Understocked Areas/Blanks: Blanks and under stocked patches (crown density below 0.4), with slopes below 25^0,and minimum area exceeding 2 hectare in extent.

Type 'C'- Old Plantations .

Type 'D' - Well stocked areas: include areas with crop density more than 0.4.

TREATMENTS PROPOSED: The various treatments proposed are as under:

Area 'A': (i) The soil and moisture conservation treatment shall be as given in Miscellaneous Regulation.

(ii) Planting Bamboo, Jamun, Arjun and grasses along the nala and river bank.

Area 'B': (i) Under stocked and blank forest areas where slopes are $<25^0$, cement check dams/ earthern dams at regular intervals on the nalas, with loose boulder structures on the upstream of these dams should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetivera grass slips should be planted on the silted soil. On gentler slopes ($<25^0$) CCT works should be done locally available should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

3) Area 'C' : This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area..

4) Area 'D': The SMC works like bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.

MARKING RULES:

Marking will be done in the same year along with demarcation. The marking technique is described in detail in the chapter Miscellaneous Regulations.

The marking rules for each type of area will be as follows:

Type A - Protection Area: Only dead trees will be marked for felling provided their removal will not cause soil erosion.

Type B - Understocked Area: All edible fruit and flower yielding trees will be reserved from felling. The following trees will be marked for felling:

All dead and malformed trees after retaining two dead trees/ha.

All but one vigorously growing coppice shoot per stool provided seedling regeneration of any tree species is absent.

Type C-Groups Of Young Poles: All edible fruit and flower yielding trees such as Moha, Char, Tendu, Aonla, Chinch, Bel, Sitafal, and trees of Kulu will be reserved from felling. No pole crop removal is recommended in these areas.

Type D – Mark the tree which is silviculturally available.

III. ANJAN WORKING CIRCLE

Preparation of treatment map:

After demarcation of the coupe, Range Forest Officer will inspect the area and prepare a treatment map for the same and it shall be thoroughly verified by the Assistant Conservator of Forests. The treatment maps will show the following areas.

Method of treatment

Treatments proposed: The various treatments proposed are as under:

Area 'A': (i) The soil and moisture conservation treatment shall be as given in Miscellaneous Regulation.

(ii) Planting Bamboo, Jamun, Arjun and grasses along the nala and river bank.

Area 'B':

(i) Under stocked and blank forest areas where slopes are $<25^0$, cement check dams at regular intervals on the nalas, with loose boulder structures on the upstream of the check dam should be constructed to prevent early siltation of the check dam. After siltation of loose boulder structures agave suckers or khus/vetvera tussuks should be planted on the silted soil. On gentler slopes ($<25^0$) CCT works should be done and locally available species as per DCF's choice should be sown at 0.5m intervals. DCF should ensure that the seed is fresh by conducting germination tests before they are sown on CCT's. Works shall be completed before the onset of Monsoon. Quantum of work will depend upon the site requirement.

Area 'C': This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

Marking rules for Anjan working circle

Marking For Type 'A' Area: No marking will be carried out.

Marking for type 'B' Area:

(i) The undesirable under growth, which is preventing growth of natural regeneration of desired species will be removed.

Marking for type 'C' Area:

Thinning shall be carried out in pole crop areas. If the plants ara available. Silviculturally.

No fruit bearing tree shall be marked for felling .

IV. FODDER WORKING CIRCLE

Preparation of treatment map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

Treatment:

The various treatments proposed for the above mentioned areas are as follows:

Area 'A':

i. Poly bag planting on 'V' shape furrows- species, distance between two furrows, two plants etc should be fixed as per recommendations of Research Wing.

ii. The SMC works including LBS, gabion and gully plugging will be carried out wherever essential.

Area 'B' In area, which are having better soil depth and are fit for raising trees, fodder species like Anjan, Neem, Ber, Apta will be planted along with the standard soil and moisture conservation works of gully plugging and nalla bunding.

Area 'C' The SMC works like Van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability.

Type D areas:- Soil and moisture conservation works to be taken in these areas

The following species given in the list below should be preferred.

Grasses-

1. Dongari grass *Chrysopogon fulvas*

2. Motha Paunay (Sheda) *Sehima nervosum*

3.	Anjan grass	*Cenchrus cillaris*
4.	Marvel	*Dicanthium annulatum*

Legumes-

1.	Stylosanthus species viz.	Hamata, scabra
2.	Wild tur	*Atylosia scaraboides*

V. AFFORESTATION WORKING CIRCLE:

Treatments proposed:

The various treatments proposed are as under:

Demarcation of coupes: The main coupe shall be demarcated one year in advance of working.

Preparation of treatment map: It will be prepared by RFO and verified by ACF. The trace of the coupe map will show the contours along with important features like nalas, old plantations etc.

The following areas shall be shown distinctively in the map:

I) Area 'A' – Protection areas : It shall include the following areas

- Areas with steep slopes i.e. more than 25^0
- Eroded areas or areas liable to erosion.
- Twenty meters wide strip on either side of the water courses.

II) Area 'B'–Under stocked areas: include areas with crop density less than 0.4.

Area suitable for taking up afforestation shall be marked on it and shall also show prominently the type and location of SMC works to be undertaken.

III) Area 'C'- Old plantation areas: include areas under old plantations.

IV) Area'D'–Well stocked areas: include areas with crop density more than 0.4.

All prominent nallahs, perennial sources of water, water bodies etc. shall also be shown in the TM and numbered. Laying of grids shall be done only in B and D type areas. In B areas where plantations are prescribed, grids of 0.5 (100X50 mtrs) hectare

size while in D areas, grids of 1 ha. size (100 x100 mtrs) shall be laid. Grid wise record of operations eg. Planting of seedlings, tending of NR, root stock management, singling of coppice, weeding etc. shall also be maintained by the RFO.

The various treatments proposed for the above mentioned areas are as follows:

1) Area 'A':

- The SMC works including LBS, gabion and gully plugging will be carried out wherever essential. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.
- Soil binders like Sisal (Agave sp.); local grasses etc. shall be planted as per the site requirement.

2) Area 'B' :

These areas shall be treated in following two stages:

a) **Restorative phase:** This phase will be of one year duration and will prepare the site for the planting activity by improving its soil moisture content. During this phase, soil and moisture conservation works shall be carried out. The area of the annual working unit shall be protected completely from biotic interference by digging a T.C.M./ stone walls/ live hedge.

During this phase various works will be taken up as under:

- Preparation of the T.C.M. and/ or live hedge around the working area: Preparation for the live hedge should be started before the rains set in so that the seeds/ cuttings/ seedlings of suitable local species should be sown/ planted at the onset of the rains. TCM may be dug after the rains.
- Species like Sagargota, Agave, Euphorbia, Bamboo, Karvand and other suitable local species should be grown on the mound of TCM or as a live hedge.

b. **Productive phase:** In the second year, the planting activity shall be taken in the same annual working unit only after ensuring that the area is fully protected and treated with SMC works.

- Rooted stock shall be properly tended.
- Suitable local miscellaneous species including fuel wood, fodder tree species, NTFP and medicinal plant species will be planted in the under-stocked areas having good

soil depth. In low rainfall areas for better moisture conservation, instead of pits, planting in contour trenches should be done.

- Economically important species that occur locally shall be planted. No exotic species shall be planted.

Area 'C':

i) This area does not need any planting. In areas where the field officer feels that the regeneration is inadequate, 625 plants per hectare should be artificially supplemented to improve the stock of the area.

Area 'D':

- The SMC works like van tale, bandharas, nalla-bunding, gully plugging etc. will be carried out as per the site suitability. Sites with perennial sources of water should be tackled appropriately as explained under 'general prescriptions'.
- No planting shall be done in these areas.
- Felling is not prescribed.

VI. CHAPTER NON-TIMBER FOREST PRODUCE

Prescriptions

Fire Protection measures: Collection of NTFP is often associated with forest fire, because the villagers set fire around the NTFP-yielding trees for clearance of leaf litter and undergrowth. Fires are also caused by agents of *tendu* contractors to get better flush of *tendu* leaves. If left unattended such fires spread into forests as forest fires.

Documentation of NTFP collection.

Agency For Harvesting:- As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is with gram panchayat.

Market: All probable industrial consumers shall be identified and quality grades be fixed and department shall act as a facilitator between JFMC and consumer.

VI I) CHAPTER FOREST PROTECTION

Special Objects Of Management

- To protect the forests from illicit felling, encroachment, fire and grazing.

- To sensitize local people about forest protection and involve them in preventing forest offences.
- To raise the moral of staff and strengthen their capabilities to deal with illicit felling, encroachment, poaching etc.

Protection Measures

A Protection plan is to be prepared at division level at the start of new year in January for taking strict protection measures in pursuance of GR dated 8.5.2003. Protection plan will cover following issues.

1. Joint patrolling with JFM committee members and staff of adjoining range, round and beat.

2. Forest allowance to Police Patils in villages adjoining forests organizing Police Patil's meetings at range level.

3. Checking weekly markets for prevention of illegal trade of NTFP and wildlife parts and products.

VIII. CHAPTER JOINT FOREST MANAGEMENT

- JFM micro plans are to be dovetailed with broad prescription of approved working plan.
- Maintenance of forest boundary, removal of encroachment, control over illicit cutting, illegal grazing, fire and wildlife offences shall receive priority apart from regular undertaken works such as SMC and plantations.
- Transparency in program has to be ensured through transparent payment mechanisms.
- Villages which have not received funds should also be accorded importance.

IX. CHAPTER WILDLIFE MANAGEMENT

Prescriptions

- Soil and moisture conservation works will be taken up, where ever possible, in all forest areas, additional measures to be taken to form water holes.
- Reorientation of people's awareness about wildlife through programs like wild life week celebrations in educational institutions and remote villages.
- Creating artificial barrier to restrict the wildlife not to raid the agricultural fields(which is increasing day by day)

- Estimation of wildlife will be carried out every third year during first week of May.

X. Eco tourism.

The following sites have been identified and listed below that have great potential and resourceful to make ecotourism a success in Jalgon Forest Division.

- Padmalay Ganesh Temple in Erandol range.
- Muktai Bhavani conseravation reserve in Vadoda range.
- Landor Khori in Jalgaon Range.
- Patna Devi Mandir (Chalisgaon Range).
- Hatnur Dam In Vadoda Range

Following works and activities will be taken

All Forest parks will be completely fenced with chain link fencing Emphasis will be given on creating wood lots of medicinal plants, forest tree fruit garden, creeper garden, hedge garden, bamboo plantation etc. Nature and cultural interpretation / awareness centre will be created. These should be fully utilized and should be open for the public. Audio-visual aids and equipments shall be provided. Improvement in eco-tourism infrastructure such as internal roads, view points, regulation of entry/exit at gates shall be done.

XI. CHAPTER BIODIVERSITY CONSERVATION.

The area of this forest division is situated in biodiversity rich part of Maharashtra. Extreme seasonal variation, diverse topographical characters, undulating areas with many rich valleys and table lands watered by annual and perennial streams, in the catchment of Tapi, Purna, Girna,Bori rivers creates diverse habitat with flora and fauna. Therefore different kinds of plants animals, harbor in these division.

Prescription for the maintenance & Enhancement of Biodiversity.

(i) Sustainable harvesting of Medicinal Plants should be strictly adhered to. As the division already has the list of local medicinal practitioners (LMP) and the species used by them, it shall be the duty of the Division to chalk out the ways and means of sustainable harvest, with or without the consultation with the LMPs, at its own discretion.

(ii) Sensitization of the Staff of Jalgon division to the issues of biodiversity is of utmost importance. The Division shall involve such experts and institutions in consultation with the Maharashtra Biodiversity Board, Nagpur for such trainings and workshops. Our tendency to limit our management practice to only Teak and prominent wildlife species should be done away with.

(iii) The forest division in consultation with the local Colleges, anthropological/Social science institutions and the Maharashtra State Biodiversity Board should carry out Biodiversity studies on the lesser known lower life forms of the flora and fauna. It may be seen that as the forest department has concentrated its working in the higher life form of trees and mammals/birds other species have been relegated to oblivion.

- Documentation and studies of herbaceous plants.
- Documentation and studies on the fungi, ferns, algae and Lichen and moss (If any).
- Carry out entomological studies (Particularly butterflies).
- Carry out herpetological studies.

XII. CHAPTER MANAGEMENT OF FOREST HEALTH AND VITALITY:-

This chapter on maintenance and enhancement of Forest Health and vitality deals with the general condition of the health and vigor of the forest and steps that are needed to be taken in order to maintain and improve it.

SPECIAL OBJECTIVE OF MANAGEMENT :

- Improve the regeneration status of the forest by encouraging seedling origin new regeneration.
- Minimizing the occurrence and impact of forest fire on forest.
- Detecting and containing pests and diseases from defoliators and skeletenisers to all forms of parasites, fungal attacks..

XIII. CHAPTER CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES :-

This chapter on conservation and Maintenance of soil and water resource focuses on the need to put soil and water on an important pedestal as that which is given to wildlife and forests. In the Department, soil and water conservation need necessary be

tagged to the other conservation measures like plantations works etc but needs to be recognized as an important independent activity. Soil and water are two important natural resources that support the existence of all the being including human and forests.

General characteristics of soil and water resources in Jalgaon :

The National Bureau of soil survey and land use planning. ICAR and Dept of agriculture, GOM etc have published the soil Resource Atlas, Jalgaon District in 2005.

Soil Type : soils are varied in nature. Their extent and development depends on the environmental setting in which they have been evolved

Soil Depth :- The soil depth is of vital important for plant growth as it provides foothold to plant to drew the required water and nutrients from underground sources. As such the greater soil depth normally results in better growth.

Soil Erosion

The soil have been grouped into different erosion classes, their areal extent and expected soil loss is given below.

SPECIAL OBJECTIVES OF MANAGEMENT:

- To protect, conserve and improve the forest land forming part of watershed for more efficient water retention and infiltration.
- To protect and enhance the water resource originating from forest lands.
- To check soil erosion and to reduce the effect of sediment yield on the watershed.
- To rehabilitate the deteriorating lands.
- To moderate the floods peaks at downstream areas.

XIV. MANAGEMENT OF THE SPIRITUAL, CULTURAL ASPECT OF FORESTS AND ECOTOURISM

For the people of India, environmental conservation is not a new concept. Historically, the protection of nature and wildlife was an ardent article of faith, reflected in the daily lives of people, enshrined in myths, folklore, religion, arts, and culture. Some of the fundamental principles of ecology-the interrelationship and interdependence of all life-were conceptualized in the Indian ethos and reflected in the ancient scriptural text, the Isopanishad, over 2000 years ago. It says, This universe is

the creation of the Supreme Power meant for the benefit of all his creation. Each individual life-forms must, therefore, learn to enjoy its benefits by forming a part of the system in close relation with other species. Let not anyone species encroach upon the other's rights.

XV. FIANACIAL FORECAST :-

There has been a steady increase in the funding to the Working Plan activities of the Forest Division in the past two years. This increase is a good sign and needs to be maintained. Looking into the prescriptions of the plan it is seen that the implementation of this plan will incur an average amount of Rs. 1087.62 lakh annually in the first three years and Rs 1456.67 Lakh annually for the next seven years that is from the fourth year onwards. The total expenditure will come to Rs. 1345.955 Lakh annually.

SOURCE OF FUNDS FOR THE IMPLEMETATION OF THE PLAN

The sources of funds during the last Plan were Plan Schemes, Non-Plan schemes,CAMPA, District Plan (DPDC), MNREGA, special Project Jalyukt Shivar,etc.

PLAN Funds: From the Plan expenditure statement, as provided by the DCF, the annual Plan funding is Rs 1000.9 lakh per year. Going by this average, the expenditure that would be required for the implementation of the Plan/Scheme needs to be enhanced.

NON PLAN : The amount received by the last three years under Non Plan averages approximately to Rs. 820.096 lakhs per year.

CAMPA: The CAMPA is an important source of funding. In the Jalgaon Division, the CAMPA fund between 2011-12 to 2013-14 was Rs. 7 lakhs. This can be increased for the core forestry operations for the implementation of the plan.

District plan: The District Plan funding for the up gradation of Nurseries, the development of Eco-Tourism sites, etc should be explored.

MNREGA: Labour intensive works that can be implemented through MNREGA should be thought of as a good source of funding. EGS, which is the original scheme

started for employment guarantee as the first such scheme in the country by the Government of Maharashtra, should also be tapped into as done in the past.

NAP (FDA) : The National Afforestation Program implemented all over the country with emphasis on peoples participation should be made use of for the implementation of the Working Plan prescriptions.

Special Projects: State specific and District-specific projects like Jalyukt Shivar and others should be taken up for the implementation of the Plan. However,it should be noted that the implementation of such projects should be as per the Working Plan and not in conflict with it. A point to be noted is that sometimes the DCF taking the opportunity of the funds available, takes up work on coupes not due even though such work could be carried out on the due coupes. This should be avoided.

BENEFIT COST RATIO:

The cost of implementing this Working Plan is expected to be more than the benefit. This is the B.C. ratio of only those parts of the tangible benefits that would be directly extracted as per the tables placed below.

As discussed under the Chapter 9 in Para 9.6 Forest Resource Accounting, if the value of the benefits of the Forest including tangible and intangible is taken into account, the amount that is being derived as benefit far outweighs and exceeds the little investment that will be put in. The value of the benefits derived from the Forests is around Rs 601316.30 lakhs as per the current rate of NPV value for the Jalgaon Forest. As the NPV rate is taken for the benefits accruable over the period of 20 years the annual benefit comes to Rs. 30065.81 lakhs. This figure as per the new NPV rate proposed is Rs. 1357040.44 lakh but the annual period is variable for various forest types and situations. Hence it is difficult to find the annual benefits.

XVI. CHAPTER MISCELLANEOUS REGULATION:

1. Boundary demarcation of all un-demarcated areas (Entire Zudpi jungle are, Acquired private Forest & Non Forest land taken over for C.A) to be accomplished in first three years of the plan.

2. Boundary pillar which is not easily vulnerable to damage.

3. Three years Survey and Demarcation Programme.

4. Boundary demarcation is necessary due to honeycombing.

5. Updating of areas registers.

6. Where claims are finally rejected, removal of such encroachments.

XVII. SCINCE AND RESEARCH

RESEARCH GAPS:

Because of the lack of any research works/paper related to the Division, the many chapters that involve specific information onJalgaon Forest Division could not be written with accurate data. The research gap is in almost every aspect of the Working Plan as our writing of the Plans in early years has not looked into the new aspects that the need of our present times require, like Biodiversity and all its components, Climate change and Carbon sequestration\NTFP research, ITK, Trees outside forests, Social and cultural aspects of forests, Ecosystem services etc.

Sample Plots

For the preparation of this Working Plan a total of 1501 sample plots were laid and the relevant detailed information was recorded. These are distributed in different Working Circles under different ranges and are well-distributed throughout the division. A total of 50 number of representative plots were chosen taking 10 from each Working Circle and the details are shown below:

Selection of Plots: As the forests of Jalgaon is of one single forest type of sub-group 5-A Southern Tropical Dry Deciduous forests, with a sprinkling of other types, the major variation in the forest is not in the type of the forests but in the attributes (like density, composition age distribution etc.) within the type. As the Working Circles were identified based on these attributes, each Working Circle stands as representative of the density and composition of the forest, hence the choice of 10 sample plots form each Working Circle. Secondly, the ten sample plots chosen are the most representative for each of the Working circle in terms of species distribution, age density and other factors.

Regeneration Plots:

Selection of Plots: The Sample Plots have been surveyed as per the New Working Plan Code 2014 and have in them the four numbers of 3 x 3 m sub-plots recorded for

the regeneration too. These plots will also be the plots where regeneration will also be studied. This will make the monitoring and data collection easier as well.

Data to be Collected: Regeneration plots are established to study the regeneration status of important species. Data should be collected on population dynamics of seedlings, saplings and young trees. Each seedling and sapling should be marked individually. The marked seedlings should be measured and monitored periodically.

The status of growth, their health and conditions should be measured in detail. The conditions of soil (depth, humus content etc), presence of litter, the canopy opening level, should be recorded properly. The incidences of pest should be recorded. Any threat and outside interference like fire, grazing etc should be removed. The monitoring should be done periodically, the period of which should be decided in consultation with the SOFR unit and the Research wing. The role of mycorrhiza and litter cover management should be considered.

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CHAPTER-20

TREE COVER OUTSIDE FOREST AREA

20.1: INTRODUCTION:

This Chapter deals with the important aspect of tree presence and its contribution for tree cover of the District and forest Division of Jalgoan.

Trees outside the forest are defined by default, as all trees excluded from the definition of forest and other wooded lands. Trees outside the forest are located on "other lands" mostly on farm lands, community lands, land along the roads, river, railway line, canal and built-up areas, both in rural and urban areas. A large number of TOF consist of planted or domesticated trees. TOF include trees in agro forestry systems, orchards and small woodlots. They may grow in meadows, pastoral areas and on farms, or along rivers, canals and roadsides or in towns, gardens and parks. Some of the land use systems include all cropping and shifting cultivation, permanent tree cover crops (e.g. coffee, cocoa), windbreaks, hedgerows, home gardens and fruit-tree plantations .

Jalgoan forest division comes under Jalgaon, Bhusawal, Bodwad, Muktainagar, Jamner, Bhadgaon, Amalner, Pachora, Parola, Chalisgaon, Dharangaon and Erandol Talukas. These 12 Talukas are having geographical area 8794.54 sq.km. of which Jalgoan Forest Division is having 869.14 Sq.km. area.

The Plantation/Tree outside Forests (TOF) for State of Maharashtra according to the State of Forest Report 2015 is 1,232.17 sq. kms adding 2.38% to the forest cover of the State. However no specific figure for the District is available.

TOF (Rural) The area decide to be surveyed: The TOF area includes all areas outside the traditional /notified Reserved and Protected Forests but excludes areas of Municipality, Corporation, Cantonment Board or 5 a notified area Committee etc. which has population more than 5000 and more than 75% male working population are engaged in non-agricultural occupation.

The TOF (rural) area within a district is stratified into block, linear & scattered stratum using remote sensing methodology. Adequate sample points within each stratum will be selected randomnly to capture the variability. The lat./long. of each

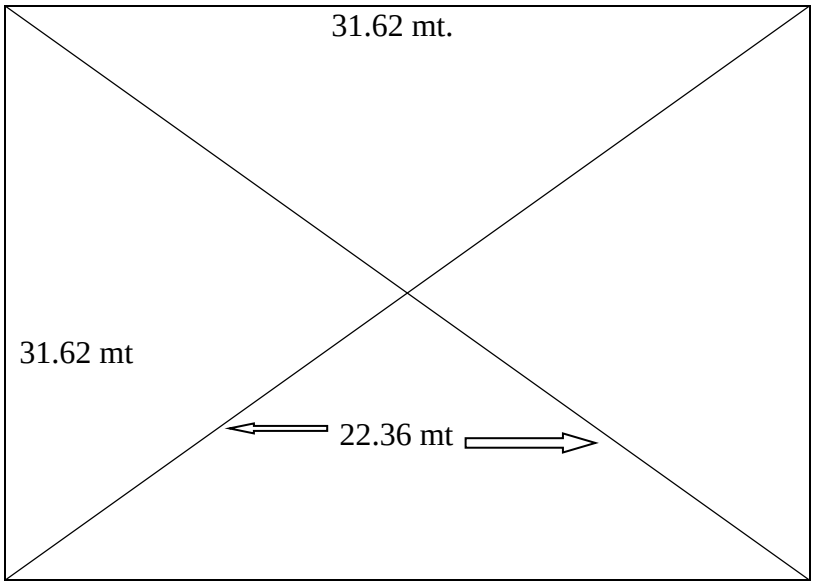
sample point within each stratum in a particular district will be communicated to the respective zonal headquarters for onward transmission to the field units.

Maps to be used during survey: Only the latest published maps on 1:50,000 scale will be used, however if the maps are not available on this scale the alternative maps like grey prints, or bromide prints or even 1″ = 1 mile scale maps can be used during survey. A precaution has to be taken that no area is left unsurveyed for the non-availability of maps.

Survey design: The study area for this survey is considered as rural areas outside forest areas of the district. For any survey, sampling frame is required. Stratified random sampling method is being adopted for the survey. The district is further stratified into three strata namely, block, linear and scattered. Plots are the sampling units and frame of strata as blocks, linear and scattered stratum of each district will be prepared by the headquarter. The number of sample plots and size in blocks; linear and scattered stratum to be surveyed in the non-hilly district are as follows: a) In a district 50 square plots of 0.1-hectare sizes in block stratum will be located and surveyed. b) In a district 60 rectangular plot of 10m x 125m of sizes in linear stratum will be located and surveyed. c) In a district 60 square plots of 3.0-hactare sizes in scattered stratum will be located and surveyed. From the study conducted for determination of plot sizes and sample size for all the three strata, initially it was concluded that 35 plots in block and 50 plots each in linear and scattered stratum are to be surveyed. However, it is felt some points may not be traceable on the ground or may be inaccessible or status of points may not match with the stratum or may fall in forest/ urban areas.

Tree: It define as A woody perennial with a single main stem, having diameter 10 cms or more at breast height (1.37m). If there are stems below 1.37 m height then individual branch/stem which has attained 10 cms dbh will be considered as individual tree. It also includes bamboo, palms, coconut, neem, peepal, fruit trees etc.

1. Data collection 1.12.1 layout of the plot in the block stratum



2. Layout of the plot in the linear stratum

After reaching the center of the plot at given lat. & long as per sample list the plot centre is to be fixed keeping 62.5m on both sides. Accordingly, plot along the linear strip is to be laid out and width of 10m will be taken with the help of chain/ measuring tape from the starting canopy of the strip of trees. If any of the side is less than 62.5 m then plot center is to be adjusted in such a manner that each side of the adjusted plot is 62.5 m respectively, as shown in the figure below

3 layout of the plot in the scattered stratum After reaching the plot center with the help of lat. & long. a square plot of 3.0 ha will be laid out.

TOF (Urban)- The definition of urban area followed in this survey is same as followed in the decennial Population Census of Urban areas in 1991 Census and consist of: A, (i) All places with a Municipality, Corporation, and Cantonment Board or Notified Town area Committee etc.

The urban area corresponding to the selected district is the area of interest for this survey. The urban centers notified by office of RG of India is being taken as urban area of the districts concerned.

Maps to be used during survey: Only the latest UFS maps taken from NSSO will be used during survey.

Survey design: The study area for this survey is considered as urban centers defined in district census Book. For any survey, a sampling frame is required. Sampling frame for urban areas has been prepared by an agency called National Sample Survey Organisation (NSSO) under the Ministry of Statistics and Programme Implementation Government of India. This organization conducts surveys by the name of Urban Frame Survey (UFS). They divide the whole urban centers of a district in blocks called UFS blocks. These blocks are having clearcut well defined natural boundaries. These blocks are formed on the basis of 600-800 population or 120-160 households and cover the whole area within the geographical boundary of town including vacant lands. 4 The sampling technique to be used is stratified random sampling. The number of sample blocks to be surveyed in the district is to be decided by the following method. a) In the district 10 % of total blocks will be selected and proportionately distributed in five class of town when available UFS blocks in the districts are less than 500. Minimum number of blocks should not be less than twenty in a district. b) In the district 5 % of total blocks will be selected and proportionately distributed in five class of town when available UFS blocks in the districts are between 500 and 1000. c) In the district 2.5 % of total blocks will be selected and proportionately distributed in five class of town when available UFS blocks in the districts are more than 1000. With restriction that the maximum number of selected blocks should not exceed 60. Note: It should be ensured that at least four blocks should fall in each class of town. This may increase the number of blocks in the district from the given percentage. The sample blocks in each class of town will be selected by using random number table. A town class wise sample list of randomly selected blocks in each district will be prepared and provided to concerned field parties for carrying out complete enumeration of all the trees of 10 cm and above dbh in the prescribed formats.

Definition of trees outside forest (urban) area Trees outside forest (urban) Area: (ii) All other places which satisfy the following criteria: A minimum population of 5000 At least 75% of male working population being engaged in non-agricultural (and allied) activities; and, A population density of at least 400 persons per sq.km (or 1,000 per sq.mile)

(iii) Places having distinct urban characteristics such as major project colonies, areas of intensive industrial development, railway colonies, important tourist centres - even though such places may not strictly satisfy the criteria of (a) & (b).

	Forest Cover outside the RFA/GW	Tree Cover	Extent of TOF
Maharastra	16,139	10,806	26,945
Jalgaon	338.91	299.36	813.35

(in sq km)

Trees Outside Forests planted under Social Forestry Jalgaon Division during the period 1982 to 2007.

1. Total beneficiaries :- 822

2. Total Planted Area :- 9869.71 ha.

3. Road side plantations in km. :- 484.50

4. Total No. of seedlings planted :- 13.95 lakh

5. No. of surviving trees upto 2007 :- 6.97 lakh

6. Percentage survival -- :- 49.99 %

These Seven lakhs mature trees that have survived may be presumed to have been retained by the beneficiaries to some extent. They have added a substantial additional forest cover in the district.

Trees Outside Forests planted under Social Forestry Jalgaon Division during the period 2008 to 2017.

Block Plantation

1. Total Planted Area - 237.51 ha.

Road-side Plantation

1.Total lengthin Km. - 352.25 km.

2. Total No. of Seedlings Planted 5,73,038

3. Survival count of seedlings at the time of handing over the scheme 2,86,519

The above information has been extracted from the booklet prepared by the Jalgaon Social Forestry Division where year-wise, scheme-wise and species planted are given. The same is too bulky to be appended.

The Trees Outside Forests need to be assessed by the Social Forestry Division of the District. With the present data already available with the Division &precise number of trees and forest cover present in the areas outside can be arrived at. There is a need to design a model for the survey of trees outside forest at the state level so that a realistic figure of the TOF could be arrived at.

The Trees outside Forests need to be assessed by the Social Forestry Division of the District. With the present data already available with the Division, a precise number of trees and forest present in the areas outside forest can be arrived at. There is a need to design a model for the survey of trees outside forest at the state level so that a realistic figure of the TOF could be arrived at.

The Forest Survey of India, Ministry of Environment and Forest has come up with the field manual on assessment of trees outside forest (urban) which may be taken as a guide for the assessment of the TOF in the urban areas of the District.

20.2: AGRO FORESTRY

Agro forestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboo, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components. Agroforestry can also be defined as dynamic, ecologically based, natural resource management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels. In particular, agroforestry is crucial to smallholder farmers and other rural people because it can enhance their food supply,income and health. Agroforestry systems are multifunctional systems that can provide a wide range of economic, socio-cultural, and environmental benefits.

There are three main types of agroforestry systems:

Agrisilvicultural systems are a combination of crops and trees, such as alley cropping or homegardens.

Silvi-pastoral systems combine forestry and grazing of domesticated animals on pastures, rangelands or on-farm.

The three elements, namely trees, animals and crops, can be integrated in what are called **agro silvi-pastoral** systems and are illustrated by home-gardens involving animals as well as scattered trees on croplands used for grazing after harvests.

Agroforestry is a low-input system which combines trees with crops in various combinations or sequences. Agroforestry also has the potential to reduce risk through diversification of a variety of products, including food, fuel wood and animal fodder. Agroforestry combines agriculture and forestry technologies to create more integrated, diverse, productive, profitable healthy and sustainable land-use.

Availability of Land for agro-forestry:

Table No. 20.1 Change in Land-use Pattern in three talukas comprising Jalgoan Forest Division. (1990-95 to 2005-10)

Taluka	Year	T.G.A.	A.U.F.	A.N.A.F.	O.U.L.E.	F.L.	N.S.A
Jalgoan	1990-95	95000	35163	4308	2666	1192	57146
	2005-10	95000	35163	929	7182	510	62216

Note :-

T.G.A. **- Total Geographical area**

A.U.F. - **-Area under forest**

A.N.A.F. **- Area not available for cultivation**

O.U.L.F **- Other uncultivable land excluding fallow land.**

F.A. **- Fallow Land**

N.S.A. **- Net sown area.**

The above table gives a picture of what area is under fallow (both current and other fallows), area which is very much needed figure for assessing the possible expansion and scope of forestry and agroforestry.

Not only is agroforestry possible in the area sown but the area under current fallow and other fallow which is about 5840 ha. is a potential area for agroforestry under its different types namely, Agrisilvicultural, Silvipastoral and Agrosilvipastoral.

The areas not available for cultivation, Fallow land & uncultivable land excluding fallow land is another opportunity that is open for the creation of forest crops that would benefit the local people and ease the pressure on the forests. As envisaged by the National Forest Policy, it is important that the wastelands in any part of the country and in this District should not remain but be transformed into productive lands by way of forestry and agroforestry.

The Social Forestry Department of the State and the Department of Agriculture/Horticulture in collaboration with the Forest Department should work towards the possibility of bringing this area under some form of forestry and agro forestry.

Plantation on Non Forest Government Land :- Such areas should be identified and Plantation of suitable local species along with species of commercial importance should be planted with the help of community participation. Suitable silviculture and management practices must be applied for getting good output. Peoples participation is necessary for getting good results.

Roadside/Canal-side Plantations:

With the adoption of the Bihar Model of Roadside Plantation, it is seen that the burden of the **SFD** staff in taking up such plantation has reduced and that the success of the plantation is also excellent. This rate of plantation could be increased covering more sites and taking up more such plantations in the future.

Other Models and Plantation:

The following types of Agroforestry possibilities should also be explored as per the site conditions and the requirement of the people.

a. Boundary/Bunds Plantation: Trees on boundary + crops

b. Block plantation: Trees + Crops

c. Energy plantation : Trees + crops during initial year

d. Alley cropping: Shrubs + crops

e. Agrihorticulture: Fruit trees + crops

f. Agrihortisilviculture : Trees + fruit trees + crops

g. Hortipasture : Fruit trees + pasture/animals

h. Shelterbelts : Trees + /- crops

i. Windbreaks : Trees + /-crops

j. Homesteads: Multiple combination of trees, fruit trees etc.

Suggestive Steps for the Increase of Agroforestry

(a) As per the table above, the identification of the fallow lands, culturable and unculturable wasteland Range/Taluka-wise in agricultural land which is available for taking up afforestation should be done at the District level.

The area under community land should be given priority for plantations.

(b) Drawing up appropriate time specific action plan is essential, which will require the involvement of the Social Forestry Department and the Agriculture Department along with the Forest Department

(c) Farmers must be encouraged and motivated by way providing them technical assistance and cooperation by forest department and SFD for taking up planting trees.

(d) Land laws, if any, should be so modified wherever necessary so as to facilitate and motivate individuals and institutions to undertake tree-farming and grow fodder plants, grasses and legumes on their own land.

(e) Wherever possible, degraded lands should be made available for this purpose either on lease or on the basis of a tree-patta scheme, Steps necessary to encourage them to do so must be taken. Appropriate regulations governing the felling of trees on private holding should be appropriately relaxed.

(f) High quality planting stock including clonal planting stock supported with improved silvicultural management practice can be used in a second green revolution in India this time in respect of tree crops for timber and fuel-wood / fodder production. This critical requirement of genetically improved high quality planting stock should not be neglected, which will impact productivity and quality improvements.

(g) Peoples support in forest conservation is to be recognized by the state forest departments. Appropriate extension programme are to be undertaken to motivate and make them conscious of the value of trees, wildlife and nature in general. This can be achieved through the involvement of educational institutions, Krishi Vigyan Kendras, mass media, audio-visual aids and the extension machinery, Trainers Training Centres to learn agri-silvicultural and silvicultural techniques to ensure optimum use of their land and water resources.

(h) The wood based industries have important role to play in development of agroforestry. They should consider making appropriate arrangements with farmers and play a facilitative role in arranging quality planting material and enter into buy back arrangements.

(i) Preferred Tree and bamboo species under agro forestry by farmers and not naturally available in neighboring forests may be exempted from the transit permit and felling regulations.

(j) The possibility of a Public-Private Partnership in regenerating the culturable wasteland and barren unculturable wastelands of about 260 sq.kms. should be explored. This can also be explored for raising the improved planting material for supply to the farmers.

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CHAPTER-21

CONTROL AND RECORDS

21.1: CONTROL AND RECORDS:

The following records will be maintained in the Jalgoan forest division office:

i. Control forms.
ii. Deviation proposals.
iii. Compartment history.
iv. Plantation registers.
v. Nursery register.
vi. Divisional notebook.
vii. Boundary registers.

i. Control forms:

All control forms and Compartment histories shall be maintained as per the formats prescribed in Appendix No. XXXVI

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.

Two sets of control forms will be prepared. One set will be kept in the division office and the other set will be submitted to the Deputy Conservator of Forest, working Plan, Dhule. The forms will be sent annually by the Deputy Conservator of Forest Jalgaon Division to the Deputy Conservator of Forest, working Plan, Dhule not later than October, 1st every year taking the necessary entries. All entries showing the deviations from the prescriptions will be underlined in red color. The Deputy Conservator of Forest, working Plan, Dhule will scrutinize it and process further. The division office will prepare the control forms of the coupes worked every year from the start of the working plan religiously and submit the same to working plan office in the control form as given in volume II by April month end. The division will also submit location maps of the area treated along with lattitude and longitudes(northings & eastings) to working plan office. The treated area maps are registered in GIS system and the monitoring of vegetational changes should be done using remote sensing images year after year by working plan office. The False colour composites

for the entire division area required for image processing are procured by division office from National Remote Sensing Center(NRSA) and given to working plan office regularly. The images should be of September to October period. The working plan office will verify 10 percent of the field work done by division office to check whether the prescriptions are properly implemented or not.

ii. **Deviation Proposals:** Due to lack of funds or due to any other reasons the division fails to treat the coupe as per working plan proposals, the division should submit deviation proposal at the end of every year of coupe treatment for further necessary action. Minor deviations can be sanctioned at the level of the CCF working plan or the PCCF as the case may be: but the PCCF, before sanctioning the major deviations of the followig nature, will necessarily take prior approval of the Regional CCF of the Ministry of Environment and Forests:

- Change in Silvicultural System.
- Clear Felling of Natural Forest.
- Formation of new Felling Series: and
- Large scale felling due to natural calamaties, which can not be adjusted against future yield.

iii. Compartment history:

Compartment histories i.e. the records of various forestry activities and observations made in the past year will be maintained in Forms prescribed in Appendix XXXVI

Each Compartment must have a separate file its records. Compartment history must be maintained in the office of Jalgaon forest division since they keep the record of past management practices and their effects on the growing stocks.

Every year, in July, the range Forest Officer should fill in the necessary information and will send it to Dy.C.F Jalgaon 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 sent to Deputy Conservator of Forest, working Plan, Dhule for scrutiny.

iv. Plantation and nursery registers:

Plantation registers & Nursery registers will be maintained for all the areas regenerated artificially as per established departmental procedures. Appendix no. XXXXII.

v. Divisional note book:

At divisional level, all important matters will be recorded by the DCF Jalgaon division 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. Appendix no XXXXIV**.**

vi. Fire records:

They should be maintained as per the latest orders from State Government from time to time.

vii. Other records:

List of amendments to working plan and list of area changes will be maintained in prescribed forms.

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The consultative committee meeting was held at Nagpur on dt.26.4.19 for approval of DWPR of Jalgaon Forest Division. The following members of the committee have given various suggestions / corrections to be incorporated in DWPR of Jalgaon Forest Division.

After incorporating all the suggestions / changes final DWPR of Jalgaon Forest Division is re-submitted herewith for its approval.

The compliance for the suggestions given by various members is given below.

S.No.	Suggestions	Compliance
Suggestions made by Shri Praveen Shrivastav Principal Chief Conservator of Forests (Information Technology and Policy) M.S Nagpur :		
1	Allotted areas should be deleted from working plan.	As per GIS cell Nagpur satellite imaginary data shows that total area of encroachment of Jalgaon forest division is 8643.08 ha. out of this 930.61 ha. area under Encroachment comes in Muktai Bhavani conservation reserve so tatal 7713.03 ha. has been deleted from the working plan and it is separately kept under miscellaneous regulations. (Page NO.330). (Ground truthing of the deleted (Encroached area should be done jointly by the DILR & Forest Department Jalgaon and after verification encroached area should be Properly treated.)
2	Verify area shown under PF/CA Protected forest area and area of compensatory Afforestation should be shown separately.	Area verified and section wise area shown on page no.8 of Vol –I

S.No.	Suggestions	Compliance
Suggestions made by Shri. V K Sinha, Retd. Principal Chief Conservator of Forest Nagpur		
1	For preparation of working plans area of last working plan is referred instead of that, land records should be referred.	Area of land record referred . The area of last working plan (T.S.K. Reddys Plan) is tallied with the proposed working plan area. Vol-I page no.8
2	Areas included in Conservation reserves should be deleted from this plan.	Total area of the Muktai Bhavani Conservation Reserve is 12274.063 ha. has been deleted from the varies working circles of the proposed Working plan Vol—I page No.9.
3	In area statement, Reserved forest area should be further classified section wise.	The Reserve forest area of the proposed working plan has been further classified by the Gazette Notification under various Section of the IFA Vol-I Page No.8.
4	Check species which were proposed for planting in Babul working circle in previous plan.	Plantation of Babul and babul species is prescribed in the previous W.P. (T.S.K Reddys plan) given on page no 142 of Vol –I has been checked and found correct.
5	Regeneration data should be included as Appendix in working plan.	Data on regeneration status is collected along with enumeration of the crop in four 3mX3m sub plots in the enumeration plots . The number of regeneration of R1, R2 and R3 of Height up to 1 mt., 1 to 3 mt. and above 3 mt. and beyond 3 mt. respectively. The data is incorporated in chapter no 4. Page No.33 and 34 of Vol-I.
6	Conservation reserve area should be deleted from working plan.	Total area of the Muktai Bhavani Conservation Reserve is 12274.063 ha. has been deleted from the varies working circles of the proposed Working plan Vol—I page No.8.
7	Prescriptions proposed in Protection working circle should be revised. Climber cutting, removal of trees etc item should be deleted.	Prescription Proposed in Protection W.C. has been revised under heading 2.6.2 silvicultural system page No.168of Vol- I. Climber cutting ,removal of trees has been deleted form the cleaning opration under title 2.6.11.1 (Method of treatment) Page no.169 of Vol-I.
8	Prescriptions proposed for eco sensitive zones should be revised Plantation species should be given.	Considering the notification Gov. of India . Dated 9th December 2016 regarding declaration of Eco-sensitive zone accordingly the prescriptions are changed please see page No174 of Vol-I and for habitat improvement some of the species are prescribed for plantation

9	Maximum five common climber species should be cut other species should be retained.	Maximum five common climber Species which are to be cut 1. Chilar 2. Kadu 3.Kuhili 4.Sagargota 5. Vasan are given and other climber species should be retained is given on page no.186 Vol-1 under title 3.6.11 Subsidiary silvicultural operations .
10	In Anjan working circle, prescription for removal of malformed then should be deleted as it is not used for timber.	In Anjan working Circle in marking rules all malformed advance growth of Anjan up to 30 cm girth and malformed trees has been deleted please see page no 195. (Sec.4.6.10 (i.) of Vol – I.)
11	In fodder working circle prescription for planting of Subabul And Glyricidia to be deleted.	In Fodder Working circle under treatment proposed type A & C, D Species like Subabul ,Glyricidia have been deleted page no 207 (Sec.5.6.11) of Vol – I.
12	FRA / PESA prescription should not be included in working plan	Prescription of FRA has been deleted from the proposed W.P. page no 63 (Sec.8.8) Vol- I
13	Prescriptions proposed for soil and moisture conservation works, in Forest Protection (overlapping) working circle.	Prescriptions for soil and moisture conservation Works are incorporated on page no.247 Vol- I .The treatments for steep slopes where gradient is $> 25^0$ and $<25^0$ the details are given.
Suggestions made by Shri. S.G. Tembhurnikar, Additional Principal Chief Conservator of Forest (Conservation) M.S Nagpur		
1	As area is degrading in Jalgaon Forest Division, fodder and development should be focused mainly.	The area of Jalgaon forest Division is degrading therefore in the B type area fodder species and grass beds are proposed in fodder W.C. Page No 206 (Sec.5.6.10) Vol. I
2	Boundary should be demarcated using DGPS method.	Under Boundary Maintenance the Boundaries are to be demarcated by using DGPS method has been prescribed and under miscellaneous regulation same is also being done page no 253 of Vol-I.
3	Comparison of Carbon stock enumeration with national level figures be given.	Data on Carbon Stock is collected along with enumeration of the crop in Jalgaon forest division it is carried out by the SOFR Nasik Unit and Jalgaon forest division field staff under the guidance of Chief Statistician PCCF office M.S, Nagpur Where in Carbon Stock (Carbon Sequestration) has been worked out and information is given on Page No 52 Vol- I.
4	FRA/PESA prescription should not be included in working plan.	Prescription of FRA has been deleted from the proposed W.P. page no. 63 in vol.I

5	Information to tackle the issue of degraded areas should be given.	In Afforestation W.C. on page no 215 under General Prescription for treatment under stocked and blank forest areas where slopes are $<25^0$ should be treated by intensive soil and moisture conservation works like gully plugging, nala bunding, LBS, CCT, deep CCT works are recommended and seed sowing of Neem, Khair, Moha and other local species should be done in bushes as per site suitability before the onset of Monsoon.
Suggestions made by Shri. S.H. Patil, Principal Chief Conservator of Forest (Production and Management), M.S Nagpur. :		
1	Mukta Bahavani should be corrected as Muktai Bhavani.	Spelling corrected on page no.276 vol. I
2	Mention the area of Muktai Bhavani reserve Plan	The total area of Muktai Bhavani Conservation preserve is12274.063 Ha. is mentioned on page no 9 of Vol- I.
3	Conservation area plans should be revised / extended.	Dy Conservator of Forests Jalgaon forest division is taking care to revise the conservation plan and extend the period in consonance with the proposed working plan period.
4	Delete species Siretro in Fodder working Circle.	Species Siretro deleted from foder working Circle. (Page no 207 Vol -I)
5	As per National Working Plan Code 2014 Wild life management (over lapping) working circle. Forest protection (over lapping) working circle, JFM (over lapping) working circle, NTFP (over lapping) working circle, etc. should be written as chapters instead of working circles.	All the overlapping working circle are changed into the chapters. Page No NTFP 222-238 Forest Protection 239-254 JFM 255-262 Wild life management 263-271
Suggestions made by Shri. A.N. Tripathi, Additional Principal Chief Conservator of Forest (Working Plan-West) M.S Pune. :		
1	Reasons behind carrying out less work should be mentioned.	During plan period 2008-09 to 2017-18 due to shortage of funds targets of plantation under different heads were given less than actual area proposed in the working plan.

<table>
<tr><td>2</td><td>Details of works carried out should be given</td><td>During plan period 2008-09 to 2017-18 the works of artificial regeneration, soil & moisture conservation were carried out in various working circle. Year wise works carried out is as under.
<table>
<tr><td>Name of working circle</td><td>Page no.</td><td>Plantation works Table No.</td><td>SMC works TableNo</td></tr>
<tr><td>P.W.C</td><td>101,102</td><td>11.3</td><td>11.4</td></tr>
<tr><td>I.W.C</td><td>104,105</td><td>11.5</td><td>11.16</td></tr>
<tr><td>Anjan W.C</td><td>106,107</td><td>11.7</td><td>11.8</td></tr>
<tr><td>Fodder W.C</td><td>109</td><td>11.9</td><td>11.10</td></tr>
<tr><td>Babul W.C.</td><td>112,113</td><td>11.1</td><td>11.12</td></tr>
<tr><td>Afforestation W.C</td><td>116</td><td>11.13</td><td>11.14</td></tr>
<tr><td>Plantation Management Overlapping W.C</td><td>199</td><td>11.15</td><td>11.16</td></tr>
</table></td></tr>
<tr><td>3</td><td>Prescriptions pertaining to eco sensitive zone should be based on sanctioned document.</td><td>Considering the notification of Govt of India. Dated 9th December 2016 regarding declaration of Eco-sensitive zone accordingly the prescriptions are changed (Page no 174 of Vol - I) and for habited improvement some of the species are prescribed for plantation.</td></tr>
<tr><td>4</td><td>Result of old Anjan plantations should be included.</td><td>The Anjan Plantations were taken in the Vadoda range of Jalgaon division, since 2008 to 2018 under different schemes. Total area covered 1028.13 ha. The survival % of the plantation is enclosed. Page No. 106 Vol –I</td></tr>
<tr><td>5</td><td>Thinning item should be removed in Anjan plantations.</td><td>In the Anjan Working circle thinning was prescribed in the plantation areas, now thinning is removed from the subsidiary silvicultural operations. (Page no.197.)</td></tr>
</table>

Sd/-
Deputy Conservator of Forest,
Working Plan Division, Dhule.

Copy submitted with compliments
1.The Principal Chief Conservator of Forests, (Production & Management) M.S. Nagpur
2. Chief Conservator of Forests, Workinng Plan, (West) pune
3. Chief Conservator of Forests (T.) Dhule Circle Dhule.
4. Deputy Conservator of Forests, Jalgaon Division.

महाराष्ट्र वन विभाग

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2. CD (Stock Map KML ¾Ö Division Shape File)

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Sr. No.	Suggestions	Compliance
Suggestions made by Regional Office of the MoFF & CC. Nagpur letter no.F.No.12-4/2002(FOR) 6255 Dated 14/02/2020F		
1	Below mentioned information sections and sub sections are missing and few sections and sub sections are not written as per National Working Plan Code 2014 in the Working Plan:	
	i. Name of the Working Plan Officer who has written the Working Plan is not mentioned. The same has to be written on cover page of the Working Plan.	Necessary Suggestion has been complied.
	ii. Reason for reduction in area of Working Plan from previous working Plan is not mentioned. The same may be submitted.	Reason- The area under Muktai Bhavani Conservation reserve is 12274.063 ha. has been reduced from the total area of the plan. Total area -86914.13 Muktai Bhavani area -12274.063 Working plan area- 74640.10 (page no 160)
	iii. Information on list of lichens, algac, fungl etc under Other section in Glossary of terms Chapter is not included	Necessary Suggestions have been complied on page no.lxxix
	iv. Harvestable Girth of Different species in Old Working of Plan and New Working Plan is not included in the Working Plan.	Harvestable Girth of i) Teak- 110 cm. ii) Shisam, Bija, Aim, Haldu- 120 cm. iii) Tiwas, Khair - 90cm are given in the previous working plan written by P.R.Vaidya (Dy.C.F.) Period 1966-97 to 1980-81 under Selection Com Improvement Working circle. However in the subsequent Working plan selection com Improvement working circle were not prescribed and therefore 1980-81 onward there was no green felling, so in new W.P.2019-20 to 2028-29 SCI working circle is not prescribed, hence harvestable girth class is not given.
	v. Section-8.1 of Part-I should have been Number of JFM committee and area(s) protected by them instead of Introduction.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 60
	vi. Section-8.8 of Part-I should have been Status of compliance of Forest right Act (FRA) instead of implementation of FRA 2006 in Jalgaon Forest Division.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 62
	vii. Section-11.3 of Part-I i.e. Special works of improvement undertaken is not included in	Necessary Suggestion has been complied and incorporated in DWPR on page no. 97.

	the Working Plan.	
	viii. Chapter. II (Protection Working Circle). a. Section 2.4 of Part II should have been Felling series, Cutting sections and JFM areas instead of Felling series, Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 164
	ix. **Chapter. III (Improvement Working Circle).** a. Section 3.4 of Part II should have been Felling series Cutting sections and JFM areas instead of Felling series, Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 178
	b. Section 3.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the treatment.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 180
	c. Section 3.6.11 of Part-II should have been Subsidiary silvicultural operations cleaning and thinning instead of Subsidiary silvicultural operations only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 183
	x. Chapter. IV (Anjan Working Circle). a. Section 4.4 of Part-II should have been Felling series. Cutting sections and JFM areas instead of Felling series, Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 189
	b. Section 4.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the treatment.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 192
	c. Section-4.6.11 of Part II should have been Subsidiary silvicultural operations cleaning and thinning instead of Subsidiary silvicultural operations only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 194

	xi. Chapter. V (Fodder Working Circle). a. Section-5.4 of Part II should have been Felling series, Cutting sections and JFM areas instead of Felling series. Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 201
	b. Section-5.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the treatment.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 203
	c. Section-5.6.11 of Part II should have been Subsidiary silvicultural operations cleaning and thinning instead of Subsidiary silvicultural operations only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 204
	xii. **Chapter. VI AFWC** a. Section-6.4 of Part II should have been Felling series, Cutting sections and JFM areas instead of Felling series Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 212
	b. Section-6.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the treatment.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 213
	xiii. Chapter.VII(Non Timber Forest Produce (Overlapping) Working Circle). a. Section-7.4 of Part II should have been Felling series, Cutting sections and JFM areas instead of Felling series. Cutting sections only.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 219
	xiv.Chapter. VIII (Forest Protection (Overlapping) Working Circle). a. Section-8.4 of Part II should have been Felling series, Cutting sections and JFM	Necessary Suggestion has been complied and incorporated in DWPR on page no. 237

	areas instead of Felling series. Cutting sections only.	
	xv . Chapter. IX (Joint Forest Management (Overlapping) Working Circle). a. Section-9.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the cuttings.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 255
	xvi. Chapter.X (Wildlife Management (Overlapping)Working Circle). a. Section-10.6.1 of Part-II should have been Analysis of the crop instead of analysis of Wildlife.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 262
	b. Section-10.6.10 of Part-II should have been Method of executing the felling instead of Method of executing the cuttings.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 264
	xvii. Since ecotourism i.e. Chapter-II is mentioned as Overlapping Working Circle all the Sections and Sub-Sections has to be written as per Working Plan Code.	Necessary Suggestion has been complied and incorporated in DWPR on page no. 270 to 278
	xvii. Information on below mentioned Sections are not written as per contents mentioned in National Working Plan Code 2014. a. Tree cover outside Forest areas.	Given in DWPR on page no. 362 to 371
	b. Status of Biodiversity Conservation in Forests.	Given in DWPR on page no. 20
	c. Growing Stock of wood	Given in DWPR on page no. 47
	d. Growing Stock of Bamboo	Given in DWPR on page no. 48
	e. Carbon Stock	Given in DWPR on page no. 50
	f. Carbon sequestration and Mitigation.	Given in DWPR on page no. 52
2	Stock map of the division is not submitted along with the Working Plan.	Stock map of Jalgaon forest division is being submitted with this compliance.

3	Soft copy of KML/Shape files w.r.t boundary of the division is not submitted.	Soft copy of KML/Shape files w.r.t boundary Of Jalgaon forest division is submitted herewith.

(B.T.Bhagat)
Deputy Conservator of Forest,
Working Plan Division, Dhule