

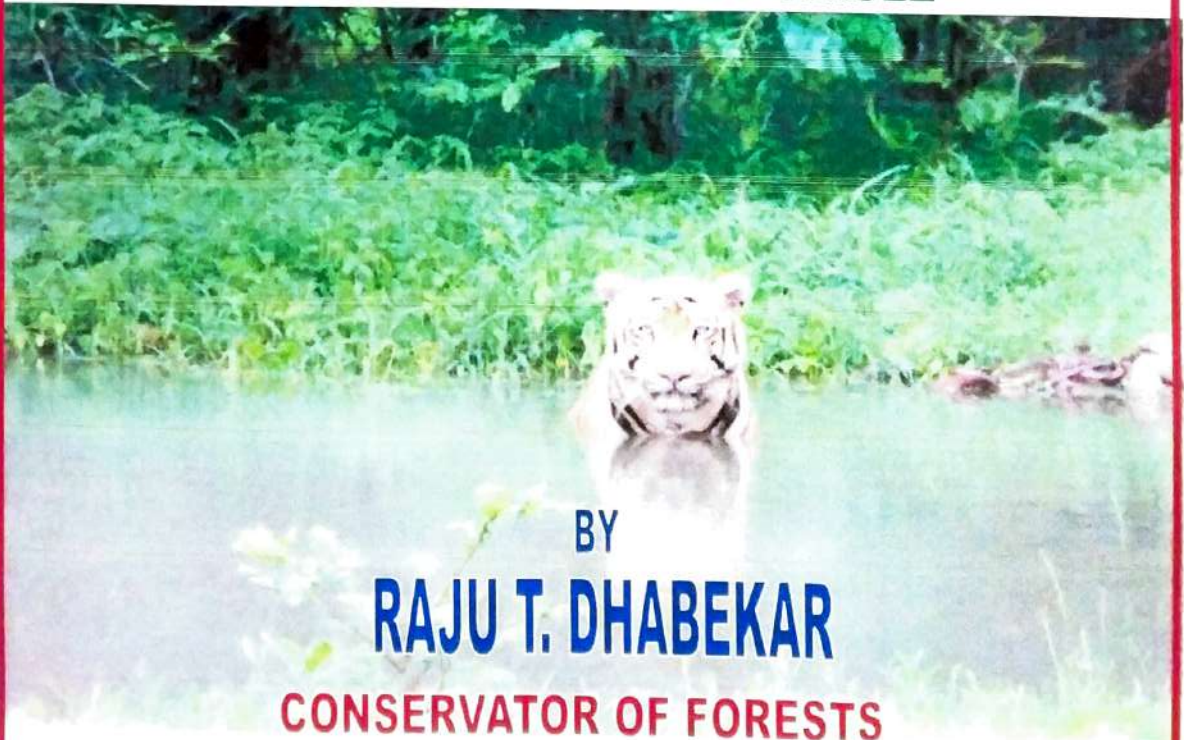


GOVERNMENT OF MAHARASHTRA

WORKING PLAN
FOR THE PERIOD 2016-17 TO 2025-26

VOLUME - I

CENTRAL CHANDA FOREST DIVISION
CHANDRAPUR
CHANDRAPUR FOREST CIRCLE



BY
RAJU T. DHABEKAR
CONSERVATOR OF FORESTS
WORKING PLAN, CHANDRAPUR

GOVERNMENT OF MAHARASHTRA

NO. FDM-2015/CR NO.293/F-2

Revenue & Forest Department

Madam Kama Road,

Hutatma Rajguru Chowk,

Mantralaya, Mumbai 400032

Date :- 12 August, 2016

3 SEP 2016

**SUBJECT: APPROVAL OF WORKING PLAN OF CENTRAL
CHANDA FOREST DIVISION (MAHARASHTRA)
WRITTEN BY SHRI.RAJU T.DHABEKAR, I.F.S. FOR
THE PERIOD OF 2016-17 TO 2025-26.**

MEMORANDUM:

The undersigned presents compliments to the Principal Chief Conservator of Forests (Production & Management) and, with reference to his letter No. Desk-14 WP/Central Chanda/940/2015-16, Dated 28.10.2015 on the above subject, is directed to convey the sanction of Government of Maharashtra to the working plan of CENTRAL CHANDA FOREST DIVISION, Maharashtra State for the period of 2016-17 to 2025-16 prepared by SHRI.RAJU T.DHABEKAR, I.F.S.

The Government of India, Ministry of Environment and Forests has already conveyed its approval to the said working plan vide its letter No. WP-10/RON/2015-NGP/679, dated 29.07.2016 under certain conditions. These conditions should be strictly followed.

By order and in the name of the Governor of Maharashtra,

Yours Faithfully,

(D.L.THORAT)

Joint Secretary to the
Govt. of Maharashtra

Conservator of Forests
Working Plan Division

To,

1. The Principal Chief Conservator of Forests, (Hoff)
Maharashtra State, Nagpur.
2. Principal Chief Conservator of Forests, (Production & Management)
Maharashtra State, Nagpur.
3. Addl. Principle Chief Conservator of Forests, (Working Plan West), Pune
4. Conservator of Forests, (Working Plan), Division, Chandrapur
5. Chief Conservator of Forests (T), Chandrapur.
6. Select File Desk F-2.

अपर प्रधान मुख्य वनसंरक्षक (कार्य आयोजना - पूर्व), नागपूर यांचे कार्यालय.

सि.पी.अॅड बेरार शाळेजवळ, रयिनगर, सिव्हिल लाईन्स, नागपूर
दूरध्वनी क्र. (०७९२) २५६५०५९ फॅक्स क्र. (०७९२) २५६५०५९

कमांक कक्ष-१४/काआ/ मध्यचांदा / ४४२/२०१६-१७
नागपूर-४४० ००९, दिनांक २६/०७/१६

विषय :- मध्यचांदा वनविभागाचे श्री आर.टी.धाबेकर लिखित कार्यआयोजना सन २०१६-१७ ते २०२५-२६ या कालावधीचा प्रारूप कार्यआयोजनेस मंजूरीबाबत

संदर्भ- अपर प्रधान मुख्य वनसंरक्षक (मध्य), पर्यावरण, वन एवं. जलवायु परिवर्तन मंत्रालय, भारत सरकार, नागपूर यांचे पत्र क्र १०/RON/२०१५/NGP/ ६७९ दि. २०/०७/२०१६

उपरोक्त संदर्भित पत्र क्र १ अन्वये केंद्र शासनाने श्री आर.टी.धाबेकर लिखित पुर्व मध्यचांदा वनविभागाचे कार्यआयोजनेस सन २०१६-१७ ते २०२५-२६ पर्यंत मंजूरी प्रदान केलेली आहे. सोबत संदर्भित पत्राची छायांकित प्रत सहपत्रित करण्यात येत आहे.

संदर्भित पत्रात नमुद केलेल्या अटीच्या अधिन राहुन दिलेल्या निर्देशाप्रमाणे आवश्यक ती कार्यवाही करावी व सदर कार्यआयोजनेस तातडीने अमलात आणावे.

तसेच केंद्र शासनाने मंजूरी प्रदान केलेल्या पुर्व मेळघाट वनविभागाचे कार्यआयोजनेच्या खंड-१ व खंड-२ ची प्रत्येकी १ प्रत या कार्यालयाचे ग्रंथालयात ठेवण्याकरिता सादर करावी. तसेच कार्यआयोजना खंड-१ व खंड-२ ची एक प्रत इंदिरा गांधी वनअकादमी, देहंरादून मुख्य वनसंरक्षक तथा वनसंशोधन तज्ञ,पूणे यांचे कार्यालयातील मध्यवर्ती वाचनालयाकरिता ही पाठवावी व सदर कार्यआयोजनेचे Soft Copy सुद्धा या कार्यालयास सादर करावी.

सहपत्र- वरील प्रमाणे


अपर प्रधान मुख्य वनसंरक्षक
(कार्य आयोजना-पुर्व) नागपूर.

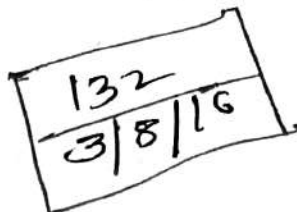
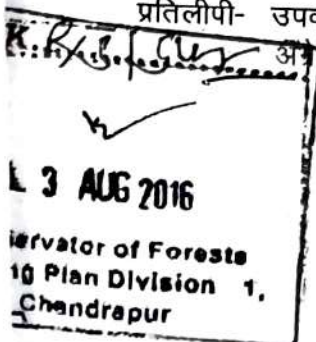
प्रति,

वनसंरक्षक कार्यआयोजना विभाग चंद्रपूर

प्रतिलिपी :- प्रधान मुख्य वनसंरक्षक (उत्पादन व व्यवस्थापन) म. रा. नागपूर यांना माहितीस्तव सादर.

प्रतिलिपी :- मुख्य वनसंरक्षक, (प्रादेशिक) चंद्रपूर यांना सहपत्रासह माहिती व आवश्यक कार्यवाहीस्तव अग्रेषित.

प्रतिलिपी- उपवनसंरक्षक मध्यचांदा वनविभाग यांना सहपत्रासह माहिती व आवश्यक कार्यवाहीस्तव अग्रेषित.





भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS
& CLIMATE CHANGE

Regional Office (WCZ)
Ground Floor, East Wing
New Secretariat Building
Civil Lines, Nagpur - 440001
E-mail: apccfcentral-ngp-mef@gov.in

F.No. WP-10/RON/2015-NGP/679

Date: 29/07/2016.

To,

The Secretary (Forests),
Revenue and Forest Department,
Hutatma Rajguru Chowk
Madam Cama Marg
Mantralaya, Mumbai-400032.

Sub: - Working Plan of Central Chanda Forest Division of Chandrapur Circle written by Shri Raju T. Dhabekar, IFS, Chief Conservator of Forests (WP), Chandrapur for the period 2016-17 to 2025-2026.

- Ref: - (1) PCCF (P&M), Maharashtra Letter No. Desk-14/WP/Central Chanda/940/2015-16 dated 28.10.2015.
(2) This office Letter No. WP-10/RON/2015/518 dated 11/12/2015.
(3) PCCF (P&M), Maharashtra Letter No. Desk-14/WP/E.Alibag/1313/2015-16 dated 22/01/2016. and Letter No. Desk-14/WP/SCC/1354/2015-16 dated 01/02/2016.
(4) This office Letter No. WP-10/RON/2015-NGP/421 dated 20/05/2016.
(5) PCCF (P&M), Maharashtra Letter No. Desk-14/200/2016-17 dated 31/05/2016.

Sir,

With reference to the above mentioned subject, I am directed to inform that Draft Working Plan Report submitted by PCCF (P&M) vide letter at reference (1) above was examined and few shortcomings were observed and the same was communicated vide this office letter at reference (2) above. To the queries raised by our office vide letter at reference, (2) above, compliance report under reference (3) above was received in this office and after examination of the same it was observed that compliance report was incomplete and the same was communicated vide this office letter at reference (4) above. The requisite information was received in this office under reference (5) above and after considering the same, the approval of the Central Government is granted to the said Working plan in accordance with the powers vested under Forests (Conservation) Act, 1980 and subject to the following conditions:

1. The currency of the Working Plan shall be for a period of 10 years i.e. from 2016-17 to 2025-26. Necessary corrections may be made in the final copy of the Plan.



2. The orders of Hon'ble Supreme Court in the matter of Godavarman Thirumulkpad Vs Union of India in W.P. (Civil) No. 202/95 and related interlocutory applications shall be strictly adhered to. Any prescription or operation at variance with the Hon'ble Supreme Court's order shall be kept in abeyance till the order is in force or otherwise modified.
3. Further, in compliance with order to Hon'ble Supreme Court's Order dated 22.09.2000, the Government of Maharashtra shall ensure that regeneration of forests is commensurate with fellings carried out under this working plan.
4. No felling shall be carried out without allocating necessary fund for implementation of regeneration operation so as to make regeneration commensurate with felling. In the events 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.
5. Following the directions of the Hon'ble Apex Court in their order dated 22.09.2000, a Core group has been constituted under the Chairmanship of the Director General of Forests and Special Secretary for deciding the extent of harvesting that could be permitted under approved Working Plans for ensuring regeneration to be commensurate with felling. Instruction/ directions of the Central Government that may be issued in future in this regard shall be strictly complied with. Felling to be done by State Government only after seeking permission from Core Group constituted by the MoEF & CC, New Delhi.
6. Intervening period will be considered as per the prescriptions of the last working plan and wherever work has been carried out may be got regularized/ will be considered as part of last working plan after taking approval of competent authority wherever needed.
7. No forests bearing naturally grown trees shall be clear felled for any purpose whatsoever.
8. Standard thinning and silvicultural operations under the strict supervision of Assistant Conservator of Forests and above will be allowed as per norms to improve the health of growing stock while executing the prescriptions of the Working Plan.
9. Prescriptions of micro plans for JFM (if made) should not deviate from the broad framework /guidelines of the Working Plan and shall be in accordance with various orders of Hon'ble Supreme Court.
10. Felling carried out on forest land after seeking approval of the Central Government under Forest (Conservation) Act, 1980 will not be treated as deviation. However, proposed felling in the forest division shall be restricted proportionately in the current/ future years to compensate this removal.
11. No deviations shall be made from the prescriptions of Working Plan read with the conditions stipulated herein without prior approval of the Central Government under Forest (Conservation) Act, 1980. However, deviations of positive nature i.e. out of turn plantation carried out outside the worked area under any project, schemes and compensatory afforestation may be approved by the competent authority of the State Government to time.

Guj



12. Midterm review of Working Plan shall be undertaken after five years so as to make any changes, if needed to meet the objectives, with the approval of Regional Office, Nagpur.
13. The exploitable girth of tree species and period of felling cycle shall not be lower than the approved in previous working plan.
14. In the vicinity of Nalas and water bodies felling shall not be undertaken.
15. Felling shall not be undertaken near the known resting places of wild animals.
16. Removal of dead and diseased trees will be undertaken under the supervision of an officer not below the rank of Assistant Conservator of forests.
17. All kind of felling including that of dead, dying and diseased trees and for granting of right and concession as well as all illicit felling should be compiled along with the estimation of their stand volumes as per the same volume table used for the assessment of growing stock. This report shall be prepared annually working circle and compartment wise by the territorial Sub- DFO and shall be submitted to the CF, Working Plan for this purpose within 02 months of the end of control year in a proforma, to be designed by the said authority for the purpose. Such removal shall be accounted for against the prescribed felling yield of the relevant year.
18. To ensure sustainable management of Non Timber Forest Produce (NTFP), scientific assessment of estimated quantity has to be done before their removal as per the prescription of Working Plan.
19. Status of rare, endangered and near extinct species shall be monitored closely and adequate measures will be taken for their protection and conservation.
20. Execution of Working Plan shall be in conformity with the National Forest Policies prevalent at that time.
21. A definite plan has to be made to remove encroachment and plant the vacated area by planting suitable local species as per Government of India and Hon'ble Supreme Court Orders/Guidelines in the matter.
22. Eco-tourism shall/ may be undertaken on sustainable basis. No permanent structures shall be allowed at such sites. Temporary structures made up of local forest produce may be allowed for public. Such sites will be declared Plastic free zones and these eco-tourisms sites will be managed by the forest department as per the prescriptions of the working plan.
23. Demarcation and consolidation of Forest Boundaries will be done adequately.
24. Gregarious flowering of bamboo, if any, must be reported to ICFRE and other institutes as mandated and the situation be dealt with standard protocol.
25. Exotic species should not be planted in Plan areas.



43. The Central Government reserves the right to review, modify, withdraw, this approval at any time if any of the conditions of approval are not implemented. Relevant modification in the working plan are required to be carried out so as to keep it in conformity with the orders, circulars and guidelines issued by the Central Government or the Apex Court under Forest (Conservation) Act, 1980 or any other statute and National Forest Policy from time to time.

Yours faithfully

(Charan Jeet Singh)
Scientist 'C'

Copy to:

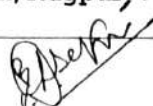
1. The Additional Director General of Forest (FC) Ministry of Environment, Forest & Climate Change Indira Paryavaran Bhawan, Jor Bagh, New Delhi, New Delhi 110003.
2. The Secretary, Government of Maharashtra, Revenue & Forests Department, Hutatma Rajguru Chowk, Madam Cama Marg, Mantralaya, Mumbai - 400 032.
3. The Principal Chief Conservator of Forests (P&M), Van Bhawan, Ramgiri Road, Civil Lines, Nagpur - 440001.

(Charan Jeet Singh)
Scientist 'C'

STANDING CONSULTATIVE COMMITTEE MEETING HELD ON 10 JUNE, 2015

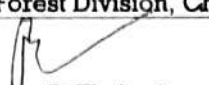
- Ref : 1) G.R. Revenue & Forest Department No. MSC 2004/CR-102/F-2, dated 26.6.2004.
2) G.R. Revenue & Forest Department No. FDM-2015/CR-95/F-2, dated 29.4.2015.
3) PCCFM.S.Nagpur's letter No.Desk-14/WP/SCCMeeting/168,dated 25.5.2015.

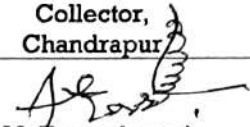
Draft Working Plan (DWPR-II) of Central Chanda Forest Division was discussed and approved by the Standing Consultative Committee under the Chairmanship of Principal Chief Conservator of Forests (HoFF), Maharashtra State, Nagpur in the meeting held on 10th June 2015 at Van Sabhagruh, Nagpur, *with certain recommendations/suggestions as per the Minutes of the meeting.*


(Raju.T.Dhabekar)
Conservator of Forests,
Working Plan, Chandrapur


(Gajendra Hire)
Dy. Conservator of Forest,
Central Chanda Forest Division, Chandrapur

(Dr. Deepak Mhaisekar)
Collector,
Chandrapur


(Sanjay P. Thakre)
Chief Conservator of Forests,
Chandrapur Circle, Chandrapur

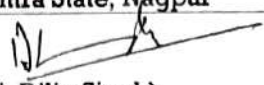

(M. Karunakaran)
Add. Principal Chief Conservator of Forests,
Working Plans (East) Nagpur

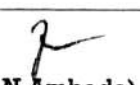
(Dr. Mohan Jha)
Add. Principal Chief Conservator of Forest (IT & P)
Maharashtra State, Nagpur

(Shri. Dr. V.K. Sinha)
Add. Principal Chief Conservator of Forest
(Conservation)
Maharashtra State, Nagpur

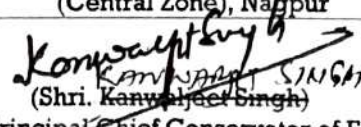

(Shri. B.S.K. Reddy)
Add. Principal Chief Conservator of Forest
(In-charge of Chandrapur Circle)
Maharashtra State, Nagpur

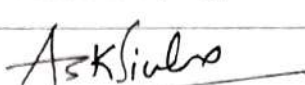
(Dr. V. D. Chafekar)
Add. Principal Chief Conservator of Forest
(Working Plan-West) Pune

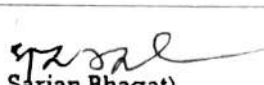

(Shri. Dilip Singh)
Add. Principal Chief Conservator of Forest
Maharashtra State, Bio-diversity Unit, Nagpur


(Shri. V.N. Ambade)
Regional Manager, Forest Survey of India,
(Central Zone), Nagpur


(Shri. Shri. Bhagwan)
Add. Principal Chief Conservator of Forest
(BP&D)
Maharashtra State, Nagpur


(Shri. Kanwar Singh)
Add. Principal Chief Conservator of Forest
(Regional)
MoEF, Nagpur


(Shri. A.S.K. Sinha)
Principal Chief Conservator of Forest (P&M)
Maharashtra State, Nagpur


(Shri. Sarjan Bhagat)
Principal Chief Conservator of Forest (Wildlife)
Maharashtra State, Nagpur


(Shri. A. K. Saxena)
Principal Chief Conservator of Forests (HoFF)
Maharashtra State, Nagpur



SUMMARY OF DRAFT WORKING PLAN REPORT OF CENTRAL CHANDA FOREST DIVISION

THE TRACT DEALT WITH

This working plan is the consolidated working plan for all the forest areas incharge of the Forest Department in Ballarsha, Dhaba, Kothari, Rajura, Wansadi, Wirur and Jioti Forest Ranges of Central Chanda Forest Division in Chandrapur Circle.

The forest area included in this working plan is 1,11,908.057 ha, out of which 90822.934 hectare is Reserved Forests, 18045.593 hectare Protected Forests and 3039.480 hectares Unclassed Forests. These areas lie between latitudes $19^{\circ} 31'$ to 20° North and longitudes $78^{\circ} 50' 30''$ to $79^{\circ} 45'$ East.

The boundaries of the tract dealt with are as follows :

- ⇒ **North** : Painganga and Wardha rivers along the Yavatmal District, Chanda and Mul Forest Ranges of Chandrapur Non-Buffer Forest Division of Maharashtra State.
- ⇒ **East** : Wainganga river along with Gadchiroli district and Telangana State.
- ⇒ **South** : Wardha river and Andhra Pradesh.
- ⇒ **West** : Andhra Pradesh, Pandharkawada and Chandrapur Non-Buffer Forest Divisions of Maharashtra State.

CONFIGURATION: The most of the forest areas of Rajura subdivision are on undulating terrain and rest are on slight undulation. The tract lies between 192.2m to 588.6m above MSL with the highest point in Manikkgarh hills at Jettameda with an altitude of 588.6 m above MSL.

DRAINAGE: The tract is interspersed with big and small nalas draining into the Wardha and Wainganga rivers. Southern slopes of Manikkgarh hills drain into river Godavari through small nalas.

GEOLOGY : The geological formations of the tract are as follows:

Recent to Sub-Recent – Alluvium/Laterite.

Eocene to Cretaceous – Deccan trap.

Permo-Carboniferous – Sandstone/Shale, Kamathi and Barakar Formation (Lower Gondwana) Sandy soils/Sandstone/Shale/Talchir Formation. (Lower Gondwana) Black cotton soils.

Pre-Cambrian – Shale/Sandstone/Limestone. (Vindhyan System) Loamy soils.

CLIMATE: The climate is characterised by a hot summer, well distributed rainfall during the south-west monsoon season and general dryness except in the rainy

season. Mercury reaching upto 48° Celcius during summer and dipping down to 7° Celcius in winter. The average rainfall is 1433 mm. There is no incidence of frost in the tract.

FORESTS: The forests of the tract dealt with under this plan belong to sub group-5A, "Southern Tropical Dry Deciduous Forests", as per the revised classification of forest types of India by H.G.Champion and S.K.Seth.

Following subtypes are noticed:

Forest Types	Champion and Seth's Classification
Group	Tropical Dry Deciduous Forest
Sub-group 5 A	Southern Tropical Dry Deciduous Forest
I. Climax Types:	
(i) 5 A/C _{1b}	Dry Teak Forest
(ii) 5 A/C ₃	Southern Dry Mixed Deciduous Forests.
II. Edaphic Types:	
(i) 5/E2	Boswellia Forests.
(ii) DS1	Dry Deciduous Scrub.

LEGAL STATUS WISE FOREST AREAS

Sr.No	Legal Status	FD Territorial Area(ha)	FDCM Area(ha)	Gross area with FD Area(ha)
1	RF	90822.934	31134.648	121957.582
2	PF	18045.593	226.00	18271.593
3	UF	3039.480	0.00	3039.480
	Total	111908.057	31360.648	143268.705

Population of the district: 23.52 Lakh
 Population density of the tract: 166/sq km
 District area: 11280 sq km.
 Cattle population of the tract: 884146 cattle unit as per 2006-07 cattle census.

Administrative setup : The tract includes 7 ranges, 31 rounds and 120 beats.

PAST SYSTEM OF MANAGEMENT:

BRIEF HISTORY OF THE FORESTS : Forests of this tract derived its linkage from two distinct lineage of past history. Rajura Sub Division was part of erstwhile Hyderabad State i.e. Nizam State while other areas were part of Central Province.



PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS:

RESERVED FORESTS: Dhaba and Kothari Ranges of this plan were combined as Dhaba Range prior to 1954-1955 and Ballarshah Range was the part of Chanda range of West Chanda Division prior to 1965 in the past, the tract dealt with was managed range wise by separate working plans. Therefore, past systems of management is described separately for Dhaba (old) and Ballarshah ranges as follows:

DHABA RANGE (PRESENTLY DHABA AND KOTHARI RANGES): The Reserved Forests of this tract, constituted in the year 1879, were leased out for about 20 years to purchasers and commuters was indulged in indiscriminate felling of evidently choicest species and quality. In 1899 working plan for these forests were prepared by Punnaswamy, the then Divisional Forest Officer, which was soon abandoned due to non approval of prescriptions there in by the Chief conservator of forests. Thereafter teak forests in the Wainganga tract (Presently Waitrana felling series of Dhaba Range) were worked under heavy improvement fellings and the better quality mixed forests in Dhaba Range (Presently Kothari Range) under coppice with standard.

DONALD'S WORKING PLAN OF 1913: The first regular working plan for this forest was prepared by Donald in 1913. Under this plan CWS and Improvement Felling. Areas were allotted to one felling series each. Felling cycle of 20 years was initially decided but it was raised to 40 years in the year 1924 for felling series in Dhaba Range. In the year 1927, transition felling for coppice with standard in Plain Teak Forest of Dhaba Range was introduced. In the year 1934, these areas were brought under clear felling. In 1932 a special overlapping semal felling series was formed in each range.

N.T. HUSSAIN WORKING PLAN (1937-38 TO 1946-47) The objects of management decided were to maintain the forest under the most suitable silvicultural treatment for a sustained supply of timber and other produce and to arrange to meet the local demand for grazing.

WORKING CIRCLES: The total areas of the tract were divided into four non overlapping and one overlapping working circles. These are as follows :

Conversion Working Circle.

Improvement Working Circle.

Selection Working Circle.

Miscellaneous Working Circle

Bamboo Overlapping Working Circle.

Conversion Working Circle: Waitrana felling series in Dhaba Range of the tract dealt with was included under this working circle.

Conversion period : 60 years.

Site quality III

Harvestable girth 3 feet.

Periodic Blocks: 3 PBs with 20 years felling cycles. PB I defined but PB II & PB III not.

Out of 1078.269 ha, 763.641 ha area was converted.

DASHPUTRE'S (1953-54) EXTENDED TO 1973-74: Immediate objects decided were as follows:

- I. To meet the local demand for timber, fuel, minor forest produce and grazing.
- II. To preserve the forests where necessary in the interests of conservation of soil and water supply.
- III. To meet the demand for timber and other forest produce and to obtain the maximum sustained annual revenue, while at the same time improving the condition of the forest.

WORKING CIRCLE: To achieve the objectives as decided above the following working circles were formed.

- I. Conversion Working Circle,
- II. Selection Cum Improvement Working Circle,
- III. Palntation Working Circle,
- IV. Coppice With Reserve Working Circle,
- V. Khair (overlapping) Working Circle,
- VI. Semal(Overlapping) Working Circle,
- VII. Bamboo (Overlapping) Working Circle,
- VIII. Miscellaneous Working Circle.

Conversion Working Circle: This working circle included teak and mixed forests of III to II quality in Dhaba Range (Watrana felling series) of the tract dealt with. Conversion Period 80 years. Harvestable girth 4 feet, Felling Cycle 20 years, Five Periodic Blocks were formed. Areas were separately allotted to Periodic Blocks I. PBI was kept separately while PB II was grouped with PBV and PB III was grouped with PB IV.

Areas regenerated during the currency of the Dashputre's plan were as under. Out of 632.522 ha, 600.546 ha was converted.

The above together with the areas converted during the period of Shri. Tasdique Hussain's working plan amounted to the following hectarage. Area converted from 1707.773 ha is 1364.193 ha.

B. BALLARSHAH RANGE: Ballarshah Range was formed in the year 1965. Prior to that it was the part of Chanda Range of West Chanda Forest Division. Initially W.P. was prepared by Ranges.

THE WORKING PLAN OF GANGA PRASAD (1897-1900): Ballarshah, Chanda and Moharli Ranges were part of Haveli Range. Ganga Prasad prepared the first working plan for Haveli Range for the period from 1897 to 1900. This working plan



presented improvement felling. From 1924 onwards cutting back, thinning and climber cutting was done. The forest of Ballarshah Range was regularly worked.

VAHID'S WORKING PLAN (1927-37): The fundamental principle of forest management to obtain the greatest possible yield was recognised as:

- I. To attainment of normal forest and
- II. To establish regeneration to the normal extent.
- I. Objects of management decided were :
 - II. To obtain maximum possible sustained annual yields.
 - III. To supply the local demand.
 - IV. To maintain the forest in the interest of the water supply.
 - V. To aim at the creation of a normal forest with a normal series of age classes and with normal regeneration.
- VI. With the minimum damage of the forest and the minimum hindrance to the realisation of the above objects to provide grazing to the local cattle.

The following working circles were constituted.

- I. High Forest Working Circle,
- II. Coppice With Standards Working Circle,
- III. Low Forest Working Circle,
- IV. Bamboo Working Circle,
- V. Low Forest Unworked Working Circle.

The better quality forests of Ballarshah Range were worked under low forest working circle. The remaining areas were allotted to low forest unworked working circle.

The financial rotation for miscellaneous species were fixed at 30 and 40 years for the forests of average quality of IVa and IVb respectively.

E. HEWETSON'S WORKING PLAN (1936-37 to 1945-46): Vahid's Working Plan replaced by Hewetson's Plan in the year 1936-37. Vahid's Plan was for 10 year w.e.f. 1927-28. But it was revised after completing eight years only due to failure of regeneration. The revised plan covered areas of North Chanda Forest Division and was brought into force in 1936-37. Ballarshah Range, the tract dealt with was the part of the then Chanda Range.

The main objects of management decided were:

- I. To obtain the maximum sustained yield of all classes of forest produce.
- II. To meet the demand of the local people for different forest produce.
- III. To retain mixture of species but to favour valuable tree species.

The following working circles were formed:

- I. High Forest Working Circle.
- II. Coppice with Standard Working Circle.
- III. Miscellaneous Working Circle.
- IV. Bamboo Working Circle.

The workable areas of Ballarshah Range of the tract being dealt with (Then Chanda Range) were allotted to Coppice with standard working circle.

S.N.SINGH AND R.B. MUZUMDAR'S WORKING PLAN (1949-50 to 1963-64):

Singh included all R.F. areas in Ballarshah Range under management.

The objects of management decided were:

- I. To obtain the maximum sustained yield of all kinds of produce.
- II. To satisfy the local demand for small timber, firewood and other minor forest produce and conserve as far as possible those tree species which produce edible fruits and flowers.
- III. To provide grazing to the maximum possible extent consistent with the silvicultural requirements for maintaining the forests perpetually productive and to maintain and improve the pasture in areas specially set apart for grazing purposes.
- IV. To satisfy the local and export demands for large sized timber and export demand for firewood and charcoal.
- V. To satisfy the demand of industries for timber, bamboos and other produce.
- VI. To increase the proportion of valuable species such as teak, semal, bija, shisham etc. in the forests by the preferential treatment and planting. Pure crops were discouraged and suitable mixture was prescribed to maintain in the growing stock.
- VII. To combat the ill effects of soil erosion whenever it had started and to prescribe preventive measures against further soil erosion.
- VIII. To aim at the creation of normal forest with all that it implies.
- IX. To conserve species suitable for the plywood industry wherever they occur.

The following working circles were constituted.

- I. Plantation Working Circles.
- II. Selection Cum Improvements Working Circles.
- III. Coppice With Reserve Working Circles.
- IV. Pasture Working Circles.
- V. Miscellaneous Working Circles.
- VI. Bamboo overlapping Working Circles and
- VII. Semal overlapping Working Circles.

The tract dealt with under this plan was allotted mainly to Coppice With Reserve Working Circle. Bamboo bearing areas were allotted to Bamboo overlapping working circle.

K.N. KHISTI'S WORKING PLAN (1979-80 to 1993-94): This plan covered Reserved Forest areas under Ballarshah, Kothari and Dhaba Ranges.

The objects of management decided were:

- I. To mitigate the effects of soil erosion and to preserve and promote vegetative cover on precipitous hill slopes.
- II. To meet demand for small timber, firewood and bamboo.



- III. To meet the outside demand for large sized timber, firewood and charcoal to the extent the forests can bear.
- IV. To provide grazing facilities for cattle to the extent compatible with scientific management of this forests.
- V. To enhance potential value of the forests by raising plantations of important species particularly teak.
- VI. To progressively increase yield of timber and firewood on sustained basis with due regard to silvicultural requirements of the forests.
- VII. To attain normal forests.
- VIII. Consistent with above, to derive maximum financial benefits.

The following Working Circles were formed:

- I. Conversion Working Circle.
- II. Coppice with Reserve Working Circle.
- III. Miscellaneous Working Circle.
- IV. Bamboo overlapping Working Circle.

CONVERSION WORKING CIRCLE: This included Watrana Felling Series of Dhaba Range and a portion of the Aksapur SCI felling series of Kothari Range under Dashputre's Plan. The objects of management decided were:

- I. To manage the forests permanently as high forests for the production of big sized timber.
- II. To covert the irregular crop into the normal series of age gradation in even aged blocks.
- III. To secure sustained yield in perpetuity.
- IV. To meet the demand of commerce and industry in respect to teak and other species.
- V. Consistent with (iv), to meet the local demand for forest produce to the best possible extent without impairing the productive capacity of the forests.
- VI. Consistent with the above to derive maximum financial benefits

Rotation period: 100 years and conversion period: 60 years.

COPPICE WITH RESERVE WORKING CIRCLE: Low quality forests of Kothari and Ballarshah Ranges were allotted to this working circle. Five felling series (already in previous plan) in Ballarshah Range and four felling series (New) in Kothari Range were formed. The main objects of management decided were:

- a. To improve the condition, composition and density of the tree crop and ensure adequate regeneration by appropriate silvicultural system.
- b. To meet the local nistar demand for small timber, poles and firewood.
- c. To meet local requirement of fodder and grazing and
- d. Consistent with the above to obtain maximum outturn of small sized timber and firewood, not only to meet the local demand but also for

export of surplus forest produce and thereby obtaining maximum financial benefit.

Rotation for the coppice was fixed at 40 years and accordingly 40 annual coupes in each felling series were laid down. Yield was regulated by area.

WIRUR, RAJURA AND WANSADI FOREST RANGES:

The tract dealt with present day Forest Ranges : Rajura, Wansadi and Wirur were under the then Hyderabad State of Nizam. Prior to 1882, the forests were controlled by Revenue department. They had introduced a permit system. Permit holders were allowed to cut the trees for their bonafied use. Special staff was not provided to conserve the forests. The control was nominal.

In 1882 the Forest Department was constituted and forests were placed under the control of the department. Even then up to 1921 the felling were very unsystematic and consisted in removal of valuable species such as teak and bija by permit holders.

From 1921 onwards however, felling under improvised schemes were started. The systems adopted were mainly Coppice with Standard and Selection-cum-improvement felling systems.

WORKING PLAN OF S.M. RAZVI(1931-1944):

- I. "Intensively Workable" Felling Series: 40 years rotation.
- II. "Experimentally Workable" Felling Series. 40 years rotation.
- III. "Scrub" Felling series: 30 years rotation

Coppice-with-Reserves system was prescribed by him for all the felling series.

WORKING PLAN OF S.G.BHOGALE (1945-55 extended upto 1966-67):

- I. Coppice with Reserves Working Circle,
- II. Anduk (*Boswellial serrata*) overlapping working circle,
- III. Bamboo Overlapping Working Circle,
- IV. Plantation Overlapping Working Circle
- V. Miscellaneous Working Circle

S.B.KULKARNI'S PLAN (1967-68 to 1981-82 extended upto 1986-87):

General objectives:

1. To combat the ill-effects of soil erosion and to preserve and promote soil cover on the steep and precipitous slopes.
2. To satisfy the local as well as out side demand of timber, firewood and charcoal to the extent the forests can bear.
3. To enhance the value of the forests by increasing the proportion of valuable species such as teak, bija and khair and also of the industrially important species such as eucalyptus, semal and maharukh by the preferential treatment and by plantations.
4. To satisfy the demand of timber, bamboos and other forest produce required by various industries.



5. To convert the degraded forests into pasture to supplement the increasing grazing needs.
6. To regulate grazing on the basis of incidence and to distribute the cattle as evenly as possible both in the interest of silviculture and of the cattle themselves.
7. To obtain progressively increasing yield of all kinds of forest produce.
8. To aim at the creation of normal forests with all that it implies.

FOLLOWING WORKING CIRCLES WERE FORMED:

- I. Conversion Working Circle.
- II. Miscellaneous Plantation Working Circle.
- III. Selection cum-improvement Working Circle.
- IV. Coppice with Reserve Working Circle.
- V. Pasture Working Circle.
- VI. Miscellaneous Working Circle.
- VII. Bamboo (Overlapping)
- VIII. Khair (Overlapping)

Conversion Working Circle:

Rotation Period : 60 years.

Felling Cycles: 20 years.

Periodic Blocks: 3.

PB I: Clearfelling & artificial regeneration

PB II & PB III: Unallotted & Thinning and hygienic operations prescribed.

WORKING PLAN OF S. S. MAHAJAN, R. N. BISWAS, V. B. PANDIT and Dr. NAND KISHOR: (Period 1993-94 to 2002-2003)

1. Selection cum Improvement Working Circle,
2. Afforestation Working Circle,
3. Bamboo (Overlapping) Working Circle,
4. Miscellaneous Working Circle and
5. Wildlife Overlapping Circle.

SELECTION CUM IMPROVEMENT WORKING CIRCLE:

- I. To utilize the full potential of the site for producing big sized timber and
- II. To improve the forests, both in composition and density by suitable tending operations and plantation.

Selection Girth for species of class I 120 cm and for species of Class II 90 cm.

Felling Cycle: 20 years and 13 felling series.

AFFORESTATION WORKING CIRCLE: The total area included in this working circle is 7113.875 hectare.

BAMBOO (OVERLAPPING) WORKING CIRCLE: An overlapping bamboo working circle covering bamboo bearing forests over 29137.43 hectare 74 compartments and 6 sub compartments have been formed. (1) To meet the local demand and (2) To harvest bamboo on scientific lines so as to get the maximum sustained yield. 6 Cutting Series with 3 cutting section each have been carved.

MISCELLANEOUS WORKING CIRCLE: This working circle includes following types of areas:

- I. Area under proposed Manickgarh Forest Park. (1,659.209Ha).
- II. Area under Lease. (501.960Ha).
- III. Area along interstate boundary dispute. (2,016.367Ha).
- IV. Areas of Manickgarh, Kawitgaon, Ahson, Kanergaon and Talodhi blocks which are mostly under encroachment and areas of Jaitapur, Naranda and Erai blocks which are totally under encroachment or cultivation. (32,751.383Ha).
- V. Total area covered under this working circle is 37,828.919 hectare spread over 92 full compartments, 4 part compartments and 29 sub compartments.

WILDLIFE OVERLAPPING CIRCLE: This overlapping working circle covers the entire area of the Rajura, Wansadi and Wirur forest ranges of this division.

Conclusions:

- I. Absence or inadequacy of natural regeneration in areas near human habitat.
- II. Explosion in human and cattle population which resulted in increasing the pressure on the forests by many folds and thus accelerated the process of degradation of forests. The executive agency cannot check this degradation due to its various limitations.
- III. Improper or inadequate execution of prescriptions of the plan.
- IV. Illiteracy and lack of knowledge among the population regarding the science of silviculture and intangible benefits of the forests.
- V. Lack of motivation of people in participation of development of common resources i.e. forests.
- VI. Last but not the least the poverty of the major part of the population.



WORKING PLAN OF SHRI RAMJI SINGH YADAV & SHRI G.P.GARAD (PERIOD 2004-05 TO 2013-14)

The Working Plan of Shri Ramji Singh Yadav and Shri G.P.Garad for the period 2004-05 to 2013-14 were in progress. However vide Govt. of India Letter No. 12-10/2002(FOR)/1097 dated 3.6.2014 the extension was granted for one year i.e. 2014-15.

The aims and objectives of this plan were also based on the National Forest Policy 1988 and following general objects of management were proposed.

1. To preserve forest cover on stiff hill slopes, along the nala banks and water sources and to prevent soil erosion and to preserve site and environment.
2. To enrich the growing stock in other natural forest and to restock all the under stock and degraded forest to achieve normality of growing stock in shortest possible time.
3. To meet the requirement of small timber, fuel wood, fodder and minor forest produce of the rural and tribal population on top priority.
4. To increase the production of minor forest produce and to manage the same scientifically to utilize the potential to the maximum possible extent on sustained basis.
5. Consistent with the above objective to ensure maximum sustained yield.

5.6.5. WORKING CIRCLE:

Following working circle were proposed in the plan.

Sr. No	Working Circle	No. of Comptt. included	Aera (Ha.)
1	Selection cum Improvement Working Circle	220	46040.147
2	Afforestation Working Circle	92	22,101.912
3	Improvement Working Circle	52	11366.263
4	Old Teak plantation Working Circle	132	9204.392
5	Fodder working Circle	144	20544.140
6	Bamboo (Overlapping) Working Circle	165	20,553.481
7	N.T.F.P. & Medicinal Plant (Overlapping) Working Circle	556	1,14,309.399
8	Wildlife Protection (Overlapping) Working Circle	556	1,14,309.400
9	Miscellaneous Working Circle	27	5,052.545
	Total :- Working Plan Area	556	1,14,309.400
	Area Managed by FDCM	108	2,8785.315
	Total :-	664	1,43,094.714

SELECTION - CUM IMPROVEMENT WORKING CIRCLE:

The main object of management was to have ecological balance with special objects like increase the value and productivity of the area and to obtain big small sized timber, poles & firewood on sustained basis. Area of the coupes are divided into -

TYPE - A: PROTECTION AREAS:

This will include

Areas on slopes more than 25 degree;

20 meter (One chain) wide area on either side of banks of nallas and river courses.

TYPE - B : UNDERSTOCKED AREAS :

This will include all areas below 0.4 density.

TYPE - C : GROUP OF YOUNG POLES:

This will include areas having group of young poles an extent of minimum 2 ha at a place.

TYPE - D₁ : WELL STOCKED AREAS:

This will include all areas above 0.4 density.

To facilitate the preparation of treatment map each coupe, in general, will be divided into 4 sections. Each type of area will be demarcated of its extent at one place is minimum 2 ha Except the nalla banks etc. which will be marked irrespective of its extent. On receipt of the treatment map, the same will be scrutinised by an ACF and approved by the Dy. Conservator of Forests, No area will be treated as unworkable as some kinds of work will be carried out in each type of the area mentioned above.

TYPE - D₂:

Area to be planted with teak after canopy removal. It will include the area with a well drain soil having teak supportive soil like sandy loam having ph between 6.5 to 7.5, site quality III and has indicator species of teak climax.

- I. Marking and Demarcation of coupes is done one year in advance.
- II. Main felling of coupes after marking is done departmentally.
- III. On approval of treatment map, S.M.C. works are to be started with marking and to be completed before the onset of monsoon in the next year.
- IV. Cutting back operation is done in the following year of the main felling of coupe.
- V. Cleaning operation is carried out in the sixth year from the year of main felling.
- VI. Harvestable girth for marking.



Species	Site Quality & Harvestable Girth (in Cms.)				
	II	II / III	III	III / IV	IV
Teak	135	120	105	90	75
Miscellaneous Species Group -					
A - Ain, Bija, Haldu, Kusum	165	150	135	120	105
B - Others	150	135	120	105	90
C - Khair, Lendia, Garari.	45	45	45	45	45

Lendia and garadi should be completely removed above exploitable girth. Except for Group - A all trees of Group - B above exploitable girth will be removed, provided these are silviculturally available.

IMPROVEMENT WORKING CIRCLE:

Forests allotted are generally degraded. Prime object of management is to prepare crop to be managed under SCI in future. Special objects are to improve the crop, to check soil erosion and restore the quality & density of forests.

- I. Demarcation of coupe and marking is done one year in advance.
- II. Afforestation activities are taken up in the coupe where the density of forest crop is less than 0.4.
- III. SMC works are also taken up in the year of marking of coupes.
- IV. Cutting back operation is done in the following year of the main felling.
- V. Cleaning operation is carried out during the 3rd and the 5th year of main felling in D type area.

The working cycle has been fixed at 20 year. Since it is intended to restore to improvement felling only, no regular yield has been fixed. Marking rules are envisaged to remove the trees above exploitable girth as prescribed in SCI and those trees not only likely to survive till next felling cycle. Marking will also be a thinning marking and congested poles will be removed to provide space for other trees to grow.

AFFORESTATION WORKING CIRCLE:

All protected forest areas which have not been planted or having unsuccessful plantations, area under Miscellaneous Working Circle of previous plans and areas taken as zudpi jungle for compensatory afforestation are taken in to this working circle. Areas are degraded due to heavy grazing, illicit cutting and fire. The main objective is to reclaim the area with SMC and afforestation works, to enhance productivity through planting of indigenous species of small timber, firewood and fodder.

- I. Demarcation of coupe and marking is done one year in advance.
- II. Afforestation activities are taken up in the coupe where the density of forest crop is less than 0.4.
- III. Choice of species will depend on soil type, depth, drainage and local requirements.
- IV. Indigenous species of small timber, firewood and fodder are preferred.

- V. SMC works are also taken up in the year of marking of coupes.
- VI. Cutting back operation is done in the following year of the main felling.
- VII. Bamboo planting is done in the 4th year of the main felling.

These areas have been degraded due to heavy grazing illicit cutting and fire. Keeping in view these factors, special objects of management for this area will as follows:

- I. To reclaim the areas by intensive soil and moisture conservation and afforestation works and to enhance the productivity through planting indigenous species of small timber, fire wood and fodder value to meet the local demand.
- II. To involve the local people in afforestation works under the scheme of people's participation in forest management.
- III. To meet the demand of local people for small timber, firewood and fodder to the maximum possible extent.

FODDER WORKING CIRCLE :

Includes area located adjoining to villages. Mostly denuded & under stocked due to heavy grazing. Compactness of soil has resulted in failure of regeneration of timber species.

The Objectives and prescriptions are -

- I. To improve the quality & quantity of fodder by introducing better varieties.
- II. To meet local demand for fodder & thereby reduce grazing pressure on forest land.
- III. Demarcation of coupe and preparation of map is done each year.
- IV. Grass seed sowing is taken up in the coupe where the density of forest crop is less
- V. SMC works are also taken up in the year of demarcation of coupes.

One coupe from each fodder series will be taken up each year for special improvement operation and will remain close to grazing for a period of two years. Thus, in the first year coupes "A" will remain close to grazing while coupes B to F will remain open for grazing. In the second year coupes A and B will remain close to grazing and coupes C to F will remain open to grazing. In the third year coupes A and D to F will remain open to grazing while coupes B & C will be closed to grazing. In the fourth year coupes A, B, E, & F will remain open to grazing while coupes C & D will remain closed to grazing. In this way after every six years the cycle will be repeated.

TEAK PLANTATION WORKING CIRCLE:

Most of the teak plantations are successful. The main objective of teak plantations in Conversion W.C. was to have teak crop with growth parameters comparable to those in the yield table.

- I. Demarcation - The thinning area should be properly demarcated.



- II. Thinning in plantation areas is carried out at 10th year, second thinning in 15th year and subsequent thinning will be at an interval of 10th year as per yield table /stand table of teak. The first thinning should be carried out mechanically to provide space on purely silvicultural considerations. The subsequent thinning will be executed so that normalcy condition is achieved in the long run.
- III. Cleaning operation is carried out in all types I, II and III areas.
- IV. Cleaning operation will be carried out in next year after thinning & in the 5th year.

BAMBOO (OVERLAPPING) WORKING CIRCLE:

Includes all areas where bamboo is present in workable quantity. The main objectives are

- I. To harvest bamboo scientifically so as to get optimum sustained annual yield.
- II. To meet nistar demand of local people and commercial demand of industries.

In Central Chanda Forest Division there is Total 11 cutting series and the areas are divided into 3 coupes. viz. A, B and C and one of the coupes from each cutting series is worked annually. Out of 11 felling series, 3 are commercial bamboo felling series and 8 are nistar bamboo felling series. Majority of the bamboo areas are worked by BILT.

Main prescriptions for working of bamboo coupes are as under -

- I. Demarcation of bamboo coupe will be carried in the year of its felling.
- II. Sample plots should be laid for estimation of yield from the coupes.
- III. Felling is permitted from October to May.
- IV. Coupes are rigidly protected from fire by taking up fire protection measures.

NON WOOD FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE :

This is an overlapping working circle covering the entire area of the Division.

Main objectives are -

- I. To manage the NTFP scientifically to utilize the existing potential optimally.
- II. To enhance its productivity.
- III. To take measures for its sustained yield.
- IV. To generate employment.
- V. Important NTFP species of the tract are Tendu leaves, Moha flower, Moha seed, Hirda, Behda, Awala, Amaltas seed, Biba, Rohan flower, gums etc. and the same are collected by the inhabitants of the forest areas.

WILDLIFE (OVERLAPPING) WORKING CIRCLE:

This is an overlapping working circle covering entire area of the Division. The Total area included in this working circle is 1,14,309.4 hectares. The nature of crop covered under the working circle has already been discussed. The major prescriptions include creation of waterholes and habitat development measures for maintenance of viable population of wildlife.

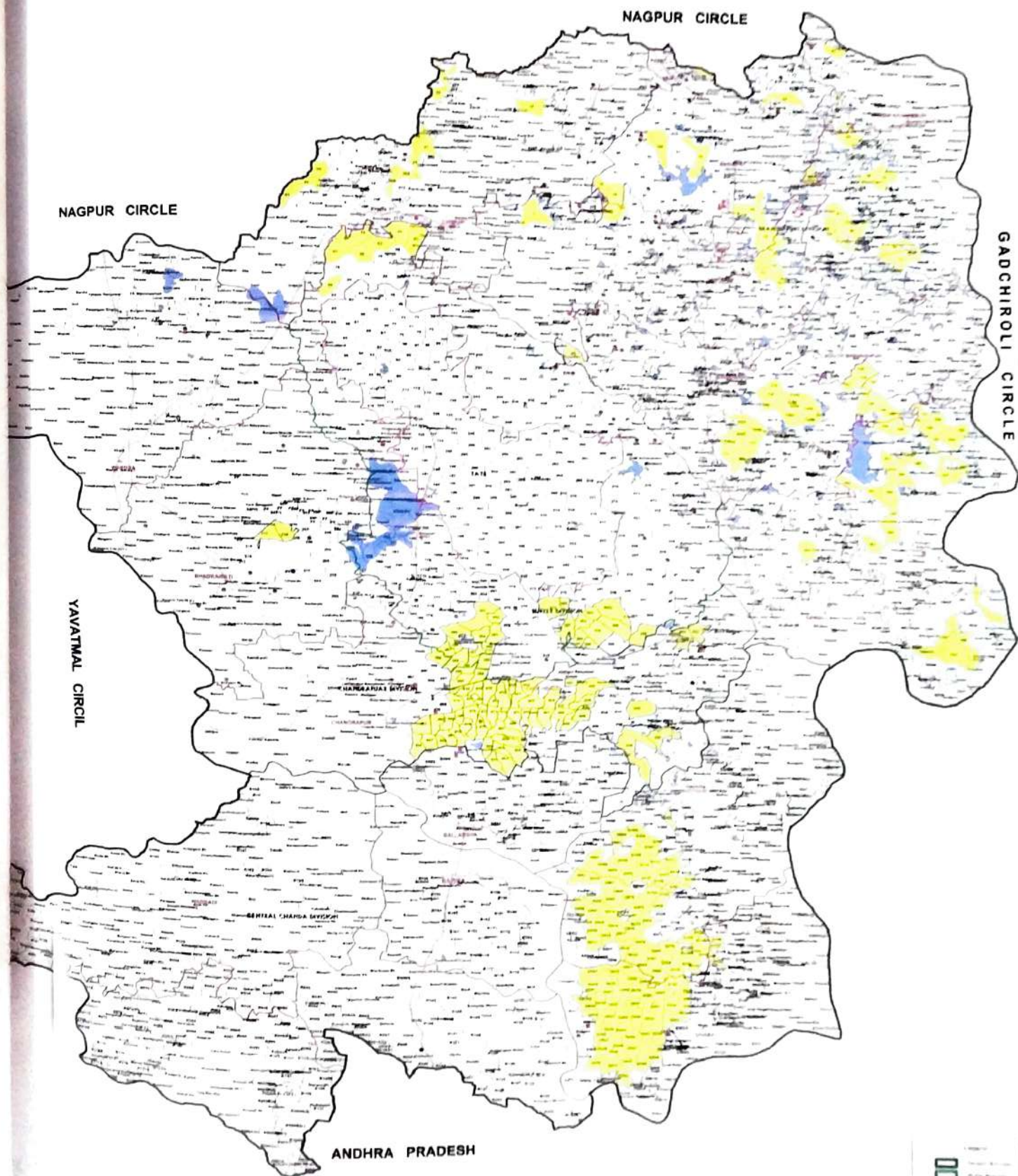
STATISTICS OF GROWTH AND YIELD:

GROWTH OF TEAK: During the preparation of this plan stem analysis of 6 teak trees from Watrana forests were carried out by the team of working plan division Yavatmal. The data so collected site quality wise and are given in appendix of this plan report.

CAI and MAI curve for II/III intersect each other at the age of 75 year and average volume per tree is 1.22 cubic meter which corresponds mean and current annual increment to 0.016 cubic meter per year and gbh 142.3 centimeter. CAI and MAI curve for III intersect each other at the age of 75 year and average volume per tree is 0.80 cubic meter which corresponds mean and current annual increment to 0.0106 cubic metre per year and gbh 122 centimetre. During the preparation of working plan of Pandharkawada Forest Division stump/stem analysis had been carried out by the DCF WP Yavatmal during 1999-2000. 10 Trees each from III/IV and IV of all India Teak Site Qualities were selected from Parwa, Umari and Pandharkawada Ranges and analysed. It is seen that CAI and MAI curves for III/IV and IV teak site qualities cut in the 75th and 50th years, which correspond to 98.9 cms and 73 cms g.b.h.(o.b.) with corresponding current annual increments (c.a.i.) 0.0072 cubic meter/year and 0.0053 cubic meter/year respectively. Data for other species are collected from various working plans.

====00====

MAP OF CHANDRAPUR CIRCLE CHANDRAPUR





PART II

FUTURE MANAGEMENT PRESCRIBED AND MODE OF EXECUTION

Inclusion of all Reserved Forests, Protected Forests and Unclassed Forests in incharge of present Central Chanda Forest Division (Territorial). Wherever necessary new compartments were given treating each compartment and part of compartment as separate identity and as single unit. The entire area was scanned on GIS and accordingly planimitted area was calculated with the help of specific software. Also vegetal cover with the help of enumeration carried out and satellite imageries were used as the tool for density wise area distribution.

Following working circle were proposed in the plan.

1. Selection cum Improvement Working Circle
2. Improvement Working Circle.
3. Old Teak plantation Working Circle
4. Afforestation Working Circle.
5. Fodder working Circle.
6. Miscellaneous Working Circle
7. Bamboo (Overlapping) Working Circle
8. Non-Timber Forest Produce (Overlapping) Working Circle.
9. Wildlife (Overlapping) Working Circle.

Sr. No	Working Circle	No. of Comptt. included	Aera (Ha.)
1	Selection cum Improvement Working Circle	34	7738.266
2	Improvement Working Circle	181	47229.313
3	Afforestation Working Circle	88	16930.853
4	Fodder Working Circle	93	5421.484
5	Old Teak plantation Working Circle	13	8429.939
6	Miscellaneous Working Circle	82	26158.207
7	Bamboo (Overlapping) Working Circle	87	26648.737
8	Non-Timber Forest Produce (Overlapping) Working Circle	491	111908.062
9	Wildlife (Overlapping) Working Circle	491	111908.062
	Total :- Working Plan Area	491	111908.062
	Area Managed by FDCM	122	31360.648
	Total :-	606	143268.710

1) SELECTION CUM IMPROVEMENT WORKING CIRCLE.

Area	7738.266 ha.
No of compartments	34
Felling cycles	20 years
No of working series	4
No of coupes	20
Average area of coupe	97.00 ha.

(A) Site Quality II/III: Harvestable Girth: 135 cms. trees per hectare or of harvestable trees per hectare, whichever is less, is to be marked for felling.

(B) Site quality III
Harvestable girth = 120 cm.

(C) Site quality III/IV.
Harvestable girth = 105 cm.

(D) Site quality IV.
Harvestable girth = 90 cm.

Treatments : Area will be demarcated one year advance of the main working. Grid of 100m x 100m will be laid down to divide the area into the grid of 1 ha each.

Each grid will be treated separately. Treatment for each grid will be given as per the area and existing crop.

Enumeration: Enumeration of each tree including regeneration status in a particular grid will be carried out and inventory of the same will be prepared.

Treatment map

Areas A - Protection areas

- Steep slope.
- Buffer area

B - Understocked area density < 0.4 and extent > 0.5 ha at a place.

C - Pole crop and old plantation not covered in old plantation working circle.

D - Well stocked area density > 0.4

Effective nala bunding and gully plugging to the extent as per site requirement and sanctioned by the competent authority.

A - Area - No felling.



B - Area - Teak and suitable miscellaneous species to be planted, removal of dead dying trees irrespective of girth classes.

C - Area - In general no planting but thinning to the young crop will be carried out as per the prescriptions given in Most Important Other Regulations.

D - Area - In general no planting will be done but felling will be done as per the marking rule, removal of dead dying trees irrespective of girth classes.

MARKING RULE.

A - No tree will be marked for felling.

B - All dead, dying and malformed trees except 2 trees/ha will be marked for felling. All high live stump to be cut as clear to ground as possible. Malformed seedlings to be cut back and established multiple coppice shoots and pole will be reduced to one per stool retaining the vigorous one.

C - As per the thinning rule thinning will be carried out. The dead, dying, diseased and malformed poles will be marked for thinning first and then the remaining.

D -

- I. Climber to be cut.
- II. If required, multiple coppice tree/pole to be marked to reduce the number of stem one per stool.
- III. No tree for marking unless it is silviculturally available.
- IV. Teak trees preferably coppice origin to be marked for felling as per yield regulation.
- V. Miscellaneous trees will be marked for felling as per the requirement.
- VI. Irrespective of girth class all malformed, dead trees will be marked for felling retaining two dead trees per ha.
- VII. Undesired growth preventing or likely to prevent the development of seedling of regeneration of the desired species will be removed.
- VIII. Thinning in other girth classes will be carried out, if necessary.

REGENERATION:-

NATURAL REGENERATION will be encouraged by giving special treatment to young recruits so that they will be established. Complete protection from fire and grazing and soil working around the young recruits will be sufficient to achieve the objective. While cut back operation and other silvicultural works will keep the health of the forest in good shape.

ARTIFICIAL REGENERATION: a) In under stocked and blank areas and the areas where natural regeneration fails to come, artificial regeneration will be introduced.

b) Canopy removal: - Nearly 250 ha. area will be selected for planting teak by removing canopy, as per the condition enlisted by GOI.

2)Harvesting and Disposal of Forest Produce.

- Timber and Fire Wood.
- Tendu leaves.
- Grazing

3). Irregular harvesting.

- 1) Survey and demarcation of areas and Boundaries Maintenance
- 2) Fire protection.
- 3) Grazing control.
- 4) Watershed approach.
- 5) Deviations.
- 6) Soil and Moisture conservation.
- 7) Miscellaneous Areas Statement .
- 8) Forestry Extention.
- 9) Survey and Maps.
- 10)Position of Encroachments.

CONTROL AND RECORDS.

I	=	Control & Records.
II	=	Compartment History.
III	=	Plantation and Natural Regeneration Register.
IV	=	Seed and Nursery Register
V	=	Divisional Note Book.
VI	=	BoundaryRegister

FINANCIAL FORECAST: As follows:

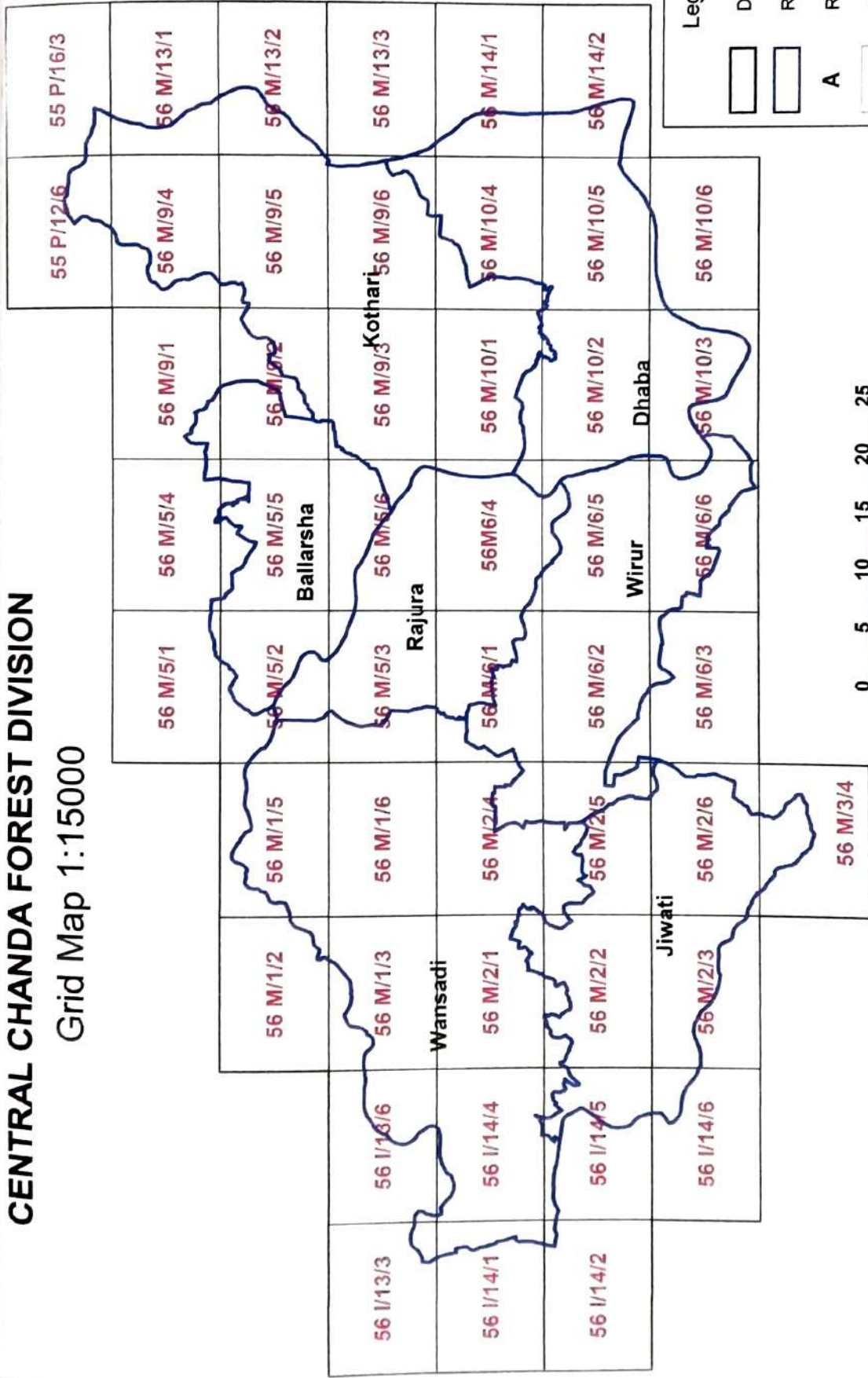
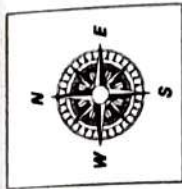
Implementation of prescriptions of this draft plan will require expenditures to be incurred and will also generate revenue to the State and employment to the local people. The details of these have been discussed in draft plan.

The cost of preparation of the Working Plan for Central Chanda Forest is Rs.52.30 per hectare.

====00====

CENTRAL CHANDA FOREST DIVISION

Grid Map 1:15000



Division Boundary

Range Bdy

A

Range Name

Grid 15000

A

Grid 15000

Legend





ABBREVIATIONS USED IN THE PLAN

AC/ac	:	Acre
ACF	:	Assistant Conservator of Forests
AR	:	Artificial Regeneration
AD	:	Anna Domini (After Christ)
a.m.s.l.	:	above mean sea level
Av	:	Average
b.h.o.b.	:	breast height over bark
C.A.I./cai	:	Current Annual Increment
C.B.O.	:	Cutting Back Operation
°C	:	Degree Celcius
cm	:	Centimetre
C.W.R.	:	Coppice With Reserve
C.C.T.	:	Continuous Contour Trench
Cum	:	Cubic Metre
Comptt.	:	Compartment
d.b.h.o.b.	:	diameter at breast height over bark
d.b.h.u.b.	:	diameter at breast height under bark
D.C.F.	:	Deputy Conservator of Forests
D.F.O.	:	Divisional Forest Officer
Dt	:	Dated
DF	:	Disforrested.
Dn.	:	Division
E.G.S.	:	Employment Guarantee Scheme
F.A.O.	:	Food and Agriculture Organisation
D.F	:	egree Farenheit
F.D.C.M.	:	Forest Development Corporation of maharashtra Limited.
F.L.C.S.	:	Forest Labourer's Co-operative Society
F.R.S.S.	:	Forest Resources Survey Scheme

GLOSSARY OF LOCAL NAMES

Adjat	:	Miscellaneous Species
Bakhar	:	Agricultural instrument
Bidi	:	Hand made cigarette wrapped in tendu leaf
Chandra	:	Chandrapur
Dandi	:	Agricultural instrument
Doh	:	A deep pond in a river or stream
Bora	:	Agricultural instrument
Gadh	:	Fort
Geru	:	Red Ochre or Red earth
Ghat	:	A Road with a Steep Gradient
Gairan	:	A Place for Herding Cattle
Gaothan	:	A Site Kept Reserved for Housing
Gully	:	Channel
Jagir	:	An estate conferred by the state in return for services.
Jagirdar	:	The holder of jagir
Jamindar	:	The Holder of Zamin i.e. land
Jhiras	:	Temporary Small Well Dug in Nalas During Summer
Juar	:	A cultivated millet
Jungle	:	Forest
Kacha road	:	Temporary road
Kankar	:	Lime nodules
Karka	:	Whippy bamboo
Katha	:	Catechu
Kopar	:	Agricultural instrument
Kharif	:	Monsoon Crop
Khasara No.	:	Serial number given to any portion of land entered in land Records
Khories	:	Valleys in between two hills
Malguzari	:	Land tenure system which existed in Vidarbha
Malki Lands	:	Lands belonging to private individuals
Mouza	:	A village Area
Mandav	:	A shade
Murram	:	A Reddish Hard Soil
Naka	:	Barrier on road for checking forest produce in transit
Nala	:	A Water Course



Nadi	:	River
Nistar	:	Forest produce required for bonafide agriculture or domestic purposes
Nistar Patrak	:	Record of Rights on Government land
Occupational	:	The nistar granted to village craftsman i.e. Mahar, Chambhar, Lohar etc. at concessional rates for purposes of their Craft.
Padit	:	A barren or Waste land
Paidawar	:	Wild edible flowers, fruits or roots
Patwari/Talathi	:	Village Revenue Officer
Patta	:	A Sanad granted for use of land
P.C.No.	:	Patwari Circle number
Pucca	:	Permanent Construction
Pulla	:	Bundles of Cut Grass
Rabi	:	Winter Crop
Rahadari	:	Transit
Raiyatwari	:	A form of land tenure, applied to land in raiyatwari tenure and to villagers.
Ramna/Kuran	:	A Grass Reserve Close to Grazing
Regur	:	Black Cotton Soil
Rith	:	A Deserted Village Site
Satkatha	:	Miscellaneous tree species
Tiphan	:	Agricultural instrument
Taluka/Tahsil	:	A Revenue Administrative Block.

====00=====

LOCAL AND BOTANICAL NAMES OF PLANTS OCCURRING IN CENTRAL CHANDA FOREST DIVISION.

A. TREES

Local Name	Botanical Name	Family
Achar(H), Char(M)	<i>Buchanania lanzan</i>	Anacardiaceae
Ain(M), Saja(H)	<i>Terminalia alata</i>	Combretaceae
Ali/Aal/Bartondi	<i>Morinda tinctoria</i>	Rubiaceae
Amaltas/Bahawa	<i>Cassia fistula</i>	Caesalpiniaceae
Amta	<i>Bauhinia malabarica</i>	Caesalpiniaceae
Akashneem	<i>Millingtonia hortensis</i>	Rignonaceae
Aam	<i>Mangifera indica</i>	Anacardiaceae
Apta/Kachnar	<i>Bauhinia racemosa</i>	Caesalpiniaceae
Aonla	<i>Emblica officinalis</i>	Euphorbiaceae
Arjuna/Kahu	<i>Terminalia arjuna</i>	Combretaceae
Asah/Lendia/Schena	<i>Lagerstroemia parviflora</i>	Lythraceae
Babul/Babool	<i>Acacia Nilotica</i>	Mimoseae
Bakain/Bakaneem	<i>Melia azadirach</i>	Meliaceae
Beheda	<i>Terminalia bellerica</i>	Combretaceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Bhirra	<i>Chloroxylon swietenia</i>	Rutaceae
Biba/Bhilawa	<i>Semecarpus anacardium</i>	Anacardiaceae
Bija	<i>Pterocarpus marsupium</i>	Fabaceae
Bistendu	<i>Diospyros montana</i>	Ebenaceae
Bor/Ber	<i>Zizyphus mauritiana</i>	Rhamnaceae
Chandan	<i>Santalum album</i>	Santalaceae
Chichwa	<i>Albizia odoratissima</i>	Mimoseae
Chinch	<i>Tamarindus indica</i>	Caesalpiniaceae
Dahibaras	<i>Cordia macleodii</i>	Boraginaceae
Dhaman	<i>Grewia tilifolia</i>	Tiliaceae
Dhawada/Dahwada	<i>Anogeissus latifolia</i>	Caesalpiniaceae
Dhoban/Phansi	<i>Dalbergia paniculata</i>	Fabaceae
Ghoti/Ghot	<i>Zizyphus glaberrima</i>	Rhamnaceae
Ganohi	<i>Abrus precatorius</i>	--
Garari	<i>Cleistanthus collinus</i>	Euphorbiaceae

Gongal	<i>Cochlospermum religiosum</i>	Cochlospermaceae
Haldu	<i>Adina cordifolia</i>	Rubiaceae
Hiwar	<i>Acacia leucophloea</i>	Mimoseae
Hirda/Harra	<i>Terminalia chebula</i>	Combretaceae
Jambhul/Jamun	<i>Syzigium cumunii</i>	Myrtaceae
Kalam.Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
Kakai	<i>Flacourtia indica</i>	Flacourtiaceae
Kala siras	<i>Albizia lebbek</i>	Mimosaceae
Karai	<i>Millusa velutina</i>	Anonaceae
Karanj	<i>Pongamia pinnata</i>	Fabaceae
Karu(Cassia)	<i>Cassia siamea</i>	Caesalpiniaceae
Khair	<i>Acacia catechu</i>	Mimoseae
Kusum	<i>Scheleichera oleosa</i>	Sapindaceae
Kawat	<i>Limonia acidissima</i>	Rutaceae
Kulu	<i>Sterculia urens</i>	Sterculiaceae
Khirni	<i>Manilkara haxandra</i>	Sapotaceae
Kumbhi	<i>Careya arborea</i>	Lecythidiceae
Kusug	<i>Schleichera oleosa</i>	Sapotaceae
Lendia/Lenda/schena	<i>Lagerstroemia parviflora</i>	Lythraceae
/Asah		
Lokhandi	<i>Ixora arborea</i>	Rubiaceae
Medsing	<i>Dolichandrone falcata</i>	Bignoniaceae
Moha/Mahuwa	<i>Madhuca longifolia</i>	Sapotaceae
Maharukh	<i>Ailanthus excelsa</i>	Simarubaceae
Mokha	<i>Schrebera swietenoides</i>	Aristolochiaceae
Moyen/Mowai	<i>Lannea coromandelica</i>	Anacardiaceae
Neem	<i>Azadirachta indica</i>	Meliaceae
Parad	<i>Stereospermum</i>	Bignoniaceae
	<i>Squaveolens</i>	
Paradi	<i>Stereospermum</i>	Bignoniaceae
	<i>chelenoides</i>	
Pipal	<i>Ficus religiosa</i>	Moraceae
Papada	<i>Garenia latifolia</i>	Rubiaceae
Rohan	<i>Soymida febrifuga</i>	Meliaceae
Sag/Sagwan/Teak	<i>Tectona grandis</i>	Verbenaceae

Saja/Ain
 Salai
 Semal(Borgu)
 Shiwan/Siwan
 Sirius(Black)
 Sirius(White)
 Sissoo
 Sitaphal
 Sinduri
 Surya
 Tendu
 Tiwas/Tinsa
 Umber

Terminalia alata
Boswellia serrata
Bombax ceiba
Gmelina arborea
Albizzia lebbek
Albizzia procera
Dalbergia sissoo
Annona squamosa
Mallotus philippensis
Xylia xylocarpa
Diospyros melanoxylon
Ougenia oojeinensis
Ficus racemosa

Combretaceae
 Burseraceae
 Bombaceae
 Verbenaceae
 Mimoseae
 Mimoseae
 Fabaceae
 Annonaceae
 -
 Mimosaceae
 Ebenaceae
 Fabaceae
 Moraaceae

====00====

B. SHRUBS AND HERBS

Local Name	Botanical Name	Family
Banrahar	<i>Flemingia Semialata</i>	Fabaceae
Bharati	<i>Gymnosporia spinosa</i>	Celastraceae
Chipti	<i>Desmodium pulchellum</i>	Fabaceae
Chillari	<i>Mimosa rubicaulis</i>	Mimoseae
Chillati	<i>Caesalpinia sepiaria</i>	Caesalpinaceae
Dudhi/Kalakuda	<i>Wrightia tinctoria</i>	Apocyanaceae
Dhavati	<i>Woodfordia floribunda</i>	Lythraceae
Dikamali	<i>Gardenia resinifera</i>	Bubiaceae
Ghaneri	<i>Lantana camera</i>	Verbenaceae
Kudursi	<i>Bridelia hamiltoniana</i>	Euphorbiaceae
Kudmudi	<i>Gardenia gummifera</i>	Rubiaceae
Kharoti	<i>Grewia Hirsuta</i>	Tiliaceae
Kharata	<i>Dodonaea viscosa</i>	Sapindaceae
Kari Korando	<i>Carrissa spinarium</i>	Apocyanaceae
Korat	<i>Barleria prionitis</i>	Acanthaceae
Kuda, Indrajav	<i>Holarrihena antidysenterica</i>	Apocyanaceae
Muradsheng/Marorphal	<i>Helicteres isora</i>	Sterculiaceae
Nirmali	<i>Strychnos potatorum</i>	Strychnaceae
Neel	<i>Indigofera cassioides</i>	Papilionaceae
Nirgudi	<i>Vitex negundo</i>	Verbenaceae
Parijatak	<i>Mucunahes arbitristis</i>	Nyctanthaceae
Phetra-safed	<i>Gardenia latifolia</i>	Bubiaceae
Phetra-kala	<i>Tamilnadia uliginosa</i>	Bubiaceae
Sindhi/Chhindi	<i>Phoenix sylvestris</i>	Arecaceae (Palmaceae)
Tarwar	<i>Cassia auriculata</i>	Caesalpinaceae
Tarota	<i>Cassia tora</i>	Caesalpinaceae
Waghoti	<i>Capparis horrida</i>	Capparidaceae
Zingrool/Pharsa	<i>Grewia orbiculata</i>	Tiliaceae

C. HERBS

Local Name	Botanical Name	Family
Divali	<i>Tephrosia hamiltonii</i>	Fabaceae
Gajargawat	<i>Parthenium hysterophorus</i>	Astraceae
Gokru	<i>Tribulus terrestris</i>	Zygophyllaceae
Hamata	<i>Stylosanthes hamata</i>	Caesalpiniaceae
Pivla Dhotra	<i>Argemone mexicana</i>	Papaveraceae
Pivili tilwan	<i>Cleome viscosa</i>	Cleomaceae
Rantulsi/Bantulsi	<i>Hyptis suaveolens</i>	Lamiaceae
Rantur	<i>Atylosia scarabaeoides</i>	Fabaceae
Scabra	<i>Stylosanthes scabra</i>	Caesalpiniaceae
Tarota	<i>Cassia tora</i>	Caesalpiniaceae

D. GRASSES AND BAMBOOS

Local Name	Botanical Name	Family
Bans/Bamboo	<i>Dendrocalamus strictus</i>	Poaceae
Bans/Bamboo	<i>Oxyternant Thera stocksil</i>	Poaceae
Bans/Bamboo	<i>Bamboosa balkowa</i>	Poaceae
Bans/Bamboo	<i>Bamboosa bamboo.</i>	Poaceae
Bans/Bamboo	<i>Bamboosa tulda.</i>	Poaceae
Bans/Bamboo	<i>Bamboosa vulgaris</i> Schrad.	Poaceae
Bhurbhusi	<i>Eragrostis tenella</i>	Poaceae
Duswa/Haryalli/Doob	<i>Cynodon dactylon</i>	Poaceae
Dongri gavat	<i>Chrysopogon montana</i>	Poaceae
Guhar, marwel	<i>Andropogon annulatus</i>	Poaceae
Kans	<i>Saccharum spontaneum</i>	Poaceae
Khas	<i>Vetiveria zizanioides</i>	Poaceae
Kodmor	<i>Apluda varia</i>	Poaceae
Kunda	<i>Ischoemum pilosum</i>	Poaceae
Kusal	<i>Heteropogon contortus</i>	Poaceae
Mushan	<i>Iseilema laxum</i>	Poacea
Paonia	<i>Sehima sulcatum</i>	Poaceae
Sabai or sum	<i>Ischaemum angustifolium</i>	Poaceae
Sheda	<i>Sehima nervosum</i>	Poaceae
Tikhadi/Rusa/Rosha	<i>Cymbopogon martini</i>	Poaceae



E. CLIMBERS

Local Name	Botanical Name	Family
Bhuikand/Baichend	<i>Dioscorea daemona</i>	Dioscoriaceae
Chilati	<i>Acacia pinnata</i>	Mimoseae
Eruni	<i>Zizyphus oenoplia</i>	Rhamnaceae
Gunchi/Gunj	<i>Abrus precatorius</i>	Papilionaceae
Khajkuri	<i>Mucuna pruriens</i>	Fabaceae
Kukuranji	<i>Calycopteris floribunda</i>	Combretaceae
Lalbel/Papri	<i>Vontilago denticulata</i>	Rhamnaceae
Mahulbel/Mahul	<i>Bauhinia vahlli</i>	Caesalpiniaceae
Palasvel	<i>Butea superba</i>	Fabaceae
Piwarvel	<i>Combretum ovalifolium</i>	Combretaceae
Ramdaton	<i>Smilax zeylanica</i>	Liliaceae
Shatova/Satawari	<i>Asparagus racemosus</i>	Lilliaceae
Shembi	<i>Acacia pinnata</i>	Ceasal piniaceae
Kawavel,Dudhi(Nagbel)	<i>Cryptolepis buchanani</i>	Asclepiadaceae

F. PARASITE

Local Name	Botanical Name	Family
Panda	<i>Dendrophthoe falcata</i>	

G. EPIPHYTES

Local Name	Botanical Name	Family
Vanda	<i>Vanda cesellata</i>	Crchidaceae

====00=====

LOCAL AND BOTANICAL NAMES OF MEDICINAL PLANTS OCCURRING IN CENTRAL CHANDA FOREST DIVISION.

Local Name	Botanical Name	Family
Pivili tilwan	<i>Cleome viscosa</i>	Cleomaceae
Rantulsi/Bantulsi	<i>Hyptis suaveolens</i>	Lamiaceae
Rantur	<i>Atylosia scarabaeoides</i>	Fabaceae
Scabra	<i>Stylosanthes scabra</i>	Caesalpiniaceae
Shatova/Satawari	<i>Asparagus racemosus</i>	Liliaceae
Kawavel,Dudhi(Nagbel)	<i>Cryptolepis buchanani</i>	Asclepiadaceae
Bhuikand/Baichend	<i>Dioscorea daemona</i>	Dioscoriaceae
Khajkuri	<i>Mucuna pruriens</i>	Fabaceae
Khas	<i>Vetiveria zizanioides</i>	Poaceae
Tikhadi/Rusa/Rosha	<i>Cymbopogon martini</i>	Poaceae
Achar(H),Char(M)	<i>Buchanania lanzan</i>	Anacardiaceae
Amaltas/Bahawa	<i>Cassia fistula</i>	Caesalpiniaceae
Amta	<i>Bauhinia malabarica</i>	Caesalpiniaceae
Akashneem	<i>Millingtonia hortensis</i>	Rignonaceae
Aam	<i>Mangifera indica</i>	Anacardiaceae
Aonla	<i>Emblica officinalis</i>	Euphorbiaceae
Babul/Babool	<i>Acacia Nilotica</i>	Mimoseae
Bakain/Bakaneem	<i>Melia azadirach</i>	Meliaceae
Beheda	<i>Terminalia bellerica</i>	Combretaceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Biba/Bhilawa	<i>Semecarpus anacardium</i>	Anacardiaceae
Bija	<i>Pterocarpus marsupium</i>	Fabaceae
Bistendu	<i>Diospyros montana</i>	Ebenaceae
Bor/Ber	<i>Zizyphus mauritiana</i>	Rhamnaceae
Chandan	<i>Santalum album</i>	Santalaceae
Chinch	<i>Tamarindus indica</i>	Caesalpiniaceae
Dhatura	<i>Adhatoda vasica</i>	
Garari	<i>Cleistanthus collinus</i>	Euphorbiaceae
Gongal	<i>Cochlospermum religiosum</i>	Cochlospermaceae
Hirda/Harra	<i>Terminalia chebula</i>	Combretaceae

Jambhul/Jamun
Kusum
Kawat
Kulu
Khirni
Kumbhi
Medsing
Moha/Mahuwa
Maharukh
Neem
Paradi
Pipal
Saja/Ain
Salai
Sitaphal
Sinduri
Tendu
Umber

Syzigium cumunii
Scheleichera oleosa
Limonia acidissima
Sterculia urens
Manilkara hexandra
Careya arborea
Dolichandrone falcata
Madhuca longifolia
Ailanthus excelsa
Azadirachta indica
Stereospermum chelenoides
Ficus religiosa
Terminalia alata
Boswellia serrata
Annona squamosa
Mallotus philippensis
Diospyros melanoxylon
Ficus racemosa

Myrtaceae
Sapindaceae
Rutaceae
Sterculiaceae
Sapotaceae
Lecythidiceae
Bignoniaceae
Sapotaceae
Simarubaceae
Meliaceae
Bignoniaceae
Moraceae
Combretaceae
Burseraceae
Annonaceae
-
Ebenaceae
Moraaceae

====00=====

COMMON AND ZOOLOGICAL NAMES OF THE ANIMALS AND BIRDS COMMONLY FOUND IN CENTRAL CHANDA DIVISION

A. LIST OF ANIMALS

Common Name	Scientific Name
Tiger /Wagh(M)/ Sher(H)	<i>Panthera tigris</i>
Panther/Bibta(M)/Tendua(H)	<i>Panthera pardus</i>
Wild Dog /Dhole (M)/Jungli Kutta(H)	<i>Cuon alpinus</i>
Indian Bison /Gawa(M)/Gaur(H)	<i>Bos gaurus</i>
Striped Hyena/Tadas(M)/Lakkadbagha(H)	<i>Hyaena hyaena</i>
Jackal/Kolha(M)/Siyar(H)	<i>Canis aureus</i>
Wolf/Landga(M)/Bhedia(H)	<i>Canis lupus</i>
Red Fox	<i>Vulpes vulpes</i>
Indian Fox	<i>Vulpes bengalensis</i>
Jungle cat	<i>Felis chaus</i>
Black buck	<i>Antelope cervicapra</i>
Sambhar	<i>Cervus unicolor</i>
Cheetal	<i>Axis axis</i>
Barking deer	<i>Muntiacus muntjak</i>
Chausigha	<i>Tetracorus quadricornis</i>
Chinkara	<i>Gazella gazella</i>
Hog deer	<i>Axis porcinus</i>
Nilgai	<i>Boselaphus tragocamelus</i>
Wild boar	<i>Sus scrofa</i>
Sloth bear/ Aswal(M)/ Bhalu(H)	<i>Melursus ursinus</i>
Common langur	<i>Presbytis entellus</i>
Porcupine	<i>Hystrix indica</i>
Hare	<i>Lepus nigricollis</i>
Mouse Hare	<i>Ochotona roylei</i>



Civets
Indian Pangolin/Khawala manjar
Bush Rat
Field Mouse
Mongoose(M)/ Newala(H)
Spiny Field Mouse
Mouse deer
Common Giant Flying Squirrel
Indian Giant Squirrel

Viverra megaspila
Maus crassicaudata
Gollunda ellioti
Mus booduga
Herpestes edwardsi
Mus platythrix
Tragulus meminna
Petaurista petaurista
Ratufa indica

B. LIST OF BIRDS

Common Name	Scientific Name
Pond Heron or Paddy bird	<i>Ardeola grayii</i>
Cattle Egret	<i>Bubulcus ibis</i>
White Breasted Waterhen	<i>Amaurornis phoenicurus</i>
Grey Partridge	<i>Francolinus pondicerianus</i>
Jungle Bush Quail	<i>Perdica asiatica</i>
Yellow Wattled Lapwing	<i>Vanellus malabaricus</i>
Rose Ringed Parakeet	<i>Psittacula krameri</i>
Blosson Headed Parakeet	<i>Psittacula cyanocephala</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Koel	<i>Eudynamis scolopacea</i>
Crow Pheasant (Coucal)	<i>Centropus sinensis</i>
Spotted owlet	<i>Athene brama</i>
Common Indian Night Jar	<i>Caprimulgus asiaticus</i>
White Breasted Kingfisher	<i>Halcyon smyrenesis</i>
Common Kingfisher	<i>Alcedo atthis</i>
Green Bee Eater	<i>Merops orientalis</i>
Hoopoe	<i>Upupa epops</i>

Indian Roller
 Golden Backed Wood Pecker
 Rufous Backed Shrike
 Golden Oriole
 Black Drongo
 Brahminy Myna
 Common Myna
 House Crow
 Jungle Crow
 Small Minivet
 Common Iora
 Red Vented Bulbul
 Common Babbler
 White throated Fantail Flycatcher
 Paradise Flycatcher
 Magpie Robin
 Indian Robin
 Gray Wagtail
 Pied or White Wagtail
 Grey Tit
 Purple Sunbird
 House Sparrow
 Red Jungle Fowl
 Common Peafowl
 Scavenger Vulture
 Indian Long Billed Vulture
 Dusky Horned Owl
 Brown Hawkowl
 Brown Wood Owl
 Common Grey Hornbill

Coracias bengalensis
Dinopium benghalense
Lanius schack
Oriolus oriolus
Dicrurus adsimilis
Sturnus pagodarum
Acridotheres tristis
Corvus splendens
Corvus macrorhynchos
Pericrocotus cinnamomeus
Aegithina tiphia
Pycnonotus cafer
Turdoides caudatus
Rhipidura albicollis
Terpsiphone paradisi
Copsychus saularis
Saxicoloides fulicata
Motacilla cinerea
Motacilla alba
Parus major
Nectarinia asiatica
Passer domesticus
Gallus gallus
Pavo cristatus
Neophron perenopterus
Gyps indicus
Bubo coromandus
Ninox scutulata
Strix leptogrammica
Urocyon bairdii



Great Indian Bustard
Rock Bees
Smaller Forest Bees

Choriotis nigriceps
Apis dorsata
Apis indica

C. ENDANGERED WILDLIFE

Common Name	Scientific Name
Tiger	<i>Panthera tigris</i>
Panther	<i>Panthera pardus</i>
Sloth bear	<i>Melursus ursinus</i>
Peacock	<i>Pavo cristatus</i>
Bison	<i>Bos gaurus</i>
Civet cat	<i>Viverra megaspilla</i>

====00====

Part - I

SUMMARY OF FACTS
ON WHICH PROPOSALS
ARE BASED

CHAPTER – I

THE TRACT DEALT WITH

SECTION 1.1 : NAME AND SITUATION :

1.1.1. This working plan is the consolidated working plan for all the forest areas in charge of the Forest Department in Ballarsha, Dhaba, Kothari, Rajura, Wansadi, Wirur and Jioti Forest Ranges of Central Chanda Forest Division in Chandrapur Forest Circle in Chandrapur District of Maharashtra.

1.1.2. The first consolidated working plan written by Shri Ramjee Singh Yadav IFS and Shri G.P.Garad, IFS Dy.Conservator of Forests, Working Plan, Yavatmal for the period 2004-05 to 2013-14 and one year i.e. 2014-15 extension has been granted by GOI vide letter No. 12-10/2002(FOR)/1097, dated 3.6.2014 of Central Chanda Forest Division covering the entire forests i.e. Reserved Forests, Proposed Reserved Forests, Protected Forests and Unclassed Forests (Zudupi Jungle under taken by division and the non forest areas under taken by the division for compensatory afforestation). The forest area included in this working plan is 114309.399_ha, out of which 88862.742 ha is Reserved Forests, 19647.197 ha Protected Forests and 5799.46 hectare Unclassed Forests. Excluding FDCM Area 28785.315 ha

Total forest area including in this working plan is 111908.057 ha. Which comes to 68.49% of the total geographical area of the division. Out of total forest area 90822.934 ha. is Reserved Forest, 18045.593 ha. Protected Forest, 3039.480 ha. Unclassed forest. Total area covered by this plan included newly created Reserved Forest, Zudpi Jungle and Big tree (Unclassed Forest) An area of FDCM 31360.648 ha. is excluded.

1.1.3. The forest areas of Ballarsha, Kothari, Dhaba, Rajura, Wansadi, Wirur and Jioti Ranges are situated within the civil territories of Ballarshah, Chandrapur(part), Rajura, Korpana, Pombhurna, Mul(part) and Gondpipri Tahsils of Chandrapur District. These areas lie between latitudes **19° 31' to 20° North** and longitudes **78° 50' 30" to 79° 45' East**.

1.1.4. The boundaries of the tract dealt with are as follows :

↑ **NORTH** : Wardha rivers along the Yavatmal District, Chanda and Mul Forest Ranges of Chandrapur Non Buffer Forest Division.

⇒ **EAST** : Wainganga river along Gadchiroli district and Andhra Pradesh.

↓ **SOUTH** : Wardha river and Telangana State.

← **WEST** : Telangana State, Pandharkawada and Chandrapur (Non Buffer) Forest Divisions of Maharashtra State.

SECTION:1.2 : CONFIGURATION OF THE GROUND :

1.2.1. The terrain in Ballarshah, Kothari and Dhaba Ranges is mostly flat to gently undulating. Small patches to the North-East and North-West of Dhaba and Kothari Ranges are slightly hilly. The altitude varies from 180 metre to 294 metre above mean sea level. The hill blocks have Western and Southern aspects and streams drain into the Wardha river. Streams in the North-East drain into Andhari Nala, a tributary of the Wainganga.

1.2.2. Nearly 30% of forest areas of Rajura, Wirur, Wansadi and Jioti ranges are situated in the plain with slight undulations. This consists of Rajura, Somthana, Moorti, Chicholi, northern and eastern portions of Garlapeth, Mangalhira, Chanai-Barsa I, and Chanai-Barsa II, Pardi, Kanergaon, Ahson and other isolated Blocks. Manickgarh is very hilly and rugged country with one main ridge, which branches and re-branches in all directions forming several plateaus of varying extents at places. Southern portion of Garlapeth block and south-west half of Siddheshwar block are also very hilly with steep slopes. The lowest altitude of the plains forests is 169.2 meter above the mean sea level, while the highest point is attained by the main ridge of Manickgarh hills at Jettameda with an altitude of 588.6 meter above the mean sea level.

DRAINAGE :

1.2.3. The tract is interspersed with big and small nalas draining into the Wardha and Wainganga rivers. The important nalas which flow or contain water throughout the year are Upasa and Pilkhana nalas in Dhaba Range; Bhagrati, Bhivkund, Pandharpani, Jharan and Hatti nalas in Ballarshah Range and Dhaba, Jamri, Lahan Jharan etc nalas in Kothari Range. Apart from nalas mentioned above, there are a number of seasonal nalas within the tract flowing during monsoon and till the end of February.

1.2.4. The whole of the forests tract of Rajura, Wansadi and Wirur ranges , excepting the southern slopes of Manickgarh block, forms the catchment of Wardha river which ultimately drains into Wainganga forming Pranhita river which is a major tributary to Godavari river. Northern slopes of Manickgarh hills drain into Painganga river through Mehindi, Jevra, Deoghat, Varu, and Bop nalas and also into Wardha river through Sasti nala. Painganga river joins to Wardha river in the north at Jugad. Forests of Rajura, Chicholi, Somthana, Moorti, Siddheshwar and Garlapeth blocks drain into Wardha river through Rajura, Dongar and Annur nalas. Southern slopes of Manickgarh hills drain into Pedda vagu through Chikali vagu, Bapar Vagu and Persikuder nalas; the Pedda vagu ultimately draining into river Godavari through Pranhita river.

SECTION 1.3: GEOLOGY, ROCKS AND SOILS :

1.3.1. GEOLOGY & ROCKS:- The geological formations of the tract are as follows:

RECENT TO SUB-RECENT – Alluvium/Laterite.

EOCENE TO CRETACEOUS – Deccan trap (Basalt), (Feruginous gravelly soils) with Inter-Trappeans.

PERMO-CARBONIFEROUS – Sandstone/Shale, Kamathi and Barakar Formation (Lower Gondwana) Sandy soils/Sandstone/Shale/Talchir Formation. (Lower Gondwana) Black cotton soils.

PRE-CAMBRIAN – Shale/Sandstone/Limestone. (Vindhyan System) Loamy soils.

RECENT TO SUB-RECENT:- Deposits of laterite of Recent to Sub-Recent age occurs in the vicinity of Manickgarh fort towards South and South West.

EOCENE TO CRETACEOUS :- Almost the whole Southern part of the area is covered by Deccan Trap. It consists of layers of basaltic lavas, varying from amygdaloidal basalt to massive basalt. At places, the amygdules are filled with various minerals like quartz, amethyst, calcite, agate chaledony and jasper. The rocks are generally dark grey and greenish grey in colour. The non vesicular types are hard, tough, compact and medium to fine grained, breaking with conchoidal fracture. The vesicular types are comparatively soft and break more easily.

PERMO-CARBONIFEROUS:- The formations belonging to this division include Sandstones and shales of Lower Gondwana Systems and consists of Kamathi, Barakar and Talchir Formations. A small portion in north, between the villages Sangoda-Bergaon and Awarpur-Bakardi and also a considerable area towards NorthEast and East, which include areas surrounding Sasti, Manickgarh, Rajura Wirur and Chicholi belongs to Kamathi and Barakar Group of formations.

PRE-CAMBRIAN:- Almost three fourth of the tract which lies on the north belongs to this division. It is known as Vindhyan System and mainly contains shale, sandstone and limestone.

1.3.2 SOILS:- The soils of the tract dealt with come under the Lower Maharashtra (Deccan) Plateau (Metamorphic) Soil type of Maharashtra under which western side is dominated with alluvial plain and the eastern portion has uneven hill ranges. The soils are developed from granite, gneisses, schists and alluvium.

1.3.3. SOILS OF SUMMITS AND SPURS:- Gently sloping summits and spurs consists of shallow, well drained, neutral to alkaline (pH 6.5 - 8.5), fine loamy to loamy, calcareous, Typic Ustorthents and Lithic Ustorthents with severe erosion and low water holding capacity.

1.3.4. SOILS OF UNDULATING LANDS:- Gently sloping undulating lands consist of shallow to moderately deep, well drained, neutral (pH 6.5 – 7.5), loamy, fine loamy and fine. Lithic and Typic ustorthents and Typic Ustrophepts with low water and nutrient holding capacities and moderate to severe erosion.

1.3.5. Very gently sloping undulating lands consist of deep to very deep, moderately well drained, neutral (pH 6.5-7.5) clayey Vertic Ustopepts and

Typic Chromustants with moderate erosion, high water and nutrient holding capacity.

1.3.6. SOILS OF HILLS AND RIDGES WITH PEDIMENTS:- Moderately sloping hills and ridges consist of shallow, well drained neutral (pH 6.5-7.5) loamy- skeletal, Lithic Ustorthents, Typic Ustorthents and Typic Ustorthents with severe erosion and moderate stoniness.

1.3.7. Gently sloping pediments surfaces consist of slightly deep, well drained loam Typic Ustropepts and Typic Ustorthents with severe erosion. At places deep, well drained, slightly acidic (pH 5.5-6.5), fine loamy, Typic Haplustolls and Typic Ustropepts with moderate erosion are observed.

1.3.8 Very gently sloping pediments surfaces consist of very deep, well drained, calcareous, neutral to alkaline (pH 6.5-8.5), clayey Typic chromusterts and Typic Ustropepts and Vertic Ustropepts with high water holding and high Chemical Exchange Capacity.

1.3.9 SOIL OF ALLUVIAL PLAINS:- Very gently sloping plains of alluvial origin consist of very deep, moderately well drained, neutral (pH 6.5-7.5), cracking, clayey, Typic Chromusterts, Vertic Ustropepts and Typic Ustropepts. These soils have high shrink swell potential, high water holding capacity, high exchangeable bases.

1.3.10.SOILS OF VALLEYS:- The gently sloping valleys consist of very deep, moderately well drained, fine loamy, calcareous, neutral to alkaline (pH 6.5-8.5), Fluventic Ustochrepts and Vertic Ustochrepts with moderate erosion.

1.3.11. SOIL CONSTRAINTS:-

- Coarse textured soil with low water and nutrient holding capacity.
- Ridges and hill areas are prone to erosion.
- Indiscriminate felling of trees and improper agricultural practices by the resident tribals cause deterioration in the ecosystem.

1.3.12. POTENTIAL :- Area has assured rainfall of more than 1200 mm and rich in coal, limestone, dolomite, manganese etc ores.

The soils are deep and have high water holding capacity (WHC) and high fertility in plains.

1.3.13. STRATEGIES:- Afforestation of the hilly areas to restrict degradation through erosion and to develop the species of timber.

1.3.14. The range wise distribution of rocks and the soils derived therefrom are as follows :

1.3.15. BALLARSHAH RANGE: The forests in this range are growing over Kamthi sandstones. The tract from Ballarshah to Junona and extended upto Warora is almost entirely coal bearing and has high potential of coal reserves. The soil is sandy loam, moderately deep and supports medium quality mixed forests.

1.3.16. KOTHARI RANGE : In this range, area North-East of village Kanhargaon and North of village Aksapur is comprised of sedimentary rocks of purana group. This group is represented by quartzites and limestones of conglomerates formation. Soil derived from these is clayey loam and supports medium quality (IV a to III) forests. Rest of the areas of Kothari Range is comprised of the Kamthi series of rocks belonging to the Lower Gondwana system. Kamthi series is represented by the feruginous sandstones and clays, both white and yellow. Soil derived is fairly deep, fertile sandy loam and supports high quality mixed forests. However, the soil being sandy loam, soft and friable is easily susceptible to erosion wherever the area is subjected to undue opening and undesirable impact due to biotic factors, such as heavy grazing, illicit felling and annual fires. The patches, where the top layer of the soil has been eroded due to sheet or gully erosion, have become comparatively less fertile and supporting only low quality (IV) forests. Such patches are not uncommon in this tract.

1.3.17. DHABA RANGE : The tract to the West of Dhaba is covered by Kamthi series of rocks represented by sandstones and clays. The remaining forest areas to the North-East of Dhaba is occupied by the igneous rocks, such as gabbro and pyroxenite and gneisses of Pre-cambrian age. The soil to the West of Dhaba is sandy loam deep and fertile supporting high quality mixed forests and to the North-East of Dhaba is clayey soil which is grayish in colour and supports medium quality teak forest (IV -III). Narrow band of limestone formation belonging to Vindhyan series exists which lies between Dongargaon in the South-East to Karanji in the centre. Soil is clayey loam with moderate depth and fertility and supports forests of quality- III to II.

1.3.18. RAJURA RANGE: Most of the areas of this range comprise Pre-Cambrian formation of Vindhyan system and contains shale, sandstone and limestone. Also some Permian-Carboniferous formation is found consisting of sandstone and shales of Lower Gondwana and Kamthi and Barakar groups of formation.

1.3.19. WANSADI & JIOTI RANGES : Most of the areas of this range comprise Pre-Cambrian formation of Vindhyan system and contains shale, sandstone and limestone. Also some Permian-Carboniferous formation is found consisting of sandstone and shales of Lower Gondwana and Kamthi and Barakar groups of formation. Southern portion of this range areas are of Eocene to Cretaceous age forming the Deccan trap. It consists of layers of basaltic lavas, varying from amygdaloidal basalt to massive basalt. At places, the amygdaloids are filled with various minerals like quartz, amethyst, calcite, agate chalcedony and jasper. The rocks are generally dark grey and greenish grey in colour. The non vesicular types are hard, tough, compact and medium to fine grained, breaking with conchoidal fracture. The vesicular types are comparatively soft and break more easily.

1.3.20. WIRUR RANGE: Areas of this range are of Eocene to Cretaceous age forming the Deccan trap. It consists of layers of basaltic lavas, varying from amygdaloidal basalt to massive basalt. At places, the amygdules are filled with various minerals like quartz, amethyst, calcite, agate chalcedony and jasper. The rocks are generally dark grey and greenish grey in colour. The non vesicular types are hard, tough, compact and medium to fine grained, breaking with conchoidal fracture. The vesicular types are comparatively soft and break more easily. Some areas are of recent to subrecent age and Permo- Carboniferous age. Soils are found as mixture of sandy soil, skeletal soil, stony red soil and black cotton soils inter mixed with each other at places.

SECTION- 1. 4: CLIMATE:

1.4.1. The climate is characterised by a hot summer, well distributed rainfall during the south-west monsoon season and general dryness except in the rainy season. Three distinct seasons are recognised, which are as follows :

1.4.2. HOT SEASON (SUMMER) : Summer is mostly hot and dry. It starts from the end of February and continues upto mid of June i.e. onset of monsoon. April and May experience unbearable heat.

1.4.3. MONSOON SEASON (RAINS) : Normally, monsoon breaks in by mid of June and continues upto October. Average annual rainfall in this tract is 1377 mm.

1.4.4. COLD (WINTER) : It starts from November and continues upto the end of February. Winter is fairly cool, pleasant and healthy. Occasional showers are received. Frost does not occur.

1.4.5. RAINFALL:

Records of rainfall for Rajura Station of Central Chanda Forest Division are available from 1975 onward. The annual rainfall varies from 900 mm. to 1600 mm. The rain fall data for four season periods i.e. from 1951 to 1965 (Data from S.B. Kulkarni's plan), from 1975 to 1985 and from 1986 to 1991, 1999;2011 have been taken for comparison. The following table gives the comparative average rainfall for the respective periods.

Month/Year	Average rainfall at Rajura Station in mm.				
	1951-1965	1966-1985	1986-1991	1999	2011-12
January	1.40	11.02	6.17	NA	NA
February	10.70	2.90	30.67	NA	NA
March	16.30	1.36	20.33	NA	NA
April	18.50	4.64	10.17	NA	NA
May	11.10	0.82	28.17	NA	NA
June	164.00	189.63	232.00	184.2	180.60
July	292.60	346.23	371.67	382.9	258.00
August	368.00	187.56	439.67	333.2	232.20
September	269.60	310.50	190.00	228.2	154.80
October	65.70	62.22	78.50	50.4	73.00

November	6.50	5.90	16.67	NA	0.00
December	2.40	9.82	9.33	NA	0.00
TOTAL FOR YEAR	1226.80	1132.65	1433.33	878.9	898.60

1.4.6. Pre-monsoon showers occur in the month of May and the main rainy season starts from June and continues upto October. Rainfall Averages for this tract indicate that 86 % of the annual rainfall is received during June to October and 14 % during pre and post monsoon months. It is also noticeable from above table that average rainfall decreased during 1975-1985 period and increase during 1986-1991 periods and again decreased in 1999 and again decreased in 2011-12.

ANNUAL RAINFALL AT RAJURA (in millimeter)

Month/Year	1986	1987	1988	1989	1990	1991	1999	2011
January	12	20	0	0	0	5	0.00	NA
February	92	0	60	0	32	0	0.00	NA
March	11	22	32	16	41	0	0.00	NA
April	38	0	20	0	0	3	0.00	NA
May	4	0	0	0	160	5	0.00	NA
June	164	87	270	273	436	162	279.0	180.60
July	464	133	605	191	448	389	132.0	258.00
August	858	252	265	251	741	271	301.0	232.20
September	450	97	237	182	97	77	205.9	154.80
October	28	103	186	3	151	0	119.2	NA
November	0	64	13	0	0	23	0.00	NA
December	51	0	0	5	0	0	0.00	NA
Total	2172	778	1688	921	2106	935	1037.1	825.60

1.4.7. It is obvious that rainfall is not steady for all the years. Variation of rainfall is too much. It was 2172 mm in 1986. While in 1987 it was only 778mm. The variation of rain and temperature adversely affects the regeneration of forests naturally or artificially.

1.4.8. TEMPERATURE:

1.4.8. Temperature data for a station locating in the geographical area of this division is not available. But this tract has the same climatic condition as that of Chandrapur; the abstract of average temperature data for Chandrapur station is produced here.

TEMPERATURE AND RELATIVE HUMIDITY

Month	Mean daily Max.	Mean daily Min.	Highest max. Ever.		Lowest min. ever.		Relative Humidity % at hours.	
			°C	Date	°C	Date	08.30	17.30
Jan	29.0	9.5	35.6	29/1/1900	2.8	10/1/1899	69	41
Feb	33.0	11.8	39.6	29/2/1951	3.9	2/2/1905	60	33
Mar	37.2	16.8	44.4	27/3/1892	7.2	5/3/1898	43	23

Apr	40.9	21.6	46.1	30/4/1942	11.7	1/4/1905	39	22
May	42.5	22.2	48.8	16/5/1912	18.9	9/5/1919	35	21
Jun	37.4	22.4	47.2	10/6/1931	20.0	18/6/1919	61	51
Jul	31.9	21.4	40.6	4/7/1997	17.8	31/7/1954	79	75
Aug	30.7	22.1	37.2	3/8/1954	18.3	26/8/1954	81	74
Sep	32.2	20.9	37.2	22/9/1899	18.3	28/9/1904	81	72
Oct	32.5	15.8	37.8	9/10/1899	11.7	27/10/1882	73	60
Nov	30.7	11.7	36.1	9/11/1960	7.2	27/11/1950	71	52
Dec	29.1	8.3	33.1	22/12/1933	3.9	19/12/1883	74	46

Temperature during summer shoots up fairly high. The average maximum temperature reaches upto 46⁰ c. The maximum and minimum temperature recorded is 48.8⁰ Celsius and 2.8⁰ Celsius respectively.

SN	MONTH	YEAR	MAXIMUM	MINIMUM
1	January	2011	33.6	9.7
2	February	2011	34.	12.8
3	March	2011	38.4	18.0
4	April	2011	42.6	21.3
5	May	2011	47.8	26.4
6	June	2011	44.2	23.2
7	July	2011	35.6	22.8
8	August	2011	34.4	21.8
9	September	2011	33.2	22.1
10	October	2011	34.4	19.9
11	November	2011	33.0	14.1
12	December	2011	29.5	9.8
YEAR' 2011(In degree Celcius)			47.8° C	9.7° C

1.4.9. RELATIVE HUMIDITY:

1.4.9. The average monthly relative humidity percentage, recorded at Chandrapur for the period from 1881-2010 have been received from INDIA METEOROLOGICAL DEPARTMENT, Nagpur Region, Nagpur is given in **Appendix No.II.** of Volume II. The air is generally dry except during the south west monsoon season when the humidity in the afternoon exceeds 70%. The summer months are driest when the relative humidity in the afternoon varies between 20% to 25%.

1.4.10. FROST: Frost does not occur in this tract.

1.4.11. DROUGHT: Drought like condition is felt during summer when water shortage is felt by regeneration, vegetation and wildlife.

1.4.12. STORMS AND WINDS: From October to March North-Easterly and from April to September South-Westerly winds are experienced. Their incidences are not common. Occasional storms occur in pre monsoon period. Thunder storms occur in all the months, their incidence being the highest during the monsoon season and lowest during the winter season.

1.4.13. HEALTH CONDITION: The health condition within the tract is not bad. However, skin diseases like leprosy, eczema and water - borne diseases, such as diarrhea, dysentery are common. Typhoid, Malaria, Fileria

and T.B. cases are also observed but in less number. Medical facilities in urban areas are adequate. However, in rural areas people have to travel upto 8 kms for getting medical facilities. Primary health centres exist at Ballarshah, Gondpipri, Kothari, Dhaba, Pombhurna, Rajura, Korpana, Gad Chandur, and many sub-centres have been established at various places. Ayurvedic dispensaries exist at Bhangaram Talodhi, Tohogaon, Kothari, Kunghada and Talodhi Mokasa. Medical facilities extended by industries in the areas like Ballarpur Paper Mill at Ballarpur (Ballarshah), Manickgarh Cement Factory at Manick Garh, Larson and Turbo Cement Factories at Awarpur, and GadChandur, Ambuja Cement Factories and Western Coal Field Limited at various places e.g. Sasti, Ballarpur, Gowari, Wirur etc are also serving the people in a great extend. In interior, even today tribal people mostly depend on local herbal medicines prescribed by vaidu.

SECTION- 1.5 : WATER SUPPLY :

1.5.1. Tanks, wells and borewells from the main sources of water supply. The Wainganga, Painganga and the Wardha are three perennial rivers to add to water supply. In some villages network of pipelines for drinking water has also been established. People of Saknur, Gujar, Chatnadgaon, Kudenadgaon and Hetinadgaon villages even today totally depend upon perennial nalas for water. Even drinking water is made available from nalas only. Such situation does not exist in other villages of the tract. Scarcity of water is felt during summer when water table recedes and wells and tanks dry up. During this period people obtain their drinking water either from the perennial wells or by digging water holes in the river beds locally known as “Jhara”.

1.5.2. The list of existing wells and tanks in the division have been given in **Appendix No.XV** of volume II In the village Kanhargaon of Kothari Range there is a continuous flow of water from Artesian Well. FDCM has regulated this flow of water by application of Pipe Line that surves permanent source of water for villagers and FDCM Colony in that area.

SECTION- 1.6 : DISTRIBUTION OF AREAS :

1.6.1. The total area of the Reserved Forests, Protected Forests and Unclassed Forests under this plan as it stood on 01.04.2014 are 90822.934 ha, 18045.593 ha, and 3039.480 ha respectively. Out of which 31134.648 hectare of Reserved Forests & 226.00 Protected Forests are with Forest Development Corporation of Maharashtra (A Maharashtra State Undertaking) and is being managed under the Management Plan prepared by FDCM. Thus, the net area with Central Chanda Forest Division is 90822.934 hectare of Reserved Forests, 18045.593 hectare of Protected Forests and 3039.480 hectare of Unclassed Forests totaling to 111908.057 hectares. These forests are spread over seven Forest Ranges, viz Ballarshah, Dhaba, Kothari, Rajura, Wirur, Wansadi and Jioti.

1.6.2. The distribution of Reserved Forests, Protected Forests and Unclassed Forests by ranges is as given below:

RANGEWISE DISTRIBUTION OF THE AREA (IN HA)

Sr.No	Range	Area of Ranges in ha	Area handed over to FDCM in ha	Total area in ha
1	Ballarshah	15,829.315	226.00 PF	16055.315
2	Kothari	11,599.490	17494.579 RF	29094.069
3	Dhaba	5,341.204	13640.069 RF	18981.273
4	Rajura	10,376.132	0.00	10376.132
5	Wirur	19,961.269	0.00	19961.269
6	Wansadi	20,592.362	0.00	20592.362
7	Jioti	28,208.285		28208.285
	Total	111,908.057	31360.648	143268.705

(RF = Reserved Forests; PF = Protected Forests, UF = Unclassed Forests, Area is in hectare.)

TABLE SHOWING THE RANGE WISE AREAS LEGAL STATUS OF AREAS

Range	Range area in ha Area (ha)	RF Area (ha)	PF Area (ha)	UF Area (ha)
Ballarshah	15,829.315	11272.926	4556.389	0
Kothari	11,599.490	5325.215	6274.225	0
Dhaba	5,341.204	2954.945	2377.219	9.040
Rajura	10,376.132	10270.010	106.122	0
Wirur	19,961.269	19961.269	0	0
Wansadi	20,592.362	15860.724	4731.638	0
Jioti	28,208.285	25177.845	0	3030.440
Total	111,908.057	90822.934	18045.593	3039.480

(RF = Reserved Forests; PF = Protected Forests, UF = Unclassed Forests, Area is in hectare.

LEGAL STATUS WISE FOREST AREAS

Sr. No	Legal Status	FD Territorial Area(ha)	FDCM Area(ha)	Gross area with FD Area(ha)
1	RF	90822.934	31134.648	121957.582
2	PF	18045.593	226.00	18271.593
3	UF	3039.480	0.00	3039.480
	Total	111,908.057	31360.648	143268.705

1.6.3. The areas of R.F. in Ballarshah, Kothari, Dhaba Rajura, Wirur, Wansadi and Jioti Ranges as shown above are not the same as were taken in the previous plans. The difference in areas is due to the following reasons :

- (i) Due to disforestation of some area during the previous plan period.
- (ii) Due to afforestation of some areas.

(iii) Inclusion of Bhari Forest Block.

(iv) Due to finalisation of allotment of compartments to the FDCM Now there is no ambiguity so far as allotment of areas to the FDCM is concerned. Only R.F. areas are given to the FDCM except at Ballarshah an area of 226 hectares has been given to FDCM for Sale Depot and Administrative Building and Residential Quarters. The list of compartments transferred to the FDCM has been given in **Appendix No.V** of Volume II .The distribution of areas between the department and the FDCM has been given as above.

SECTION - 1.7: STATE OF BOUNDARIES:

1.7.1 The old Reserved Forests of Ballarshah, Dhaba and Kothari Ranges which were reserved in the year 1879 have been demarcated by traditional means. The length of external boundary line is 250.04 km, of which 117.60 km is natural features. Artificial boundaries consist of 13 metre (40 feet) cleared line with pillars at suitable intervals. The pillars consist of a central wooden stake of durable timber with pyramidal top surrounded by a cairn of stone or earth. At certain places wooden stakes have been replaced by RCC posts. Total height of the stake is about 2 metres of which about 50 cm projects above the cairn. They are numbered serially anti-clockwise. Each village boundary has separate series of numbers. The demarcation exists but improvement in maintenance is needed. Taking into account the increasing pressure on forest and criminal activities, it is very much essential to demarcate outer boundary of the forests by R.C.C. Pillars of approved design.

1.7.2. 322.465 ha P.F. in Kothari Range was declared R.F. in the year 1983 but this has not been demarcated so far. Immediate demarcation of the same is needed. Maintenance of compartment boundaries needs improvement.

1.7.3. Demarcation of Protected Forests is not seen in the field. Due to this, area is vulnerable to encroachment and some areas have already been encroached. Its demarcation by R.C.C. pillars of approved design is very much essential otherwise this will go on shrinking due to encroachment.

1.7.4. Rajura, Wansadi and Wirur ranges form the old Rajura Tahsil. Rajura Tahsil has been transferred as a whole from Hyderabad State to the erstwhile Bombay State and subsequently to Maharashtra State. Earlier this Tahsil was in Nanded District. Later on it was transferred to Chandrapur District. The traverse line running around the tahsil forms the inter-state boundary between Maharashtra and Andhra Pradesh. This traverse line is an artificial one and major portion of it run through forests. The boundary stones, erected at the time of traverse survey of the villages are missing.

1.7.5. Further, the tahsil map, published by the Land Records Department, on the scale of 1" = 1 mile, dose not tally completely with the printed toposheets published by the Survey of India. Similarly the inter state boundary which forms the western boundary of Mangalhira block is also subject to dispute as boundary demarcation on the ground does not exists. Therefore, the map of 2" = 1 mile scale is used, which was accepted in last plan and the boundaries are also kept as it without any change to avoid the complications.

1.7.6. The external boundaries of Somthana, Mangalhira, Chanai-Barsa I and II, Naranda, Talodhi, Kewitgaon, Erai and Jaitapur are not traceable due to longstanding cultivations. From Kulkarni's plan period these boundaries have not been maintained and at present pillars are also missing at many places. Thus the position of the boundaries in respect of above blocks is very much unsatisfactory and needs to be given urgent attention as prescribed in last plan but not attended at all.

1.7.7. Compartment boundaries also not maintained properly and are not traceable in many cases. Statement showing length of external and internal boundary lines by compartments have been given in **Appendix No XLII** of Volume II.

SECTION- 1. 8 : LEGAL POSITION :

1.8.1. Descriptions of areas of Ballarshah, Dhaba and Kothari forest range.

1.8.2. RESERVED FORESTS : Before the enactment of Indian Forest Act (VII of 1878) forests of Ballarshah, Dhaba and Kothari ranges were in possession of either malgujars or zamindars. The greater part of these forests was declared reserved under section 34, IFA of 1878 by the local Government's (Central Provinces), Gazette Notification No.917 (i), dated the 24th February, 1879. The total Reserved Forest areas covered under this notification and included in Ballarshah, Kothari and Dhaba Ranges is 53081.778 ha. The balanced forest areas remained with Zamindars and Malgujars till the abolition of the proprietary rights in 1951. In 1894 and in the succeeding years the forests were split up into three classes, viz :

A : Areas to be retained permanently as reserves.

B-1 : Areas declared available for cultivation.

B-II : Areas not finally placed in either of these classes.

1.8.3. Transfers between A and B classes have been frequent. The R.F. area covered in this plan is 25709.636 ha. On the 1st July, 1908 Dhaba Range was transferred from North to South Chanda Division. Out of 50884.808 ha Reserved Forests in three ranges, 12389.77 ha in Kothari and 12685.35 ha in Dhaba Ranges were transferred and handed over to FDCM as per policy decision taken by department. 322.465 ha P.F. areas in Ghosari, Kudesaoili and Parsodi villages of Kothari Range were declared R.F. under section 20 of IFA, 1927 vide Government of Maharashtra Gazette Notification No.WS-5-E - FOR - 1(1975) DESK - IX - II, dated 17th February, 1983.

1.8.4: PROTECTED FORESTS: In 1951, the M.P. Abolition of Proprietary Rights (Estates, Mahals, Alienated lands) Act, 1950 (1 of 1951) was passed and all the private forests possessed by Malgujars and Zamindars within the tract vested in the State Government with effect from 1st April, 1951. Initially they were taken over by the revenue department. Later on the suitable areas were

transferred to the forest department for management as per the M.P.Gazette Notification No.2239/286/XVI, dated 9.4.1951 and 7177/CR/617, dated 4.11.1951. The same was declared Protected Forests under section 29 of IFA, 1927 vide M.P.Government Gazette Notification Forest No.3065 - 1216, XI, dated 13th August, 1955 and 1056-12623 FF,dated 08.08.1957. Subsequently, for protected forest areas in Ghosari, Kudesoli and Parsodi villages the intention to constitute Reserved Forests under section 4 of IFA, 1927 was declared vide Bombay Government Gazette Notification No.FLD - 1258/II-3314-E, dt.August 20,1959. Forest settlement officer was appointed who submitted his report to the Government recommending reservation of 322.465 hectare of Protected Forest area in these three villages. The same was declared Reserved Forests under section 20 of IFA vide Maharashtra Government Gazette Notification No.WS-S-E-FOR-1(1975) DESK IX-II, dated 17th February, 1983. Besides, some Protected Forest areas were disforested from time to time vide Government Notifications, the number of which have been given in **Appendix No XX** of Volume II. The net protected forest areas available as on mention date 1st July, 2001 as per record is 7142.223 ha in addition to it 6367.372ha is proposed to be Reserved Forests under various gazette notifications. Out of these some areas are under encroachment as well, the list of encroachments after 1978 and rangewise abstract of encroachments before 1978 as per available records have been given in **Appendix No XLVIII** of Volume II.

1.8.5: Descriptions of the areas of Rajura, Wansadi and Wirur forest ranges of Central Chanda Forest Division.

1.8.6: Out of the total area of 75,938.366 hectare an area of 67,494.026 hectare is the reserved Forests declared under section 18 of Hyderabad Forest Act of 1326 F.(1916 A.D.) and section 19 of Hyderabad Forest Act II of 1355 F (1945 A.D.). This area is contained in 10 blocks namely Rajura, Somthana, Chicholi, Siddheshwar I & II, Garlapeth, Manickgarh, Pardi, Kanhergaon and Ahson. The rest of blocks with an area of 6116.849 hectare are Protected Forests. An area of 4602.420 hectare in Mangalhira and Talodhi block was proposed to be reserved forest before the State Reorganisation. But the reservation proceedings were not completed while in earstwhile Hyderabad State and the same have been not attended to since its transfer to Maharashtra State. The statement showing the notifications of reservation of forest as reserved or protected forest have been given in **Appendix No XIX** of Volume II.

1.8.7 In the year 1982, 1288.00 hectare from Moorti, Chanai Barsa Block I&II , Jaitapur, Kawitgaon, Erai and Naranda Blocks has been proposed for reservation by the Commissioner of Nagpur Division, Nagpur vide his letter No. S/502/FOR-(1981) Desk-IX-II dated 4.12.1984. As per the section 4 of the Indian Forest Act, 1927 (XVI of 1927) in its application to the State of Maharashtra. The said notification has been published in the gazette of the Government of Maharashtra dated 28th August, 1982. The matter needs to be perused. The above proposed Reserved Forests areas were previously

declared as Protected Forests under section 29 and 30 of Hyderabad Forest Act II of 1355 F. (1945A.D.).

1.8.8. At the time of reservation of Manikgarh block only seven enclaves were shown as excluded though there were as many as 116 (of which 77 villages are in Maharashtra) villages of long standing. Out of these 7 enclaves 4 were wholly in the Maharashtra State whereas 2 are completely in the Andhra Pradesh and in case of one enclave some part is in Maharashtra and some part is in Andhra Pradesh (earstwhile Hyderabad State) as per the map prepared by the Hyderabad settlement Officer at the time of reservation. Thus the total area of enclaves, included in the area, handed over to Bombay State is 1979.399 hectare. That area had been excluded from the Working Plan prescription of Kulkarni's plan and Dr Nand Kishor's plan.

1.8.9 In Manickgarh block out of the total area of 48378.465 hectare shown against Maharashtra State, 2954.695 hectare area had already disforested. As per the stock mapping which is an ocular estimation an area of 20385.323 hectare is under encroachment or cultivation. A detailed note regarding encroachment and survey carried out by the Land Record Department was given in the last plan which is still pertinent and hence reproduced here.

1.8.10. In addition to this area an area of 2327.491 ha in Bhari Block of Wansadi Forest Range is being incorporated to Forest Department for the first time as that was earlier in the possession of Revenue Department. That area has status of Proposed Reserved Forests. Thus, the total forest areas of Rajura, Wansadi and Wirur ranges comes to 75,938.366 hectare.

ENCROACHMENT IN MANICKGARH FOREST BLOCK:

1.8.11. Initially, the Manickgarh block was the part of earstwhile Hyderabad State. This block was declared as Reserved Forests by the Earstwhile Hyderabad State vide Notification No. Nil dated 18/10/1953 under Hyderabad State Forest Act.

1.8.12. As per the above notification, 82945.428 hectare of land was declared as reserved forests. But during the reorganisation of state in 1956, only 48378.465 hectare of land was transferred to the earstwhile Bombay State. As per the record available, it is seen that at the time of transfer of this area, there were 77 helmets in and around forest.

1.8.13. In the beginning, the above area was attached to the Rajura Sub Division and the sub division was the part of Nanded District of Nizam State. Later on the same was transferred to Chandrapur District.

1.8.14. Though the area was declared as Reserved Forests, the demarcation was not done on the ground. Later on in the year 1965-66, preparation of working plan was taken in hand for this area by Shri S. B. Kulkarni. During the stockmapping, it was noticed that about 5523.795 hectare of the area was under encroachment or shifting cultivation. But the said areas

were neither shown on the maps nor the demarcation was done on the ground.

1.8.15. As per the notification declaring the Reserved Forests of Manickgarh block, Seven enclaves were kept unreserved which were excluded from the reserved forest area. However, these areas were not demarcated. Most of the areas of this block is hilly with rugged terrain and undulating topography which extend from east to west. The ancient residents like Gond, Kolam, etc. used to practice shifting cultivation and hunting for their livelihood. Owing to the remoteness and hilly terrain, this area was not accessible from the Maharashtra side. But same was approachable from Telangana State and Marathwada as the communication facilities were available from the above areas. People from Telangana and Marathwada took the advantage of this geographical factor and started to encroach the area. In the beginning, the extent of encroachment by these people was negligible till 1958. These encroachments could not be detected because of the absence of the village boundary and reserve forest boundary. Similarly, cultivated land was also neither shown on the map nor on the ground. As a result, the encroachments could not be detected and if detected, they could not be evicted due to absence of proper demarcation on the ground.

1.8.16. Keeping the above facts in view, a survey by Land Record Department was carried out in 1963-64 to demarcate the village boundary and Reserved Forest boundary and show it on the map. But during that survey cognizance of the notification issued in 1953 was not taken at all and the encroached land was allotted to the encroachers by issuing them pattas. In addition to that, most of the land was shown as “Gairan” and “Parampok”. In this way, only 15517.316 hectare out of total 48378.465 hectare land was shown as Reserved Forest area. The fact can be easily understood from the following table.

TABLE SHOWING DETAILS OF AREAS OF MANICKGARH BLOCK

Sr No.	Type of area	As per Zadti Register of 1931 (in ha)	As per Survey carried out by the LR. Deptt. In 1963-64 (in ha)
1	Total area of 77 villages	62,328.960ha.	54,697.804
2	Parampok	21,316.430ha.	8407.845
3	Gairan	571.010ha.	2336.389
4	Kamshetwar	20,255.040ha.	0
5	Pot Kharab	20,255.040ha.	0
6	Gaothan	1857.130ha.	0
7	Kharij Khata	1857.130ha.	0
8	Nala	57.060ha.	0
9	Padit	204.010ha.	0
10	Forest land	48,149.588ha.	15517.316 (RF)

1.8.17. Thus major part of the forest land was shown as revenue land and the encroachment area was regularised. The issuance of patta encouraged the

encroachers and as a result, it was seen that since 1964 encroachments are increasing steadily and continuously. In 1974, approximately 15960.810 hectare of forest land was found to be encroached, in which traditional cultivation was nearly 5519.510 hectare. As per the records, number of encroachers and their caste wise classification was as shown below in 1974:

Caste	No of encroachers	Caste	No of encroachers	Caste	No of encroachers
Gond	156	Dhiwar	33	Dhangar	10
Kolam	18	Baudha	33	Muslim	114
Laman	668	Kumbhar	5	Other	478
Maratha	825	Telangana	18	Total	2358

Gond and Kolam are the native tribes of this area while others are intruders from Marathwada and Andhra Pradesh.

1.8.18 ACTION TAKEN AGAINST ENCROACHMENT: These encroachments have been started since 1958 and the offences were registered against encroachers. Keeping in view the increasing tendency of encroachment, combined action was taken by the Forest, Revenue and Police departments in 1969., but the same was stayed by the Government of Maharashtra vide telegraphic order No. LEN/5169/133966B dated 22/5/1969. Even then the Forest Department did not remain silent but struggled hard to evict these encroachments by initiating action from time to time.

1.8.19. The above order played an important role in demoralising the forest staff and encouraging the encroachers. As a result during the rainy season of 1969 encroachers started reckless cutting of forest trees and did fresh encroachments in the remaining areas. This stay order was withdrawn on 2/9/1970. Till then, the encroachments were on progress. The seriousness of this problem was put forth before then Chief Minister of Maharashtra on 3/7/1970 and the concerning order was passed on 2/9/1970. During the process two rainy seasons passed and areas were gone under encroachment to a large extent. During the period from July 1969 to March 1971 nearly 8093.7 hectare of forest land was encroached and forests were destroyed by clear felling the same. During 1971-72 additional encroachment over about 1353.69 hectare recorded and during 1972-73 nearly 969.2 hectare encroachments were noticed. In this way by 1973, 15937.11 hectare of forest land was under encroachment. Out of this, approximately, 12000.00 hectare of forest land was encroached upon by the people of Marathwada and Andhra Pradesh.

1.8.20 ATTEMPTS MADE TO DEMARCATHE THE BOUNDARY: In 1967-68 survey and demarcation party was formed under the control of Assistant Conservator of Forests. The party started village wise demarcation of Reserved Forests in the Manikgarh block, but this work could not be completed due to non-availability of concerned maps. In addition to this, people destroyed the land marks fixed by the survey party. Thus, that attempt for demarcation also failed.

1.8.21. In 1970-71, combined attempts for demarcation were made by forest surveyors and foresters, but it was seen that encroachers had continued their encroachment in such a reckless manner that all the land marks around the demarcated area were also destroyed without any hitch and therefore, it was useless to continue this work further.

1.8.22. During the period of 1971-72 to 1972-73 the problem of encroachment was very much under control because the patrolling of the mobile squads of Central Chanda Division and West Chanda Division. During the rainy season of 1971 negligible fresh encroachment were noticed.

1.8.23. In the month of January-February of 1972, Revenue Department started demarcation of the 3.25 hectare plots on the revenue land for the unknown purpose, it created the rumour that every family is getting 3.25 hectare plot and the encroachment is going to be regularized. It was the time for general election. This rumour encouraged the encroachers and they started calling back their relatives from Andhra Pradesh and Marathwada who had left the area earlier due to the continuous and tireless attempts by the forest department to evict the encroachments. Thus again an exodus of encroachers intruded the valuable forests and started clear felling of the forest and thus creating new encroachments with vigour on large scale. Forest Officers tried their level best to stop all these gigantic activities. But the situation went out of control.

1.8.24. Deputy Conservator of Forest, Central Chanda Division tried to get the help from Collector and Police officers but in vain. Thousands of Rupees were spent for construction of forest road to facilitate the patrolling for effective control.

FOREST ROADS CONSTRUCTED TO CONTROL THE ENCROACHMENT:

Sr No.	From	To	Length (km)
1	Chandur	Rupapeth	40.4
2	Dhanakdevi	Jioti	9.7
3	Sawalhira	Yelapur	9.7
4	Ergaon	Kodepur	12.9
5	Naokari	Manickgarh	6.5
6	Dewada-Bhaipathar	Manickgarh	32.3
7	Jivti	Wani	15.0
8	Jivti	Shengaon-Gadchandur	35.0
9	Gadchandur	Nokhari-Jivti	25.0
10	Wani	Gudsela	10.0
11	Gudsela	Shedwahi	5.0
Total			203.00

1.8.25. During the period 1-12-68 to 30-6-73, offence cases were registered against the 2985 encroachers, who had encroached over an area of 8148.75 ha. Out of these cases 455 cases were transferred to Revenue Department but Revenue Department could evict the encroachments in only 47 cases. Record is not available about the outcome of remaining cases.

1.8.26 In 1973, a vigorous combined action by Forest, Revenue and Police Departments launched against the encroachers. The action proved to be quite successful and nearly 500 families were about to go to their native places. But in the meanwhile a rumour spread out that the above action has been stayed by the government. And the encroachers, who were on their way back, again returned and settled.

1.8.27 Unfortunately, the above rumour was found to be the fact and the action was stayed by the government of Maharashtra on 14-7-1973. During March, 1974, again the combined action against the encroachers was initiated. Till 15-6-1974, encroachments over an area of 9307.77 ha of land in 54 villages done by 2068 families were evicted as per the Maharashtra Land Revenue Code, 1966. However, it was seen that due to the political pressures and stay orders issued by the Government of Maharashtra from time to time, evicted encroachments were reoccupied by the encroachers and even they started fresh encroachments in the surrounding forest area. In 1974 following orders were issued by the Government vide order No. FLD/3674/160930, dated. 25-2-1974

- 1) To disforest the 5190.50 hectares of traditionally cultivated land (as per working plan) and to regularize the same by transferring to Revenue Department.
- 2) To dispose off the balance land from the encroachers except the land for which pattas are given by the Revenue Department.
- 3) Forest Department should carry the plantation works on the encroached land (excluding the traditional cultivated land).
- 4) To distribute the 2314.97 hectares of cultivable land to the landless people according to the principles of high power committee.
- 5) For the remaining 2504.19 ha Land of Revenue Department, action should be taken according to Maharashtra Land Revenue Code, 1966.

1.8.28. As per the above orders, in 1974, teak plantations were raised on 400.00 hectares of encroached land but the same is not present today on the spot. It might have been destroyed by the encroachers. Similarly, 2814.995 hectares of land was transferred to Revenue Department on 15.4.1974. But the informations regarding the action taken on the other issues are not available.

The Reserved Forest land, as shown below was disforested by Government and declared as unreserved in order to distribute the same among the encroachers.

i) As per Government order No. FLD/3674/160930 F-3, dt. 24-10-79, 2916.51 ha (7207 acres).

ii)As per order No. FLD/3676/142950 P-3, dated, 4.3.1976, 38.123 ha (94 acres).

Thus, in all 2954.694ha area is already disforested.

1.8.29. S.B. Kulkarni prepared the Working Plan for this area in 1967-68. As per the plan, major part of the Manickgarh block was kept under selection-cum-Improvement Working Circle and the remaining part was under the Conversion Working Circle. However, during the period 1967-68 to 1985-86, only an area of 7818 ha under the different felling series of S.C.I. Working Circle (Total area of the S.C.I. Working Circle was 44,186.465 ha Area of Manickgarh block), the following area is not useful for forestry works.

The statistical information is as shown below:

a)	Land under traditional cultivation	5519.570 ha
b)	Land under encroachment	20385.323 ha
c)	Disforested land	2954.695 ha
	Total :	28859.527 ha

1.8.30. A proposal was sent by the Divisional Forest Officer, Central Chanda Division to the Revenue Department to regularise the encroachments over an area of about 9000 hectare which was encroached upon during the period from 1972 to 1978. But as per the letter from Assistant Conservator of Forests, Rajura Sub Division No. WSP/2/483, dt. 8/10th May, 1984, Revenue Deptt. Could regularize only 1713 ha of land covering 63 villages on the Manickgarh hills. Similarly, since there is no demarcation on the ground it is not possible to identify the exact Reserved Forest boundary in situ.

Even the encroachments which have been regularised so far have neither been demarcated on the ground nor on the maps. To solve this problem there is only one solution and i.e. to demarcate the area afresh with the help of Revenue and Land Records Department taking into consideration the 1953 notification. With the initiative, taken by the Working Plan Division, D.F.O. Central Chanda had discussed the issue with the F.S.O. Chandrapur and submitted detailed proposals to the Conservator of Forests, South Chanda Circle, for demarcating the area jointly, vide his No. Sur/Demarcation/C/74, dt. 18-4-85. But that was not materialised at all.

1.8.31. From the above facts, it is crystal clear that no map can be prepared, showing the exact forest boundary and the encroachments there in the present condition.

1.8.32. The special efforts required to manage the encroachment area are described in the miscellaneous regulation.

1.8.33. Above report was the part of previous plan. The position thereafter did not improve during the execution of last plan. The efforts taken to evict the encroachment during the september 2002 was not fruitful in the light of strong

political agitation and the inadequate knowledge of the extent of forest areas in the tract in the light of above background.

1.8.34. During the course of Bommewar Writ petition No. 3669/2009 against Maharashtra Government, Hon'ble High Court Mumbai Bench at Nagpur issue, the order to prepare a map showing Forest Land, Revenue Land & Disput Land with the help of MRSAC & problem of disputed land will be resolved by Chief Secretary, GOM. RFO Jiwati & Tahsildar Jiwati are preparing the list of area under enchroachment that is disputed land.

SECTION :1.9 : RIGHTS AND CONCESSIONS (FOREST PRIVILEGES) :

1.9.1. There are no rights. Concessions and privileges are given to the agriculturists of certain villages as per the government orders regarding privileges and nistar as follows:

NAGPUR, WARDHA AND CHANDA DISTRICTS:

1.9.2. **PROTECTED FORESTS :** The following privileges are allowed :-

(1) **NISTAR** :- To grant nistar to the villagers as per the limits fixed by the wazib-ul-arz of nistar patrak, the villagers are allowed to remove free of cost thorns, palas etc. for their bonafide use.

(2) **BOMBOOS** :- Dry bamboos only are allowed to be extracted free of cost for the bonafide domestic use. Green Bamboos can be removed at half the sanctioned rates, if this is specifically mentioned in their Wazib-ul-arz.

(3) **TIMBER FOR REPAIRS TO HOUSES** :- The villages are allowed to cut Satkatha trees free of cost for the purpose. Cutting and removal of teak, sal, shisham and semal is prohibited.

(4) **TIMBER FOR BUILDING CONSTRUCTION** :- With permission of the Deputy Commissioner and other revenue Authorities, the villagers can obtain the timber to the extent specified below for the purpose :-

(i) Timber worth Rs.200 or less.	Tahsildar.
(ii) Timber upto Rs. 500	Additional Deputy Commissioner.
(iii) Timber exceeding Rs.500	Deputy Commissioner.

(5) **TEAK TIMBER FOR NISTAR:** - Teak is not given free of cost. If any villager intends to purchase teak, he has to apply for the same to the Revenue authorities. On approval of his application the teak are to be marked by the Forest Department and given to the applicant.

1.9.3. RESERVED FORESTS:

(1) **TIMBER AND FUEL TO THE AGRICULTURISTS** :- Agricultural timber below 24" girth have been supplied at the rates fixed by the

Divisional Forest Officer in consultation with the Deputy Commissioner and these rates have been half of the prevalent market rates

(2) Timber above 24" girth is sold to the Agriculturists at the market rates.

(3) **COUPES LEASED OUT TO CONTRACTORS :-** The contractors have to make available the material below 24" and fuel to the quantity as directed by the Divisional Forest Officer for sale to the agriculturists at the rates fixed by the Divisional Forest Officer and the Deputy Commissioner which are 50 percent of the market rates. Whenever the local rate of a head-load of fuel is more than an anna it should be limited to one anna only and if the rate is less than one anna, the lesser rate is to be continued.

1.9.4.TIMBER FOR AGRICULTURAL IMPLEMENTS: - The agriculturists are permitted to remove the material required for the Agricultural purposes on rated passes to be issued by the respective village Patels. These passes are to be issued at the scheduled rates prevailing in the District. This concession is to be enjoyed in June and July and from 15th September to 15th November every year.

1.9.5.FUEL AND GRASS: - Within the radius of 5 miles from a town they are to be sold to the people only on rated passes at the rates fixed by Government in order to control the rise in prices of these commodities in the markets.

1.9.6. FUEL FROM UNMARKETABLE DEAD TREES: - All dead fuel trees are to be cut by Forest Department on a belt of a furlong to either side of the roads passing through reserve forests and are to be sold to people on permits.

1.9.7. FUEL FROM WORKED COUPES: - The fuel can be extracted at the prevailing rates. If a piece of wood of more than 8' length is entirely useless as timber and is worth only as fuel, it can be removed. Removal of green piece of wood more than 8' length of prohibited species is not allowed.

1.9.8. The Bansods or Burads are allowed to extract up to limit of 1,500 green bamboos per household per year for their small-scale cottage industries at the concessional rates.

1.9.9. Timber (except of teak) is to be supplied free of cost to the flood and fire sufferers. Even teak can be given if the Divisional Forest Officer thinks fit to do so from the silvicultural point of view.

1.9.10. If the Reserve Forest boundary is adjacent to the Hutments and 'Badis' of the villages, the Reserved Forests boundary may be receded back by 5 chains but the management of this strip have been under the Forest Department. In such cases, the boundary to be demarcated have been of 5' width only.

1.9.11.SALAI TIMBER FOR MARRIAGE CEREMONY ETC :- One or two salai trees can be removed at the rate of Rs.1.40

1.9.12. CONCESSION TO KUMBHARS: - For the preparation of bricks, tiles and other earthen pots, the Kumbhar can get earth and sand free of cost. Whose annual income extends to Rs. 10,000 or who give sales tax cannot get this benefit. Kumbhars have to get written permission from the Deputy Conservator of Forests to burn his kiln.

1.9.13. No tax is to be levied for collection of iron ore from the forests. Persons bringing fuel from reserved forests for burning iron kilns have been required to pay Rs.1 as commutation per kiln per year.

1.9.14. Edible fruits such as Mahua, Achar can be collected free of cost.

1.9.15. Cobblers can get the babool bark on free passes from “Minhai Daraktan” (Sawamitwa Adhikari Jungle). Bark of the marked trees or felling from annual coupes can be given to them at scheduled rates.

1.9.16. Construction of bunds in the reserved forests, their maintenance and repairs, digging for water stream in the nalas, is allowed without restrictions except that the villagers are to inform such actions of theirs to the Divisional Forest Officers concerned.

1.9.17. Teak fuel from the Departmentally worked coupes and from the contractors' coupes after their leased period is over, can be given to iron smith for preparation of coal to the extent of 36 cart-loads for their bonafide use at the rate of Rs 15 per house-hold as commutation.

1.9.18. Carpenters teak (Khod) can be made available to them at the rate of Rs.8 per cartload from the Departmentally worked areas.

1.9.19. Brushwood and thorns for fencing :- Where thorns are not available, the villagers are permitted to remove brushwood from departmentally or contractors' felled trees at a scheduled rates. Green thorns and thorny bushes can be cut.

1.9.20. MOORAM, STONE, SAND ETC. :- Further repairs of houses, bunds and to burn kilns, the agriculturists can bring earth, mooram, stone, sand, gitti, free of cost from the reserved and protected forests provided the same area is not leased out to some contractors or given to Public Works Department.

1.9.21. GRAZING CONCESSIONS :- Two classes amongst the villagers have been drawn e.g. (i) Agriculturists and (ii) Non-Agriculturists. The cattle possessed by the agriculturists is divided into two categories, viz (i) Agricultural cattle and (ii) Non-agricultural cattle.

(a) Agricultural Cattle includes:-

- (i) An agriculturist possessing 8 and less animal units.
- (ii) Six animal units per plough, if the number of cattle exceed 8 animal units.

(b) CONCESSIONS :- (i) Agriculturists, agricultural labour and carpenter, iron smith, etc. are entitled to graze 4 animal units free and 4 at concessional rates, if he has total 8 animal units or less.

(iii) Those having more than 8 animal units are allowed 6 animal units per plough at concessional rates and the rest at the commercial rates.

Cattle units are decided as under :-

(1) Cow or bullock more than 3 years age.	1 unit.
(2) Buffalo, he or she more than 3 years age.	2 units.
(3) Calf (young one of cow) more than a Year and less than 3 years.	$\frac{1}{2}$ units.
(4) Heiffer (young one of buffalo) of more than a year and less than 3 years.	1 unit.
(5) Calf or heiffer less than a year	Nil

(c) If a single stray animal or cattle is seen grazing inside the Reserved Forests and adjoining the reserved forests boundary, they are to be driven out of the reserved forests without enlisting any offence against their owners.

====00====

CHAPTER – II

THE FORESTS

SECTION: 2.1 : THE COMPOSITION AND CONDITION OF THE CROP :

The forests of the tract dealt with under this plan belong to group 5, sub group - 5A, “**Southern Tropical Dry Deciduous Forests**”, as per the revised classification of forest types of India by H.G.Champion and S.K.Seth.

2.1.1. Within this main sub-group considerable local variations occur depending mainly upon edaphic, topographic, biotic factors and past treatment. The influence of altitude and aspect is seen in Rajura sub Division where altitudinal variations are prominent. As per the variations in type and depth of soil, the composition and quality of the crop vary. On the basis of the aforesaid factors the forests of the tract being dealt with can be classified as follows:

Forest Types	Champion and Seth's Classification
Group	Tropical Dry Deciduous Forest
Sub-group 5 A	Southern Tropical Dry Deciduous Forest
I. Climax Types:	
(i) 5 A/C _{1b}	Dry Teak Forest
(ii) 5 A/C ₃	Southern Dry Mixed Deciduous Forests.
II. Edaphic Types:	
(i) 5/E2	Boswellia Forests.
(ii) DS1	Dry Deciduous Scrub.

2.1.2. Well drained loamy and alluvial soil bears better quality forests. The quality deteriorates on shallow soil and water-logged areas. Types as classified above and their occurrence in relation to the geological formations are described as follows:

GENERAL DESCRIPTION:

2.1.3.- 5A/C_{1b} - DRY TEAK FOREST : This type of forests occur in the tract dealt with. In this type the canopy is fairly closed and trees are of large, tall and well grown. Teak of all India teak site quality III and IV are found there and occurrence of teak in varied quantitative is indication of this type. Rainfall varies from 1000 mm to 1750 mm. Change in floristic composition is more owe to soil composition to rainfall variation. Mixed dry deciduous forest with teak usually forms the major proportion of the crop on shallow porous or stiff clayey soils. This type of forests are mostly found in the tract mostly in Dhaba, low hill forest in Kothari Ranges, major portion of Chicholi block, Western portion of Garlapeth block, in extreme eastern and western

portion and also in small scattered patches in Manikgarh block. Due to wide range of variations in edaphic factor, the forests of this sub-type can further be divided into following local sub-types for the purpose of their descriptions. Puer Teak Forest of Dhaba Range, Low Hill Forest of Kothari Range and Teak Forest of Rajura Sub Division.

2.1.4. PUER TEAK FORESTS OF DHABA RANGE : Teak constitutes 80 to 90 percent of the total growing stock as most of the areas had been converted earlier. Miscellaneous associates are very less and scattered. The terrain is mostly plain to undulating. The site supports mostly quality III interspersed with II and IV stands with density varying from 0.5 to 0.6

FLORISTIC :

2.1.5. TOP CANOPY : Main associates of teak in top canopy are ain (*Terminalia alata*), bija (*Pterocarpus marsupium*), lendia (*Lagerstroemia parviflora*), dhawada (*Anogeissus latifolia*), bhirra (*Chloroxylon swietenia*), semal (*Bombax ceiba*) etc.

2.1.6. MIDDLE STOREY: Though middle storey is not so distinguished yet occasionally occurring species are dhaman (*Grewia tilifolia*), amta (*Bauhinia malabarica*), aonla (*Emblica officinalis*) and bel (*Aegle marmelos*) etc.

2.1.7. BAMBOO : Dendrocalamus strictus species of bamboo is found mostly along nala banks.

2.1.8. SHRUBS: Under growth is very sparse. Species found are dikamali (*Gardenia resinifera*), ber (*Zizyphus mauritiana*), Kuda (*Holarrhena pubescens*) etc.

2.1.9. HERBS: Neel (*Indigofera tinctoria*), tarota (*Cassia tora*) and Kutra (*Achyranthes aspera*) etc.

2.1.10. GRASSES: Bhurbhusi (*Eragrostis tenella*), Kusal (*Heteropogon contortus*), mushan (*Iseilema laxum*) etc.

2.1.11. CLIMBERS: Palasbel (*Butea superba*), waghati (*Capparis spp*), eroni (*Zizyphus oenoplia*), kukranji (*Calycopteris floribunda*) and lalbel (*Ventilago denticulata*) etc.

2.1.12. LOW HILL FORESTS OF KOTHARI RANGE : These occur in patches along the nala banks and well drained hill slopes and tops towards the northern boundary of the range. Teak constitutes about 20 to 30% of the total natural growing stock whereas in converted areas it is more than 70%. The lower portion of the dwarf hillocks attain quality III with density varying from 0.6 to 0.7. The forests on the drier side where soil is stony and shallow are mostly of quality IV a and fairly open.

FLORISTIC:

2.1.13. TOP CANOPY: Main associates are dhawada (*Anogeissus latifolia*), ain (*Terminalia alata*), bhirra (*Chloroxylon swietenia*), moha (*Madhuca*

latifolia), Chichwa (*Albizzia procera*), satpuda (*Dalbergia paniculata*), beheda (*Terminalia bellerica*), tendu (*Diospyros malanoxylon*) etc.

2.1.14. MIDDLE STOREY: Middle storey consists of garari (*Cleistanthus collinus*), mowai (*Lannea coromandelica*), bel (*Aegle marmelos*), achar (*Buchanania lanzan*), khair (*Acacia catechu*), lokhandi (*Ixora arborea*), amta (*Bauhinia malabarica*).

2.1.15. BAMBOO: *Dendrocalamus strictus* species is present all over the tract in scattered patches.

2.1.16. SHRUBS: Dikamali (*Gardenia resinifera*), murar sheng/morarphal (*Helicteres isora*), bharati (*Maytenus emarginata*).

2.1.17. HERBS: Tarota (*Cassia tora*), diwali (*Tephrosea vellosa*) and *Tephrosea purpurea*), manduli/Gokhru (*Trubulus terrestris*).

2.1.18. GRASSES: Bhurbhusi (*Eragrostis tenella*), Kusal (*Hetero pogon contortus*), mushan (*Iseilema laxum*).

2.1.19. CLIMBERS: Kukranji (*Calycopteris floribunda*), waghathi (*Cappans roxburghii*) and palasbel (*Butea superba*).

2.1.20. TEAK OF RAJURA SUB DIVISION: Teak in Rajura Sub Division is found in different blocks in different proportion and varied extent. The parent rock in the plain area is sandstone with deep sandy soil and in the hills the parent rock is Deccan trap with black cotton soil in patches laterite with red earth. Proportion of teak in natural forest is 10% to 25% whereas in converted areas it is more than 80%. The proportion of economically important miscellaneous species is 15% to 25%. The quality of crop is III to IV and density varies from 0.4 to 0.6

FLORISTIC:

2.1.21. TOP STOREY: *Tectona grandis*, *Chloroxylon swietenia*, *Anogeissus latifolia*, *Diospyros melanoxylon*, *Terminalia alata*, *Mitragyna parviflora*, *Madhuca longifolia*, *Pterocarpus marsupium*, *Lannea coromandelica*, *Lagerstremia parviflora*, *Schrebera swieteniodes*, *Dalbergia paniculata*, *Dalbergia latifolia*, *Bombex ceiba*, *Ferroia elephantum*, *Manilkara hexandra*, *Adina cordifolia*.

2.1.22. MIDDLE STOREY: *Cleistanthus collinus*, *Wrightia tinctoria*, *Acacia catechu*, *Zizyphus xylopyrus*, *Emblica officinalis*, *Buchanania lanzan*, *Cassia fistula*, *Bahunia malaberica*.

2.1.23. BAMBOO: *Dendrocalamus strictus*.

2.1.24. SHRUBS: *Holarrhena antidysentrica*, *Helectreres isora*, *Woodfordia floribunda*, *Bridelia hemiltoniama*, *Gardenia gummifera*, *Indigofera tinctoria*, *Flemingai species*

2.1.25. HERBS: *Cassia tora*, *Phoenix acaulis*.

2.1.26. GRASSES: *Ischaemum laxum*.

2.1.27. CLIMBERS: *Calycopteris floribunda*, *Butea superba*, *Ventilago calyculata*, *Mucuna pruriens*, *Abrus precatorius*, *Acacia pennata*.

Reproduction of teak, dhavada, tendu, ain, and garari is coming in patches but is very much inadequate to restock the area.

2.1.28. 5A/C₃ - SOUTH DRY MIXED DECIDUOUS FORESTS :

2.1.29. This type occurs in Kothari, Ballarshah Ranges, major portion of Rajura block, north eastern and southern portion of Chicholi block, north western portion of Siddheshwar block, plains forests of northern portion of Garlapeth block, Manickgarh, Pardi, Chanai Barsa I and II, Somthana and Moorti blocks.. In the moist area of this tract bija- semal - polyalthia local sub-type is distinctly seen. Teak constitutes very low proportion in the growing stock. Large sized and well grown bija trees are common in occurrence. The quality of the crop in Kothari Range varies from III to II and density varies from 0.5 to 0.7. The quality of the crop in Ballarshah Range varies from III to IV and density from 0.5 to 0.6 while in Rajura Sub Division area quality is III to IV and density from 0.4 to 0.6. The crop is middle aged to mature.

FLORISTIC :

2.1.30. TOP CANOPY : Bija (*Pterocarpus marsupium*), dhawada (*Anogeissus latifolia*), tendu (*Diospyros melanoxylon*), semal (*Bombax ceiba*), Salai (*Boswellia serrata*), Chichwa (*Albizia procera*), beheda (*Terminalia bellerica*), mowai (*Lannea coromandelica*) and moha (*Madhuca latifolia*).

2.1.31. MIDDLE STOREY: Karai (*Milusa velutina*), Kate ain / Kasai (*Bridelia retusa* / *Flacourtia indica*), bhirra (*Chloroxynon swietenia*), Shisham (*Dalbergia latifolia*), garari (*Cleistanthus collinus*), surya (*Xylia xylocarpa*), khair (*Acacia catechu*), achar (*Buchanania lanzan*), lendia (*Lagerstroemia parviflora*), aonla (*Embellica officinalis*), biba (*Semecarpus anacardium*), bel (*Aegle marmelos*), rohan (*Soyimida febrifuga*) etc.

2.1.32. BAMBOO: *Dendrocalamus strictus* species of bamboo is found almost every where. Due to flowering in the year 1984, clump formation has not so established all over the areas. Harvestable bamboos are available in Ballarshah and Kothari ranges. Clump formation in bamboo regeneration is getting momentum with passage of time. In artificially regenerated areas also the clump formation has established and need removal of culms to ease the clumps from congestion.

2.1.33. SHRUBS: Kuda (*Holerrhena pubescens*), ghoti (*Zizyphus glaberrima*), dikamali (*Gardenia resinifera*), apta (*Bauhinia racemosa*), ahal (*Moringa citrifolia*), palas (*Butea monosperma*), amaltas (*Cassia fistula*), murar-sheng or murar-phal (*Helicteres isora*), bharati (*Maytenus emarginata*).

2.1.34. HERBS: Tarota (*Cassia tora*), neel (*Indigofera tinctoria*),

2.1.35. GRASSES: Bhurbhusi (*Eragrostis tenella*), Kusal (*Heteropogon contortus*)

2.1.36. CLIMBERS: Eroni (*Zizyphus oenoplia*), palasbal (*Butea superba*), Kukranji (*Calycopteris floribunda*), nagbel (*Cryptolepis buchanani*), lalbel or papri (*Ventilago denticulata*).

2.1.37. BOSWELLIA FOREST: In these forests salai is associated with moyen and garari.

Proportion of salai is more than 40% of the growing stock in overwood. At places its proportion exceeds 80% over extensive patches tending to form pure salai crop. Next to salai moyen occurs frequently in overwood and in patches attains the proportion of 10-30% of growing stock in overwood. The quality of crop varies from III to IV and density from 0.4 to 0.6. Most of the areas are in Rajura Sub Division and of these most of the areas are under encroachments and present crops are confined to steep slopes and areas unsuitable for cultivation. Crop is mainly middle aged to mature. Garari is the main species occurring in the underwood. Bamboos are found mainly along the nalas. Undergrowth is comparatively less.

2.1.38. FLORISTICS:

I. TOP CANOPY: *Boswellia serrata*, *Chloroxylon swietenia*, *Anogeissus latifolia*, *Diospyros melanoxylon*, *Terminalia alata*, *Mitragyna parviflora*, *Madhuca longifolia*, *Pterocarpus marsupium*, *Lannea coromandellica*, *Lagerstremia parviflora*, *Schrebera swieteniodes*, *Dalbergia paniculata*, *Dalbergia latifolia*, *Bombex ceiba*, *Adina cordifolia*, *Schleichera oleosa*, *Xylia xylocarpa*, *Albizia lebbek*, *Terminalia arjuna*.

II. MIDDLE STOREY *Cleistanthus collinus*, *Brightia tinctoria*, *Acacia catechu*, *Zizyphus xylopyrus*, *Embllica officinalis*, *Buchnanian lanzan*, *Cassia fistula*, *Bahunia malaberica*, *Butea monosperma*, *Semecarpus anacardium*, *Mallotus philippensis*, *Strychnos potatorum* etc.

II BAMBOO: *Dendrocalamus strictus*.

III SHRUBS : *Holarrhena antidysentrica*, *Helectreres isora*, *Woodfordia floribunda*, *Bridelia hemiltoniana*, *Gardenia gummiifera*, *Indigofera tinctoria*, *Woodfordia fruticosa*, *Flemingia species*

IV HERBS: *Cassia tora*, *Phoenix acaulis*.

IV GRASSES: *Ischaemum laxum*, *Andropogon contritus*, *Cymbopogon martini*, *Sorghum spp*,

V CLIMBERS: *Calycopteris floribunda*, *Butea superba*, *Ventilago calyculata*, *Mucuna pruriens*, *Abrus precatorius*, *Acacia pennata*.

2.1.39. DRY DECIDUOUS SCRUB FORESTS: It is found in isolated areas mainly Protected Forests of Dhaba and Ballarshah Ranges which are very near to villages and isolated blocks of Rajura Sub Divisions like Kanergaon, Ahson, Talodhi, Naranda, Jaitapur, Kawitgaon and Erai which are also surrounded on

all sides by villages. The vegetation is characterised by the stunted growth of the tree species of the dry deciduous forests. A thin grass growth is present during the short moist season otherwise the soil is bare. Climbers are few and mostly zerophytic.

SECTION:2. 2 : INJURIES TO WHICH THE CROP IS LIABLE :

2.2.1. The main causes of injuries to which the crop is liable are as follows :

A : HUMAN AGENCIES

(i) Fire (ii) Illicit cutting (iii) Encroachment

B : ATMOSPHERIC AGENCIES

(i) Wind and hailstorms (ii) Drought

C : OTHER AGENCIES :

(i) Grazing (ii) Wild animals (iii) Climbers (iv) Shrubs

Detailed descriptions of the above are as follows :

2.2.2. HUMAN AGENCIES :

2.2.2. FIRE : The forests are deciduous in nature. Falling of leaf normally starts from the beginning of February. The period from February to June is extremely dry and hot. During this period the floor of the forests remains full of inflammable dry leaf litters and therefore the forests during this period are vulnerable to fires. Fire taking place at the end of the winter and beginning of summer is not as severe as that during hot summer. Fire of summer kills the naturally regenerated young seedlings, coppice shoots and plantations too. The growth of surviving seedlings, affected from fire becomes stunted and their establishment periods become long. During summer most of the areas get burnt more than once. Severe fire causes considerable damage to trees as well by scorching their bases which ultimately leads to unsoundness and hollowness and render them liable to be attacked by fungi and insects. The fire prevents formation of humus by destroying the microflora and burning out of organic matter. The fire accelerates soil erosion also by destroying the soil cover as well as the organic matters.

2.2.3. The main cause of forest fire is the collection of Tendu leaves. Fires are set, illegally, by tendu contractors to obtain profuse leaves from tendu coppice shoots. Fires are also set by local villagers to facilitate movement in the forests for tendu, gum and other forest produce collection. Sometimes, villagers in certain pockets of forest to have good flush of grasses, hunters to do hunting and grazers for no valid reasons set fire in the forest. The persons involved in all reasons of forest fire are mostly local villagers. Therefore, to have effective control over this great problem, it is very much necessary to take the local people in confidence and in consultation with them planning should be done.

2.2.4. ILLICIT CUTTING :

2.2.4. The problem of illicit cutting is common in all six ranges. However, gravity, mode of operation and reason of illicit cutting vary from range to

range. In Dhaba and Kothari Ranges organised illicit cutting is not so common. The main reason of illicit cutting is done by the local villagers to meet their agricultural and household needs. The scenario in Ballarshah Range is different. The extent of illicit cutting for firewood is very much prominent. Besides, in this area for commercial purpose organised gangs operate along the inter state boundary. The illicit cutting of bamboo is common in division. The magnitude of illicit cutting of bamboo in Ballarshah Range is much more. The illicit cutting and lopping magnitude of tendu trees by tendu contractors have increased due to change in system of tendu collection. In Rajura Sub Division i.e. in Rajura, Wansadi and Wirur Forest Ranges, illicit cutting is mainly for domestic purposes e.g. for construction of huts and agricultural implements and bamboo for various items of bamboo. Another serious nature of illicit cutting is for the clearance of ground to encroach upon the area for cultivation in these areas. People resorted to heavy felling for that purpose in past. But this activity in present is in check. Sometimes interstate gangs operate in organised tree felling. Its nature becomes aggravated when the name of Naxal Protection is given to illicit cutter in the name of Local uses.

2.2.5. ENCROACHMENTS : The incidence of Encroachment in a Reserved Forests of the tract dealt with is a rare phenomena in Dhaba, Kothari and Ballarshah tract whereas in protected forests, it is very common. But in Rajura, Wirur and Wansadi tract the distinction between Reserved and Protected Forest is immaterial for encroachers. The lack of proper demarcation and maintenance of the P.F. in first kind of areas and even for R.F. in second type of areas is the main reason for encroachments. The hunger for land and time to time political patronage to encroachers had made the problem much more aggravated. Proper recording by Revenue and Forest departments have been not maintained. Lack of proper and just coordination between these two departments regarding viewing the encroachment as a bane for environment is more hurting the cause of environment. The people having their land adjoining to the forest boundary have general tendency to increase their areas by extending boundaries into the forest area. The complete record of encroachment is not available either at divisional or range level. The boundary between revenue land and P.F. is required to be demarcated and maintained by approved RCC cairn.

ATMOSPHERIC AGENCIES:

2.2.6. WINDS AND HAIL STORMS: Strong winds blow during pre-monsoon and monsoon period, causing uprooting of shallow rooted tree species, such as teak, dhoban etc. Occasionally hailstorm damages the fruit crop of moha and achar. Hailstorm in the month of April and May sometimes damages tendu leaves and thereby making them unfit for bidi making.

DROUGHT: Occurrence of drought is not the common feature in this locality. The less moisture retentivity of soil makes the forests susceptible to drought to a considerable extent.

Damage due to drought is restricted to young classes of growing stock and retards the growing vigour of saplings and regeneration.

2.2.7. FROST: Frost does not occur in this tract.

2.2.8 : OTHER AGENCIES :

2.2.8. GRAZING: The incidence of grazing in the forest surrounded by thickly populated villages is very heavy and is specially noticeable in Ballarshah, Rajura, Jiwati and Wansadi Ranges. The people have Nistar rights in P.F. and privileges in Reserved Forests for grazing of cattle and therefore, forests are vulnerable to grazing. Continuous heavy grazing not only prevents regeneration of tree species to come up and establish but also the young regeneration obtained during the closure is lost soon after the areas are opened to grazing. In grazing with clayey soils the trampling by cattle results in hardening of soil and thereby reduction in the soil aeration. In sandy soils heavy grazing results in accelerated erosion and denudation.

WILD ANIMALS: Browsing of naturally regenerated and planted seedlings by herbivorous animals, particularly by chitals, sambars and barking deer etc. is seen.

INSECTS AND FUNGI: Sporadic attacks of teak leaf skeletonisor (*Eutectona machaeralis*) and teak defoliator (*Hyblea purea*) come across every year in teak patches. Damages from other sources are negligible.

CLIMBER: The common climbers found in this tract are eroni, kukranji, palasbel, ramdaton, chilati and mahulbel. These climbers coppice vigorously and are hardly affected by fire. The damage is caused by strangling of trees when they entwine a sapling or a tree. Usually the apical bud is destroyed. The deep grooves formed by entwining the large trees reduce the yield and value of timber. Epiphytes and ficus species also cause damage.

2.2.9. SHRUBS, WEEDS AND GRASSES: The common perennial woody shrubs are murarsheng (*Helicteres isora*), neel (*Indigofera tinctoria*), Jilbili (*Woodfordia fruticosa*) and gursukri (*Grewia hirsuta*). Common weeds found are tarota (*Cassia tora*) and menduli (*Xanthium strumarium*). Common grasses found in this tract are Bhurbhusi (*Eragrostis tenella*), Kusal (*Heteropogon contortus*) and mushan (*Iseilema laxum*). Damage due to above mentioned shrubs, weeds and grasses is seen to some extent in suppressing the naturally regenerated seedlings.

SECTION: 2.3: SOIL EROSION:

2.3.1. Soil erosion is the gradual process of loss of top layers of soil which contains humus, organic matters, chemicals and other nutrients on which plants feed. It results in decrease in soil fertility, lowering of sub soil water level, water holding, change of soil structure etc. The soil erosion is prominent in the marginal areas of the Reserved Forests, specially those which are subjected to heavy grazing and illicit cutting. Sheet and gully erosion is found in some parts of Kothari and Ballarshah Ranges. In Rajura,

Somthana and Chincholi blocks about 2000 hectare of undulating area around nalas are severely affected by erosion. In these areas top layer of soil had washed away and rills as well as cross able gullies are formed and are progressing further at a fast rate. Even ravine formation in this area is found. Garlapeth, Siddheshwar and Manikkgarh forest blocks are also under severe soil erosion mainly due to encroachment and removal of forests of upper areas for cultivation and encroachment.

2.3.2. Plant cover acts as a very efficient soil binder, checking the flow of water and helping it to percolate downwards. As a result of ruthless fellings, fire and excessive grazing, the forests thin out, losing power to regenerate and consequently the soil is deprived of its protective covers. With the setting in of the monsoon, the non/unprotected soil cover lies prone to be attacked by millions of little hammer like drops of water. As a result, the soil gets compacted with consequential loss of its absorbing capacity. The suspended soil particles seal the pore spaces of the soil, while the muddy suspension percolates into the earth to such degree, that the soil absorbs but little. The excess water, while running off, removes the top soil in which the organic matters, humus, chemicals and other nutrients on which plants feed are stored.

====00=====

CHAPTER – III

UTILISATION OF THE FOREST PRODUCE

SECTION: 3.1: AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION:

3.1.1. The local population of the tract consists mainly of agriculturists of various classes, such as Kunbis, Budhist, Gonds, Marars, Kolam, Kawars, Banjara, Pradhans etc. The Kunbis predominate so greatly in number that the word Kunbis has become almost synonymous with cultivator. Brahmins, Kapewar, Komtis and Kunbis have settled in the prominent villages on the outskirts of forest blocks now connected by affordable all weather roads. Mainly Marathas, Labhans, Mangs,, Gonds and Muslims who have migrated from Marathwada and Andhra Pradesh inhabit the Manickgarh plateau while Kunbis and others dominate the plains. Rests of the communities are interspersed all over. The tracts along the river Wainganga, the Wardha and the Pranhita and the areas along Chandrapur – Allapalli road and Rajura via Gadchandur – Awarpur road are comparatively thickly populated. The interior tracts of Ballarshah, Kothari, Dhaba, Rajura, Wansadi and Wirur Ranges are thinly populated and mostly Gonds and other aboriginal are seen in this part.

3.1.2. Aboriginal tribes viz. Gonds though tillers constitute bulk of the forest labour during non agricultural season. Their hardiness gets them considerable remuneration through forest works. The economic status of these people is very poor. They are not getting adequate benefit of various Government schemes and are unable to get benefit of reservation policies in services as their educational level is poor. Though the government is taking integrated approach to enhance their socio, economic and educational status of the poor particularly of tribals, the fruit of those schemes have yet be fully utilised by those concerned.

3.1.3. Kunbis, Kapewar, Brahmins and Muslims practice agriculture and are unwilling to work as forest labour. Komtis indulge in traditional money lending and possess extensive areas under agriculture. They are the richest in the tract. Ahirs, Adhars, Kapewars, Khatis and Burad are artisans. Rests of the communities have either small areas under village or no lands at all and they have to depend upon agricultural and forestry activities as labour force to earn their livelihood. Besides, the above communities, golkars and dhangers resort to rearing of cattle, sheep and goats and sale of their produce viz milk, ghee etc. Banjaras are the nomadic herdsmen and resort to rearing of cattle by establishing cattle camps. The labour force consisting of gonds, mahars and other poor communities mainly attend to agriculture on priority and attend to forestry operations during non-agricultural season. In addition,

they indulge in collection of edible fruits, such as tendu, mahua flowers and fruits, khirni and achar for their domestic consumption or for sale or barter.

3.1.4. The tract dealt with comes under Chandrapur (Part), Ballarshah, Rajura, Korpana, Jioti, Pombhurna, Mul (Part) and Gondpipri Talukas of Chandrapur District. The total population of Chandrapur District as per 2011 census is 23.52 lacs. Out of which Chandrapur Taluka 5.47 lcs., Gondpipri Taluka 0.79 lcs., Rajura Taluka 1.69 lcs., and Korpana Taluka 1.57 lcs. Jioti Taluka 0.61 lcs., Ballarshah Taluka 1.62 lcs.,

Total geographical areas of Chandrapur district is 11280 sq.km. Out of this Chandrapur Taluka 991.98 sq.km., Gondpipri Taluka 1018.7 sq.km., Rajura Taluka 1689.2 sq.km., and Korpana Taluka 778.24 sq.km. Jioti Taluka NA and Ballarshah Taluka 258.72 sq.km. (As per District Social & Economic Survey, Chandrapur – 2012.)

Talukawise break up of population of Chandrapur District, Gondpipri Taluka and Rajura Taluka as per year 2011 census is as follows:

(POPULATION OF THE TRACT; 2011 CENSUS)

Taluka/ District	Area in sq km	Population/sq km	No of villages		No of towns	No of houses ('000)	No of families ('000)	Population (in thousand)		
			Inhabited	Deserted				Male	Female	Total
Ch`pur Dist	11280	166	1473	319	12		388	9.10	8.62	17.72
Ch`pur Tah	991.98	499	90	13	1		73	205	192	397
B`sha	258.72	*	*	*	*		19	52	49	101
Gondpimpri	1018.7	101	144	24	0		6	4	42	46
Pombhurna	*	*	*	*	*		*	*	*	*
Rajura	1689.2	108	143	11	2		6	20	18	38
Korpana	778.24	123	127	12	0		21	21	20	41
Jioti	*	*	*	*	*		*	*	*	*

(* Separate figures are not available)

3.1.5.The details of workers and non-workers as per 2011 census in Chandrapur District, Ballarsha, Pombhurna, Gondpipri, Mul, Korpana, Rajura & Jioti Talukas are as given below.(Figures are in hundred)

Sr. No.	Livelihood classes	Name of Tahsil					
		Ballarsha	Pombhurna	Gondpipri	Mul	Rajura & Jioti	Korpana
1	Cultivators	4932	8819	11769	12638	23170	24065
2	Agricultural labourers	3721	6995	8039	13823	13561	14977

3	Livestock, Fisheries, Forestry etc.	192	70	55	17	15	22
4	Mining Works	310	7	12	24	98	6
5	House hold Services	142	32	18	17	10	14
6	Other than house hold	411	230	11	49	12	5
7	Construction work	191	112	5	11	5	4
8	Commercial worker	336	166	17	19	6	8
9	Transporter work	164	104	5	8	6	2
10	Other services	27065	2204	5061	9745	17367	15310
11	Non workers.	10748	3152	1000	1240	820	712
12	Total Population	48212	20891	25992	37591	55070	55125

(Source: Socio-economic review and district statistical abstract of Chandrapur District for the year March 2012)

3.1.6. As per the report of Agricultural Directorate, Pune for the year 2010-11, break up of land holding in the Chandrapur District are given as below:

Land holding in hectare	% of land holders
Upto 0.5	2.3%
0.5 – 1.0	7.69%
1 – 2	22.6%
2 – 5	43.30%
5– 10	18.15%
10 –20	4.72%
>20	1.03%

69.40 % of total area under cultivation is being used for food grain cultivation. Among food grains only paddy crop covers maximum 25.9% of areas under cultivation, next comes Jawari with 27.42% and pulse covers 13.12 % of the cultivation area.

3.1.7. The percentages of total sown area which is under irrigation in Chandrapur District, Chandrapur, Mul, Gondpipri, Rajura and Korpana Talukas are 30.97%, 30.71%, 47.02%, 13.44%, 34.01% and 16.63% respectively. The main source of irrigation is canal, tanks and wells. Lift irrigation and pumps fitted at nalas and rivers are also used for irrigation purposes. Chandrapur District is not having any major irrigation project and the tract dealt with is not having any major irrigation project and the tract dealt with is not having any either major or medium irrigation project. Villages within the tract dealt with are normally small and cultivable areas are

in patches and in small blocks. Almost all villages are having malgujari tank locally known as Bodi. These tanks are very potential for providing water for both drinking and irrigation purposes. But the potential of these tanks are not being fully utilized. Rice is the main irrigated crop. About 89.10 percent of irrigated area is used for paddy crop. Chilly is extensively cultivated.

3.1.8. CATTLE POPULATION as per 2007 cattle census.

CATEGORY	NAME OF TAHASIL					
	BALLA RPUR	POMBU RNA	GOND PIPRI	MUL	RAJURA & JIWTI	KORAPNA
1	2	3	4	5	6	7
Hybrid ox > 3 years	46	8	104	126	56	67
Hybrid Cow >3 years	248	17	143	175	338	250
Native ox > 3 yrs	5610	12787	16314	21862	24255	27631
Native Cow > 3 yrs	4361	6095	8780	8788	14199	17244
Hybrid Calf >3 years	277	16	214	223	363	227
Native Calf > 3 yrs	5414	9501	11016	12822	15729	17286
He Buffalo > 3 yrs	29	138	90	480	279	421
She Buffalo > 3 yrs	2027	1935	2566	4487	5111	4882
Buffalo Calf >3 yrs	1955	1598	2327	5133	4756	3814
Other Catle	4195	450	1117	161	4896	5461
Horse/pany/others	4	0	0	0	15	0
Sheep	0	744	7215	11444	3368	347
Goat	11550	11525	18817	16826	36947	41127
Poultry	34383	40844	65723	65264	84074	62930

(Source: Chandrapur District Social and Economic Assessment for 2006-07)

Grazing Pressure: As per the cattle census of 2006-07 the total cattle in the district is 8.84 lakh. Besides that number of sheep, goat, horse/pony, poultry is 0.23 lakh, 1.36 lakh, 0.02 lakh and 3.53 lakh respectively. Cattle pressure on the forests of tract dealt with is tremendous. Not only the cattle of villages in or around the forest areas depend on forests for grazing but, the cattle from other areas or even herds of nomadic people from other region also intrude in these forests from time to time. The carrying capacity of all the forests of tract including area handed over to FDCM Ltd is worked out to be approximately 1.73 lakh cattle unit. This figure has been arrived at assuming all the forests are made available for grazing and no area remains closed for grazing. But the fact is that some of the area need strict grazing control and kept close for grazing e.g. regeneration areas are closed for grazing and Kuran areas are

not opened for grazing but for cutting of grasses for stall feeding. We can easily visualise that the forests are under tremendous grazing pressure.

3.1.9. People rear large number of cattle not for milk but for calf and farm yard manure. Besides, the number of cattle in villages is status symbol. Due to large number of cattle, stall feeding is not practiced in this tract. They are left for grazing only in the forests and therefore, the forest area of the tract dealt with is under tremendous pressure.

3.1.10. The major population of the tract residing in the rural areas consists chiefly of agriculturists and agricultural labourers. Most of the agriculturists are small and marginal farmers. Majority of the population depends greatly upon the forests to meet their various basic needs. The principal needs for which the people of the tract depend on the forests are as follows :

3.1.11. TIMBER: Teak is preferred in building construction, agricultural implements and household furniture. Due to prohibitive price of teak timber its use is beyond reach for the majority of the local population. Therefore, people have to bank upon miscellaneous species to meet out their timber requirement. Miscellaneous timber species in common demand are ain, khair, tiwas, dhaman, bhirra, garari, lendia, hiwar, dhawada etc.

3.1.12. FIREWOOD: Firewood is in heavy demand all over the tract. Firewood is mainly used by the local tribal people for cooking and keeping their houses warm during winter. Poor people mainly rely upon firewood to withstand severe cold during winter. They sometimes use firewood to keep wild animals away during nights. Besides, the extraction of firewood by headloaders to earn livelihood as well as for commercial purpose is very common in this tract. The headloaders feed firewood to local towns, cities and even in villages. The forests of Ballarshah and Rajura are heavily burdened with this problem. The forest area set aside for nistar purpose has been exploited to such an extent that except khirni no other species is seen in such areas. Dhawada, khair, bhirra are valued as firewood. The firewood extracted from coupes is sold in auction and purchasers of the same are mostly charcoal manufacturers. Due to all these reasons the pressure of firewood on the remaining Reserved Forests has increased tremendously. Particularly in Ballarshah area the forests are being thinned by headholders. Effective measures to control this problem are to be taken.

3.1.13. BAMBOO: Bamboo is popularly known as Poor's timber. A local people make use of bamboo in making mainly bamboo articles such as bamboo mats, baskets, grain container, and other articles. The local tribal people use bamboo for house construction, cattle shed, wall of huts, fencing their campus etc. Most of the people bring bamboo from forests of the tract and adjoining forests illicitly. Major portion of Bamboo is used by the paper and pulp industries.

3.1.14. GRASSES: Mainly three types of grasses are found in this forest viz. Fodder grass, thatching grass and broom grass. The dry fodder is used to

supplement feed to the mulching cattle, thatching grass is used for huts and cattle shed making and broom grass is used for making broom. Broom grass is sold by auction at division level.

3.1.15. GRAZING: The protected forest areas, set aside for nistar and grazing purposes, have degraded to such an extent that hardly any patch of such area is seen to have grasses. Privilege was granted for grazing in Reserved Forests as well, but due to degradation of Protected Forests and manifold increasing cattle population the incidence of grazing in Reserved Forests have increased tremendously, resulting in deterioration of R.F. as well.

3.1.16. FRUITS, FLOWERS AND LEAVES: Bulk of the inhabitants being poor, resorts to collection of moha flowers and fruits of tendu, khirni and char for their bonafide consumption. Teak and mahul leaves are used for thatching and preparation of rain cover during monsoons. Palas and moha leaves are used for preparation of patrawalli (plates) and drona (cups) either for bonafide uses during religious or customary functions or for sale to earn livelihood.

3.1.17. FIBRES: Palas roots are dug up and cured to obtain floss for making ropes. Twinning climbers and their bark is also put to similar use.

3.1.18. OTHER PRODUCTS: Edible tubers and roots are obtained by aboriginals for their bonafide consumption. Thorns are removed to erect or mend their fencing. Gum is collected for sale, barter or local use. Palas and tendu leaves are used for preparing chutta or bidis for local use. The people secure their requirements from the Reserved Forests.

SECTION: 3.2: MARKETS AND MARKETABLE PRODUCE:

3.2.1. MARKETS: The forests of the tract dealt with yield timber, poles, firewood and non wood forest produce. Most of the Non Wood Forest Produces are marketed by Tribal Development Corporation under Monopoly Act and are sold by tender at Division level. Timber, poles and firewood after extraction from the coupes are brought to the sale depots and sold in open auction. The main sale central depot for timber is at Ballarshah where all better quality timber is brought and sold. However, low quality and less quantity of timber is sold at local depots at Kothari, Gondpipri, Kalmana and Rajura.

3.2.2. Timber market at Ballarshah has earned wide reputation and so purchaser from all over the country attend the sale of timber through Government agencies. The market practically disposes of the various trade quality timbers of teak, ain, bija, haldu, shisham, semal etc. Timber sold at Ballarshah Government Timber Depot is graded into the trade qualities in various girth and length classes and is sold in open public auction. Sale by negotiation or supply to Government and other institution is negligible. Ballarshah having Railway station has added facilities for export of timber from this place to various timber consumption centres. Firewood is sold either in situ or at local depots. Firewood is consumed mainly by charcoal

manufacturers for charcoal making. License for plucking and processing of Tendu leaves are given to contractors by Government through process of tender.

MARKETABLE PRODUCE: The principal marketable forest produce are:

A. MAJOR FOREST PRODUCTS:

Timber and poles, Fiewood, Tendu leaves & Bamboo.

B: MINOR FOREST PRODUCTS:

Grasses, Hides and horns & Other forest produces.

The descriptions of the above are as follows:

MAJOR FOREST PRODUCTS:

3.2.3. TIMBER AND POLES: Teak and shisham timber are in great demand and fetching very good price. They are sold in all quality, length and girth classes. Other timber species having ready market are bija, ain, haldu, tinsa, tiwas, dhawada, bhirra, khair, rohan, semal, salai etc. Salai, mowai and semal logs above 45 cm girth are preferred for packing cases. Semal logs above 45 cm are used in match industry. Purchasers prefer big sized timber and pay handsome price. Poles of teak, garari, lendia, ain have competitive local market.

3.2.4. FIREWOOD: Dhawada, dikamali, khair, garari are the main firewood species. Firewood is extracted either by working coupes or removal of wind fallen material from the floor of the forests. Firewood is extracted in fuel beats of size 2 mt x 1.2 mt x 1 mt and the same is sold in open auction. Purchasers are mainly charcoal manufacturers. Local demand of the people is met by giving permission of the specified cartloads or headloads to remove from the forest. Ballarpur Paper Mill Limited and BHL are also using the firewood to some extent. Firewood is likely to put to a variety of uses, such as rayon pulp, hard board etc.

3.2.5. TENDU LEAVES: Tendu leaves are used as wrapper of bidi. State Government gives the licence for collection and processing of tendu leaves through tender every year. Villagers get handsome wages for collection and processing of tendu leaves. It is one of the most important revenue giving item to government and employment to local people.

3.2.6. BAMBOO: There is a heavy demand for the bamboo by Paper Mill Ballarpur. Before flowering of the Bamboo area, bamboos were being harvested by Bilt from all allotted commercial felling series and the local nistar demand of the people was being met from the Nistar Coupes. The other demand for bamboo is of local artisan for making bamboo articles. The tract is potential for bamboo production. Due to gregarious flowering the naturally regenerated seeding are in the process of clumps formation.

B) MINOR FOREST PRODUCE: As per the Panchayati Raj Amendment Act the ownership of minor forest produces is with Panchayat in Schedule areas

and Government of Maharashtra has extended it to Panchayats through enactment.

3.2.7. GRASSES: Broom grass is important for revenue earning and is sold by inviting tender at division level. In schedule areas it is with Panchayats to collect and dispose with.

3.2.8. HIDES AND HORNS: Hides and horns of wild animals have great demand within and outside the country. Mostly these were exported. These were collected by the licence holder and royalty fixed by the department was paid by them. At present no collection of hide and horns is allowed as per the amendment to Wildlife (Protection) Act.

3.2.9. OTHER FOREST PRODUCE: Most of the minor forest produce are collected by TDC through local people. Moha flowers and fruits of tendu, khirni, char and moha are collected by tribal people for their bonafide consumption or sale. Panchayats are empowered to collect and dispose MFP. At present TDC (Tribal Development Corporation, a Maharashtra Government Undertaking), is working for betterment of tribal people in the area. The tract is rich in rocks and minerals. Mainly major minerals like coal, limestone, dolomite etc are being extracted as per the existing laws of the land.

SECTION:3. 3 : LINES OF TRANSPORT :

3.3.1. RAILWAYS: Chandrapur and Ballarshah are railway stations on the Central Railway (Broad gauge) and Rajura, Vihirgaon, Wirur and Makodi are railway stations on the South Central Railway linking Delhi and Madras. As such Ballarshah, Chandrapur and Rajura are the main market centres able to export bulk of timber, charcoal etc. to various consumption centres in the country. In addition, Chandrapur is also linked to Gondia (Junction on Bombay – Hawrah rail link by broad gauge) and Jabalpur by narrow gauge converted into broad gauge railway. (S.E.Railway). These two rail links serve the tract dealt with for export of the forest produce therefrom.

3.3.2. ROADS: Entire timber and other forest produce is transported from forests to the main market, namely Ballarshah and Chandrapur by roads. A State Highway road connecting Chandrapur and Allapalli and beyond to Sironcha passes through Ballarshah, Kothari and Gondpipri forests. Entire road is fordable through out the year. A number of feeder roads join this main road. Some of important feeder roads are Ballarshah – Chichpalli; Dhanapur – Dhaba; Gondpipri – Khedi. Aksapur – Pombhurna and Kanhargaon – Zargaon. These remain fordable, almost throughout the year. Similarly, Rajura sub division is connected with Chandrapur Asifabad (Andhra Pradesh) State Highway. In addition to that the tract is connected with a large number of motorable roads and cart roads. The lists of existing roads in the tract have been given in **Appendix No.XIV** of Volume II.

3.3.3. RIVER: Very negligible or practically no produce is exported through this medium.

SECTION: 3.4: METHODS OF HARVESTING AND THEIR COSTS MAJOR FOREST PRODUCE (TIMBER AND FIREWOOD)

3.4.1. AGENCY FOR HARVESTING: Till the year 1980 forest coupes for timber and firewood were being worked through three agencies, viz.

i) Department, ii) F.L.C.S. and iii) Contractors.

As per the policy decision taken by the Government of Maharashtra vide R & FD No.FCT/1581/93544/F-1, dated 04.04.87, harvesting by contractor system was totally stopped, with a few exceptions, with effect from July, 1981. Now main felling coupes are worked either by the department or through FLCS. Subsidiary silvicultural operations in the coupes are carried out by the department.

3.4.2. METHODS OF FELLING AND EXTRACTION:

Usually marking is completed upto the end of previous year and the felling starts after the end of rainy season. Timber trees and poles are felled first and conversion into logs and poles is done by saw. Firewood is prepared with saw and axe. Dragging or carting of timber, poles and firewood upto jungle depot is done by bullock carts and tractors. Transport of the timber and poles from coupe depots to sale depots is mostly done by Government trucks.

(ii) Firewood is cut into billets and stacked in the coupe itself in the form of beats of size 2.0 m x 1.20 m x 1.0 m. It is stacked in the same depot in appropriate lines of 1m height and is recorded in terms of number of beats.

The trees are marked as timber or fuel depending upon its capability of producing timber, pole and firewood. The estimates of volume for timber and firewood are prepared by using local volume factors. After approval of the estimate by the Conservator of Forests concerned, felling operations start.

After felling and conversion into logs and poles, measurements are taken and are engraved at the butt end of the logs, with digital nails, along with the tree numbers and number of log. Besides, the marking of passing hammer is also made. Poles are classified by girth classes and their average volume is taken.

After arrival of the logs in the sale depot, they are given serial numbers and measured again. The difference between measurements at the jungle depot and at the sale depot is reconciled.

(vi) All the logging operations are done by engaging local labourers in the departmental working and by the members of the FLCS in case of coupes worked by F.L.C.S. For most of the items of work by job rates are given.

B. TENDU LEAVES:

3.4.3. Tendu trade has been nationalized by the Government of Maharashtra Act. No.LVII of 1969. Tendu leaves were collected by the department through agents till 1990 season. After that, it is being sold on lumpsum basis. The different rates of collection for different areas/circles are fixed by the

Government. The area of this division has been divided into 26 units which comprise 23 units/working groups. Normally, collection of tendu leaves commences from the last week of April and continues upto the first week of June each year. Tendu leaves are collected by engaging labourers who deliver the leaves at various collection centres called "Phadi". After drying etc bagging of leaves is done at collection centres and then bags are transported to the approved godowns. The quantity of tendu leaves is measured in standard bag. One standard bag contains 1000 bundles/pudas. Each bundle/puda contains 70 tradable leaves.

C) OTHER NON WOOD FOREST PRODUCTS:

3.4.4. Moha flowers and seeds, char, gum, honey, edible and non-edible fruits, hides and horns etc are other marketable Non Wood Forest Produce. Most of them are collected by TDC through local tribals. Hides and horns were used to be collected by the licence holders prior to complete ban of collection of hides and horns. The tract is rich in minerals as well.

3.4.5. GRASS: Broom grass is sold by auction. Other palatable grasses are used by the local people for their cattle. Coarse grasses are used by the local people for thatching.

Now minor forest produces come under the ownership of Gram Panchayats in schedule areas and respective grampanchayats are responsible for collection and disposal of minor forest produces.

3.4.6. COST OF HARVESTING: The minimum wage for different forestry operation is fixed by a committee headed by Conservator of Forests every year. The committee fixes the wage rates based on the prevailing minimum wage rate sanctioned by Labour Commissioner of Maharashtra.

3.4.7. CHARCOAL: The manufacturing of charcoal is now prohibited in this tract.

SECTION- 3. 5: PAST AND CURRENT PRICES:

3.5.1. As there is a big gap in the demand and supply position of timber and the gap is increasing year after year leading to the increase in price of the forest produce year after year. The statement showing the average market rates for various kinds of timbers prevailing at Government Timber Depot at Ballarshah during the year 2013-2014 and the average rates of fuel beats sold in Chandrapur Forests Circle from the year 2013-14- have been given in **Appendix No.VIII** of Volume II.

====00=====

CHAPTER-IV

STAFF AND LABOUR SUPPLY

SECTION: 4.1: STAFF.

4.1.1 The tract dealt with forms the Central Chanda Forest Division and is under administrative control of Deputy Conservator of Forests, Central Chanda Forest Division. The headquarter of Central Chanda Forest division is at Chandrapur. The Deputy Conservator of Forest is the Head of the office. He is Regional Head in respect of Financial Powers conferred by State Government. The tract includes 7 ranges, 31 rounds and 120 beats. The administrative setup of Central Chanda Forest Division is as follows:

Sr.No	Class	Name of the Post	Sanctioned		
			Permanent	Temp.	Total
1	I	D. C. F.	1	0	1
2	I	A.C.F.	4	1	5
3	I	F.S.O.	0	1	1
4	II	R.F.O.	7	1	8
5	II	Office Suptd.	1	0	1
6	III	Revenue Inspector	1	0	1
7	III	AwalKarkun	1	0	1
8	III	Forester	54	4	58
9	III	Forest Guard	129	24	153
10	III	Surveyor	2	0	2
11	III	Chief Accountant	1	0	1
12	III	Accountant	11	0	11
13	III	Stastical Asstt.	1	0	1
14	III	Clerk cum typist	18	0	18
15	III	Steno-typist	1	0	1
16	III	Jeep Driver	10	1	11
17	III	Police Constable	0	1	1
18	IV	Naik	1	0	1
19	IV	Peon	8	0	8
20	IV	Cleaner	3	0	3
21	IV	Chowkidar	1	0	1
22	IV	Watchman	0	1	1
23	IV	Mali	1	0	1
24	IV	Dakrunner	1	0	1
25	IV	Daftari	1	0	1
26	IV	Forest Labour	217	0	217
		Total:-	476	33	509

R.F.O.s, the Foresters and the Forest Guards are being judiciously utilized. For having better management, not only of the human resources but of the forests in general, reorganisation of the division had been carried out carving protection and development ranges where development units are overlapping units along with territorial units. During the field inspection and discussion with field staffs it was revealed by field staffs that instead of carving of overlapping units it would have been better to have smaller territorial units. Hence some of Beats, Rounds and even Ranges need to be regrouped as in some of the Beats the most of the forest areas have been now under the Management Plan of FDCM This is an administrative measure and needs to be taken at appropriate level.

4.1.2 ACCOMMODATION: Accommodation made available by the Forest Department is inadequate. Majority of the staffs members have not been provided with accommodation.

4.1.3 REST HOUSE: There is a Forest Rest House at Jiwati managed by department and at Kanhargaon presently managed by FDCM and Inspection Huts at Rajura, Pombhurna, Jioti and Gondpipri.

4.1.4 FOREST COMMUNICATION: All the range headquarters are connected to the division by metalled roads. Round and Beat head quarters are connected by the state transport bus service. Division Head Office and all range headquarters have been provided with telephones. Wireless network is being contemplated to have quick communications amongst field staffs and controlling officers for better control of forests regarding illicit cutting and fire control and all forestry related works.

4.1.5 OFFICE AUTOMATION: The Division office and all Territorial Range Offices and Depot offices have been equipped with computers and most of the staffs and officers of grade I, II and III have been trained to handle these computers.

SECTION: 4. 2: LABOUR SUPPLY.

4.2.1. The position of the labour supply is fairly satisfactory except for some time during the rains when the agricultural works coincide with the afforestation works. Still there is not much of difficulty in procurement of labour for various forestry works.

====00====

CHAPTER – V

PAST SYSTEM OF MANAGEMENT

SECTION :5. 1 : GENERAL HISTORY OF FORESTS:

5.1.1 Present Central Chanda Forest Division comprises two distinct political and geographical areas. River Wardha divides these two areas completely. North of Wardha river area consists of Ballarshah, Dhaba and Kothari forest ranges. South of Wardha river contains Rajura, Wansadi and Wirur forest ranges. Former area was under erstwhile Central Province State of Union of States just after Independence while later area was under Hyderabad State. Short forest histories of both areas are being discussed as follows.

5.1.2 DHABA, KOTHARI AND BALLARSHAH FOREST RANGES: The first authentic record in the ancient history about the tract is the visit of the Chinese pilgrim, Heiun Tsang to the capital of Kosala, the Buddhist king in the year 639 A.D. Various inscriptions reveal that strong kingdom with flourishing civilisation under the rule of Kosala kings was existing around that period over this tract whose capital according to one source was at Chanda and from other sources was at Bhadrawati or Wairagarh. From Kosala Kings territory was occupied by the Mana Kings of Wairagarh. The Gond seized power from the Mana Kings and ruled over the tract from about 1240 to 1751 A.D. The Gond King of Ballarshah founded the Chanda Fort. The Bhosale dynasty (the Marathas) acquired the tract from the Gond Kings and ruled over it from 1751 to 1853. The last king of Maratha Raghuji Bhosale died without heir in 1853 and the Maratha Kingdom was finally annexed by the East India Company to the British Crown in the year 1854. The British ruled over the tract from 1854 to 1947. From 1947 to 1956 the tract constituted part of erstwhile Central Province and later on Madhya Pradesh under Indian Union. In 1956 with the reorganisation of Indian States the areas were with Mumbai and subsequently on bifurcation of the Mumbai State in 1960, it constituted the part of Maharashtra State.

5.1.3 BRIEF HISTORY OF THE FORESTS : History of the forests prior to 1879 is not available. After enactment of Indian Forest Act VII of 1878, lot of forest lands, in possession of malgujars and Zamindary were declared as Reserved Forests and the remaining forest areas remained with zamindars and malgujars till the abolition of the proprietary rights in 1951. The total Reserved Forest area in the present Dhaba, Kothari and Ballarshah Ranges is 25709.636 ha. In 1951, the M.P. Abolition of Proprietary Right (Estates, Mahals, Alienated lands) Act, 1951 (1 of 1951) was passed and all the private forests of the district vested in the Government with effect from April 1, 1951. Initially they were taken over by the Revenue Department and later on the areas suitable for management under forest were transferred to the forest department for management. The total transferred forest areas in the present

Dhaba, Kothari and Ballarshah Ranges were declared as protected forests u/s 29 of IFA, 1927 in the year 1955 and 1957 vide Madhya Pradesh Government Gazette Notification No. 30561216-X, dated 04-06-1955 and 1056-12623/FF dated 08-08-1957. The intention to constitute 18986.34 acres ha of P.F. into R.F. was declared vide Maharashtra Government Gazette Notification No.FLD/1258/II-3314-E dated 30.5.1959. As per Maharashtra gazette notification Nagpur Division Supplementary Part –I dated 2nd June 1960 No-II-1837-E for 2504.4.98 acres of areas intention to constitute Reserved Forests was notified. Forest settlement officer after conducting enquiry recommended reservation of 427.752 ha P.F. The proposed PF areas were declared as R.F. u/s 20 of IFA, 1927 vide Gazette Notification No. WS-S-E-FOR-1(1975) DESK-IX-II, dated 17th February, 1983.

SECTION :5.2 PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS :

5.2.1. RESERVED FORESTS : Dhaba and Kothari Ranges of this plan were combined as Dhaba Range prior to 1954 –1955 and Ballarshah Range was the part of Chanda range of West Chanda Division prior to 1965. In the past, the tract dealt with was managed range wise by separate working plans. Therefore, past systems of management in described separately for Dhaba (old) and Ballarshah ranges as follows :

5.2.2. DHABA RANGE (PRESENTLY DHABA AND KOTHARI RANGES) The Reserved Forests of this tract, constituted in the year 1879, were leased out for about 20 years to purchasers and commuters was indulged in indiscriminate felling of evidently choicest species and quality. In 1899 working plan for these forests were prepared by Punnaswamy, the then Divisional Forest Officer, which was soon abandoned due to non approval of prescriptions there in by the Chief conservator of forests. Thereafter teak forests in the Wainganga tract (Presently Watrana felling series of Dhaba Range) were worked under heavy improvement fellings and the better quality mixed forests in Dhaba Range (Presently Kothari Range) under coppice with standard.

DONALD'S WORKING PLAN OF 1913 :The first regular working plan for these forest was prepared by Donald in 1913. Under this plan Coppice With Standard and Improvement Felling areas were allotted to one felling series each. Felling cycle of 20 years was initially decided but it was raised to 40 years in the year 1924 for felling series in Dhaba Range. In the year 1927, transition felling for coppice with standard in Plain Teak Forest of Dhaba Range was introduced. In the year 1934, these areas were brought under clear felling. In 1932 a special overlapping semal felling series was formed in each range.

5.2.3. RESULTS OF DONALD'S PLANS :

The analysis of results of the prescriptions given in Donald's Plan was summarised by Tasdique Hussain which is reproduced as follows:

Inferior mixed forests without teak, occupying large area in all felling series remained unworked for lack of demand.

ii) Better quality mixed forests containing bija and semal in Dhaba Range: Total area was divided into Coppice With Standard and Improvement Felling Working Circles. Thinnings, cultural works and climber cutting though prescribed were neglected. Owing to this, forests were infested with eroni and overgrown with bamboos and poles of shade bearing species. The regeneration status of bija was bad on account of the dense bamboo and valueless underwood. Regeneration and trees of lower girth classes of this species became scarce. Reproduction of semal was also deficient but poles were common. Teak regenerated well in patches.

iii) **PLAIN TEAK FORESTS IN DHABA RANGE:** These forests were managed under coppice with standards for 14 years and then treated under transition felling. The results of treatment under coppice with standard was a general increase in proportion of teak and the creation of a dense underwood of teak poles over topped by standards. Transition fellings were introduced to admit the rapid removal of standards so that the forests could eventually be managed on even aged woods, but their object did not appear to have been understood and standards were removed very sparingly. Since 1934 the forests were worked under clear felling system.

iv) **HILL TEAK FORESTS IN DHABA RANGE :** Large timber of teak and other valuable species were removed under improvement fellings but except in a few coupes worked during the last two years, thinnings, climber cutting and tending operations were badly neglected.

5.2.4. N.T. HUSSAIN WORKING PLAN (1937-38 TO 1946-47) :Donald's Plan was replaced by N.T.Hussain's plan in 1937. This included areas of Dhaba, Markhanda, Ghot & Sironcha Ranges. Out of these Dhaba (presently Dhaba and Kothari Ranges) comes under the tract dealt with.

5.2.5. OBJECTS OF MANAGEMENT : The objects of management decided were to maintain the forest under the most suitable silvicultural treatment for a sustained supply of timber and other produce and to arrange to meet the local demand for grazing.

5.2.6.WORKING CIRCLES : The total areas of the tract were divided into four non overlapping and one overlapping working circles.These are as follows :

Conversion Working Circle.

Improvement Working Circle.

Selection Working Circle.

Miscellaneous Working Circle

Bamboo Overlapping Working Circle.

5.2.7. CONVERSION WORKING CIRCLE :Watrana felling series in Dhaba Range of the tract dealt with was included under this working circle.

5.2.8. METHODS OF TREATMENT : Improvement felling, CWR and clear-felling all three systems were tried in the past. In improvement felling teak regenerated (naturally) well but the subsequent development in the reproduction was observed to be suffered for want to light. Other two systems worked well. It was observed that teak grew best under full overhead light and in view of this consideration, the general treatment adopted in this working circle was clear felling. For the purpose of giving treatment, forests were divided into following two types :

Those containing a high proportion of teak and sufficient teak reproduction and

Those in which teak does not occur or is found only as poles or reproduction.

The treatment for type (i) decided was clear felling subject to the following reservations.

No felling in under stocked patches.

Semal trees below 3.5 feet in girth were reserved.

In type (ii), ordinarily no felling was prescribed but the improvement in the young teak crop was considered. In such places, therefore, inferior trees standing over teak was prescribed to be removed and any large patches of forest containing profuse teak advance growth were prescribed for clear felling.

5.2.9. CONVERSION PERIOD: The average quality of the tract being III, teak above 3 feet in girth is generally found unsound. On the basis of the analysis of data collected from Betul District in M.P., the above size was found to be expected in 60 years and therefore, conversion period was fixed as 60 years.

5.2.10. ALLOTMENT OF PERIODIC BLOCKS: The conversion period was divided into 3 periods of 20 years each and allotment was made to all the three periodic blocks. As much as possible old woods were allotted to PBI. Distinction between PB II and III was arbitrary but all the young woods resulting from clear felling in the past were placed under PB III which was again divided into III A and III B, the former included irregular woods and the latter the young even aged stand.

5.2.11. FELLING RULES: Felling rules for all PB's and types as mentioned above decided were as follows :

PB-1:

TYPE A : Clear fell all crop after reserving.

Semal under 3 feet in girth.

All growth in poorly stocked patches.

II) TYPE B:

No felling if there was no teak.

If teak reproduction and poles were found scattered or occurred on small groups removal of inferior trees standing among them.

If there were large patches containing teak reproduction, clear fell entire crop.

PB II : The principal operation in this block was thinning. Revenue felling was strictly prohibited. The felling rules were
Harvest dead and dying trees.

Make thinning in favour of teak and other valuable species.

Open up teak reproduction if under inferior trees but no felling of teak for assisting reproduction.

PB III A : The main objects were to provide adequate growing space for teak trees and poles, and to free them from interfering miscellaneous trees. Based on this, felling rules decided were

To harvest dead trees.

To remove unsound trees of the valuable species if likely to die or deteriorate during the next ten years.

To carry out thinning in favour of teak and other valuable species.

To remove inferior trees and unsound teak interfering with teak advance growth but not to fell any sound teak for assisting the advance growth.

To clear entire crop where profuse teak reproduction occurs in large groups under inferior trees.

To cut back suppressed advance growth, malformed or unsound teak poles.

5.2.12. PERIODIC BLOCK-III B :

The operations prescribed were climber cutting and thinning. Thinning was intended to be heavy so as to reduce the coppice shoots to one per stool and was also aimed at removal of wolf trees. The other points of importance were:

Poles of seed origin were preferred to coppice.

Coppice from young stools was preferred to that from old stools.

Where teak percentage was tending to pure, poles of inferior species were retained in preference to teak aiming to have a mixture of teak and other species in the ratio of 80:20.

Dominated ghoti and palas trees were retained to protect the soil.

PLANTING AND CULTURAL OPERATIONS:

PB I : After main felling, following planting and cultural operations were prescribed to be carried out in coupes of PB-I.

Planting of teak stumps in the rains after main felling.

Casualty replacement, weeding, climber cutting and cleaning in the second year if needed.

Repetition of operations mentioned in (ii) in subsequent years at the discretion of the Divisional Forest Officer. Carrying out cleaning, thinning in the fifth, tenth and twentieth year after main felling.

PB-III A : Cleaning, thinning and climber cutting as in PB-I in patches where clear felling were carried out were prescribed.

5.2.13. IMPROVEMENT WORKING CIRCLE:

This included workable hill teak and small areas of the plain's teak forest areas of Dhaba Range which formed the part of Karanji felling series only.

5.2.14. METHOD OF TREATMENT: Forest areas included were generally on steep slopes and prone to erosion. The proportion of valuable species was small and lead to the market was long. Due to these reasons, instead of intensive management the treatment adopted was improvement fellings, aiming at increasing the proportion of teak and other valuable species. Besides, harvesting of silviculturally available mature trees was prescribed. The operations prescribed for improvement were :

Heavy thinning in favour of teak and semal;

Removal of dead and dying trees.

Cutting back of badly grown unsound teak poles and removal of trees and bamboo likely to interfere with the resulting coppice.

Freeing of teak and semal reproduction from the shade of bamboos and inferior trees.

Clear felling of small patches containing profuse teak reproduction after reserving unharvestable semal.

Teak was considered mature on attaining girths of 41/2', 31/2' and 21/2' forest of II, III and IV quality areas respectively. Semal 31/2 feet and over in girth and Saja, Bija, Haldu and Shisham 4 feet and over were considered mature. Marking of only mature and silviculturally available trees was prescribed.

5.2.15. FELLING CYCLE AND YIELD REGULATION: The felling cycle adopted was 20 years and regulation of yield was done by area.

5.2.16. FELLING RULES: The following felling rules were prescribed.

All salable, dead and dying trees have been removed.

Mature teak, Semal, Bija, Shisham, Haldu and Saja have been removed provided silviculturally available.

Heavy thinnings have been done in favour of teak and semal.

Miscellaneous trees and bamboos interfering with young teak and semal have been removed. Suppressed teak advance growth malformed or unsound teak poles have been cut.

Cutting back of unsound profuse teak reproduction and clear felling of the whole overwood after reserving semal below 31/2 feet in girth.

5.2.17. SELECTION WORKING CIRCLE: This working circle included the high quality mixed forests in Dhaba Range (presently Kothari and Dhaba Ranges), which was divided into three felling series for administrative convenience, viz. Kothari, Chiondha, Bamanpalli. Total area of Bamanpalli comes under this working circle in Dhaba Range was transferred to FDCM Kothari and Chiondha felling series comes under Kothari Range and part of these two felling series is included in Aksapur felling series and rest of the area transferred to FDCM

5.2.18. This area contained high quality mixed forests with a large proportion of semal and bija with scattered teak. Established reproduction of semal was scarce but poles were common. Regeneration of bija was poor. Teak regenerated well and all size classes were represented adequately.

5.2.19. OBJECT OF MANAGEMENT: The object of management was to obtain teak, bija and semal in large sizes and poles of garari, bhirra etc. for local needs.

5.2.20. METHOD OF TREATMENT: The method of treatment prescribed was to harvest matured marketable timber trees and thereby providing opening in the forest leading to provide adequate light and space for regeneration and development of valuable species. The various operations prescribed to be carried out were as follows:

(i)**SELECTION FELLING:** This included harvesting of matured semal, teak bija and valuable species.

(ii)**THINNING:** Under this operation felling was carried out to provide adequate growing space for semal, teak and bija left standing.

(iii)**FREEING TEAK ADVANCE GROWTH:** Removal of other trees and bamboos interfering with teak was prescribed. On occurrence of teak advance growth in patches, the entire crop except semal, was prescribed for clear felling. Semal was retained as it has such foliage which does not interfere with the development of young teak.

(iv)**REGENERATION OF SEMAL AND BIJA:** Despite profuse regeneration of both the species during the rains seedlings, these were not persisting for the unknown reasons. As per the observation in the open forests of North Chands Division, both semal and bija were regenerating well. In the flat localities in Dhaba forests, due to dense undergrowth of Bamboo and poles it was guessed that seedlings were being perished for want of light and therefore removal of undergrowth in patches bearing poles of species like garari, dhawada, khair, dhaman, bhirra, lendia etc., required by the local people, was prescribed. This operation was prescribed to be tried on a large scale in Kothari and Chiondha felling series and in 20 acre areas per year in

Bambanpalli felling series. Besides, due to non assurance of success of natural regeneration, planting of species in compact favourable localities was also prescribed. Due to non availability of areas in the worked coupes, planting in other suitable localities outside the coupes was also prescribed.

5.2.21. HARVESTABLE GIRTH: The harvestable girths (gbh) decided for teak and semal was 106.68 cm and over and for bija 120 and over. In the year 1940 the harvestable girth for semal was raised to 121.92 cm and in year 1947 the girth limits of both bija and semal were raised to 152.40 cm

5.2.22. CHOICE OF SPECIES: The species favoured were teak, semal, bija, saja, shisham, khair, garari, bhirra, dhaman and dhawada.

5.2.23. FELLING CYCLE: Felling cycle of 20 years was decided.

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

To remove teak and semal 3 1/2 feet and over and bija 4 feet and over in girth.

To remove mature trees of other species if marketable.

To select patches containing poles of species like garari, khair, bhirra, dhaman, dhawada, lendia etc. required by the local population and clear fell all growth except, teak, semal and bija.

To make heavy thinning for teak, semal and bija including those in the patches treated under rule (iii).

To remove inferior growth standing over scattered teak reproduction. The latter should be cut back if suppressed.

(vi) Where profuse advance growth of teak occurs in patches, cut it back if suppressed and clear fell entire crop after reserving semal.

(vii) Cutting all climbers, specially eroni.

5.2.25. During the period 1940-41 to 1945-46 irregular fellings were done in suitable areas of some fellings series and the areas allotted to miscellaneous working circle to meet enhanced demand of supply to department. The fellings which were invariably light were done on sound silvicultural lines. Hence there was no adverse effect of these irregular fellings in the growing stock.

5.2.26. Main felling coupes of Watrana F.S. in conversion Working Circle and main felling coupes of Improvement Working Circle were worked in advance during the year 1951-52 as per Government orders to meet the immediate need of funds required by the State Government.

5.2.27. MISCELLANEOUS WORKING CIRCLE: This included the forest villages and mixed forests which were not fit for regular management. The area included of the tract dealt with comes presently in both Kothari and Dhaba ranges. The major part of these areas have been transferred to FDCM

5.2.28. METHOD OF TREATMENT:

FOREST VILLAGES: Timber in the forest villages was treated as reserved and to be harvested with the permission of the Conservator of Forests. The method of executing felling was prescribed to be the same as for periodic block in Conversion Working Circle.

(ii) **OTHER FORESTS:** The working of such areas was prescribed to be with the adjacent coupes in the regular felling series on the lines of improvement fellings.

5.2.29. BAMBOO WORKING CIRCLE: This is overlapping working circle and included areas bearing bamboos. The tract dealt with was covered under four felling series spread over both Dhaba and Kothari Ranges. Most of the part of Dhaba Range and some part of Kothari Range have been transferred to FDCM

5.2.30. Bamboo areas were prescribed to be worked in a four year felling cycle.

5.2.31. FELLING RULES: The following felling rules were prescribed.

No culm under 1 year of age has been cut.

The height at which culms are to be cut will not exceed 18 inches from the ground.

At least eight culms over 1 year of age have been retained in each clump.

(iv) No dead bamboos have been left in any clump during harvesting.

Digging of rhizomes was prohibited.

5.2.32. RESULTS OF TASDIQUE HUSSAIN'S PLAN: The analysis of results of the prescriptions given in Hussain's Plan was summarised by Dashputre which is being reporduced as follows :

5.2.33. CONVERSION WORKING CIRCLE: The selection of area for immediate conversion operation was on the whole fairly satisfactory, but a considerable portion of the forests included in this working circle was not likely to be suitable for conversion operations. Such areas were well allotted to PB II or mostly PB III, with the presumption that by the time they come up for conversion, the condition of the crop would be so improved under the treatment prescribed as to render conversion possible. Examination of such areas however, reveals futility of such expectation. In fact the edaphic and biological factors which render such conversion operations impossible now are too permanent to entertain such hopes and a better thing would have been to confine the working circle to such a small areas only wherein intensive working was possible.

5.2.34. The clear felling done in Periodic Block – I has produced excellent young woods. The wholesale clear-felling has however, resulted in an absolutely pure teak crop to an undersirable extent. This defect was rectified

in the last 5 or 6 coupes in which healthy and vigorous species were retained to obtain a mixture crop to a quite satisfactory extent. The results of conversion are as follows :

Range	F.S.	Coupes	Area in ha		Remarks (%of success)
			Total	Converted	
Dhaba	Watrana	I to XVI	1075.269	763.641	71%

5.2.35. In area of PB-II, crop was heavily exploited. Though revenue fellings were strictly prohibited yet large number of mature trees or valuable species was removed. This resulted that some of the areas which were expected to come up for final were deficient in older girth classes. The opening up of teak reproduction under inferior species, however, helped in establishing stand of advance growth in most of the areas. Heavy harvesting also took place in PB IIIA.

5.2.36. The tending operations carried out in the young woods as per the prescriptions have brought the stems in healthy and vigorous growing condition.

5.2.37. SELECTION WORKING CIRCLE: The regeneration of bija and semal were left to chance due to absence of knowledge of technique. Besides, the prescriptions for using compensatory plantations of 20 ha was too ambitious and so implementation area had to be reduced to 8 ha In the plan it was also laid down to pursue the experiments to evolve a technique for artificial regeneration of bija and semal. But in experiment nothing could come up substantially and so plantation of teak were taken, which became successful in most of the cases. The details of plantation taken are as follows :

F. Series	Area Planted	
	Teak	Mixed
Kothari	66.36 ha	6.069 ha

5.2.38. DASHPUTRE'S (1953-54) EXTENDED TO 1973-74: Hussain's Plan was replaced by Dashputre's Plan in the year 1954. This included forest areas of Ghot, Dhaba, Markhanda, Sironcha and Aheri Ranges. Out of these Dhaba (presently Dhaba and Kothari Ranges) comes under the tract dealt with.

5.2.39. OBJECTS OF MANAGEMENT: The ultimate object decided was the attainment of a normal growing stock. But this could be left as an unachievable concept and immediate objects decided were as follows:

To meet the local demand for timber, fuel, minor forest produce and grazing.

To preserve the forests where necessary in the interests of conservation of soil and water supply.

To meet the demand for timber and other forest produce and to obtain the maximum sustained annual revenue, while at the same time improving the condition of the forest.

5.2.40. WORKING CIRCLE: To achieve the objectives as decided above the following working circles were formed.

Conversion Working Circle,
Selection Cum Improvement Working Circle,
Plantation Working Circle,
Coppice With Reserve Working Circle,
Khair (overlapping) Working Circle,
Semal (Overlapping) Working Circle,
Bamboo (Overlapping) Working Circle,
Miscellaneous Working Circle.

5.2.41. CONVERSION WORKING CIRCLE: This working circle included teak and mixed forests of III to II quality in Dhaba Range (Watrana felling series) of the tract dealt with.

5.2.42. CONVERSION PERIOD: The working circle included teak and mixed forest of quality III to II. Teak formed high proportion in the growing stock. Advance growth of teak was abundant in this locality. The forests were intended to be converted into normal series of age classes in even age blocks. Teak was considered the principal species. However, a mixture of teak (60%) and misc. species (40%) was contemplated. Based on growth data obtained from stem analysis in Watrana felling series, the teak was estimated to attain 4 feet girth in sound condition at the age of 70 years and therefore, conversion period of 80 years was decided.

5.2.43. ALLOTMENT OF PERIODIC BLOCKS: Five Periodic Blocks were formed. Areas were separately allotted to Periodic Blocks. PBI was kept separately. PB II was grouped with PBV and PB III was grouped with PB IV.

PRESCRIPTIONS PROPOSED FOR PERIODIC BLOCKS:

5.2.44. PB-1: The area of Watrana felling series having abundant established reproduction of teak was included in PB-I. Clear felling was prescribed with modification in respect of reservation of miscellaneous poles. Clear felling was restricted in mixed forests containing no teak in the over wood or in the shape of reproduction. Poor quality mixed areas with inadequate stocking and areas prone to erosion were also excluded from clear felling. All semal trees below 137.16 cm in girth, well grown khair trees and fruit bearing trees to the extent of 20 to 25 per 0.4 ha were excluded from fellings. From area liable to

erosion only dead trees were prescribed to be removed. Mature or under mature trees standing over the patches of pole crop upto 76.20 cm in girth (bgh) were prescribed to be removed, provided such patches extended over 0.8 ha or more. Thinning was prescribed wherever necessary. Better stocked teak and miscellaneous forests without adequate regeneration of teak were considered unfit for conversion. In such area, removal of mature teak and other marketable misc. species, if available on silvicultural grounds; bamboos and inferior growth interfering with teak, dead and badly living trees were prescribed. Thinning of required grade was prescribed in congested patches of valuable growth. Plantation was not recommended.

5.2.45. Subsidiary, regeneration and cultural operations were prescribed to be carried out in the year following the main felling. Regeneration operation included cutting back of all suppressed and badly grown advance growth, not cut back at the time of main fellings. Cultural operations were prescribed to be carried out in the second, third and subsequent years in the clear felled areas and in the second year in other areas. These consisted of removal of inferior species, overlapping species, climber cutting, cutting of bamboo when interfering with favoured species, cutting back of sapling seriously damaged by wild animals, clearing the congested groups of sapling and reduction of coppice shoots to one per stool.

5.2.46. PERIODIC BLOCK – II : The crop being abnormal and middle aged, removal of all dead trees and trees of inferior species and Karka (bamboos) interfering with reproduction of valuable species was prescribed.

5.2.47. PERIODIC BLOCKS-III AND IV: Mature marketable trees of each species were to be ascertained by enumeration and one such tree in every three if available silviculturally was permitted to be removed. Removal of all dead and unsound trees, if available silviculturally and not likely to live for another 20 years was prescribed. Unsound tree was defined as a tree having hollow bole over 3 mt from the base, having half the crown dead, having outer wood of the bole fire scarred and dead to the extent of 1/3 of the bole and very badly leaning. Light thinning in favour of other species, in fully stocked areas were prescribed.

5.2.48. Young woods standing over an area of about 930.01 ha regenerated prior to introduction of 1937 plan were subjected to thinnings.

5.2.49. PERIODIC BLOCK-V: An area of 3439.95 ha converted to even-aged crops during the period of Tasdique Hussain's Plan and a few years preceding its introduction were allotted to this PB. These, however, contained patches containing irregular crop also. The object of management of these areas was to tend and thin the young woods, to maintain them in healthy and vigorous state of growth and to convert the patches containing irregular crop wherever possible. In the areas successfully regenerated in the past, thinnings in the young crop and removal of standards left over, if any in the past were prescribed. In the irregular, crop, not containing adequate advance growth of

teak, removal of overwood leaving a few well grown miscellaneous poles and cutting back of advance growth were the operations, to be carried out. In areas fit for regeneration, removal of mature marketable trees available on silvicultural grounds, removal of dead trees and removal of individual trees to encourage teak and other valuable species were prescribed.

5.2.50. PLANTATION WORKING CIRCLE: 3 compartments of the tract dealt with in Dhaba Range (Presently under Kothari Range) near village Kanhargaon were included in this working circle. Total area was put under only one felling series named Kanhargaon felling series which was divided into 30 annual coupes. The main objects of this working circle were to counter balance the paucity of recruitment of valuable species, such as semal, bija, shiwan teak and maharukh and to augment the resources in softwood species in the crop composition and to increase the value of growing stock. Taking plantation of the above mentioned species in each coupe over an area of 6 ha every year was prescribed.

5.2.51. Planting in strips by clear felling and treating crop in intervening strips under SCI fellings were prescribed. Annual area was not laid out and selection of the same was left to be decided by the Divisional Forests Officer. Rotation and felling cycle were considered not important for such a small area. Climber cutting, enumeration and removal of 2/3rd of the mature trees without causing any gap in the canopy, removal of dead and dying trees, freeing the regeneration of valuable species by removal of overwood inferior species and thinning in congested patches were prescribed to be carried out in intervening strips.

5.2.52. PLANTATION TECHNIQUE: Methods recommended for planting of semal, bija, maharukh and shiwan were as follows :

Semal: Root shoot cutting in manured pits.

Bija: Stumps (Root shoot cuttings)

Maharukh: Sowing in worked soil patches.

Shiwan: Root shoot cutting

Teak: Stump planting.

In view of the heavy porcupine and deer damage, individual porcupine and deer fencing for semal, shiwan and bija were recommended.

5.2.53. SELECTION CUM IMPROVEMENT WORKING CIRCLE: This working circle included best quality mixed forests of Dhaba Range which are presently under Kothari Range of the tract dealt with. All the felling series, except Aksapur have now been transferred to FDCM. The quality of the forest varies from III to II. Kakad and Surya are the main species in the growing stock. Bija, Semal and teak occur scattered in the overwood. Dense bamboo occurs all over. Mature trees of valuable species are few. Teak was considered mature on attaining girth of 3, 4 and 5 feet in quality IV, III and II

respectively. Bija on attaining girth of 5 feet; Haldu and Shisham 4 feet; Shiwan and Tinsa 3 feet were considered mature. Felling cycle of 30 years was adopted. Yield was regulated by area, except Kothari felling series where it was regulated by number of mature trees.

5.2.54. FELLING RULES: The following felling rules were prescribed.

Reservation of all semal and khair trees.

(ii) Total exclusion of felling in under stocked patches.

Selection felling of marketable trees species of harvestable girth if available silviculturally and not required for protection of site.

Removal of dead trees and those which are not dead but of which more than 50% of the crown is dead.

Felling of misc. species interfering with the development of valuable species.

(vi) Light thinning in congested stand to favour semal, bija, teak, ain, shisham, tinsa (tiwas), haldu in order of priority.

(vii) Clear felling small patches with profuse reproduction of teak provided the areas are not liable to soil erosion. The limit of patches for such operation was decided not less than 2 acres and more than 10 acres in any one coupe.

5.2.55. CULTURAL OPERATIONS: Cultural operations prescribed were-

(i) Climber cutting immediately before a coupe is due for marking.

(ii) CBO after contractor relinquishes coupes and

(iii) Thinning and tending in young woods resulting from past clear felling and planting. A list of such areas drawn on a thinning schedule was prescribed.

5.2.56. COPPICE WITH RESERVE WORKING CIRCLE: This working circle included inferior quality accessible area of Dhaba Range (Presently Kothari Range) and was covered within only Dewai felling series which falls within the purview of the tract dealt with. The crop was predominantly mixed and of quality varying from IV to III. Teak was occurring scattered and at times in patches. Important species besides teak were ain, bija, shisham, haldu, dhawada, garari, lendia, bhirra, surya etc. Preponderance of young to middle aged teak and deficiency of old stock were conspicuous.

5.2.57. OBJECTS OF MANGEMENT: The objects of management decided were:

(i) To produce and harvest on sustained yield basis the maximum volume of firewood for charcoal making

(ii) Good straight poles and small to medium sized timber of suitable species to meet the nistar right of the people.

(iii) In a small quantity big sized timber of valuable species from suitable promising trees and

(iv) To provide fodder and grazing to the maximum extent possible.

5.2.58. FELLING CYCLE AND COUPES: Felling cycle of 45 years was fixed. The yield was regulated by area by laying 45 equiproductive coupes.

5.2.59. METHOD OF FELLING : Semal of 137.16 cm and over and khair of 45.72 and over in girth (Ob at bh) were prescribed to be harvested one year in advance of main felling from areas not allotted to the semal and khair overlapping working circles. Other prescriptions laid down were to be excluded from working the under stocked and areas liable to erosion. Reservation in 20 meter wide strip on either side of main water courses was prescribed. Trees bearing edible flowers and fruits, all bija trees of 121.19 cm and below in girth (Ob at bh) and all trees of *Gardenia latifolia* were also reserved. Besides all advance growth, except that of garari of 22.86 cm in girth (Ob at bh) was to be reserved. About 30 trees in vigorous state of growth per acre, preferably between 61 cm to 91cm girth classes were to be retained giving preference to valuable species other than teak in pure teak patches to obtain suitable mixture. The species to be favoured were bija, ain, shisham, dhawada, lendia, aonla, tendu, garari, kalam, haldu, tinsa & bhirra. Clear felling garari patches and thinning in pole crop were prescribed. Other trees with above restricting factors were to be felled to obtain coppice reproduction.

5.2.60. OTHER SILVICULTURAL OPERATIONS: The following subsidiary operations were prescribed.

Climber cutting before working of the coupe.

CBO after completion of contractors works in the next year of the main felling. CBO included removal of standing trees marked for felling but not felled and badly damaged reserved trees; cutting back of all malformed advance growth of teak and other valuable species; freeing the coppice reproduction from bamboo and cutting of climbers and singling of the coppice shoots:

Cleaning in the 8th year.

Thinning and climber cutting in the 23rd year after the main felling in better quality patches containing teak and other valuable species.

5.2.61 KHAIR OVERLAPPING WORKING CIRCLE: This included khair bearing areas of Dhaba Range (Presently Kothari Range) of the tract dealt with. The object of management was to produce and harvest on sustained yield basis maximum khair trees of suitable size. Harvestable girth of 15 inches and above was fixed and felling cycle of 25 years was decided. Only one Kothari felling series was formed. The yield was regulated by area.

5.2.62. FELLING RULES: Harvesting of mature khair trees applying selection felling was prescribed. Dressing of stumps of felled trees was also prescribed.

5.2.63. SEMAL OVERLAPPING WORKING CIRCLE: The area bearing semal in Dhaba Range (Presently Kothari Range) was included in this overlapping working circle. The object of management was to harvest semal trees of suitable girth to meet the commercial demand on sustained basis. Four and ½ feet girth was decided as harvestable. A felling cycle of 20 years was decided. Two felling series were formed. The yield was regulated by area.

5.2.64. FELLING RULES: Selection felling of all semal trees 4½ feet and over was prescribed.

5.2.65. REGENERATION OPERATIONS: The method of inducing the reproduction of semal by root suckers was advocated. For this three years prior to harvesting of a coupe 2 to 4 lateral roots around every harvestable semal tree was prescribed to be wounded and the resulting shoots to be fenced individually.

5.2.66. BAMBOO OVERLAPPING WORKING CIRCLE: This working circle included all the compartments carrying bamboos in sufficient quantities in Dhaba Range (Presently Dhaba and Kothari Range) of the tract being dealt with. 8 felling series were formed. The felling cycle was fixed four year and therefore, each felling series was divided into four annual coupes. Standard felling rules were followed.

5.2.67. MISCELLANEOUS WORKING CIRCLE : This included forest village area and forest of Dhaba Range (Presently Dhaba and Kothari), which were unfit for working due to poor stocking, remoteness and lack of demand, precipitous slope and erosion.

5.2.68. RESULTS OF DASHPUTRE'S PLAN: The analysis of results of the prescriptions given in Dashputre's plan was summarised by K. N. Khisti which is reproduced as follows:

5.2.69. CONVERSION WORKING CIRCLE: Areas selected for immediate conversion were pure teak stands with adequate growth. These however, contained patches of mixed or pure miscellaneous forests as well. Clear felling the teak forests produced excellent teak stands. The patches of the mixed or miscellaneous forests were prescribed to be worked to remove only the mature trees of economically valuable species and to free the advance growth of teak and other valuable species by removing the growth of the inferior species interfering with their proper development. This resulted in retention of uncovered patches, scattered all over the area of this working circle of miscellaneous crop. Since the extent of such patches was not big, clear felling and artificial regeneration of teak and other economically valuable species should have been resorted to in order to secure uniform crop all over the converted areas. In laying complete reliance on natural regeneration, retention of the seedling coppice or coppice advance growth as against the coppice of older stools, unless obligatory in certain areas, was presupposed. In practice, poles coppiced from the bigger stools were seen to

have been retained, thus inducing deterioration in the quality and retarded vigour of the growing stock. In effect, all the clear felled areas were adequately stocked with uniform crop. Areas regenerated during the currency of the Dashputre's plan were as under.

Range	Felling Series	Coupe No.	Area in ha		Remarks (% of success)
			Total	Converted	
Dhaba	Watrana	I to XX	632.522	600.546	95%

5.2.70. The above together with the areas converted during the period of Shri. Tasdique Hussain's working plan amounted to the following hectareage.

Range	Felling Series	Area in ha		Remarks (% of success)
		Total	Converted	
Dhaba	Watrana	1707.773	1364.193	80%

5.2.71. In spite of adequate provisions to encourage suitable mixture of teak and miscellaneous in pure teak, patches or wherever teak tended to be pure, the converted crop in Watrana felling series contains low percentage of trees of miscellaneous species.

5.2.72. Areas allotted to PBII were seen to have been very heavily worked with the result that the left over crop was mostly middle aged with conspicuous absence of trees of mature and approach classes. This state of affairs could partially be attributed to faulty working for economic exploitation of the Forest Labourer's Co-operative Society. In fact revenue considerations should have had least weightage and the works should have been necessarily carried out as per prescriptions of the working plan.

5.2.73. Area constituting Periodic Blocks III, IV and V were adequately attended to. The resultant crop particularly in PBV. Consisted of young and fairly healthy poles.

5.2.74. SELECTION WORKING CIRCLE: Bulk of the better quality areas constituting this working circle were transferred to Forest Development Corporation of Maharashtra Ltd. The remaining areas were of medium and low quality forests borne by the hilly and undulating terrain. Bulk of the growing stock was poles to middle aged. Damage due to fire was conspicuous. Mature trees and those of the approach classes were few. In general the growing stock was grossly deficient in higher age classes. Adequate regeneration of valuable miscellaneous species had always been a problem. Compensatory plantations of bija, semal, etc. were intended to be raised. Of late bulk of the stress was laid on raising teak plantations instead of

valuable miscellaneous species. Such plantations raised during the currency of Dashputre's plan are reproduced by species as given below:

Range	Species	Area planted in ha
Kothari	Teak	46.537
	Teak and Semal	44.514
	Maharukh	6.069
	Semal	4.047
	Shiwan	6.069
	Total	107.236

5.2.75. In addition to the above, plantations of various species to the extent indicated against each one of the following were raised.

Sr. No.	Species	Area in ha
i	Teak	714.818
ii	Teak & Eucalyptus	18.210
iii	Teak & Khair	2.023
iv	Eucalyptus	437.462
v	Bamboos	220.389
vi	Tendu	8.092
vii	Eucalypus, Semal, Maharukh, Siras & Teak	40.468
	Total	1441.562

5.2.76. These were raised under various plan schemes with varying degree of success. Teak amongst them showed promising results. Eucalyptus initially responded well till first three to five years after plantations. Subsequently the percentage of mortality increased to a great extent rendering these plantations as total failure.

5.2.77. COPPICE WITH RESERVE WORKING CIRCLE: Well stocked area responded well to the treatment and got adequately stocked. Poor quality areas were refractory and no improvement in them was possible.

5.2.78. BALLARSHAH RANGE: Ballarshah Range was formed in the year 1965. Prior to that it was the part of Chanda Range of West Chanda Forest Division. Initially W.P. was prepared by Ranges.

5.2.79. THE WORKING PLAN OF GANGA PRASAD (1897-1900):

Ballarshah, Chanda and Moharli Ranges were part of Haveli Range. Ganga Prasad prepared the first working plan for Haveli Range for the period from 1897 to 1900. This working plan presented improvement felling. Forests were worked by petty purchasers who used to remove trees not marked for reservation.

5.2.80. In 1910, the system in most of the felling seires was changed to coppice with standards, but the felling of the inferior trees was not enforced except in coupes where there was demand. From 1924 onwards cutting back, thinning and climber cutting was done. The forest of Ballarshah Range was regularly worked.

5.2.81. VAHID'S WORKING PLAN (1927-37): S. A. Vahid prepared the first consolidated working plan for North Chanda Forest Division, after carrying out detailed inspection of forests, its classification into forest types and quality classes. In the year 1904 only one Forest Division of old Chanda District (Presently Chanda and Gadchiroli) was split up into North Chanda and South Chanda Forest Division due to expansion of work and revenue. For administrative convenience the forests of North Chanda Division were divided into seven ranges, viz Moharli, Haveli (Chanda), Dhaba, Warora, Bramhapuri, Gunjewahi (Presently Sindewahi) and Wairagarh. Later on in the year 1908, Dhaba Range was transferred to South Chanda Forest Division with effect from 1st July 1908. In the year 1924, Moharli Range was divided into Moharli and Mul. The tract being dealt with was the part of Haveli Range (Presently Chanda Range). In 1965 a separate Ballarshah Range was formed. The fundamental principle of forest management to obtain the greatest possible yield was recognised as:

To attainment of normal forest and

To establish regeneration to the normal extent.

5.2.82. OBJECTS OF MANAGEMENT: The principal object was considered to manage forests on a financial basis with a view to securing the greatest possible sustained or expanding annual revenue. Besides the role of forests in water conservation and demand of local population were also considered. Based on these considerations, objects of management decided were:

- I. To obtain maximum possible sustained annual yields.
- II. To supply the local demand.
- III. To maintain the forest as a forest in the interest of the water supply.
- IV. To aim at the creation of a normal forest with a normal series of age classes and with normal regeneration.
- V. With the minimum damage of the forest and the minimum hindrance to the realisation of the above objects to provide grazing to the local cattle.

5.2.83. METHOD OF TREATMENT: Subject to the satisfaction of other demands revenue was the main consideration and therefore, the laws of supply and demand were observed.

5.2.84. All the species of major importance in these forest being light demanders and therefore, the growth of forests in even aged stands was considered desirable and so the method of treatment was aimed at the conversion of these forests to the uniform system consisting of a normal series of age classes in even aged stands with concentrated normal regeneration. The aim was applied at once to all teak forests and to those mixed forests which were subjected to a good demand.

5.2.85. Timber of mixed species was salable only as poles of 18 inches girth or there about and was unstable in larger sizes. Bija was unsalable except as logs of 4 feet girth and upwards. These facts with regard to the demand of different species guided to decide to treat Bija forest (mixed forest with 20% or more Bija) under a system of two storied forest with Bija as the upper storey on a long rotation and other species as an understorey on a short rotation. The French system of coppice with standards method was adopted to achieve above objects. Long term planning with this system of management was to decide either conversion of the area to Bija high forest or low forest on a short rotation based on financial results of these two. More beneficial system (in terms of money) would be followed was intended. Bamboo was found suppressing existing regeneration and preventing the establishment of new regeneration and therefore, it was treated as weed during regeneration operations in the interest of the young growth of valuable tree species. It was recognised that the poor forests degraded usually on account of maltreatment lasting for centuries and so such forests were treated as unworkable and were left untouched as any felling were likely to enhance their further degradation.

5.2.86. WORKING CIRCLE: The following working circles were constituted.

- I. High Forest Working Circle,
- II. Coppice With Standards Working Circle,
- III. Low Forest Working Circle,
- IV. Bamboo Working Circle,
- V. Low Forest Unworked Working Circle.
- VI. The better quality forests of Ballarshah Range were worked under low forest working circle. The remaining areas were allotted to low forest unworked working circle.

5.2.8. LOW FOREST WORKING CIRCLE: This included low forests of teak or mixed which were not fit for large timber production.

5.2.88. SILVICULTURAL SYSTEM: The system selected was modified clear felling. Clear felling was modified to this extent that fruit bearing trees of individual importance to the surrounding population were reserved. Under stocked forest and forest in which the process of filling up by annular group

extension was in progress were excluded. The chief source of regeneration was coppice and it was hoped that some natural regeneration on the ground would increase the density of the new crop. It was considered all species as coppicers irrespective of their age and size. Though it was conceded that clear felling had not always been a success in the past. Yet this was bypassed by saying that failure was due to omission of essential prescriptions of cleaning and climber cutting and not due to an inherent defect of the system. This was supported by quoting the following report.

5.2.89. “The silviculturist’s report of 1922-23 states: That all our species under coppice treatment show a marked falling off in girth and height is about the 20th to 25th year of their life which is due to the cramping to which they are subjected. This early culmination is remarkably constant even inspite of vast differences in soil and locality generally, and points to the fact that lack of thinning is the root of the evil”. Therefore, thinning after half of rotation age was prescribed. Before thinning climber cutting was prescribed.

5.2.90. ROTATION: The financial rotation for misc. species were fixed at 30 and 40 years for the forests of average C.P. site quality of Iva and Ivb respectively. In financial rotation, size of the produce was fixed. The age at which this is attained becomes the financial rotation. For teak financial rotation was fixed at 40 years. Each felling series was divided into 40 to 30 annual coupes as the case may be.

5.2.91. FELLING RULES: Felling rules prescribed were:

- I. To fell all trees within 3” of the ground
- II. To roughly dress all stumps.
- III. To reserve a few Moha and Char trees.
- IV. To exclude the area from felling which were not likely to regenerate through coppice and the growth of seedling regeneration existing on the ground.
- V. To reserve a narrow strips of forest along the nalas which were prone to erosion.

5.2.92. THINNING: Thinning rules prescribed were:

- I. Thinning must be crown thinning. Cutting back operation must be carried out.
- II. Clumps of coppice shoots must be thinned; the number of shoots to be retained must depend on the crown space available.
- III. Big spreading trees of inferior species and miscellaneous trees of more valuable species must be felled if suppressing young growth and if their presence is not otherwise essential which will die as a result of girdling. Dhoban, Ficus species and other which can resist girdling must invariably be felled. Salai must always be felled and not girdled.
- IV. Creepsrs must be cut.
- V. Girdling should only be resorted to in case of unsalable trees over 3” girth.

5.2.93. HEWETSON'S WORKING PLAN (1936-37 TO 1945-46): Vahid's Working Plan replaced by Hewetson's Plan in the year 1936-37. Vahid's Plan was for 10 years w.e.f. 1927-28. But it was revised after completing eight years only due to failure of regeneration. The revised plan covered areas of North Chanda Forest Division and was brought into force in 1936-37. Ballarshah Range, the tract dealt with was the part of the then Chanda Range.

5.2.94. OBJECTS OF MANAGEMENT: The main objects of management decided were:

- I. To obtain the maximum sustained yield of all classes of forest produce.
- II. To meet the demand of the local people for different forest produce.
- III. To retain mixture of species but to favour valuable tree species.

5.2.95. METHODS OF TREATMENT: Methods of treatment adopted were:

- I. The better quality forests were managed for production of large timber on a rotation of 80 years.
- II. The poorer quality forests were worked on a rotation of 40 years, mainly for the production of poles and fuel to meet the local demand. Regeneration was prescribed chiefly by coppice.
- III. Bamboo was worked on a four year felling cycle.

5.2.96. WORKING CIRCLES: The following working circles were formed:

- I. High Forest Working Circle.
- II. Coppice with Standard Working Circle.
- III. Miscellaneous Working Circle.
- IV. Bamboo Working Circle.

5.2.97. The workable areas of Ballarshah Range of the tract being dealt with (Then Chanda Range) were allotted to Coppice with standard working circle.

5.2.98. COPPICE WITH STANDARDS WORKING CIRCLE: The object to constitute this working circle was to meet local demand for small timber and fuel.

5.2.99. METHOD OF TREATMENT: The chief object of management was to satisfy the local demand for small timber of size from 15 to 24 inches girth for which coppice with standard system was adopted. Clear felling was not adopted due to following reasons:

- I. Teak was not common and to increase its proportion the retention of teak standards was desirable.
- II. Semal and bija were valuable and salable only over 3 feet girth and so healthy trees below that size were not to be sacrificed.

- III. The demand for large timber of ain, shisham, tinsa etc. was increasing and it was desirable to retain standards of these species in order to meet this demand.
- IV. In poorly stocked forests, on steep slopes and other erosion prone areas, clear felling was likely to lead to further deterioration.
- V. Fruit bearing trees were to be retained because local villagers depended on them in a variety of ways.

5.2.101. CHOICE OF SPECIES: Teak, bija, tinsa, shisham and shiwan were proposed to receive preferential treatment in selection of standards for reservation during subsidiary operations and thinnings.

5.2.102. ROTATION: A rotation of 40 years was adopted in all felling series. The number of rotations of the coppice for which the standards were to be retained could not be fixed as that was largely dependent on the rates of growth of individual species and on the future demands. 40 approximately equiproductive coupes were laid down in each felling series. Yield was regulated by area.

5.2.103. METHOD OF EXECUTING THE MAIN FELLINGS: The following felling rules were adopted

- I. Demarcation and marking was prescribed one year advance of the main felling. At the same time climber cutting was also prescribed.
- II. Poor or under stocked forests, steep slopes and areas prone to erosion were excluded from working, but felling departmentally of dead, dying and over mature marketable trees was prescribed.
- III. All sound well grown semal and bija below 4 feet girth were reserved.
- IV. Sound, straight teak, ain, shisham, shiwan, bhirra and tinsa were reserved as standards. Girths between 15 to 24 inches were prescribed for selection of standards.
- V. In open forests and in places where coppice reproduction was likely to be deficient, retention of a larger number of standards to protect soil and reduce growth of grass were prescribed.
- VI. Trees bearing edible flowers and fruits liked by local villagers were reserved.
- VII. A belt of trees, especially Koha was retained along all important water courses.
- VIII. All seedlings and saplings upto 9 inches in girth, except garari were reserved.
- IX. All well grown stems of phetra (*Gardenia turgida*) and ghogal (*Gardenia latifolia*) were reserved.

5.2.104. THINNING: In the fifteenth year of main felling C-grade thinning and climber cutting were prescribed. In departmentally worked coupes subsidiary operations were not prescribed. In coupes worked by contractor, CBO was prescribed.

5.2.105. FELLING IN BAMBOO AREAS: Cut back of bamboo for a year or two before the main felling was prescribed to retard the growth of bamboo for providing the coppice regeneration a better chance of getting established.

5.2.106. RESULTS OF WORKING: The analysis of results of prescriptions given was done by Singh and Muzumdar which is being reproduced as below

(i) The results of the treatment on the above lines were, on the whole quite satisfactory in the new bamboo forests of Brahmapuri, Sindewahi and Wairagarh Ranges. But in places larger trees failed to coppice satisfactorily. In the bamboo bearing forests heavy fellings produced disappointing results. Bamboos and climbers came up more vigorously and smothered the young reproduction. Advance bamboo felling was found to be expensive and was abandoned.

(ii) The subsidiary cultural operations and thinnings after 15 years were not carried out properly.

5.2.107. BAMBOO OVERLAPPING WORKING CIRCLE: This working circle overlaps coppice with reserve working circle of Ballarshah Range. Some compartments of Ballarshah Range were included in Chanda Commercial Bamboo Felling Series which were allotted to Ballarpur Paper and Straw Board Mill Ltd. On lease of 40 years. The remaining areas constituted part of Chanda Nistar Bamboo Felling Series.

5.2.108. FELLING CYCLE: Initially felling cycle was decided 4 years. But it was reduced to 3 years in the year 1965-66. Since then 3 year felling cycle was followed.

5.2.109. FELLING RULES: The following felling rules were framed.

- I. No felling of culms under one year of age.
- II. A minimum of 8 culms over one year in each clump were to be retained. (The minimum may be increased or decreased by executive orders of C.F.)
- III. The height at which culms was to be cut was maximum 18 inches.
- IV. No dead bamboos were to be left in clumps, harvested.

5.2.110. S.N.SINGH AND R.B. MUZUMDAR'S WORKING PLAN (1949-50 TO 1963-64): Hewetson's Plan was replaced by Singh and Muzumdar's Plan. Ballarshah Range, the tract being dealt with was the part of then Chanda Range. Singh included all R.F. areas in Ballarshah Range under management. In all previous working plans two felling series, namely Itoli and Umri (of the current plan) were not included under management. These areas were brought under management in Singh's Plan for the first time.

5.2.111. During the preparation of this plan all the 'A' class forests were stock mapped showing the quality classes and types of the forests. Quality classes were fixed on the arbitrary limits of the heights. Under stocked areas and blanks too were indicated. However, density and regeneration of the crop were not indicated on topo-sheets.

5.2.112. Forests were classified for the first time on functional basis into tree, minor pasture and miscellaneous forests. Forests which could not produce large sized timber but grew medium sized timber, poles and firewood were classified as minor forests.

5.2.113. OBJECTS OF MANAGEMENT: The objects of management decided were:

- I. To obtain the maximum sustained yield of all kinds of produce.
- II. To satisfy the local demand for small timber, firewood and other minor forest produce and conserve as far as possible those tree species which produce edible fruits and flowers.
- III. To provide grazing to the maximum possible extent consistent with the silvicultural requirements for maintaining the forests perpetually productive and to maintain and improve the pasture in areas specially set apart for grazing purposes.
- IV. To satisfy the local and export demands for large sized timber and export demand for firewood and charcoal.
- V. To satisfy the demand of industries for timber, bamboos and other produce.
- VI. To increase the proportion of valuable species such as teak, semal, bija, shisham etc. in the forests by the preferential treatment and planting. Pure crops were discouraged and suitable mixture was prescribed to maintain in the growing stock.
- VII. To combat the ill effects of soil erosion whenever it had started and to prescribe preventive measures against further soil erosion.
- VIII. To aim at the creation of normal forest with all that it implies.
- IX. To conserve species suitable for the plywood industry wherever they occur.

5.2.114. MEHTOD OF TREATMENT: Forests were classified on functional basis into tree, minor, pasture and miscellaneous forests. This treatment for each class was given on the basis of its requirements.

5.2.115. WORKING CIRCLE: The following working circles were constituted.

- I. Plantation Working Circles.
- II. Selection Cum Improvements Working Circles.
- III. Coppice With Reserve Working Circles.
- IV. Pasture Working Circles.

- V. Miscellaneous Working Circles.
- VI. Bamboo overlapping Working Circles and
- VII. Semal overlapping Working Circles.

5.2.116. The tract dealt with under this plan was allotted mainly to Coppice With Reserve Working Circle and some compartments, such as 444, 445, 455, 492B, 493, 494, 512 and 521 were allotted to miscellaneous working circle. Bamboo bearing areas were allotted to Bamboo overlapping working circle.

5.2.117. COPPICE WITH RESERVE WORKING CIRCLE: This working circle included all workable areas of Ballarshah Range and were divided into five felling series. The crop was mixed and Characterised by the presence of a great variety of species. The chief objects of the management of these forests were to supply on a sustained basis small sized timber, poles, firewood, fodder and grazing to the maximum possible extent. Treatments for both areas having dense and less bamboo were prescribed separately. Method for regeneration was prescribed by coppice. Rotation of 40 years was adopted for all felling series and accordingly 40 equiproductive coupes in each felling series were formed. Yield was regulated by area.

5.2.118. FELLING RULES: The felling rules prescribed were:

5.2.119. A: COUPE CONTAINING A FEW OR NO BAMBOOS

- I. Precipitous and steep stopes, under stocked areas with density below 0.4 and areas prone to erosion were excluded from working. However, marking of dead and over mature trees was left to be decided by the Divisional Forest Officer.
- II. All tree growth on either side of the main water courses upto a width of one chain were reserved, felling of dead, dying and over mature trees was left on the discretion of the Divisional Forest Officer.
- III. All edible flowers and fruit bearing trees were reserved.
- IV. All Semal and Bija trees below 4 1/2 feet girth were reserved in view of their commercial importance.
- V. Gardenia latifolia was reserved.
- VI. The species suitable for plywood industry were prescribed to be reserved.

In addition to the above reservation, other reservations prescribed were:

- A. All advance growth except garari upto 9 inches in girth.
- B. In areas where coppice growth from the main crop and the advance growth were likely to be adequate, sound and well grown teak, ain, shisham, shiwan, bhirra and tinsa were reserved. Trees upto 2 feet but less than 3 feet in girth were selected for reservation. The number of trees to be reserved was prescribed not below 30 per acre.

- C. In well stocked areas where teak tending to be pure in sufficient extensive patches, well grown poles of species other than teak and garari were reserved to obtain a suitable mixture.
- D. In areas with medium or low stocking, all well grown healthy trees except garari were reserved. The number of reserved was prescribed from 40 to 50 per acre. Trees providing shade and protection to the soil were preferred.
- E. Thinning if necessary, in patches containing pole crop was prescribed.
- F. Clear felling of garari was prescribed.

5.2.120. B.FORESTS CONTAINING BAMBOOS. In the coupe containing dense bamboo, judicious felling of bamboo three years in advance of the main felling to allow the existing reproduction of the tree species to be established was prescribed. Density of over wood was prescribed to be maintained where the reproduction was scanty to keep down bamboos, weeds and grasses. C.B.O. was prescribed in the year following the year of main felling. Climber cutting and cleaning were prescribed to be carried out in the 8th year from the year of main felling. Thinning was prescribed in the 20th year after the main felling in the better quality teak and mixed forests. All coupes were closed to grazing for a period of seven years from the year of working. However, in moderately grazed areas 3 years closure was prescribed after mid rotation and in heavily grazed areas besides above closure, monsoon closures were also prescribed.

5.2.121. MISCELLANEOUS WORKING CIRCLE: The following types of areas of the tract being dealt with were allotted to this working circle.

- I. Forests which were too remote to be harvested.
- II. Hilly areas with an open stocking.
- III. Forest villages.

5.2.122. METHOD OF TREATMENT: These forests were not prescribed for regular working. However with the permission of the Conservator of Forests, removal of dead and dying trees and selection-cum improvement felling in any area were prescribed.

5.2.123. BAMBOO OVERLAPPING WORKING CIRCLE: This working circle overlapped with above two non overlapping working circles. Some of the compartments were allotted to Chanda commercial B.F.S. which was allotted to Ballarshah Paper and Straw Board Mills ltd.; on lease for 40 years. The remaining compartments were allotted to Chanda Nister B.F.S. The bamboo felling series were recasted in the year 1965-66 as the felling cycle was reduced from 4 to 3 years.

5.2.124. FELLING CYCLE: Felling cycle was decided four years as was changed to 3 years in the year 1965-66.

5.2.125. FELLING RULES: The following felling rules were decided:

- I. No felling of culm under one year of age.
- II. The maximum height at which culms were to be cut was prescribed 18 inches.
- III. A minimum of 8 culms over one year of age was prescribed to be retained in worked clumps.
- IV. No dead culms were to be retained in worked clumps.

5.2.126. The analysis of results of the prescriptions was summarized by Khisti which is being reproduced as follows

- I. Areas without bamboos regenerated well. However, in the area subjected to heavy grazing, especially in small isolated blocks, the regeneration failed to establish and severe soil erosion became visible.
- II. In areas bearing bamboos, bamboo felling 3 years before the main felling was not carried out and due care was not taken to keep the over wood dense where the regeneration was sparse. Due to this bamboos and climbers infested such areas eliminating the regeneration over large portions.
- III. Mid rotation thinnings were allotted to be unusually heavy amounting to revenue felling and trees reserved at the time of main felling were found to be removed against the prescriptions.

5.2.127. K.N. KHISTI'S WORKING PLAN (1979-80 TO 1993-94): Reserved forests of Dhaba Range of Dashputre's Plan and part of Chanda Range (Presently Ballarshah Range) of Singh and Muzumdar's Plan were included in this plan. Dhaba Range of Dashputre's plan was divided into the present Dhaba and Kothari Ranges in 1959. Thus this plan covered Reserved forest areas under Ballarshah, Kothari and Dhaba Ranges.

5.2.128. OBJECTS OF MANAGEMENT: The objects of management decided were

- I. To mitigate the effects of soil erosion and to preserve and promote vegetative cover on precipitous hill slopes.
- II. To meet demand for small timber, firewood and bamboo.
- III. To meet the outside demand for large sized timber, firewood and charcoal to the extent the forests can bear.
- IV. To provide grazing facilities for cattle to the extent compatible with scientific management of this forests.
- V. To enhance potential value of the forests by raising plantations of important species particularly teak.
- VI. To remain progressively increasing yield of timber and firewood on sustained basis with due regard to silvicultural requirements of the forests.
- VII. To attain normal forests.
- VIII. Consistent with above, to derive maximum financial benefits.

5.2.129. WORKING CIRCLE: The following Working Circles were formed:

- I. Conversion Working Circle.
- II. Coppice with Reserve Working Circle.
- III. Miscellaneous Working Circle.
- IV. Bamboo overlapping Working Circle.
- V. 5.2.130. **CONVERSION WORKING CIRCLE:** This included Watrana Felling Series of Dhaba Range and a portion of the Aksapur SCI felling series of Kothari Range under Dashputre's Plan. Total compartments included were 31. Total area covered was 4981.686 ha. only one Watrana felling series was formed.

5.2.131. OBJECTS OF MANAGEMENT: The objects of management decided were

- I. To manage the forests permanently as high forests for the production of big sized timber.
- II. To convert the irregular crop into the normal series of age gradation in even aged blocks.
- III. To secure sustained yield in perpetuity.
- IV. To meet the demand of commerce and industry in respect to teak and other species.
- V. Consistent with (iv), to meet the local demand for forest produce to the best possible extent without impairing the productive capacity of the forests.
- VI. Consistent with the above to derive maximum financial benefits

5.2.132. SILVICULTURAL SYSTEM: Clear felling and regeneration by natural means was adopted and wherever necessary regeneration by planting the annual area was also prescribed.

5.2.133. CHOICE OF SPECIES: To maintain suitable admixture of teak and miscellaneous species bija, ain, shisham, tinsa, haldu, semal, khair, dhawada, lendia, tendu and bhirra were chosen.

5.2.134. ROTATION AND CONVERSION PERIOD: On the basis of stump analysis carried out during preparation of working plan rotation was decided 100 years and considering the annual planning potential conversion period was decided 60 years.

5.2.135. DIVISION OF AREAS INTO PB's: Total areas were divided into 4 PB's and consequently the conversion period (60 years) was divided into 4 periods of 15 years and allotment was made to all four PB I. Areas covered was 1240.370 ha PB II and PB III were clubbed together. This included areas under PB II, III and IV and some areas of SCI in Aksapur felling series in Dashputre's Plan. Area covered was 2513.50 ha PB IV was allotted,

regenerated areas during Dashputre's Plan under PB I and under plantation working circles. Area covered was 1227.813 ha

METHOD OF TREATMENT:

5.2.136. PB I: 15 Annual coupes were formed. Clear felling annual coupes with following exceptions was prescribed.

- I. Area prone to erosion were excluded from clear felling and soil conservation operations were prescribed.
- II. 20 metre wide strips along either bank of the perennial nalas was reserved against felling.
- III. Sound fruit trees of local economic importance were retained.

5.2.137. (a)Prescriptions for the regeneration was both by natural and artificial means. (b)Clear felling in areas containing patches of advance growth, (c) thinning in healthy groups of young poles and (d)planting in areas having no advance growth were prescribed.

5.2.138. PB II & III: This included mostly irregular and middle aged crop. Removal of dead trees and trees of inferior species interfering with the development or reproduction of valuable species was prescribed. Mature trees or trees approaching to maturity were prescribed not to be touched.

5.2.139. PB IV: Suitable tending and thinning operations were prescribed to be carried out.

FELLING RULES:

5.2.140. PB I: The area was divided into following types and marking rules for each type were prescribed separately.

- a) Unworkable area.
- b) Areas with natural regeneration as an advance growth.
- c) Plantation areas.
- d) Areas to be clear felled for plantation.

5.2.141. MARKING RULES:

5.2.142. General: Application all over the areas of PB I:

- I. Cutting of climber at the time of marking.
- II. Retention of crop in 20 metre wide strips on either side of the nalas, roads and removal of dead, Overmature and very unsound trees not required on silvicultural ground.
- III. Retention of healthy semal trees wherever available.

5.2.143. Rules as per above mentioned types:

- a) Unworkable areas: No marking of any trees.

- b) Area with natural regeneration in advance growth : clear felling crop and cutting back
- c) Advance growth to give seedling coppice.
- d) Plantation Area: Appropriate thinning operation was prescribed if it contained pole crop.
- e) Areas to be clear felled for :

Clear felling and planting with teak was prescribed in area suitable for teak. In patches unsuitable for teak valuable miscellaneous species such as bija, khair, semal were prescribed to be planted. In plantation 3 weedings in the first year, 2 weedings in the second year and one weeding in the 3rd year; cleaning in 5th year, 1st mechanical thinning in 7th year and 2nd mechanical thinning in 15th years were prescribed.

PB II & III: Rules prescribed were

- a) Climber cutting at the time of marking.
- b) Thinning marking in congested crop in favour of teak and other superior timber species to make the spacing $1/3^{rd}$ of the average height of the crop.
- c) Marking for felling of all dead trees.
- d) Marking of dead, over mature and very unsound trees for removal unless to for retention on silvicultural ground.

5.2.144. PB IV: The following operations were prescribed to be carried out:

- a) Cleaning cum thinning of suitable grade.
- b) Removal of overwood interfering with the growth of valuable species such on teak, bija and shisham.
- c) Cutting back of malformed advance growth and removal of dead and dying trees.
- d) Climber cutting.
- e) 1st and 2nd mechanical thinnings in th 7th and 15th years in plantation of teak and other
- f) species were prescribed.

OTHER REGULATIONS:

5.2.145. FIRE: Coupes in PB I were treated as class I under which complete protection for a period of five years was prescribed.

5.2.146. GRAZING: i) Coupes of PB I was closed to grazing for a period of five years after the year of working.

5.2.146. COPPICE WITH RESERVE WORKING CIRCLE: Low quality forests of Kothari and Ballarshah Ranges were allotted to this working circle. Five felling series (already in previous plan) in Ballarshah Range and four felling series (New) in Kothari Range were formed. The name of Dongarhaldi Felling Series of Ballarshah Range in Singh and Muzumdar Working Plan was

changed to Umari Felling Series in this plan. Besides, compartment of Ballarshah Range allotted to Miscellaneous Working Circle in Singh's Plan was allotted to C.W.R. in adjoining felling series. None of the compartments of Ballarshah

Range was allotted to other working circle. Total 79 compartments were included, out of which 42 were from Ballarshah and 37 from Kothari Range.

5.2.147. OBJECTS OF MANAGEMENT: The main objects of management decided were:

To improve the condition, composition and density of the tree crop and ensure adequate regeneration by appropriate silvicultural system.

(ii) To meet the local nistar demand for small timber, poles and firewood.

To meet local requirement of fodder and grazing and

Consistent with the above to obtain maximum outturn of small sized timber and firewood, not only to meet the local demand but also for export of surplus forest produce and thereby obtaining maximum financial benefit.

5.2.148. SILVICULTURAL SYSTEM: The individual system adopted was coppice with reserve. This system provided for reservation of valuable tree species and retention of vegetative cover in the eroded areas or areas prone to erosion. This system resolved into: (i) Coppicing all growth and attained maturity and retention of which was not essential either for silvicultural or protection reasons. (ii) Reservation of trees which were capable of producing timber of big sizes. (iii) Reservation of growth in eroded areas and areas liable to erosion.

5.2.149. CHOICE OF SPECIES: Teak was favoured most. Besides teak, bija, ain, shisham, haldu, tinsa and kalam were given preferential treatment.

5.2.150. ROTATION AND REGULATION OF YIELD: Rotation for the coppice was fixed at 40 years and accordingly 40 annual coupes in each felling series were laid down. Yield was regulated by area.

5.2.151. METHOD OF EXECUTING FELLING: For executing felling, coupe area was classified into following four types:

A: Unworkable area.

B: Areas fit for clear felling with some reservation.

C: Areas to be clear felled for raising teak.

D: Remaining areas (density 0.4 to below 0.7).

5.2.152. FELLING RULES: The following rules for above types of areas were laid down.

A: UNWORKABLE AREAS:

Climber cutting and

Felling of dead trees were prescribed.

B: AREA FIT FOR CLEAR FELLING WITH SOME RESERVATIONS.

Marking for felling all trees except the following:

- (i) All well grown advance growth upto 30 cm in girth.
- (ii) Well grown poles of teak, bija, semal, shisham, and haldu upto 45 cm in girth.
- (iii) All healthy trees of moha, char, tendu and aonla which bear edible flowers and fruits.
- (iv) All well grown trees of semal, khair, bhirra and behada which had special economic importance.
- (v) In blanks, too small for exclusion from working, healthy living trees of any shape, size and species.
- (vi) Besiders, climber cutting at the time of marking, thinning in congested pole crop of favoured species and removal of deformed and suppressed advance growth of timber were prescribed.

C: AREA TO BE CLEAR FELLED FOR RAISING TEAK: Clear felling of all the trees, except young healthy semal and planting with teak at 2m x 2m interval as per the standard method were prescribed.

D: REMAINING AREAS: In these areas marking for improvement felling consisting of the following operations were prescribed:

- (i) Cutting of all climbers and high live stumps of illicit felling.
- (ii) Felling of dead, dying and unsound trees.
- (iii) Thinning in the groups of saplings and poles of teak, bija, shisham, ain and haldu to obtain spacement $1/3^{\text{rd}}$ of the average height of the crop.

5.2.153. SUBSIDIARY SILVICULTURAL OPERATIONS:

The following silvicultural operations were prescribed to be carried out :

- (i) Cutting back operations in next year of the main felling.
- (ii) Cleaning in the sixth year after the year of main felling.
- (iii) Thinning at the half rotation age i.e. on 20th year of main felling in the pole crop only. But no felling of reserved unless they were uprooted or badly damaged.

MISC. REGULATIONS:

FIRE PROTECTION: The complete fire protection for the worked areas for the period of seven years from the year of working was prescribed.

(ii) **GRAZING:** The worked coupes were prescribed for closure to grazing for a period of seven years from the year of working.

5.2.154. MISCELLANEOUS WORKING CIRCLE: This included compartment No. 154 of Dhaba Range and 8A, 78(p), 101,530a, 531a compartments of Kothari Range. Compartment No. 530a and 531a are those areas which were declared RF in 1983. Areas included were mostly under stocked, extensively eroded and forest village areas.

5.2.155. METHOD OF TREATMENT: No. regular working was prescribed. However, irregular harvesting for the purpose of meeting demand of local people, for free grant and for departmental use was prescribed. Felling prescribed was of the nature of improvement felling which included felling of dead, dying, over mature and unsound trees provided their retention was not essential for site protection or other silvicultural reasons.

5.2.156. BAMBOO OVERLAPPING WORKING CIRCLE: Bamboo bearing areas in Kothari and Ballarshah Ranges were included in this working circle. Total area is covered under 76 compartments of which 36 belong to Kothari Range and 40 belong to Ballarshah Range. These were divided into five felling series, out of which three were allotted to Nistar and two were retained as commercial felling series. Out of compartments in Kothari Range allotted to this working circle, compartment number 79 and 115 were transferred to FDCM Ltd.

5.2.157. OBJECTS OF MANGEMENT: The objects of mangement decided were:

- (i) To harvest bamboo on scientific lines.
- (ii) To obtain maximum yield on sustained basis.
- (iii) To meet local demand for bamboos.

5.2.158. FELLING CYCLE: The felling Cycle of 3 years was adopted.

5.2.159. FELLING RULES: Following felling rules were framed:

(a) No felling was permitted during monsoon i.e. from 15th June to 30th September.

(b) Following culms were prescribed for felling irrespective of maturity.

(i) Dead and decaying culms of which growing shoots were cut to the length more than 1/3rd of the normal length or culms badly damaged and unsound.

(ii) Twistead, bent or otherwise malformed culms.

© A clump was not considered mature unless it contained more than 8 mature (more than one season old culms) culms.

(d) In a mature clump, the following types of culms were prescribed to be retained.

(i) All current season's culms.

(ii) From the rest culms equal in number to the current season's (less than 1 year old) culms or eight whichever is more.

(iii) Culms silviculturally available for harvesting were prescribed to be harvested in such a manner that the clump was worked evenly.

(iv) Culms on the periphery of the clump were retained unless essential to facilitate working in the interior portion of the clump.

(v) The height between 15cm was prescribed for cutting.

(e) Harvesting was prescribed to be deferred in case of flowered clumps till the completion of seedling.

(f) The following acts were strictly prohibited.

(i) Digging of rhizomes.

(ii) Cutting of tops of bamboos for fodder.

(iii) Use of tender bamboos for bundling.

(g) Using sharp instrument for cutting was insisted.

(h) Removal of climbers infesting bamboo clumps was prescribed.

5.2.160. RESULTS: The following features are noticed in the crop:

(i) In coppice with reserve working circle, no coppice could come out from stumps of miscellaneous species as all miscellaneous species did not respond well to coppice. Some unhealthy coppice of teak is seen.

(ii) Valuable miscellaneous species which are seen in the crop are those which were reserved during the main felling in the previous working plans.

(iii) The percentage of valuable species in the crop is very less.

(iv) Natural regeneration of certain miscellaneous species is seen and this is the hope for the future crop.

(v) Subsidiary silvicultural operations to boost up or assist natural regeneration of bamboo to establish were not carried out in flowered areas.

(vi) Bamboo flowered and consequently its regeneration suppressed the natural regeneration of miscellaneous species.

(vii) The mid term evaluation of prescriptions in terms of regeneration was not done.

(viii) Despite regeneration not responding to treatments given all coupes were allowed to be worked as if main felling has no relevance to regeneration. However, as a matter of fact is that the main objective of the main felling is the regeneration only.

(ix) In conversion working circle, the mode of regeneration adopted was by natural seedlings supplemented by planting. The area is by and large regenerated and plantations away from human habitation are mostly successful.

(x) Other silvicultural operations in such areas appeared to be not attended as per prescriptions. Thinnings are required to be carried out with the help of

yield table and climber cutting should be carried out on priority basis through out the area.

(x) Bamboo flowering took place in the year 1984 in this area. Area is full of young bamboo seedlings, but they are still to form a clump. Sporadic clump formation is seen but these are not harvestable.

(xi) After flowering no efforts are seen to have been made for boosting establishment of bamboo regeneration. The experiment of selecting healthy and well spaced bamboo seedlings and doing weeding and soil working around them was carried out in some patches. The result was encouraging, but such operations were not applied in whole area.

(xii) Heavy biotic interference is seen through out the tract. The quantum of illicitly removal of firewood by head-load is alarming. Head-load appears to be commercial. Illicit removal of bamboo is also very common and unchecked. In teak bearing areas illicit cutting of teak by local villagers as well as organised illicit cutting is also a subject to be focused on.

(xiii) Grazing pressure is tremendously high due to large cattle population. It is beyond the carrying capacity of the area. The total pressure is on Reserved Forests only as there is nothing in protected forests to (supply fodder to the cattle) share the burden of grazing.

Protected Forest have not been put under management so far and therefore, its condition has deteriorated to very alarming extent. The boundary has not been maintained and therefore, it is but natural to have difference between the area what it should have been and what it is.

Therefore, the first step towards management should be to demarcate it on priority basis by erecting RCC cairns of approved design.

(xiv) The state of boundary of Reserved Forests requires improvement. Outer boundary requires to be maintained by erecting RCC cairns of approved design.

5.2.161. PROTECTED FORESTS: In 1951, the proprietary rights were abolished and these areas vested in the state Government with effect from 1.4.1951. Initially, these areas were taken over by the Revenue department. Later on, the area in compact blocks, which were in excess of the village requirements were transferred to the forest department for management. In the year 1953, removal of forest produce except timber was permitted on rated passes to meet the bonafide needs of the people. Grazing was also permitted as per the M.P. Government Land Reforms Department No.956 – XXVIII, dated 4.12.1954. In the year 1954, Nistar officers were appointed to inquire into the nature of rights existing over forests and allot the areas vested in the Government for various village purposes. From 1954 to 1956 they carried out enquiries and prepared “Nistar patraks” for each village. Nistar Patrak is the record of rights of villagers over Government forests. In the Nistar Patraks Khasra numbers allotted for grazing of the cattle and for obtaining small timber, firewood etc. for nistar besides, other purposes, were shown. Wherever the forest area in a particular village was found to be in excess, the adjoining village with deficit forest was attached to it. Units

formed by such arrangements were called grazing and nistar zones. The areas in-charge of the forest department was declared as Protected Forests under section 29 of IFA, 1927 in the year 1955. So far these areas were not brought under systematic management. These areas were exclusively used for nistar purpose. People remained direct access to the forests which resulted in heavy damage to the forests. The condition of the crop deteriorated to the greatest extent. At most of the places, bharati, khirni etc. are seen as the constituents of the crop. Most of the areas is open out of which some areas have been planted in the past. The present plan is the first attempt to include them for systematic management.

SECTION: 5.3: ANALYSIS OF PAST SYSTEMS OF MANAGEMENT AND CONCLUSIONS DRAWN:

5.3.1. The history of the past systems of mangement reveals that the forest areas (R.F.) of the tract dealt with were managed mainly under high forest or conversion working circle, two storeyed or coppice with reserve working circle and low forest working circle. The regular system of management was started by the British administrator on realising the fact that forest is one of the most potential renewable sources of revenue. This fact was brought to the notice of the British Administration by Major Lucie Smith who recommended the reservation of these forests. Accordingly these forests were reserved by the British Administration in the year 1879 and 1895 with the intention to use these renewable source of revenue exclusively by it to extract maximum revenue. With the prime objective to have maximum revenue from these renewable source, management plans were written and implemented. In the beginning only valuable marketable species in marketable sizes were harvested and fetched maximum revenue. Except harvesting for making money no other operations prescribed for improvement of the crop were attended to. On getting market for small sized timber of both teak and miscellaneous species the two working circles conversion or high forest and coppice with reserve or low forest working circles were formed. Teak, bija and semal were most sought species. Teak bearing areas and areas under miscellaneous crop but highly potential and suitable for conversion to teak forests were put together under uniform system with concentrated regeneration applying very simple theory that almost all the species of major importance are light demanders and the growth of forests in even aged stand is desirable. Since at that time revenue was the main consideration and hence there was no scope for other thought to be given in management. Consequently the main aim of the management was to convert maximum possible forest areas into a unifrom system consisting of a normal series of age classes in even aged stands with normal regeneration.

5.3.2. Most of the miscellaneous timber species were salable only as poles of 18 inches girth or thereabout and unsalable in large sizes. Bija, one of the most valuable species of the time was salable as logs of 4 feet girth and

upwards and unsalable in small sizes. Under such a peculiar circumstances to observe the main consideration of the management in the mixed forest with a fair proportion of valuable species such as bija, a system of two storeyed forest with bija and other valuable species in the upper storey on long rotation and the other species as an under storey on a short rotation was coined and was named as coppice with standard / reserve system. The long term planning with this system was to analyse and arrive at the conclusion as to the upper or lower storey produces the best financial results. If the bija or upper storey gives the best results, conversion of the forest into a bija high forest was intended to be chosen and if the lower pole forests give the best financial results gradual removal of bija and management of low forests on a short rotation was intended to be chosen. Besides, low quality forests were managed to get small sized timber to meet the local demand so that there should not be any disturbances from local people in managing the forest as per its will. This is in short the story of silvicultural systems adopted in the past.

5.3.3. The ultimate aim of the management was recognised in past by many Working Plan Officers to attain normalcy in the forest which has been mentioned in almost all previous working plans. But it is very surprising that none could explain what is normalcy, what is structure of a normal forest and how can it be achieved. It was perhaps imagined the state of forest which could give sustained maximum return and it was only imagination and remained dream. They all confined to normal forest with a normal series of age classes only i.e. even aged forests.

5.3.4. From the above it is clear that the main consideration of management was revenue earning and accordingly silvicultural systems as per site and type of forests was adopted. So far as coppice with reserve system in miscellaneous forest is concerned, silvicultural aspect of species was completely ignored while adopting this system. Without knowing the silvicultural character of species for producing coppice, coppice system was applied for all species. Due to this many important species as well as their host have diminished in occurrence which are poor or no coppicers or which coppice only upto a certain age. All the trees do not have the coppicing character and all those, which do have all character of coppicing do not exhibit the same vigour at all stages of their life cycle. It was observed by the working plan officers in the past as well that regeneration by coppice was not coming but the perception was different. The proportion of teak in the crop increased, as teak is good coppicer upto fairly longer period of its life cycle and so result was in conformity with the ultimate aim to convert entire area into teak and hence appeared encouraging. They simply did not bother for the other miscellaneous species which did not have market demand. Alongwith prescriptions for main felling other equally or more important prescriptions used to be enshrined in working plan. However, prescriptions

for main felling were some how observed but others were mercilessly ignored. Regeneration, the main objective of felling, could not be evaluated during the operation of Khisti's Plan. The system applied should have been evaluated in terms of regeneration and accordingly decision should have been taken. We had such example when Vahid's Plan was discontinued on account of the failure of regeneration. But, unfortunately this could not be observed during operation of Khisti's Plan and all 15 coupes in all felling series of CWR under Khisti's Plan were worked but none of the stump could produce coppice, which was the expected source of regeneration for the future crop. It is the potential of the site that it is supporting some vegetation by way of natural regeneration.

5.3.5. Converting forests into teak forest by clear felling system as discussed above was the main consideration of the British to earn revenue to the maximum possible extent. At that time forests were viewed exclusively as the renewable source of revenue. Other dimensions of utility of forests were not even thought and forest is the base for living being was not even imagined. Since management was one point programme and so the system could not be evaluated in a right perspective. With the inception of the system, the mode of regeneration was adopted from natural seedlings as there was no problem in natural regeneration and its establishment. Gradually banking upon plantation to supplement the natural regeneration to some extent, was started and finally clear felling and planting had to be adopted due to poor response of natural regeneration. This was enough indication of the nature that the system needed correction. In fact nature always favours mixture due to the fact that an isolated community of a plant species cannot be stable. The theory of stability lies on interdependence and mobility. In a mixed crop, one species supports the other directly or indirectly. Some plants act as insecticides, such as leaves of garari are grab killer, some attracts birds which are responsible for seed dispersal and treatment of seeds of some species; some small plants are bad smelling which act as repellent to herbivores and thereby protect seedling around them from browsing; big trees provide shades to such small plants to survive, there are many medicinal plants on which wild animals and people residing inside forest depend for treatment and so on. Thus there is a well disciplined family structure in plant kingdom as well. The mono-culture cannot provide this. Besides, plants take nutrients from soil for their growth. The rate of taking nutrient is fast in very early stage, very fast thereafter till the rate of growth is increasing, slower after the rate of growth starts decreasing and very nominal when growth almost culminates. The plant pays back to soil by way of providing leaf litters, aeration, nitrogen fixation etc. However give and take remains adverse in early stage of life and favourable at the fag end of life. In a natural condition, give and take remains balanced and the site quality remains protected. On the contrary, even aged crop drains maximum nutrition from the soil and contributes least as it is felled before the age after which it pays back to the soil. Besides, what so ever is

paid back to the soil can not be balanced as the constituents of leaf litters of all the species are not the same as that of a single species and ability to provide other benefits to the soil is also different. All the ingredients of soil nutrition cannot be supplemented by a single species. This is mixture of so many ingredients, which are provided by different species. Thus, apart from the new policy of the management the clear felling system tends to deteriorate the site quality instead of enhancing and maintaining it. So far as revenue is concerned, miscellaneous forest is much more potential to yield revenue as it provides suitable environs to so many medicinal plants, the discovery of any one may fetch a number of times more revenue than that is fetched by teak. In future some plants may be understood the only source of life saving drugs which can not have substitute but teak can have always alternative.

5.3.6. Nature is the best manager and we should not do any act which opposes the nature. We should always try to provide the system as close as possible to the natural process for having perpetual stability. The philosophy of management lies in having healthy state of forest in perpetuity.

5.3.7. The most admiring prescriptions given in the British period was that the harvestable girths were decided by site quality but only for teak. That prescription remained confined to teak only. But unfortunately instead of integrating that prescription for all other species as well, that was forgotten even for teak too by the successors.

5.3.8. The principle of management is that interest is to be taken out keeping capital intact is not seen to have been observed. In fact no effort was made to define and quantify the capital, on which interest were to be taken. Therefore, due to lack of this knowledge, quantity which is being taken out is really the interest or interest with a part of principal or not even the total interest can not be told. What we have done so far is not done knowingly and in justified way.

5.3.9. Protected Forests were not covered under systematic management in the past and therefore, could not be supervised properly. Boundary marks were not maintained, which resulted encroachment. Indiscriminate grazing led to the deterioration of the forest to the greatest extent. Most of Protected Forests are either open or occupied by Khirni trees.

5.3.10. The concentration of wild animals, both carnivores and herbivores, is very good within the tract dealt with. In Khisti's plan a separate wildlife working circle was formed. The most sad part of it is that one of the objectives was to manage it for sustained source of sports and to earn revenue to the maximum possible extent. Other prescriptions given appear not be adhered to. At least development and improvement of basic amenities should have been done for wild animals, which had not been done.

5.3.11. The tribals are the part and parcel of the forest. Therefore, the management of the forest should be oriented in such a way that it could include the welfare of the tribal people as well. The prescriptions intended to solve their problem of “Roti”, Kapda aur Makan” (Bread, clothes and shelter) should also be thought of. Solving these problems have two fold benefits firstly, welfare of the poor people and secondly, ensured protection of forests through their co-operations.

5.3.12. Forest fire is one of the important problems. Forest burns more than once in fire season every year. Though, mostly it is ground fire yet has detrimental effect on natural regeneration and its establishment of almost all species. Besides, it burns the source of humus, the plant nutrient. The genesis of causes of fire could be analysed and listed but could not be stressed to be implemented. Research and analysis help in planning. Planning without execution is meaningless. By merely prescribing coupes to be protected from fire for some period without giving method of protection is not the remedy.

5.3.13. Grazing is also an equally important problem of the forest. Over grazing destroys every thing. To solve this problem, the origin of it will have to be searched and accordingly eradication measures will have to be oriented to hit the origin, only then this can be solved. Merely prescribing closure to grazing for a specified period can not solve the problem. In fact such prescriptions are neither followed nor practical. So long as population explosion is not checked and translation into practice of the concept of stall feeding is not practiced, this problem is beyond control.

5.3.14. Head loaders are another dimension of the forest problem. It has taken the shape of a profession. Some are bound to do it for their livelihood and some are practicing it as business. This is taking such a shape that if it is not tackled properly it will go beyond control. It is fact that there is tremendous pressure on forest for firewood and this cannot be met separately by Division. Fortunately, the production of firewood in this region is fairly good. The solution to the problem is easy if tackled at circle level and revenue coming from it is sacrificed.

PAST SYSTEM OF WIRUR, RAJURA & WANSADI FOREST RANGES OF CENTRAL CHANDA FOREST DIVISION.

SECTION: 5.4: GENERAL HISTORY OF THE FORESTS:

5.4.1. The tract dealt with present day Forest Ranges namely Rajura, Wansadi and Wirur was under the reign of then Hyderabad State of Nizam. It was brought under Hyderabad State after independence. After reorganisation of States it was transferred to erstwhile Bombay State and consequently to Maharashtra after creation of Maharashtra State in 1960. Earlier this area was

in Nanded District of Marathwada and later on transferred to Chandrapur District of Maharashtra.

5.4.2. Unfortunately no records are available to show the original extent of the forests in the tract dealt with. But it is certain that with the increase in population, to satisfy land hunger, more and more areas from the forests were brought under cultivation. The practice continued till the preparation of previous working plan in early nineties of 20th century.

5.4.3. Prior to 1882, the forests were controlled by Revenue department. They had introduced a permit system. Permit holders were allowed to cut the trees for their bonafied use. Special staff was not provided to conserve the forests. The control was nominal.

5.4.4. In 1882 the Forest Department was constituted and forests were placed under the control of the department. Even then up to 1921 the felling were very unsystematic and consisted in removal of valuable species such as teak and bija by permit holders.

5.4.5. From 1921 onwards however, fellings under improvised schemes were started. The systems adopted were mainly Coppice with Standard and Selection-cum-improvement felling systems. But the details of the areas worked are nowhere available.

5.4.6. WORKING PLAN OF S.M. RAZVI

5.4.7. A working plan was prepared in 1931 by S.M. Razvi but without any stockmapping. In his plan he allotted the forests of Rajura and Chicholi blocks to "Intensively Workable" felling series with 40 years rotation. The forests of Manickgarh and Garlapeth blocks were included in "Experimentally Workable" felling series, while Siddheshwar block was included in 'Scrub' felling series for fuel supply with 30 years rotation.

5.4.8. Coppice-with-Reserves system was prescribed by him for all the felling series. For understocked areas, the number of 'reserves' to be retained depended upon the density. Only dead, dying and seriously diseased trees were to be removed from the understocked areas. No trees were to be cut on the head of the ravines or on the edges of cliffs for fear of erosion. On the contrary, in wellstocked areas where the proportion of teak or any one principle species was excessive, no reserves were to be retained.

5.4.9. RESULTS: The sequence of fellings is nowhere traceable. However, there are some sketches which give the idea about the areas worked. In Rajura block the areas have been worked at several places along the external boundary, while in Chicholi block north-eastern and southern portions have been worked.

5.4.10. In the mixed miscellaneous forests occurring in major portion in Rajura block, mature and over mature trees of valuable miscellaneous species such as bija, bhirra, dhawda, etc., had failed to produce coppice shoots and the

reproduction mainly consisting of inferior miscellaneous species mentioned above was plentiful in patches.

5.4.11. In both the blocks, reservation of trees in the areas worked was almost negligible. The erosion was conspicuously seen in the worked areas, which were in the vicinity of nalas as sufficiently wide strip on the heads of ravines was not excluded from felling. Thus it was evident that the working of these forests was not on sound lines due to defective prescriptions.

5.4.12. In Siddheshwar block small portion of the forests in the north-eastern and western regions had been worked. In Manickgarh block also, negligible areas had been felled in compartment Nos. 15 and 42. The working appears to have been abandoned perhaps due to interior tract being difficult to negotiate and inferior tree-growth containing more of salai.

**5.4.13. WORKING PLAN OF S.G.BHOGALE:1945-46 to 1954-55
EXTENDED TO1966-67**

5.4.14. That was the first working plan prepared in a systematic manner after stockmapping the forests into quality classes. No statistics of growth and yield except for salai were collected during the preparation of that working plan and the allotment of areas for working under different silvicultural systems was done on the strength of quality classes, accessibility of the forests, and after determining the local needs as regards to timber, fuel, grazing and local industries. The working plan was prepared for a period of 10 years i.e. 1946-55. It was not taken up for revision in 1956 and was under implementation upto 1966-67. The prescriptions under the various systems of management and the results of the working are summarised below:

5.4.15. COPPICE WITH RESERVES WORKING CRICLE: Almost all the accessible forests in the tract dealt with were allotted to Coppice with Reserves working circle as they were found to be of poor quality and capable of producing poles, small timber and fuel. But it was felt that the quality of the forests was little under estimated during the previous stock-mapping. The total available area of 17287.37 ha was divided into 13 felling series for working under Coppice with Reserve system with a rotation of 40 years and a mid-rotational thinning at 20 years. Out of 13 felling series, 4 felling series were provisional.

5.4.16. The special objects of management were as follows :

(a)Management of the accessible forest of poor quality which were capable of producing poles, small timber and fuel to meet the local demand of small timber and fuel.

(b)To improve the condition of the crop by retaining the well-grown trees of valuable species like teak, ain, shisham, haldu and bija for production of large-sized timber and to secure the continued existence of these species.

(c)To maintain a continuous crop cover, to prevent erosion and to maintain sub-soil water.

(d) To increase the proportion of teak by way of retention wherever it was scarce.

5.4.17. As per prescriptions the understocked areas amounting to blanks, precipitous slopes liable to erosion and the trees on the fringes of the streams and nalas containing pools of water in dry season were to be excluded from fellings.

5.4.18. Following marking rules were prescribed for reservation :

(a) All semal trees to be reserved over the whole area.

(b) Salai and moyen trees from Siddheshwar, Garlapeth and Manickgarh blocks were to be reserved.

(c) 75 reserves per ha of teak, ain, shisham, haldu and bija preferably between 37.50 cm and 60 cm girth-limit was considered to be minimum necessary where the reproduction by seedlings and coppice origin was likely to be sufficient, to stock the area adequately. Where the reproduction by seedlings or coppice was likely to be insufficient, the best available poles of all valuable species were to be retained. In absence of these trees of any species and of any size were to be reserved.

(d) Trees of any size or shape were to be retained in blanks excluded from fellings to protect the soil.

5.4.19. Bamboos, interfering with the reproduction of valuable species, were to be felled preferably in advance of main fellings, failing which they were to be felled along with the subsidiary operations.

5.4.20. The following subsidiary operations were prescribed:

(i) All unreserved trees left unfelled by the contractor were to be felled departmentally, if their removal was necessary for silvicultural reasons.

(ii) All malformed and unpromising reproduction of the valuable species, which was not cut by the contractor, was to be cut back.

(iii) Reserved trees broken during the fellings were to be cut back.

(iv) All remaining climbers were to be cut.

5.4.21. RESULTS: The tree-growth in Rajura block, except teak areas in southern portion, comprised mainly of mature and overmature trees of miscellaneous species such as bhirra, dhawada, tendu, lendia, bija, ain, etc., along with scattered teak. Hence mature trees had been retained for the sake of reservation. Majority of the worked areas contained mature and overmature trees which had failed to produce coppice shoots. Hence coppice reproduction was poor. A good number of trees below the prescribed girth limit of 60 cm had been removed at the time of felling. Hence the number of reservation was far below the prescribed minimum of 75 trees per ha and the worked areas look open. In such open patches the reproduction of inferior species such as ghoti, kuda, papda had formed thickets along with climbers

like kukuranji, chilati etc. At places tarota had formed thick matting, the spreading root system of which had made the ground impenetrable.

5.4.22. In teak areas occurring in southern portion of Rajura block and Chicholi block, the teak reproduction of natural and coppice origin had come up well and quite satisfactorily. But mature and over mature trees of bhirra, bija, ain and dhawada had failed to produce coppice shoots. The trees below 60 cm girth have been felled which had brought down the number of reservations below the prescribed minimum of 75 trees per hectare. Hence the area looks open in patches. In such areas species such as ghoti, kuda, papda, bharati etc. had formed thickets thereby inhibiting the regeneration.

5.4.23. On the whole, it can be said that teak areas contain fairly good regeneration due to strong coppicing power of teak but miscellaneous areas were lacking in reproduction of valuable species.

5.4.24. The tree-growth in Siddheshwar and Garlapeth blocks contained less of valuable species such as teak, bhirra, bija, ain, dhawada, etc., and more of salai in overwood. The areas being hilly and crop containing more of inferior species, some areas had not been worked. The worked area from these two blocks contained the reproduction of the same inferior miscellaneous species mentioned above.

5.4.25. Further, subsidiary cultural operations had not been carried out, which had resulted into poor quality and inferior crop at places.

5.4.26. ANDUK (BOSWELLIAL SERRATA) OVERLAPPING WORKING CIRCLE: This working circle was constituted with the sole object of meeting the demands of anduk (*Boswellia serrata*) and gumpana (*Lannea grandis*) required by the Sirpur Paper Mills Ltd., for the manufacture of mechanical wood pulp and wood free paper.

5.4.27. For that purpose, the Nizam Government in the year 1947 conferred upon the Sirpur Paper Mills Limited the sole and exclusive rights of harvesting of salai, borgu and tapsi in Adilabad District in the first instance for a period of 30 years by extending the licence and lease granting the sole rights of harvesting the bamboo areas. According to that agreement, the company was to pay to the Government, during the currency of the contract period, a royalty at a basic rate of six pies per cubic foot of anduk, borgu and tapsi and other varieties of soft-wood so long as the net earnings of company over its total investment on the mechanical wood pulp and paper section were not more than four per cent and that for every one per cent increase in the net earnings of the said sections of the company above that said minimum of four per cent, the royalty was to be increased by one pie above the said basic rate of six pies per cubic foot up to ten per cent. When the earnings were to rise above ten per cent the company was to pay for every one per cent increase in said net earnings above ten per cent an additional royalty of two pies per cubic foot and the aforesaid royalty was to be made applicable only to

mechanical pulp and paper industry and was not to affect the royalty in respect of chemical pulp industry. The above rate of royalty was applicable for a minimum period of twenty-five years.

5.4.27. From the tract dealt with only the blocks, namely Siddheshwar, Garlapeth and Manickgarh, were included in that working circle as against the total nine blocks. Out of those three blocks, compartment-wise order of fellings was given only in case of Garlapeth block for a period of 5 years and not the year-wise sequence of working. In case of Siddheshwar and Manickgarh blocks neither the compartment-wise order of fellings was given nor the sequence of working.

5.4.28. Coppice reproduction of salai is not dependable as it either dies or is blown down by strong winds. Hence Coppice with Reserve system was not suitable. Similarly younger age classes were practically absent. Hence it was not possible to work those forests under high forest system. Thus the only possible system of improvement fellings was followed for working those forests, with an arbitrary rotation of 40 years and a felling cycle of 20 years.

5.4.29. For the sake of calculating the annual yield, strip enumeration of growing stock was carried out, in 30cm Girth classes, over 725.6 ha in Garlapeth block and 456.9 ha in Kadamba block; and in addition to that, ten sample trees of each girth class were also felled and then cubical contents were found by actual measurements. Based on these it was found that the standing volume per hectare was nearly 8.49 m^3 in Garlapeth block and 4.45 m^3 in Kadamba block. Taking these two blocks as a criterion, the standing volume per ha for the remaining blocks was estimated on general observations. From these figures total growing stock of salai in the nine blocks allotted to that working circle was estimated at $42,47,400 \text{ m}^3$. The annual yield of $1,06,185 \text{ m}^3$ was worked out for the rotation of 40 years. During the felling cycle period of 20 years entire areas was to be gone over in which it was assumed that half the standing volume would be harvested wherein also the annual yield worked out to $1,06,185 \text{ m}^3$.

5.4.30. The compartment was adopted as a unit for marking and harvesting. The following marking rules were laid down for the guidance of the marking officer.

(a) The sufficient number of salai trees below 90 cm Girth and gumpana trees below 75 cm were to be retained to form part of the future crop.

(b) Where trees occur in groups and patches, only seed bearers were to be retained at suitable distance and evenly distributed over the area. Seed bearers were to be retained invariably in blanks and understocked areas.

(c) No trees were to be marked in places where serious erosion is in progress unless there were trees of other species to protect the soil.

(d) All dead, dying and unsound trees were to be marked for felling. But sound trees capable of producing seeds were to be retained as seed bearers.

(e) Half the number of standing trees were to be felled unless anduk and gumpana were scarce in a compartment.

5.4.31. In subsidiary cultural operations, sowings and planting of anduk and gumpana were prescribed, so far as the available staff and funds permit, as the natural regeneration of both these species was not expected. Planting of cutting and sowing of seeds in one-foot contour strips worked to a depth of 15cm and 3.6 m apart and also in pits of 30cm x 30cm x 30cm and 3.6m apart were to be carried out.

5.4.32. RESULT: Both the species namely salai and gumpana have never been harvested so far from the tract dealt with.

5.4.33. BAMBOO OVERLAPPING WORKING CIRCLE: This working circle included all the compartments containing harvestable bamboos in workable quantities. According to the licence and lease granted by the then H.E.N. the Nizam's Government in the year 1936, the Sirpur Paper Mills Ltd. Was conferred upon the monopoly and the sole rights of harvesting the bamboo areas, for manufacture of paper and pulp, in the then Adilabad District, for a period of 30 years in the first instance from the date of actual commencement of the regular normal working of the factory and the licence and lease have been renewable for further period of like durations of such terms as may be decided upon at the expiry of the period. The rate of Royalty was fixed at Rs. 3.00 per tonne as weighed on the company's weigh bridge. The department was not authorised to sale the bamboos to any other party, for any purpose, except for the bonafide requirements of the residents of the locality. In which case, the Range Forest Officer was to issue a special permit, the copy of which was to be given to the company. The lease expires in 1969.

5.4.34. The felling cycle of 4 years was adopted and the yield was controlled by area. The following rules were laid down for the bamboo harvesting:

(i) No culms under one year of age were to be cut.

(ii) All culms were to be cut at a height of 15cm to 30 cm above the ground level. In congested clumps, culms could be cut at 45 cm from ground level.

(iii) A minimum of six culms over one year of age were to be retained in each clump.

(iv) As far as possible, no dead bamboos were to be left in any harvested clump.

(v) Digging or extraction of rhizomes was not permitted.

5.4.35. RESULTS: The bamboos flowered in the year 1943-44. As a result no programme for bamboo working from any of the blocks dealt with was given by S.G.BHOGLE in his working plan period. However it is revealed that Sirpur

Paper Mills Ltd. Extracted bamboos from Garlapeth and Manickgarh blocks as shown in the following statement:

Name of block	Extraction of bamboos (in tonnes)			
	1953-54	1954-55	1955-56	1956-57
Manickgarh	2,165	2,675	1,484	3,936*
Garlapeth		2,260	1,067	121*

NOTE: The extraction figures marked with * are from the forest tract transferred to erstwhile Bombay State after State Reorganisation.

5.4.36. After 1957 the Paper Mills could not extract the bamboo as the areas were not handed over to them. The Paper Mills represented in February 1962 to hand over the forest in Rajura Tahsil, transfer to the then Bombay State, to which Government in Revenue and Forest Department released Garlapeth block at the first instance in March 1962 and Manickgarh, Chicholi and Siddheshwar blocks in December 1962. For the purpose of extraction, seven provisional bamboo felling series were formed in December 1963. The Paper Mills started the extraction of bamboo from 1963-64 onwards. The following statement gives the felling series-wise extraction of bamboo by Sirpur Paper Mills Ltd.:

COUPE-WISE AND FELLING SERIES-WISE YIELD OF BAMBOOS (IN METRIC TONNES)

Year of	No. of coupe worked	Garlapeth block PB F.S.	Siddheshwar block		Manickgarh block			
			PB F.S.I	PB F.S.II	PB F.S.I	PB F.S.II	PB F.S.III	PB F.S.IV
1	2	3	4	5	6	7	8	9
1963-64	'A'	--	--	--	545.40	--	261.25	2,774.15
1964-65	'B'	544.70	848.01	--	176.06	145.35	2,075.00	62.23

5.4.37. PLANTATION OVERLAPPING WORKING CIRCLE : This working circle was constituted for planting the suitable sites with valuable species such as teak, semal, bija, shisham and ain. Preference was to be given for semal. For this purpose an area of 40 ha from Compartment No. 155 (old Compartment No. 449) of Rajura block was to be planted.

5.4.38. RESULTS: No Plantation was carried out in Compartment No. 155 (old Compartment No. 449) during the plan period according to Bhogle's Working Plan.

5.4.39. MISCELLANEOUS WORKING CIRCLE: The compartments, not allotted to coppice with reserves working circle, were included in this working circle. This working circle covered almost the whole of Manickgarh block excepting a small fringe on northern side included in Lakkadkot and Isapur Coppice with Reserve Working Circle. It also included other smaller blocks like Somthana, Mangalhira, Pardi, Talodhi, Ahson, Kanergaon and northern portion of Siddheshwar block. The forest allotted to this working circle contains less valuable tree growth containing more of salai and are situated in the interior and hence not brought under working under any silvicultural system of management. No definite prescriptions were laid down for the management of these areas. But the Divisional Forest Officer was authorised to carry out the irregular harvesting without reference to the Conservator for the sake of departmental purposes. The fellings under this were permitted strictly in conformity with the silvicultural principles. He was also authorised for harvesting and disposal of the produce along boundaries, road alignments, clearing for buildings, tanks and camp grounds.

5.4.40. RESULTS: No irregular harvesting was done during the plan period according to Bhogle's working plan.

5.4.41. HARVESTING OUTSIDE THE WORKING PLAN : The accessible areas bearing teak and miscellaneous crop not included for regular working in Bhogle's plan have been worked presumably under improvement fellings from 1954-55 to 1965-66. The correspondence regarding the formation of felling series, allotment of compartments and annual sequence of fellings is not available anywhere. Similarly the silvicultural system followed and the marking rules are also not traceable. However the traces showing the sequence of annual coupes and their situation is available. In all, four felling series were formed for working the forests of Manickgarh, Pardi and Mangalhira blocks under the improvement fellings, the details of which are as below:

S.No	Name of the Felling Series	Name of block	Total No. of annual coupes	Total area in ha	No. of coupes worked	Total area worked in ha
1	2	3	4	5	6	7
1	Wansadi	Manickgarh	I to XIV	648.711	I to XIII	591.246
2	Ergaon	Manickgarh	I to XIII	639.403	I to XII	563.727
3	Mangalhira	Manickgarh	I to X	565.346	I to X	365.346
4	Pardi	Pardi	I to X	350.053	I to X	350.053

5.4.42. RESULTS: The density of the crop from these area is already low and hence the working amounted to removal of trees cautiously. The natural reproduction is sparse but the coppice regeneration is plentiful. Cleanings are essential to benefit the young coppice corp.

5.4.43. HARVESTING OF KHAIR: The then Government of Hyderabad, in August, 1956, leased out sundra (khair) trees at the flat-rate of Rs. 1.50 per tree, from the forest areas falling within the Revenue District Adilabad to Shri. Laljee Muljee a resident of Hyderabad, for manufacturing katha for a period of 10 years intervening 1st July 1956 to 30th June 1965. For this purpose Khair trees marked every year in annual coupes by the forest Department were to be harvested by the contractor. The minimum girth limit for harvesting was kept at 45 cm at breast height. There was no commitment about the number of trees but the available number of trees under scientific management were to be marked. Thus contractor had no right to claim more trees than those marked in the annual coupe. The contractor was liable to pay the full amount for the total number of trees marked in the coupe whether he utilises them or not. The tract dealt with was transferred to the erstwhile Bombay State on 1st November 1956 at the time of Reorganisation of States. The contractor made a petition in 1960 requesting that he might be allowed to work the khair trees in Rajura Taluka transferred to the then Bombay State. The contractor was permitted to work as per the contract in March 1962. Accordingly, the khair trees were marked only in annual coupes. However the contractor did not harvest them but requested the Government to extend the lease period by 5 years. His request was turned down by Government in view of the opinion offered by the Law and Judiciary Department according to which the contractor was not legally entitled to extension. The contractor also made another request on 27th November 1962 to permit him to cover the entire area within 3 years, as only three years period had remained according to the agreement deed. This request was also turned down as firstly it was in contravention of agreement terms and secondly khair trees were to be marked in annual coupes in accordance to silvicultural principles. Thus so far the contractor had not harvested khair trees and the lease period of 10 years expired on 30th June 1965.

**5.4.44. THIRD WORKING PLAN OF S.B.KULKARNI
(1967-68 to 1981-82 EXTENDED UPTO 1986-87):**

5.4.45. It was prepared by S.B. Kulkarni after complete stock-mapping of the compartments. The period of the plan was from 1967-68 to 1981-82. The same was further extended up to 1986-87. The following data was compiled during the preparation of this plan.

(a) Rate of growth of teak was ascertained by stem analysis of 8 teak trees and stump analysis of 56 teak stumps.

(b) Local volume tables were prepared for teak, bija, bhirra and dhawada from the log outturn data.

© Tree enumerations were under taken in important forest blocks like Rajura, Chicholi, Garlapeth, Siddheshwar and Manickgarh to find out the nature and composition of the growing stock and the state of natural regeneration.

(d) One percent bamboo sample survey was carried out in the commercial bamboo felling series to arrive at the bamboo potential.

5.4.46. GENERAL OBJECTS OF MANAGEMENT: Those were:

- (i) To combat the ill-effects of soil erosion and to preserve and promote soil cover on the steep and precipitous slopes.
- (ii) To satisfy the local as well as outside demand of timber, firewood and charcoal to the extent the forests can bear.
- (iii) To enhance the value of the forests by increasing the proportion of valuable species such as teak, bija and khair and also of the industrially important species such as eucalyptus, semal and maharukh by the preferential treatment and by plantations.
- (iv) To satisfy the demand of timber, bamboos and other forest produce required by various industries.
- (v) To convert the degraded forests into pasture to supplement the increasing grazing needs.
- (vi) To regulate grazing on the basis of incidence and to distribute the cattle as evenly as possible both in the interest of silviculture and of the cattle themselves.
- (vii) To obtain progressively increasing yield of all kinds of forest produce.
- (viii) To aim at the creation of normal forests with all that it implies.

5.4.47. On the basis of the stock mapping details and growth data collected, the following working circles were constituted in accordance with the general objects of management:

- (i) Conversion Working Circle : 9869.850 ha.
- (ii) Miscellaneous Plantation Working Circle: 3182.490 ha.
- (iii) Selection cum-improvement Working Circle: 44186.715 ha.
- (iv) Coppice with Reserve Working Circle: 2797.335 ha.
- (v) Pasture Working Circle: 1506.600 ha.
- (vi) Bamboo (Overlapping) Working Circle: 60683.065 ha.
- (vii) Khair (Overlapping) Working Circle: 30952.125 ha.

5.4.48. The principle prescriptions under various working circles were as follows.

5.4.49. CONVERSION WORKING CIRCLE: In this working circle all India site quality IV and above area having gentle slope were included. Clearfelling system with artificial regeneration of teak and khair along with the retention of natural regeneration in groups were prescribed. Rotation was fixed at 60 years. It was divided into 3 periods of 20 years each. PB I was definitely allotted whereas PB II and PB III were grouped together and PB unallotted was formed.

5.4.50. FELLING SERIES: There were three felling series i.e Rajura, Khambada and Chicholi and in the fourth namely Dhanakdevi, the plantation programme for only 20 years was given. Yield was to be controlled by area. Felling rules were as follows:

5.4.51. PERIODIC BLOCK I: Areas liable to erosion, blanks and under-stocked areas with density below 0.4 and one chain wide strips along nala banks and slopes above 30° were to be excluded from working. Groups of poles and natural regeneration were to be retained as part of the future crop. Rest of the area was to be clearfelled and suitable sites were to be planted with teak stumps at 2m x 2m. Khair seeds were to be sown in other sites, which are unsuitable for teak, in lines 2m apart.

5.4.52. PERIODIC BLOCK UNALLOTTED: Only dead, dying and diseased trees were to be removed. However, cleanings and thinnings were to be carried out to remove congestion and improve the condition of coppice regeneration in the areas worked under the Coppice with Reserve system. In addition to above, subsidiary cultural operations like cutting back operation in the following year of main fellings, cleanings in the 6th year of plantation and in plantation area, thinnings in 7th, 13th, 25th and 41st year of planting were also prescribed. 7th year thinning was to be mechanical whereas 13th year and 25th year thinning were prescribed according to the formula.

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

Where: "D" is distance between two trees in feet and

"D" is crop diameter (Overbark) at breast height in inches.

41st year thinning was to be light crown thinning to favour dominant trees.

5.4.53. RESULTS:

As per the prescriptions, teak plantations have been carried out from the year 1969. The plantations raised during the plan period are given in table below.

Name of the Felling series	Total area in ha under PBI.	Total plantable area in ha	Actually planted area in ha upto 1985-86
1. Rajura	1003.185	905.175	703.300
2. Khambada	1066.770	970.785	644.200
3. Chicholi	752.400	712.980	550.320
4. Dhanakdevi	955.800	708.345	Nil
Total	3778.245	3297.285	1897.820

(ii) No plantations were taken in Dhanakdevi Felling series due to the problem of mass encroachments.

(iii) During the revision of that plan enumerations were carried out in the above plantations. Statistics of growth showed that the said plantations belonged to teak site quality IV and were maintained properly.

(iv) Khair seeds were not sown as per prescriptions.

(v) Cleanings and thinnings were not carried out scrupulously.

(vi) Soil and water conservation measures were not taken up.

(vii) Treatment maps were not prepared properly and as a result in unworkable areas also clearfelling was done.

(viii) In periodic block unallotted, apart from prescribed removal of dying and diseased trees, healthy, matured as well as immature trees were also felled, resulting in the over harvesting.

5.4.54. Due to the reasons mentioned above the status of the forests in PB Unallotted was degraded to a large extent, large areas had become understocked and erosion was accelerated. The following figures give the picture clear.

Name of the felling series	Area included in PB Unallotted	Area under stocked (in ha)	Area where surface soil is lost and gullies are formed (in ha)
1. Rajura	2254.230	597.046	298.523
2. Khambada	2340.090	329.676	414.838
3. Chicholi	1620.000	380.614	190.307
Total :	6214.320	1807.366	903.668

5.4.55. MISCELLANEOUS PLANTATION WORKING CIRCLE: Forests, mainly belonging to IV and III site quality from the eastern and western sides of Rajura and Somthana blocks were included in this working circle. Clearfelling system for raising artificial plantations of eucalyptus, semal, maharukh etc. was prescribed. The area was divided into two felling series i.e. Somthana and Vihirgaon. Twenty year rotation was prescribed for eucalyptus.

5.4.56. FELLING RULES WERE PRESDRIBED AS FOLLOWS: (i) Eroded areas, barren or understocked areas, nala banks and slopes above 30° were to be excluded from working. (ii) In other areas, eucalyptus seedlings at 1.5m x 1.5m spacing supplimented by stumps planting of semal, maharukh etc. to be planted after clearfelling. (iii) In degraded areas, khair seed was to be sown in lines 2m apart.

5.4.57. Subsidiary cultural operations like cutting back and cleanings were also to be carried out. However, thinning regime for eucalyptus was not prescribed. But an assessment was to be taken in the 10th year of plantation.

5.4.58. RESULTS: Deviating from the above prescriptions, from the year 1971 onwards, only teak plantations were taken regularly except in the year 1978, along with teak, semal and maharukh were also planted but it is seen that semal plantation is totally failure whereas maharukh and teak are successful to some extent.

Details of the area planted

Name of the Felling series in ha	Total area of the F.S.	Plantable area in ha	Area actually planted in ha (upto 1985-86)
1. Somthana	1988.450	1208.115	763.254
2. Vihirgaon	1283.040	929.880	573.917
Total :	3185.490	2137.995	1342.171

5.4.59. During the revision of that plan, growth data were collected. From the above data it is seen that the said planations belong to IV quality. That shows that the original site quality is maintained. That is only due to the introduction of teak. Thus the decision to plant teak instead of eucalyptus as was prescribed in the working plan was proved to be correct. But since the subsidiary operations were not carried out as prescribed the growth of the plantations is not so as desired. Moreover since the treatment maps were not prepared properly, even in understocked and erosive areas clearfelling was done and as a result, in considerable areas the survival of the plants is below 50%. As a result understocked and barren patches are also not uncommon in the planted areas.

5.4.60. SELECTION-CUM-IMPROVEMENT WORKING CIRCLE: In this working circle, areas of III and IV site quality from Garlapeth, Siddheshwar and Manickgarh blocks were included. Selection cum Improvement felling system alongwith clearfelling in suitable patches for raising teak plantations was prescribed. To supplement the natural regeneration and coppice reproduction which was inadequate to restock the areas, five percent of the coupe area in all the felling series was to be planted with teak and khair.

5.4.61. Teak being the principal species and it was to be given preferential treatment along with other valuable species viz. Bija, bhirra, shisham, ain, tiwas, haldu and kalam accordingly. Twenty years felling cycle was adopted. The area was divided in eight felling series and the yield was to be regulated by area.

5.4.62. FELLING RULES WERE AS FOLLOWS: Area liable to erosion, blanks and understocked areas with density below 0.4 and one chain widestrips along nala banks were to be excluded from working. Steep slopes above 30° were to be demarcated as protection belts. In the workable areas one out of two trees of teak, bija, bhirra, dhawada, ain, kalam, haldu and shisham above harvestable girth were to be removed if their retention was not necessary on account of silvicultural principle. Suitable sites (Five percent of the coupe area), not less than 0.8 ha at a stretch was to be clearfelled for raising plantations of teak and khair.

5.4.63. Selection girth of harvesting were fixed as follows:

Sr.No.	Species	Selection girth for harvesting in cm
1	Teak (<i>Tectona grandis</i>)	90
2	Shisham (<i>Delbergia latifolia</i>)	
3	Bhirra (<i>Chloroxylon swietenia</i>)	
4	Salai (<i>Boswellia serrata</i>) or Anduk	105
5	Bija (<i>Pterocarpus marsupium</i>)	
6	Ain (<i>Terminalia alata</i>)	
7	Halud(<i>Adina cardifolia</i>)	
8	Garari (<i>Cleistanthus collinus</i>)	45

5.4.64. Subsidiary silvicultural operations like cutting back, cleanings (in the 6th year) and thnnings (as in Conversion Working Circle) in the plantations were also prescirbed.

5.4.65. RESULTS: The areas of the six felling series from the Manickgarh block was 35,847.36 ha (i.e. 81.13%). Out of this only 1460.91 hectare (i.e. 4.07%) was worked during the next 19 years. Most of the area could not be worked either due to steep slopes or due to encroachments. Following table shows the areas worked and the average yield obtained.

Name of the felling series	Total area of the F.S. (in ha)	Actual area worked (in ha)	Numb er of trees cut per ha	Average yield per ha in cubic metre		Total yield in cubic metre	
				Timber	Fire wood	Timber	Firewood
1. Garlapeth	3613.815	3290.00	13.14	1.77	8.43	5823.30	27,735.00
2. S'shwar	4725.540	3167.00	35.51	0.89	12.42	2081.63	39,366.00
3. Punaguda	6261.300	Nil		N.work			
4. Palezari	6891.480	339.355	00.38	--	1.08	--	258.00
5. Kakband	5536.350	653.780	1.54	0.11	9.20	72.740	6,020.00
6. Khadki	6483.240	467.775	11.64	0.05	2.32	24.647	1089.00
7. Kodhapur	6117.930	Nil		N.work			
8. Tangara	4557.060	Nil		N.work			
Total	44186.715	7817.910	20.75	1.11		8739.317	74468.00

5.4.66. (i) From the above figures it is seen that only 17.69% area was worked.

(ii)As per the prescriptions, in each coupe of every felling series, 5% area was to be planted with teak, ain, khair. But it was not done.

(iii)Felling rules were not followed scrupulously.

(iv) **Subsidiary cultural operations were not carried out.**

(v) As a result of negligence of the working plan prescriptions, instead of improvement in the growing stock, it had deteriorated and due to encroachments an area of about 25,008.661 ha has gone under cultivation and tree cover is lost forever.

5.4.67. Following table gives the idea about depletion in growing stock during the period of 17 years i.e. from 1966-67 to 1983-84.

Name of the block	Total number of trees above 15 cm Girth.	
	1966-67	1983-84
1. Garlapeth	413	235
2. Siddheshwar	501	157
3. Manickgarh	469	204

Thus it is very much clear that even the capital was not intact not to speak of the increment in growing stock.

5.4.68. COPPICE WITH RESERVE WORKING CIRCLE: In this working circle, forest of Mangalhira, Chanai-Barsa I and II and Pardi blocks were included. They were capable of producing small timber and fuel wood. The tree growth in general belonged to site quality III and IV. Mainly miscellaneous species like ain, bija, dhawada, shisham, tendu, mahuwa etc. were found along with teak. Garari was the principle species. Bamboos were found only along nala banks. Advance growth and reproduction of above species was adequate in patches. Rotation was kept at 40 years. Two felling series were formed and yield was regulated by area.

5.4.69. FELLING RULES WERE AS FOLLOWS: (i) Eroded areas, areas liable to erosion, blanks, understocked areas and one chain wide strips along nala banks were to be excluded from felling. (ii) In patches of young pole crop thinnings were to be carried out. (iii) In poorly stocked areas, the number of reserve should have been 125 to 150 trees per hectare of any species. In other well stocked areas, trees of economic importance viz. Teak, bija, ain, bhirra, shisam, haldu, dhawada and tinsa were to be reserved to the extent of 40 trees per ha. Also all healthy trees of above species upto 45 cm girth were to be retained. Subsidiary silvicultural operations viz. Cutting back operation, cleaning and thinnings were prescribed. Only one thinning at the mid rotation age (20 years) was prescribed.

5.4.70. RESULTS: Most of the coupes remained unworked either due to encroachments in them or were unworkable as they were understocked since mature trees were removed in the worked areas. Coppice regeneration could not be obtained to the desired extent except for garari and lendia, that too in patches only. As a result growing stock got depleted. Due to heavy uncontrolled grazing and rocky, shallow soil and hard pan of slate at a depth of about 30 to 45 cm Natural regeneration was conspicuously absent and the growing stock was depleting day by day. Wherever some good soil occurred, it had gone under encroachments. Balance area needed urgent soil and

moisture conservation measures along with afforestation. Following table shows the extent of encroachments and understocked areas.

Forest block	Total area in ha	Area under cultivation or encroachment (in ha)	Extent of understocked area (ocular estimate)	Balance area having some growth
1. Mangalhira	1735.020	427.500	134.354	1173.166
2. Chanai Barsa I	724.545	176.810	38.913	508.822
3. Chanai Barsa II	92.340	56.314	--	36.026
4. Pardi	350.325	48.600	90.650	211.075
Total	2797.335	709.22	263.917	1824.194

5.4.71. This shows that 24.18% of the area was under cultivation or encroachment and 9% of the balance area was understocked. Following table shows the then growing stock per ha in the above areas.

Species	No. of trees per ha above 15 cm Girth
A) Ain, bija, lendia and teak	34.02
B) Behada, Khair, kalam and salai	11.49
C) Other misc. species	66.45
Total	111.96

Girth class wise percentage distribution of the above stock is as follows :

Girth in cm	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	Above 135
%of stock	31.73	18.82	13.62	10.67	6.87	5.02	4.57	3.69	5.01

5.4.72. BAMBOO (OVERLAPPING) WORKING CIRCLE: In this working circle 60,683.175ha area from Rajura, Chicholi, Garlapeth, Siddheshwar and Manickgarh blocks, distributed in 186 compartments were included. Fair stockings were seen in only following areas:

Range	Area in ha
Rajura	188.325 ha
Wansadi	4902.102 ha
Wirur	4125.785 ha
Total	9220.212 ha

And in other areas bamboo was sporadic and confined only along to nala banks in patches. The only variety that occurs is *Dendrocalamus strictus*. It had flowered gregariously in 1943-44. Three years felling cycle was adopted. Each felling series was divided in 3 coupes.

5.4.73. Felling rules were as follow:

- (i) Clumps having less than 8 culms were to be treated as understocked and were not to be harvested.
- (ii) During 15th June to 15th September felling was prohibited.
- (iii) Culms less than one year old were not to be felled.
- (iv) All dead, dying and malformed culms were to be cut.
- (v) A minimum of 8 green culms including current year culms, well distributed over the clump were to be retained.
- (vi) Culms were to be cut obliquely between 15 cms to 45 cms from the ground level.

The bamboos flowered gregariously from 1986 to 1988.

5.4.74. EFFECTS: Since the control forms are not up-to-date, information regarding the bamboo harvesting and yield obtained is not available. However, it is learnt that only from Wirur Range, some of the coupes were worked to fulfil the local demand. Due to encroachments in Manickgarh block bamboo areas have decreased.

5.4.75. KHAIR (OVERLAPPING) WORKING CIRCLE: In this working circle 30,952.125 ha area containing fair proportion of khair were included. Main object was to meet the demand of katha industry. Prescriptions were as follows :

FELLING CYCLE: 20 years.

YIELD REGULATIONS: It was done by number of khair trees.

SELECTION GIRTH FOR HARVESTING: It was kept at 60 cm Girth at b.h. from katha manufacturing point of view.

5.4.76. RESULTS: Since the prescribed number of trees was not available for felling and also since there was no demand from katha industry the working circle became defunct.

5.4.77. PASTURE WORKING CIRCLE : This working circle contained the 1506.6 ha open forests of Kanhergaon, Ahson and Talodhi blocks which had ceased to yield even small timber but are conveniently situated for providing grazing facilities to cattle from surrounding villages. A simple form of rotational grazing of two coupes system were prescribed.

5.4.78. RESULTS: Due to large increase in the cattle population prescriptions could not be implemented. At the same time, since no development works were prescribed, naturally the area was neglected. Even demarcation of the area was not maintained and it resulted in encroachments.

Name of block	Total gazetted in ha	Area under cultivation or encroachment in ha	Balance area in ha
1. Kanhergaon	418.770	418.770	0.000
2. Ahson	274.590	274.590	0.000
3. Talodhi	813.240	409.419	403.821
Total :	1506.600	1102.779	403.821

From the above figures, it is seen that 70.76% area is under encroachments which are long standing. The available area is very much degraded and over grazed. They are merely open grounds for the cattle to bask and breathe.

5.4.79. MISCELLANEOUS WORKING CIRCLE : In this working circle 15,315.075 ha area was included from the following categories.

- (i)Gaothan sites and cultivation.
- (ii)Areas along inter state boundary.
- (iii)Area with paucity of overwood.

5.4.80. TREATMENT PRESCRIBED: In the compartments containing groups of natural regeneration, cutting back and cleaning operations were prescribed.

5.4.81. EFFECT: No such operations were carried out, and the inter state border dispute is also not resolved yet.

5.4.82. GENERAL OUTCOME OF THE KULKARNI'S WORKING PLAN: If we compare the general objects of management of Kulkarni's plan and the effects of the prescriptions given for the working of various working circles it projected a rather dim picture.

(i)Since no soil conservation measures were taken during the plan period, instead of combating the ill effects of soil erosion, it had actually been accelerated.

(ii)The local demand for timber, firewood and charcoal had of course been satisfied, not only to the extent the forests could bear but even in excess of the bearance capacity of these forests. The local demand got satisfied by the local population by illicitly cutting the trees and encroaching upon forests land and thus degrading the forests to a large extent.The outside demand was also satisfied to the extent the forests could bear.

(iii)Due to the teak plantations taken in conversion and miscellaneous plantation working circles after clear felling the area, value of the forests has increased over an about 3140 ha area (i.e. 4.21% of the total area covered by the plan). However, no plantations taken in the Selection cum Improvement working circle.

(iv)Whether the demand of the various industries was satisfied or not is not known, since the figures are not available. But from the general observation it seems that the demand might not had been satisfied to the desired extent.

(v)The degraded forests had not been converted into pastures. But the said areas have mostly gone under encroachments. As a result the grazing needs of the cattle were not satisfied properly. Since the cattle cannot remain without food, they got their hunger satisfied by grazing in all the forest areas, even in plantations and thus assisting in the degradation of the forests to a large extent.

(vi)Though the grazing settlement was done, grazing could not be regulated due to explosion in cattle population.

(vii)Even sustained yield could not be obtained. To get progressively incrazing yield was out of question.

(viii) At least during the plan period, normal forests had not been created.

5.4.83. CONCLUSION: Thus, from the above discussion it was concluded that the general objectives as postulated in the working plan of Kulkarni had not been achieved mainly due to :

- (i) Absence or inadequacy of natural regeneration.
- (ii) Explosion in human and cattle population which resulted in increasing the pressure on the forests by many folds and thus accelerated the process of degradation of forests.
- (iii) The executive agency could not check this degradation due to its various limitations.
- (iv) To some extent negligence towards the prescriptions of the working plan due to lack of properly trained staff as well as inadequacy of the staff.
- (v) Illiteracy and lack of knowledge among the population regarding the science of silviculture and intangible benefits of the forests and
- (vi) Last but not the least the poverty of the major part of the population.

WORKING PLAN OF S. S. MAHAJAN, R. N. BISWAS, V. B. PANDIT and Dr. NAND KISHOR: (Period 1993-94 to 2002-2003):

SECTION: 5.5: GENERAL HISTORY OF THE FORESTS

S.B. Kulkarni's plan was followed by the plan prepared by Shri S. S. Mahajan, R. N. Biswas IFS, V. B. Pandit and Dr. Nand Kishor IFS for period 1993-94 to 2002-2003. The stockmaps of the areas free from encroachment and with clear boundaries were carried out and fresh enumeration was also carried out. On the basis of stockmapping and enumerations areas were classified under tree forests, minor forests, and miscellaneous forests and on the basis of (1) the situation and condition of the forests, (2) condition of regeneration of tree species, (3) the local needs of the population and availability of labour, staff and resources; following working circles were formed:

- (i) Selection cum Improvement Working Circle,
- (ii) Afforestation Working Circle,
- (iii) Bamboo Overlapping Working Circle,
- (iv) Miscellaneous Working Circle and
- (v) Wildlife Overlapping Circle.

5.5.1. SELECTION CUM IMPROVEMENT WORKING CIRCLE: This working circle includes better forest area of Rajura, Garlapeth, Siddheshwar I & II, Manickgarh and Chicholi blocks comprising 28670.995 hectare of forests. The special objects of management are as follows:

- (i) To utilize the full potential of the site for producing big sized timber and
- (ii) To improve the forests, both in composition and density by suitable tending operations and plantation.

The area included in this working circle was partially miscellaneous forest and rest of the area was cleared felled and planted. To achieve the special objects of management the natural crop is to be worked to produce large sized timber and at the same time the natural regeneration would be allowed to grow. In the plantation areas crops have to be tended to achieve the maximum growth rate. The areas which are understocked and contain inadequate natural regeneration have to be artificially planted. The tending of natural regeneration and selection of species in plantation have to be done in such a way, so as to achieve 50% teak and 50% other miscellaneous species in the resultant crop.

On the basis of the growth of individual species, they have been divided into two classes: (1) Class-I: It includes teak, ain, bija, haldu, dhawada, salai, kalam. The selection girth for harvesting of these species is fixed at 120 centimeter and (2) Class II: It includes bhirra, rohan, tiwas and all other superior miscellaneous species except garari. Selection girth for harvesting of these species is kept as 90 centimeter. Felling Cycle is fixed 20 years and the areas have been divided into 13 felling series.

5.5.2. FELLING RULES ARE AS FOLLOWS: Area liable to erosion, blanks and understocked areas with density below 0.4 and one chain wide strips along nala banks are to be excluded from working. Steep slopes above 45° are to be demarcated as protection belts. In the workable areas enumeration of all trees above harvestable girth and approach class have to be done in 15 centimeter girth class before starting the marking. The following reservation have to be done: (1) All healthy trees of edible fruit and flower yielding trees of moha, tendu, aonla, chinch, bel and (2) All well grown and uniformly spread trees of teak and superior miscellaneous trees below selection girth for harvesting. Keeping in view the above restrictions, the marking for felling have been following types:

(i) All dead trees after leaving 2 trees per hectare. The retention of trees have to be made from inferior species as far as possible.

(ii) All live high stumps.

(iii) 50% of the trees above selection girth of harvesting uniformly spread over the whole coupe. However in the areas having slope 25° and more no. of trees have to be marked for felling unless crop density greater than or is equal to 0.7. Marking have to be done from higher girth trees to lower girth trees so that all the overmature trees would be removed during felling from harvestable girth class.

(iv) Singling of multiple coppice shoots to one vigorously growing coppice shoot.

(v) Very light thinning marking in the crop below preharvestable girth class. No sound tree has to be removed unless its removal benefits two other trees of the same girth class.

5.5.3. In the old plantation areas and group of young poles areas thinning marking in the natural pole crop have been done so as to make average spacement equal to $1/3^{\text{rd}}$ of the average height of the crop. For the plantations, the thinning has to be done as per the site quality classes. In understocked areas:

All dead trees have to be marked for felling provided their number is more than 2 per hectare.

All live high stumps to be cut to ground level.

5.5.4. The regeneration has to be obtained through natural regeneration as well as artificial regeneration. The natural regeneration has to be properly tended to enhance the growth of the seedlings. Artificial regeneration has to be carried out in well stocked areas with deficient in natural regeneration and in understocked areas. The artificial regeneration is to supplement the natural regewneration. Bamboo is to be planted in all type of areas. Minimum of which is not to be less than one half of the coupe area.

The following subsidiary silvicultural operations have to be carried out in the next year of main felling soon after completion of working and in the subsequent years.

(a) CUTTING BACK OPERATIONS:

- i) All standing trees, marked for felling but not felled have to be felled.
- ii) All damaged trees which are not likely to recover have to be felled.
- iii) All malformed naturally regenerated seedlings have to be cut back to obtain vigorous coppice shoots.
- iv) All growth of inferior species like lantana, dikamali and kharata interfering or likely to interfere with growt of teak and other valuable species have to be cut.
- V) All climbers have to be cut.

(b) CLEANING: In the sixth year from the year of main felling, the following operation has to be carried out.

- i) Climbers have to be cut all over the area.
- ii) Inferior species interfering or likely to interfere with the growth of teak and other valuable miscellaneous species have to be cut.
- iii) Damaged seedlings due to wildlife and illicit cutting, malformed seedlings or coppice shoots have to be cut.
- iv) Coppice shoots on each stump have to be reduced to not more than 2 well spaced out vigorous shoots.
- v) In the plantations and naturally regenerated areas also cleaning works have to be done.

(c) THINNING: Thinning has to be carried out in the 11th year from the year of main felling. Following rules are laid down.

- i) All climbers have to be cut.

- ii) All dead, badly damaged or uprooted trees have to be felled.
- iii) Coppice shoots on each stump have to be reduced to 1 vigorously growing shoot.
- iv) In group of young pole crop of natural teak, thinning have to be carried out so that average spacement of the crop left have to be $1/3^{\text{rd}}$ of the height of of the crop.
- v) The thinning in old plantations has to be as per the yield table and site quality.
- vi) Area is to be strictly fire protected for the period of five years after main felling.
- vii) The area is to be closed for grazing for five years after plantation and in the case of natural regeneration after main felling.

5.5.5. RESULTS: Some of the encroached areas have also been included in this working circle making the operations to be impossible and the future crop is imaginary. In the well stocked areas the result of selection is very good. The crop is getting structured composition and regeneration has been achieved either naturally or artificially as per the site requirement.

5.5.6. AFFORESTATION WORKING CIRCLE: The area included in this working circle are relatively inferior to the areas included in the Selection Cum Improvement Working Circle. The compartments which have degraded or where plantations have failed in the Conversion Working Circle of S. B. Kulkarni's plan have to be included in this working circle. One compartment of Miscellaneous Working Circle and all compartments of Coppice With Reserve Working Circle of S B Kulkarni's plan have been included in this working circle. The total area included in this working circle is 7113.875 hectare. The main objects of management are:

To reclaim the area by intensive soil and moisture conservation works and afforestation.

(ii) To enhance the productivity of the forest land.

To involve the local people.

To meet the demand of local people of small timber, fuelwood and fodder.

5.5.7. The area under this working circle was stockmapped. The crop contains mostly middle aged to mature trees. The density of the crop varies from 0.5 to understocked and blank areas. 6 Felling Series with 20 coupes each FS have been formed. Mode of regeneration is mainly with artificial regeneration supplimented with natural regeneration.

5.5.8. RESULTS: People involvement in afforestation work is not upto mark as it was expected. The afforestation of areas are not as per the sequence given in the plan. The target of plantation is imposive on executive rather than site specific. The soil and moisture conservation works are inadequate or

negligible. Success of survival of plantations so raised is not impressive and in most of the areas it tends to be failure.

5.5.9. BAMBOO OVERLAPPING WORKING CIRCLE: An overlapping bamboo working circle covering bamboo bearing forests over 29137.43 hectare 74 compartments and 6 sub compartments have been formed. After gregarious flowering during 1986 to 1988 clump formation is in process. The objects of management are: (1) To meet the local demand and (2) To harvest bamboo on scientific lines so as to get the maximum sustained yield. 6 Cutting Series with 3 cutting section each have been carved. The cutting rules are as follows:

- i) Clumps having less than 8 culms are to be treated as understocked and are not to be harvested.
- ii) During 15th June to 15th September felling is prohibited.
- iii) Culms less than one year old are not to be felled.
- iv) All dead, dying and malformed culms are to be cut.
- v) A minimum of 8 green culms including current years culms, well distributed over the clump are to be retained.
- vi) Culms are to be cut obliquely between 15 cms to 45 cms from the ground level.
- vi) Digging of rhizomes, cutting tops of bamboo or cutting of tender bamboo is prohibited.
- vii) If bamboo flowering is noticed then that clump felling is deferred till the seeding is completed.
- viii) All climbers infesting bamboo clumps have to be removed.

5.5.10. RESULTS: As it has been mentioned that crop is in various stages of development and the clump formation is yet to complete and therefore hygienic operations have to be done in the coupe for working and the prescriptions given for cutting of bamboo would be operative only after the clumps are mature for harvesting. No specific hygienic operations have been given in the plan. In the absence of any concrete operations to be carried out for the formation of clumps no hygienic works has been taken at all. No mature clump formation has been noticed. Cutting of bamboo is out of question. Due to lack of proper and concrete prescriptions clump formation process has got set back and the crop is in bad shape.

5.5.11. MISCELLANEOUS WORKING CIRCLE: This working circle includes following types of areas:

- i) Area under proposed Manickgarh Forest Park. (1,659.209Ha).
- ii) Area under Lease. (501.960Ha).
- iii) Area along interstate boundary dispute. (2,16.367Ha).
- iv) Areas of Manickgarh, Kawitgaon, Ahson, Kanhergaon and Talodhi blocks which are mostly under encroachment and areas of Jaitapur, Naranda and Erai blocks which are totally under encroachment or cultivation. (32,751.383Ha).

v)Total area covered under this working circle is 37,828.919 hectare spread over 92 full compartments, 4 part compartments and 29 sub compartments. The method of treatments to the respective areas are as follows:

i)Special scheme needs to be prepared for the development of Manickgarh Forest Park.

ii)The area will remain under lease.

iii)Interstate border dispute should be settled and boundary should be demarcated permanently as early as possible.

iv)To regularise the encroachment in these areas special scheme has to be carried out.

V)Area free from encroachment has to be protected from grazing, fire and illicit cutting.

Vi)Plantation taken have to be maintained while plantation have to be taken in remaining areas with involvement of local people.

RESULTS: Following observations are made:

i)No Forest Park has been created so far.

ii)As per Deputy Conservator of Forests Central Chanda no forest area is under Inter State Border Dispute. Only permanent boundary marks are not on the Inter State Boundary. Errection of permanent boundary marks has so far not taken along the inter state boundary.

iii) No special scheme has been prepared to regularise the encroachments.

iv)Some plantations have been taken in the areas free from encroachment. But the survival of plantations taken so far is inadequate due to lack of control over grazing.

5.5.12. WLIDLIFE OVERLAPPING WORKING CIRCLE: This overlapping working circle covers the entire area of the Rajura, Wansadi and Wirur forest ranges of this division except the proposed for Manickgarh Forest Park for which separate scheme is to be prepared and is about 71,951.580 ha. Following prescriptions are made for the protection of wildlife in the tract.

i) While preparing the treatment map of a coupe for felling in any of the working circle potential habitat of wildlife and existing waterholes will also be identified and have to be shown on the treatment map.

ii) Marking of dead trees in any felling coupe have to be done only if their number is more than 2 trees per hectare. These trees have to be required to provide snags and den for nesting and resting of the wildlife. Trees of commercially low utility may be used for this purpose.

iii) During harvesting some unsound and hollow logs of commercially low utility, not exceeding 3 per hectare have to be left in the forest to serve as shelter for wildlife.

iv)In the plantations few trees of fruit species like gular etc. will also be planted to provide food to wildlife.

v) The water holes which are frequently used by wild animals have to be excluded for grazing by making a special mention of such areas in the grazing permit/licence.

- vi) Vigilant watch have to be kept on poachers also at the checking gates erected to check/prevent the transport of illicit forest produce.
- vii) The labour camps and transit depots have to be established away from the high wildlife density areas.
- viii) Hoardings on the importance of wildlife and protection have to be exhibited at strategic locations.
- ix) The provisions contained in wildlife(Protection) Amendment Act 1991 have to be enforced rigidly.
- x) Suitable location have to be identified where forest tanks have to be constructed to provide water to the wildlife.

5.5.13. RESULTS: To create awareness towards wildlife every year wildlife week is observed in the 1st week of October. Strict vigilance is over entire tract regarding wildlife proection. Some Vantalis (Forest Tank) have been constructed with aim to provide water to wildlife. Though these measures are inadequate to protect and conserve wildlife, the efforts are in right direction in protection of wildlife.

5.5.14. GENERAL OUTCOME OF THIS WORKING PLAN: If we compare the general objects of management of this plan and the effects as are seen today of the prescriptions given for the working of various working circles it dose not project a healthy scene to existing crop and its future.

Since no adequate soil conservation measures are being taken during the plan operation period, instead of combating the ill effects of soil erosion, it is actually being accelerated.

(ii) The concern to meet the local demand for timber, firewood and charcoal has gone in backyard. The capacity of forests is not to the extent to fulfil the local demand to fullest extent and keep the health of forest in a good shape in the present and in future.

(iii)To meet the outside demand, the forest cannot be sacrificed.

Due to the teak and miscellanous plantations taken in various areas under Maharashtra Forestry Project and other schemes value of the forests has increased. People participation in forest management is being sought and it is being felt that people cooperation is essential if we want to conserve the forests for prosperity and upliftment of environment and mankind.

Whether the demand of the various industries is satisfied or not is not known, since the figures are not available. But from the general observation it seems that the demand might not have been satisfied to the desired extent.

(vi) The deraded forests are being converted into productive forest producing fodder and grasses. But those areas which have mostly gone under encroachments revival of forests are out of question.. As a result the grazing needs of the cattle are not satisfied properly. But since the cattle cannot remain without food, they get their hunger satisfied by grazing in all the forest areas, even in plantations and thus assisting in the degradation of the forests to a large extent.

(vii) Since the grazing settlement has not been so far done, grazing cannot be regulated to the possible extent to the carrying capacity of existing forests.

(viii) As sustained yield cannot be ascertained due to lack of normal forest structure, the optimum yield is out of question in near future.

(ix) During the execution of this plan, normal forests have not been created.

5.5.15. CONCLUSION: Thus, from the above discussion it can be concluded that the general objectives as postulated in this working plan have not been achieved mainly due to –

(a) Absence or inadequacy of natural regeneration in areas near human habitat.

(b) Explosion in human and cattle population which resulted in increasing the pressure on the forests by many folds and thus accelerated the process of degradation of forests. The executive agency cannot check this degradation due to its various limitations.

(c) Improper or inadequate execution of prescriptions of the plan.

(d) Illiteracy and lack of knowledge among the population regarding the science of silviculture and intangible benefits of the forests.

(e) Lack of motivation of people in participation of development of common resource i.e. forests.

(f) Last but not the least the poverty of the major part of the population.

5.5.16. To avoid the further degradation and improve the growing stock, the forests have to be considered as assets of future. Forests have to be treated in such a way that normalcy is achieved and optimal flow of goods and services are rendered by these forests to the humankind and environment

WORKING PLAN OF SHRI RAMJI SINGH YADAV & SHRI G.P.GARAD (PERIOD 2004-05 TO 2013-14)

SECTION: 5.6: GENERAL HISTORY OF THE FORESTS :

5.6.1. The Working Plan of Shri Ramji Singh Yadav and Shri G.P.Garad for the period 2004-05 to 2013-14 was in progress. However vide Govt. of India Letter No. 12-10/2002(FOR)/1097 dated 3.6.2014 the extension was granted for one year i.e. 2014-15.

5.6.2. The aims and objectives of this plan were also based on the National Forest Policy 1988 and following general objects of management were proposed.

- i) To preserve forest cover on stiff hill slopes, along the nala banks and water sources and to prevent soil erosion and to preserve site and environment.
- ii) To enrich the growing stock in other natural forest and to restock all the under stock and degraded forest to achieve normality of growing stock in shortest possible time.

- iii) To meet the requirement of small timber, fuel wood, fodder and minor forest produce of the rural and tribal population on top priority.
- iv) To increase the production of minor forest produce and to manage the same scientifically to utilize the potential to the maximum possible extent on sustained basis.
- v) Consistent with the above objective to ensure maximum sustained yield.

CLASSIFICATION OF FOREST:

5.6.3. The functional classification of the forest has been made by taking into consideration a new forest policy as well as resolution no.MEP-1365/132211-Y Dated 6 December 1968 issued by the Govt. of Maharashtra, Revenue and Forest Department. The following classes of forest have been identified for management.

1. PROTECTION FOREST:-This includes forest which occur on very steep slopes (25 degree and above) or along river banks and forest that have become depleted through maltreatment and further harvesting of which will accelerate soil erosion and adversely affect the productivity of agricultural land in the lower regions. The management should aim at rapidly conserving these forests so that they may once again exert their beneficial influence on the soil. The water regime and physical and climatic factors of the locality.

2. TREE FOREST; This includes forest which are situated in remote tract that are prominently suited for growing large sized timber and other products of commercial value.

3. MINOR FOREST: This includes forests that are interspersed with cultivated lands and are capable of reducing small timber and fire wood and providing grazing which are the indispensable needs of the adjoining agricultural population

4. PASTURE LAND:- These are openly stocked forest or shrubs land that have ceased to yield small timber but which are conveniently situated for providing grazing to cattle used on agricultural works.

5. MISCELLANEOUS FOREST:

a) Grass Reserve:-Which are small blocks of forest situated amidst intensively cultivated tracts carrying scrubby growth and capable of producing good fodder grasses which are in short supply.

b) Remaining areas which are need for other purpose.

METHOD OF TREATMENT: The method of treatment was based on the functional classification.

5.6.4. The emphasis was on conservation of biodiversity and the meeting the demands of local people. Hence for the conservation of biodiversity and site, soil and moisture conservation works based on water shed were proposed. To

meet the local demand of people, involvement of local people in plantation and other activity has been provided in a separate Joint Forest Management (overlapping) Working Circle. The various types of forest were treated as follows.

1. PROTECTION FOREST: These areas were excluded from commercial felling, degraded and erosion from the areas like steep slopes and nala banks were adequately protected by providing suitable safeguards in marking rules. Forest areas having density less than 0.4 were allotted to the afforestation working circle.

2. TREE FOREST: - This type of forest included the better quality of forest capable of reducing large of timbers, which were comparatively away from villages and biotic pressure on them. These areas were proposed under SCI system they were managed to produce large size timber. The natural regeneration in most of the areas was adequate in areas where natural regeneration inadequate, artificial regeneration was proposed to enhance the productivity of the area, gap planting of teak to increase the overall percentage of teak to the extent of 10 to 15 percentages was proposed.

3. MINOR FOREST: - This type of forest included forest areas mainly near the human habitation. They were to be managed primarily to meet the local needs of small timber, poles and fuel wood. The growing stock in mainly of low quality mixed with patches of better quality. The density in most of the areas was below 0.4 having low natural regeneration and open eroded areas.. These forests were proposed to be managed under afforestation working circle. Soil and moisture conservation works were proposed to be taken up. Tending of natural regeneration planting of suitable indigenous species, especially for small timber poles, fodder and fuelwood was proposed. The pasture land grass reserves of previous working circles were not treated in separate working circle but mostly under afforestation working circle.

Zudpi jungle which has been transferred from revenue Department to Forest has been included in this category.

5.6.5. WORKING CIRCLE:

Following working circle were proposed in the plan.

Sr	Working Circle	No. of Comptt. included	Area (Ha.)
1	Selection cum Improvement Working Circle	220	46040.147
2	Afforestation Working Circle	92	22,101.912
3	Improvement Working Circle	52	11366.263
4	Old Teak plantation Working Circle	132	9204.392
5	Fodder working Circle	144	20544.140
6	Bamboo (Overlapping) Working Circle	165	20,553.481
7	N.T.F.P. & Medicinal Plant (Overlapping) Working Circle	556	1,14,309.399

8	Wildlife Protection (Overlapping) Working Circle	556	1,14,309.400
9	Miscellaneous Working Circle	27	5,052,545
	Total :- Working Plan Area	556	1,14,309.400
	Area Managed by FDCM	108	2,8785.315
	Total :-	664	1,43,094.714

5.6.6 SELECTION - CUM IMPROVEMENT WORKING CIRCLE:

The main object of management was to have ecological balance with special objects like increase the value and productivity of the area and to obtain big & small sized timber, poles & firewood on sustained basis. Area of the coupes are divided into –

TYPE - A: PROTECTION AREAS:

This will include

Areas on slopes more than 25 degree;

20 meter (One chain) wide area on either side of banks of nallas and river courses.

TYPE – B : UNDERSTOCKED AREAS :

This will include all areas below 0.4 density.

TYPE – C : GROUP OF YOUNG POLES:

This will include areas having group of young poles an extent of minimum 2 ha at a place.

TYPE – D₁ : WELL STOCKED AREAS:

This will include all areas above 0.4 density.

To facilitate the preparation of treatment map each coupe, in general, will be divided into 4 sections. Each type of area will be demarcated of its extent at one place is minimum 2 ha Except the nalla banks etc. which will be marked irrespective of its extent. On receipt of the treatment map, the same will be scrutinised by an ACF and approved by the Dy. Conservator of Forests, No area will be treated as unworkable as some kinds of work will be carried out in each type of the area mentioned above.

TYPE – D₂:

Area to be planted with teak after canopy removal. It will include the area with a well drain soil having teak supportive soil like sandy loam having ph between 6.5 to 7.5, site quality III and has indicator species of teak climax.

- I. Marking and Demarcation of coupes is done one year in advance.
- II. Main felling of coupes after marking is done departmentally.
- III. On approval of treatment map, S.M.C. works are to be started with marking and to be completed before the onset of monsoon in the next year.
- IV. Cutting back operation is done in the following year of the main felling of coupe.

- V. Cleaning operation is carried out in the sixth year from the year of main felling.
- VI. Harvestable girth for marking.

Species	Site Quality & Harvestable Girth (in Cms.)				
	II	II / III	III	III / IV	IV
Teak	135	120	105	90	75
Miscellaneous Species Group -					
A - Ain, Bija, Haldu, Kusum	165	150	135	120	105
B - Others	150	135	120	105	90
C - Khair, Lendia, Garari.	45	45	45	45	45

Lendia and garadi should be completely removed above exploitable girth. Except for Group - A all trees of Group - B above exploitable girth will be removed, provided these are silviculturally available.

5.6.7 RESULTS OF SELECTION CUM IMPROVEMENT WORKING CIRCLE:

The forest included in this working circle is mostly of miscellaneous species. Reproduction of teak occurs in patches while that of other miscellaneous species is fairly good. Bamboo occurs in the lower canopy and is in the form of thick congested clumps over most of the area. The mature trees are also widely scattered. The ground is fully covered with humus and grasses. The soil is deep, loamy and capable of producing high quality timber. 150 coupes in 15 Felling Series are allotted in this W.C.

Coupe No	No. of Coupe	Area Ha
I	15	2467.900
II	15	2405.200
III	15	2532.800
IV	15	2500.700
V	15	2405.000
VI	15	2353.990
VII	15	2298.360
VIII	15	2604.400
IX	15	2490.300
X	15	2365.100
TOTAL :-	150	24423.750

**The details of coupes worked under SCI working circle are as under
(Area in Ha.)**

C. No.	Year of felling	Total Coups	Total area	Fell ed cou pes	Area of felled coupe	No. of Trees marked	No. of Trees felled	Production		Production / Ha.	
								Timber C.mt.	Fuel Beat Nos.	Timber C.mt.	Fuel Beat Nos.
I	2005-06	15	2467.900	15	1712.310	33106	33106	5501.422	7264	3.212	4.24
II	2006-07	15	2405.200	15	1612.462	23478	23478	3241.039	4607	2.009	2.85
III	2007-08	15	2532.800	15	1808.900	26837	26837	6798.858	8701	3.750	4.81
IV	2008-09	15	2500.700	10	1317.540	20374	20374	3721.651	8225	2.824	6.24
V	2009-10	15	2405.000	6	749.710	34571	34571	2161.000	15870	2.880	28.86
VI	2010-11	15	2353.990	3	478.840	23173	23173	2307.60	12235	5.000	25.55
VII	2011-12	15	2298.360	5	718.145	28553	19685	3356.385	10514	2.557	10.63
VIII	2012-13	15	2375.000	7	630.200	32544	3628	451.171	2525	0.716	4.01
IX	2013-14	15	2365.100	8	1110.650	14756	14756	1157.354	3507	1.042	3.158
X	2014-15	15	2365.100	8	445.350	10169	10169	1155.324	3519	2.594	7.90
Total		150	24069.150	92	10584.107	247561	209777	29851.804	76955	24.826	91.08

Table below shows increase in fuel beats due to more fuel trees of Garari, Lendia, Khair and Ghoti felled in following coupes.

Coupe. No.	Year of felling	Total Coups	Total No. of fuel Trees	Species				
				Garari	Lendia	Khair	Ghoti	Other
V	2009-10	6	29333	14790	214	1547	1223	11559
VI	2010-11	3	19362	7347	946	1197	686	9186
VII	2011-12	5	19436	7523	1675	1753	1859	6626

The status of regeneration as per the sample plot laid out is as follows.

Range	WC.	Comp . No.	Coupe No.	Year of working	No. of sample plots laid	Size of each sample plot	No. of seedlings per Ha. Intieint	No. of tress above 1 metars hight	Remarks
							< 1M	> 1M	
Ballar sha	SCI	440	I	2005-06	1	50X50 M	745	56	Worked plot
					1	50X50 M	516	2	Control Plot
		489	I	2005-06	1	50X50 M	357	77	Worked plot
					1	50X50 M	101	10	Control Plot
		440	II	2006-07	1	50 x 50 M	1203	51	Worked plot
					1	50 x 50 M	757	2	Control Plot
		490	III	2007-08	1	50 x 50 M	283	38	Worked plot
					1	50 x 50 M	216	8	Control Plot
		453	IV	2008-09	1	50 x 50 M	844	106	Worked

								plot
				1	50 x 50 M	458	97	Control Plot
	454	V	2009-10	1	50 x 50 M	1244	280	Worked plot
				1	50 x 50 M	863	77	Control Plot
	493	V	2009-10	1	50 x 50 M	176	201	Worked plot
				1	50 x 50 M	166	90	Control Plot
	500	VI	2010-11	1	50 x 50 M	576	220	Worked plot
				1	50 x 50 M	392	127	Control Plot

From the above it is indicative that worked area supports better regeneration than un-worked area.

CRITERIA FOR ALLOTMENT OF AREAS IN SCI WORKING CIRCLE:

- I. Areas having more silviculturally mature trees are proposed to be included in SCI. Areas with all aged class trees with good regeneration are preferably included in this.
- II. Areas having density of more than 0.5 are proposed to be included in SCI.
- III. Areas capable of producing big and small sized timber, poles and firewood on sustained basis by way of improvement operation to meet the local requirement to the possible extent and ensure the sustained yield of aforesaid produce together with large sized timber in future.

ASSESSMENT OF S.C.I.WORKING CIRCLE:

The observations on working of this working circle are as under

- I. The status of natural regeneration has improved as can be seen from the data of sample plots.
- II. The hygienic condition of forest area has improved to some extent because of operations like climber cutting, removal of dead, dying and diseased trees.
- III. The congestion due to growth of inferior species like garadi, lendia etc has been eased out which has resulted in improvement of general condition of forests.
- IV. CBO works and adequate regeneration works where carried out has also helped in improving the coupe area.
- V. Harvesting works could not be carried out in 58 coupes out of 150 coupes (about 38.67%) because of unsuitability of sites.

5.6.8: IMPROVEMENT WORKING CIRCLE:

Forests allotted are generally degraded. Prime object of management is to prepare crop to be managed under SCI in future. Special objects are to improve the crop, to check soil erosion and restore the quality & density of forests.

- I. Demarcation of coupe and marking is done one year in advance.

- II. Afforestation activities are taken up in the coupe where the density of forest crop is less than 0.4.
- III. SMC works are also taken up in the year of marking of coupes.
- IV. Cutting back operation is done in the following year of the main felling.
- V. Cleaning operation is carried out during the 3rd and the 5th year of main felling in D type area.

The working cycle has been fixed at 20 year. Since it is intended to restore to improvement felling only, no regular yield has been fixed. Marking rules are envisaged to remove the trees above exploitable girth as prescribed in SCI and those trees not only likely to survive till next felling cycle. Marking will also be a thinning marking and congested poles will be removed to provide space for other trees to grow.

5.6.9: RESULTS OF IMPROVEMENT WORKING CIRCLE:

The crop consists mainly of Ain, Salai, Dhawada, Movai, Hirda, Behada etc. Teak occurs in patches, Density varies from 0.4 to 0.6. The crop is generally young to middle aged. The area in general supports the poor coppice crop of stunted teak trees which are largely malformed and crooked. Since it is intended to restore to improvement felling only, no regular yield has been fixed.

Area is divided in 6 felling series.

Yield obtained from felling in the IWC coupes is as under (Area in Ha.)

C. No.	Year of felling	Total Coupes	Total area	Felled coupes	Area of felled coupe	No. of Trees marked	No. of Trees felled	Production		Production / Ha.	
								Timber C.mt.	Fuel Beat Nos.	Timber C.mt.	Fuel Beat Nos.
I	2005-06	6	700.300	6	503.500	2386	2386	33.693	219.5	0.067	0.436
II	2006-07	6	724.900	5	436.76	2318	2318	35.723	384	0.082	0.880
III	2007.08	6	624.500	5	467.86	939	939	20.567	173.5	0.044	0.371
IV	2008.09	6	598.500	5	325.100	1443	1443	55.019	633	0.056	0.249
V	2009.10	6	532.300	1	54.05	5018	5018	49.000	520	0.573	9.250
VI	2010.11	6	543.300	1	55.65	1250	1250	157.707	820	2.834	14.734
VII	2011.12	5	511.600	1	80.400	960	960	77.440	478	0.963	6.131
VIII	2012-13	6	681.000	1	98.400	1814	1297	184.477	629	1.874	6.392
IX	2013-14	6	677.000	2	196.40	2455	2455	247.577	620	1.260	3.156
x	2014-15	6	677.700	3	109.500	376	376	38.947	95	0.355	0.86
Total		59	6271.100	30	2327.620	18583	18442	900.15	4572	4.954	32.911

CRITERIA FOR ALLOTMENT OF AREAS IN IWC WORKING CIRCLE:

The forests allotted to this working circle are degraded in quality. Due to various adverse factors forests are not in a normal stage. At present crop is generally young to middle aged. The prime object of management will be to

prepare crop so as to be managed under SCI in future. The special objects for management of these forests are.

- I. Areas having density of crop between 0.4 to 0.5 are proposed to be included in IWC
- II. Areas capable of undergoing improvement in the crop and bring normalcy as soon as possible.
- III. Where there is scope to restore the quality and density of the forests.

ASSESSMENT:

The observations on working of areas under this working circle are as under.

- I. The natural regeneration got fill up because of removal of over mature trees and thinning out of congested areas.
- II. The hygienic condition of forest area has improved to some extent because of operations like climber cutting, removal of dead, dying and diseased trees.
- III. Works such as cutting back operations and cleaning were carried out as per the prescription during the past 9 yrs. This has helped improve the site condition.
- IV. Harvesting works could not be carried out in 29 coupes out of 59 targeted coupes (about 49.15 %) as the areas were found to be unsuitable for working.

5.6.10: AFFORESTATION WORKING CIRCLE:

All protected forest areas which have not been planted or having unsuccessful plantations, area under Miscellaneous Working Circle of previous plans and areas taken as zudpi jungle for compensatory afforestation are taken in to this working circle. Areas are degraded due to heavy grazing, illicit cutting and fire. The main objective is to reclaim the area with SMC and afforestation works, to enhance productivity through planting of indigenous species of small timber, firewood and fodder.

- I. Demarcation of coupe and marking is done one year in advance.
- II. Afforestation activities are taken up in the coupe where the density of forest crop is less than 0.4 to 0.5.
- III. Choice of species will depend on soil type, depth, drainage and local requirements.
- IV. Indigenous species of small timber, firewood and fodder are preferred.
- V. SMC works are also taken up in the year of marking of coupes.
- VI. Cutting back operation is done in the following year of the main felling.
- VII. Bamboo planting is done in the 4th year of the main felling.
- VIII. Cleaning operation is carried in the 6th year of main felling.

These areas have been degraded due to heavy grazing illicit cutting and fire. Keeping in view these factors, special objects of management for this area will as follows:

- I. To reclaim the areas by intensive soil and moisture conservation and afforestation works and to enhance the productivity through planting indigenous species of small timber, fire wood and fodder value to meet the local demand.
- II. To involve the local people in afforestation works under the scheme of people's participation in forest management.
- III. To meet the demand of local people for small timber, firewood and fodder to the maximum possible extent.

5.6.11: RESULTS OF AFFORESTATION WORKING CIRCLE:

The forest included in this working circle is mostly Protected Forest consisting of miscellaneous species. Due to heavy biotic pressure like grazing and illicit cutting for fire wood, the crop has been reduced to scrubby growth. The status of natural regeneration is very poor. The heavy pressure of grazing has resulted in compaction and erosion of soil. Due to this many patches have become almost blank.

The details of coupes worked under AWC working circle are as under.

(Area in Ha.)

Coupe No.	Year of felling	Total Coupes	Total :- area	Felled coupes	Area of felled coupe	No. of trees marked	No. of Trees felled	Production		Production / Ha.	
								Timber C.mt.	Fuel Beat Nos.	Timber C.mt.	Fuel Beat Nos.
I	2004-05	6	726.300	3	257.000	1270	1270	25.569	227	0.099	0.883
II	2005-06	7	823.800	5	545.700	1922	1922	62.504	665	0.115	1.219
III	2006-07	7	787.600	4	338.400	226	226	18.073	59.5	0.053	0.176
IV	2007-08	7	739.800	5	352.700	269	269	151.996	440	0.431	1.248
V	2008-09	7	741.300	4	205.000	516	516	166.860	528	0.814	2.576
VI	2009-10	7	724.400	2	107.200	167	167	43.000	158	0.401	1.474
VII	2010-11	7	725.400	2	97.200	681	681	192.086	792	1.976	8.149
VIII	2011-12	7	888.100	2	114.000	1114	1114	147.675	831	1.295	7.289
IX	2012-13	7	806.500	Funde not available hence no work							
X	2013-14	7	813.800	Funde not available hence no work							
Total		69	7776.500	27	2017.2	6165	6165	807.763	3700.5	5.184	23.014

ASSESSMENT:

- I. SMC works on 624.050 ha. were carried out as per the prescription during the past 10 yrs. This has helped to improve the site condition as well as soil erosion has been brought under control to some extent.

- II.** Natural Regeneration works on 198 ha., Cleaning works on 658.35 ha. & Artificial Regeneration works on 751 ha. were carried out during the past.

5.6.12 FODDER WORKING CIRCLE :

Includes area located adjoining to villages. Mostly denuded & under stocked due to heavy grazing. Compactness of soil has resulted in failure of regeneration of timber species.

The Objectives and prescriptions are –

- I. To improve the quality & quantity of fodder by introducing better varieties.
- II. To meet local demand for fodder & thereby reduce grazing pressure on forest land.
- III. Demarcation of coupe and preparation of map is done each year.
- IV. Grass seed sowing is taken up in the coupe where the density of forest crop is less than 0.4.
- V. SMC works are also taken up in the year of demarcation of coupes.

One coupe from each fodder series will be taken up each year for special improvement operation and will remain close to grazing for a period of two years. Thus, in the first year coupes “A” will remain close to grazing while coupes B to F will remain open for grazing. In the second year coupes A and B will remain close to grazing and coupes C to F will remain open to grazing. In the third year coupes A and D to F will remain open to grazing while coupes B & C will be closed to grazing. In the fourth year coupes A,B,E, & F will remain open to grazing while coupes C & D will remain closed to grazing. In this way after every six years the cycle will be repeated.

5.6.13 RESULTS OF FODDER WORKING CIRCLE:

The forest included in this working circle is mostly denuded. Planting of fodder yielding tree species and broadcasting of grass seed was undertaken.

The details of coupes worked under FWC working circle are as under.
(Area in Ha.)

Sec No.	Year of felling	Total Coupes	Total area	Felled coupes	Area of felled coupe	No. of trees marked	No. of Trees felled	Production		Production / Ha.	
								Timber C.mt.	Fuel Beat Nos.	Timber C.mt.	Fuel Beat Nos.
A	2004-05	11	3660.000	3	949.600	282	282	30.977	137	0.033	0.144
B	2005-06	11	3364.400	4	1378.800	274	274	23.398	129	0.017	0.094
C	2006-07	11	3511.600	7	946.660	331	331	1.761	41	0.002	0.043
D	2007-08	11	3890.000	2	564.500	22	22	0.585	16	0.001	0.028
E	2008-09	11	3382.600	3	647.500	22	22	0	7	0	0.011
F	2009-10	11	3727.260	2	731.700	37	37	1.375	22	0.002	0.030

A	2010-11	11	3662.500	2	702.200	62	62	1.555	28.5	0.002	0.041
B	2011-12	11	3384.400	3	541.200	60	60	0	21	0	0.039
C	2012-13	11	3511.700	Fund not available hence no work							
D	2013-14	11	3890.000	Fund not available hence no work							
E	2014-15	11	3382.600	Fund not available hence no work							
Total		121	39367.060	26	6462.16	1090	1090	59.651	401.5	0.057	0.430

ASSESSMENT:

- I. SMC works on 4388.300 ha. were carried out as per the prescription during the past 10 yrs. This has helped to improve the site condition as well as soil erosion has been brought under control to some extent.
- II. Natural regeneration works on 1377 ha., Artificial Regeneration works on 480 ha.(Av.survival % is 54.52) and SMC works on 4388.300 ha were carried out during the past 10 years.
- III. Instead of broadcasting of grass seed, planting of tussocks on furrows is likely to give better results.

5.6.14. TEAK PLANTATION WORKING CIRCLE:

Most of the teak plantations are successful. The main objective of teak plantations in Conversion W.C.was to have teak crop with growth parameters comparable to those in the yield table.

- I. Demarcation - The thinning area should be properly demarcated.
- II. Thinning in plantation areas is carried out at 10th year, second thinning in 15th year and subsequent thinning will be at an interval of 10th year as per yield table /stand table of teak. The first thinning should be carried out mechanically to provide space on purely silvicultural considerations. The subsequent thinning will be executed so that normalcy condition is achieved in the long run.
- III. Cleaning operation is carried out in all types I, II and III areas.
- IV. Cleaning operation will be carried out in next year after thinning & in the 5th year.

5.6.15 RESULTS OF OLD TEAK PLANTATION WORKING CIRCLE :

This Working Circle comprises old teak plantations areas scattered in all seven Ranges. Teak plantations were taken largely in Conversion Working Circle in previous plans. Besides, some plantations of teak were also taken under different schemes in the past on suitable areas. There is some admixture of miscellaneous species along with teak. It also includes the areas where teak has been planted on the blank areas. The working circle has been created as such areas require a different management practices. The area included in this working circle is not in consolidated blocks but rather in scattered patches, spread over in all seven Ranges.

Under this working circle prescribed thinning works were completed in the following old teak plantation sites.

**Yield from worked coupes in TPWC is as under.
(Area in Ha.)**

Year of felling	No. of Sites	Area	Felled Sites	Area in (Ha.)	Area of felled Sites	No. of Trees marked for felling	No. of Trees felled	Production of material		Production Ha.	
								Timber (Cmt.)	Fuel Beat (No.)	Timber	Fuel beat (No.)
2004.05	36	1163.897	28	1163.897	1139.897	40263	40263	337.476	1574	0.296	1.381
2005.06	35	954.607	18	954.607	593.743	23246	23246	161.802	169	0.273	0.285
2006.07	28	573.888	22	573.888	464.768	33230	33230	414.634	587	0.892	1.264
2007.08	65	1480.809	27	1480.809	409.710	45895	45895	966.810	1375	2.360	3.356
2008.09	31	628.174	18	628.174	282.890	28919	28919	432.098	613	1.527	2.169
2009.10	54	1247.048	28	1247.048	297.855	18045	18045	483.000	562	1.622	1.887
2010-11	36	1054.274	18	1054.274	492.980	47362	47362	1533.272	2754	3.110	5.586
2011-12	47	1097.750	16	1097.750	135.000	9971	9971	104.470	58.5	0.774	0.433
2012-13	12	1188.62	12	284.95	284.95	32354	24237	518.185	1393	1.818	4.902
2013-14	36	1018.45	18	552.00	552.00	322354	28685	735.857	1772	1.333	3.101
2014-15	43	1362.00	32	965.670	965.670	14871	14871	842.887	1521	0.873	2.75
Total	423	11769.52	237	10003.067	5619.463	616510	314724	6530.491	12379	11.727	19.111

ASSESSMENT:

- I. There is gradual shift in the number of stems in higher girth class. This indicates incremental growth on selected retained stems.

5.6.16 BAMBOO (OVERLAPPING) WORKING CIRCLE:

Includes all areas where bamboo is present in workable quantity. The main objectives are

- I. To harvest bamboo scientifically so as to get optimum sustained annual yield.
- II. To meet nistar demand of local people and commercial demand of industries.

In Central Chanda Forest Division there is Total 11 cutting series and the areas are divided into 3 coupes. viz. A, B and C and one of the coupes from each cutting series is worked annually. Out of 11 felling series, 3 are commercial bamboo felling series and 8 are nistar bamboo felling series. Majority of the bamboo areas are worked by BILT.

Main prescriptions for working of bamboo coupes are as under -

- I. Demarcation of bamboo coupe will be carried in the year of its felling.

- II. Sample plots should be laid for estimation of yield from the coupes.
- III. Felling is permitted from October to May. Felling rules are adhered for exploitation of bamboo.
- IV. Coupes are rigidly protected from fire by taking up fire protection measures.

5.6.17 RESULTS OF BAMBOO (OVERLAPPING) WORKING CIRCLE:

This working circle extends over the entire Central Chanda Forest Division. The Total area of the working circle is 43542.648 Ha. However, Actual bamboo working area is 20553.481. There are 11 felling series. The common variety of bamboo occurring in this Division is *Dendrocalamus strictus*. It generally forms an under story all over the Division. The bamboo has gregariously flowered in 1982. Strict protection measures led to profuse regeneration which has resulted in congestion. Owing to this culm formation has been affected.

Details of bamboo coupes worked under BOWC during the year 2004 -05 to 2014-15 are as under.

Coupe No.	Year of felling	No. of Coupes	Total Area	Bamboo Area	Agency	No. of Coupe	Area	Bamboo Area	Production	
									Bamboo bundles	Long bamboo
B	2004-05	11	15616.47	7199.210	BILT	3	4073.959	3912.894	188020	0
					Dep'tt.	0	0	0	0	0
					Contractor	0	0	0	0	0
					Total :-	3	4073.959	3912.894	188020	0
C	2005-06	11	11604.030	6422.423	BILT	3	4143.954	4025.829	181717	0
					Dep'tt.	0	0	0	0	0
					Contractor	0	0	0	0	0
					Total :-	3	4143.954	4025.829	181717	0
A	2006-07	11	16053.41	6901.850	BILT	3	3966.724	3799.183	421055	11000
					Dep'tt.	0	0	0	0	0
					Contractor	5	6300.722	1565.606	21991	146610
					Total :-	8	10267.446	5364.789	443046	157610
B	2007-08	11	15616.47	7199.210	BILT	3	4073.959	3912.894	116585	0
					Dep'tt.	0	0	0	0	0
					Contractor	5	4456.387	1495.948	38533	7448
					Total :-	8	8530.346	5378.842	155118	7448
C	2008-09	11	11604.03	6422.423	BILT	0	0	0	0	0
					Dep'tt.	0	0	0	0	0
					Contractor	5	3359.396	1168.227	30299	94120
					Total :-	5	3359.396	1168.227	30299	94120
A	2009-10	11	16053.41	6901.850	BILT	3	3966.724	3799.183	57933	0
					Dep'tt.	3	5785.964	1537.061	61125	240488

					Contractor	5	6300.722	1565.606	88300	186440
					Total :-	11	16053.410	6901.850	207358	426928
B	2010-11	11	15616.47	7199.210	BILT	3	4073.959	3912.894	24563	0
					Deptt.	0	0	0	0	0
					Contractor	5	4456.387	1495.968	35738	165590
					Total :-	8	8530.346	5408.862	60301	165590
C	2011-12	11	11604.03	6422.423	BILT	3	4143.954	4025.829	183794	0
					Deptt.	5	3250.905	1138.685	29236	177945
					Contractor	0	3359.396	1168.227	0	0
					Total :-	8	10754.255	6332.741	213030	177945
A	2012-13	11	16053.41	6901.850	BILT	2	3042.43	3042.43	496500	0
					Deptt.	6	5344.017	1281.432	82470	275485
					Contractor	0	0	0	0	0
					Total :-	8	8386.45	4323.86	578970	275485
B	2013-14	11	15616.47	7199.210	BILT	3	3298.582	3298.582	476013	0
					Deptt.	5	4456.387	1495.948	71262	170580
					Contractor	0	0	0	0	0
					Total :-	8	7754.97	4794.53	547275	170580
					BILT	0	0	0	0	0
C	2014-15	11	11604.03		Deptt.	1	175.179	175.179	30000	150000
					Contractor	0	0	0	0	0
Total :-						1	175.179	175.179	30000	150000
Grand Total :-							82029.709	47787.60	2635134	1625706

ASSESSMENT :

- I. The harvesting operations have produced 16.25 lakh long bamboo and 26.05 lakh bamboo bundles which have catered to the demand of local population to a great extent.
- II. It has been observed that in the past there was a profuse regeneration of bamboo in the forests and proper silvicultural operations were not carried out to reduce the density of the bamboo clumps and as a result of which lot of congestion has taken place as compared to normal bamboo forests.

5.6.18 NON WOOD FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE:

This is an overlapping working circle covering the entire area of the Division.

Main objectives are -

- I. To manage the NTFP scientifically to utilize the existing potential optimally.
- II. To enhance its productivity.
- III. To take measures for its sustained yield.

IV. To generate employment.

V. Important NTFP species of the tract are Tendu leaves, Moha flower, Moha seed, Hirda, Behda, Awala, Amaltas seed, Biba, Rohan flower, gums etc. and the same are collected by the inhabitants of the forest areas.

5.6.19 RESULTS OF NON TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE:

The NTFP collected through TDC, Tendu licensee and other contractors is as follows.

Year	MFP	
	Moha Flower (Qt.)	Tendu Leaves (Std. Bgs.)
2004-05	160	44700
2005-06	160.26	44700
2006-07	874.80	44000
2007-08	1701.08	44000
2008-09	0.32	44000
2009-10	0	44000
2010-11	3.888	43100
2011-12	0	43100
2012-13	0	38400
2013-14	0	39000
2014-15	0	38700

Tendu and Bamboo contribute sizeable revenue to the State exchequer and also generate employment for local people during their lean season. The objective in this working circle is partly achieved because other Non Timber Forest Produces available in this tract could not be fully tapped in spite of their increasing market value.

ASSESSMENT:

- I. The objective in this working circle is partly achieved because other Non Timber Forest Produces available in this tract could not be fully tapped in spite of their increasing market value.
- II. Systematic documentation of all NTFP needs to be done.

5.6.20 WILDLIFE (OVERLAPPING) WORKING CIRCLE:

This is an overlapping working circle covering entire area of the Division. The Total area included in this working circle is 1,14,309.4 hectares. The nature of crop covered under the working circle has already been discussed. The major prescriptions include creation of waterholes and habitat development measures for maintenance of viable population of wildlife.

5.6.21 RESULTS OF WILDLIFE (OVERLAPPING) WORKING CIRCLE:

Central Chanda Forest Division is rich in wild life and bio-diversity. During census carried out in summer 2015 presence of tiger was noticed in 18 beats. Herbivores like spotted deer, sambar, and wild boar are present in sizeable number.

The estimated wildlife population as per 2015 census is as under.

Sr.	Name of Wild	Nos.	Sr.	Name of Wild animal	Nos.
1	Tiger	14	10	Rabbit	6
2	Wild Pig	517	11	Cheetal	481
3	Moneky	420	12	Ghorpad	1
4	Sambar	33	13	Bear	7
5	Nilgai	33	14	Bison	5
6	Barking deer	40	15	Bhedki	8
7	Peacock	25	16	Wild Dog	15
8	Wild Hen	15	17	Sayal	2
9	Wild Cat	4	18	Fox	1

MAJOR ISSUES IN MANAGEMENT OF WILDLIFE

- I. **MAN-ANIMAL CONFLICT** - Out of Total:- 411 villages, 265 villages are adjoining to Forests of Central Chanda Division. Hence, the incidence of wildlife attacks on human as well as cattle is more in this tract.

The extent of man-animal conflict can be gauged from the number of incidences in which compensation was given.

The details are given in the following table

Year	Incidence			
	Human Death	Human Injury	Cattle Kill	Crop Damage
2007-08	2	26	157	709
2008-09	5	31	80	534
2009-10	0	39	103	686
2010-11	2	64	282	770
2011-12	0	35	212	809
2012-13	0	14	143	927
2013-14	1	33	200	2019
2014-15	5	23	146	1338

II. HABITAT DEVELOPMENT:

WATERHOLE DEVELOPMENT- Central Chanda Division has good spread of waterholes as can be seen from the table below. Efforts are underway through different plan schemes to further development of waterholes in the tract.

Range	Perennial	Seasonal
Ballarshah	18	10
Kothari	25	25
Dhaba	16	16
Rajura	09	13
Wirur	09	09
Wansadi	13	13
Jioti	4	1
Total	94	78

SECTION: 5.7 PAST YIELD : The annual out-turn of timber, poles, firewood, bamboo and minor forest produce for last 10 years have been given in **Appendix No. IX** of Volume II.

SECTION: 5.8 PAST REVENUE AND EXPENDITURE: The statement showing revenue and expenditure of last 10 years have been given in **Appendix No. X** of Volume II.

====00=====

CHAPTER – VI

STATISTICS OF GROWTH AND YIELD

SECTION:6. 1 : STATISTICS OF RATE OF GROWTH OF TEAK AND MISCELLANEOUS SPECIES :

No study has been conducted with regard to the growth either of teak or miscellaneous species in this tract and therefore, statistics of previous plan is reproduced below.

6.1.1.GROWTH OF TEAK :

6.1.1. During the preparation of last plan stem analysis of 6 teak trees from Watrana forests were carried out by the team of working plan division Yavatmal in the year 2001-02. The data so collected were computed site quality wise and are given in **Appendix No. XXIV** of Volume II.

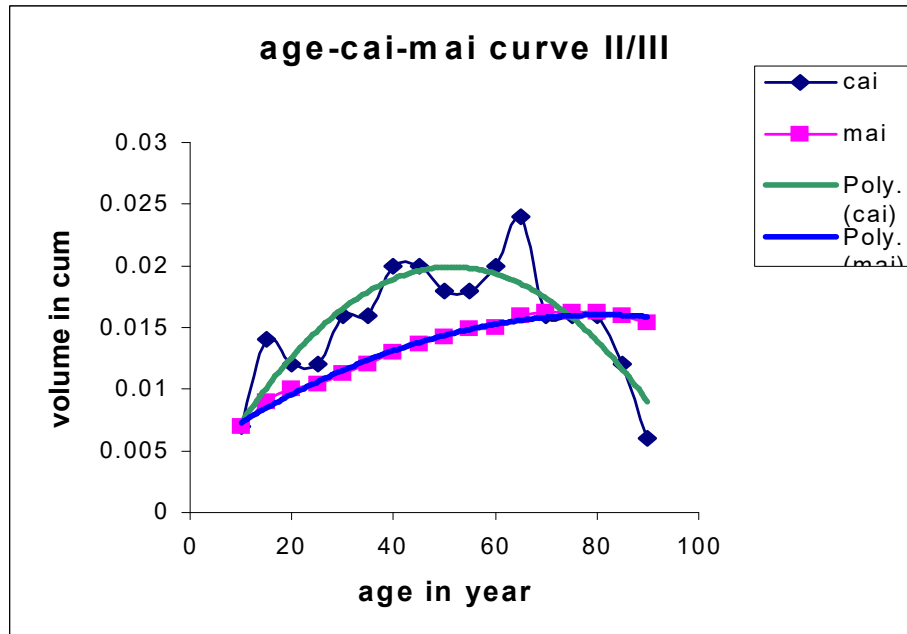
6.1.2. Data for DBH(OB), GBH(OB), Height, Volume, Current Annual Increment and Mean Annual Increment computed for Teak Site Quality II/III are produced here as follows:

Age in years	D.B.H.O. B. in cms.	G.B.H.O.B. in cms.	Ht. In Mtrs.	Volume cum	CAI Cmt/tree	MAI Cmt/tree
10	13.6	42.8	6.5	0.070	0.007	0.007
15	17.1	53.8	10.2	0.120	0.014	0.009
20	20.4	64.2	13.8	0.205	0.012	0.010
25	23.6	74.1	15.8	0.291	0.012	0.0104
30	26.5	83.4	17.8	0.340	0.016	0.0113
35	29.3	92.2	19.1	0.463	0.016	0.0120
40	31.9	100.4	20.4	0.520	0.02	0.0130
45	34.4	108.1	21.5	0.637	0.02	0.0137
50	36.6	115.1	22.6	0.710	0.018	0.0142
55	38.7	121.7	23.1	0.813	0.018	0.0149
60	40.6	127.7	24.5	0.920	0.02	0.0150
65	42.4	133.1	25.6	0.991	0.024	0.0160
70	43.9	138.0	26.7	1.140	0.020	0.0163
75	45.3	142.3	27.3	1.220	0.016	0.0163
80	46.5	146.1	28	1.300	0.016	0.0163
85	47.5	149.3	28.7	1.352	0.012	0.0160
90	48.3	151.9	29.4	1.390	0.006	0.0154

cai and mai curve for II/III intersect each other at the age of 75 year and average volume per tree is 1.22 cubic metre which corresponds mean and

current annual increment to 0.016 cubic metre per year and girth at breast height 142.3 centimetre.

6.1.3. CURVE FOR CAI AND MAI AGAINST AGE

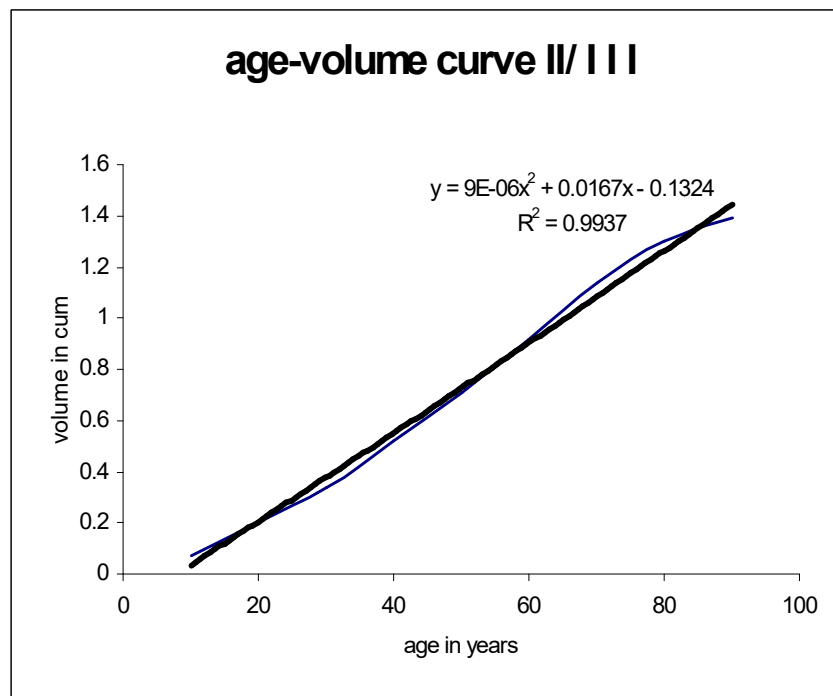


6.1.4. AGE- HEIGHT FOR TEAK SITE QUALITY II/III IS GIVEN BELOW AS FOLLOWS:

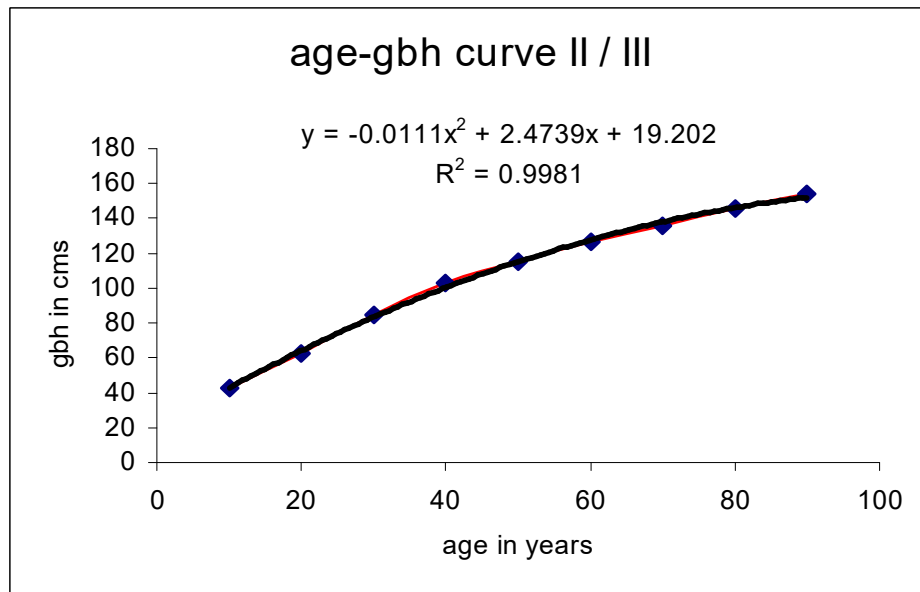
AGE-HEIGHT CURVE (SITE QUALITY II/III) :



AGE-VOLUME CURVE (SITE QUALITY II/III) :



6.1.6. AGE-GBH CURVE (SITE QUALITY II/III) :

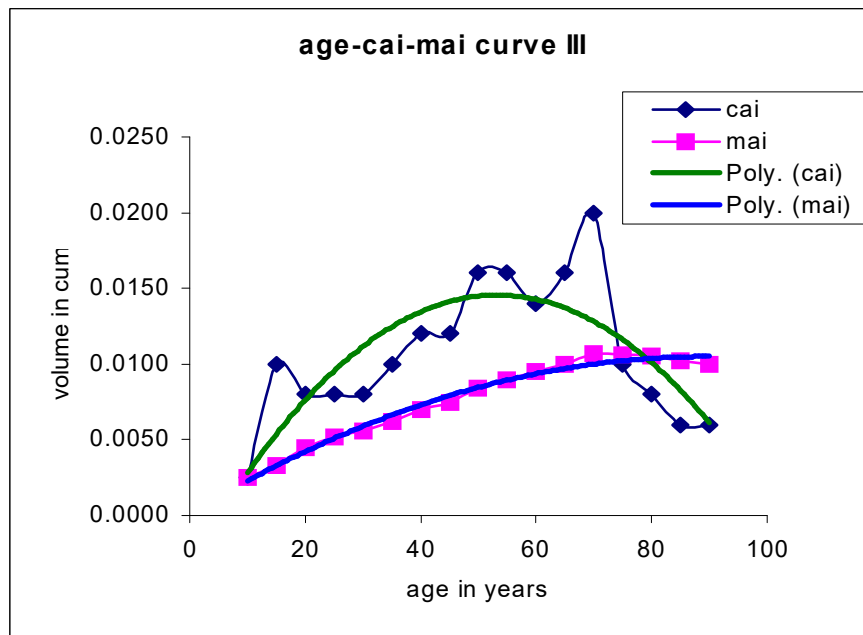


6.1.7. Data for DBH(OB), GBH(OB), Height, Volume, Current Annual Increment and Mean Annual Increment computed for **Teak Site Quality III** are produced here as follows:

TEAK SITE QUALITY III

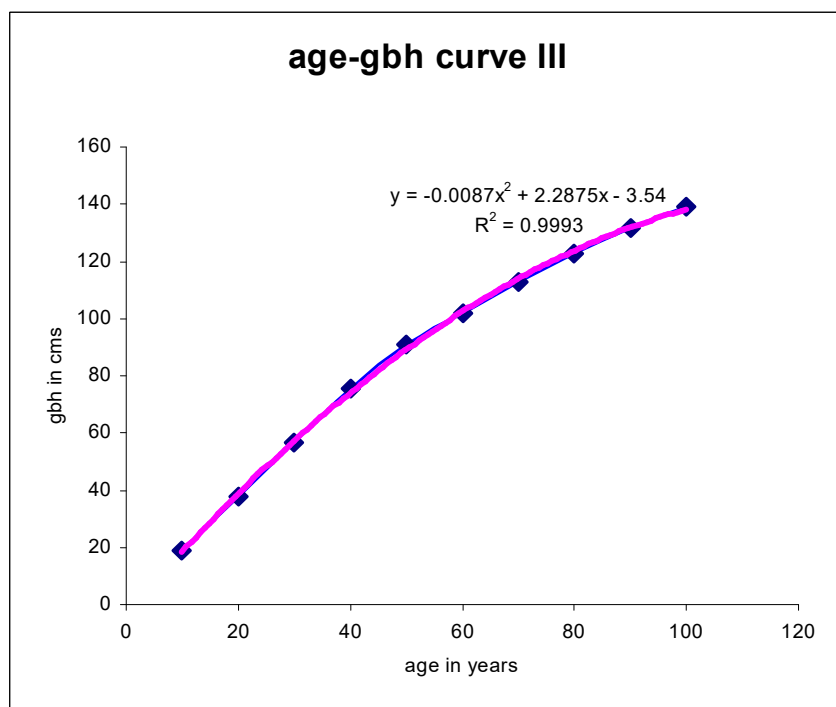
Age in years	D.B.H.O .B. in cms.	G.B.H.O.B . in cms.	Ht. In Mtrs.	Volume cum	CAI Cmt/tr ee	MAI Cmt/tr ee
1	2	3	4	5	6	7
10	6.0	18.8	5.4	0.025	0.0025	0.0025
15	8.8	27.8	7.0	0.050	0.0100	0.0033
20	12.0	37.7	9.4	0.090	0.0080	0.0045
25	14.3	44.8	10.8	0.130	0.0080	0.0052
30	18.0	56.5	12.2	0.168	0.0080	0.0056
35	21.3	67.0	13.2	0.217	0.0100	0.0062
40	24.0	75.4	14.2	0.280	0.0120	0.0070
45	26.3	82.8	15.4	0.338	0.0120	0.0075
50	29.0	91.0	16.5	0.420	0.0160	0.0084
55	30.7	96.5	17.2	0.495	0.0160	0.0090
60	32.5	102.0	18.0	0.570	0.0140	0.0095
65	34.2	107.5	18.8	0.650	0.0160	0.0100
70	36.0	113.0	19.6	0.749	0.0200	0.0107
75	37.5	117.9	20.3	0.795	0.0100	0.0106
80	39.0	122.5	21.0	0.840	0.0080	0.0105
85	41.6	130.8	21.6	0.867	0.0060	0.0102
90	44.3	139.1	22.5	0.900	0.0060	0.0100

6.1.8 CAI and MAI curve for III intersect each other at the age of 71 year and average volume per tree is 0.80 cubic metre which corresponds mean and

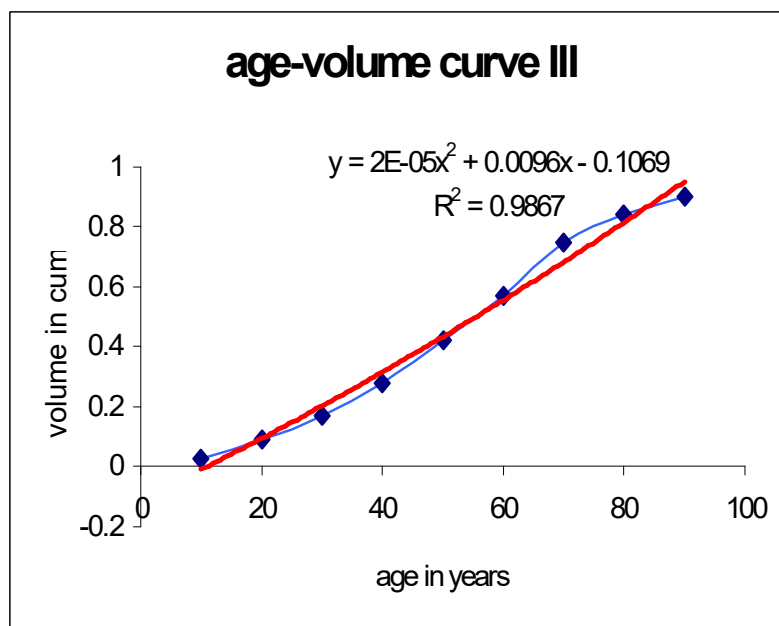


current annual increment to 0.0106 cubic metre per year and gbh 122 centimetre.

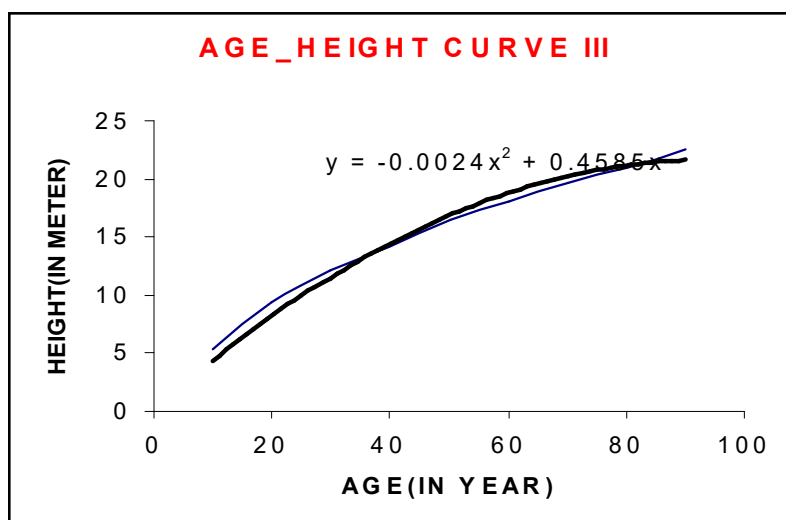
6.1.9. AGE-GBH(OB) CURVE (SITE QUALITY III):-



6.1.10. AGE-VOLUME CURVE (SITE QUALITY III) :



6.1.11. AGE HEIGHT CURVE (SITE QUALITY III)



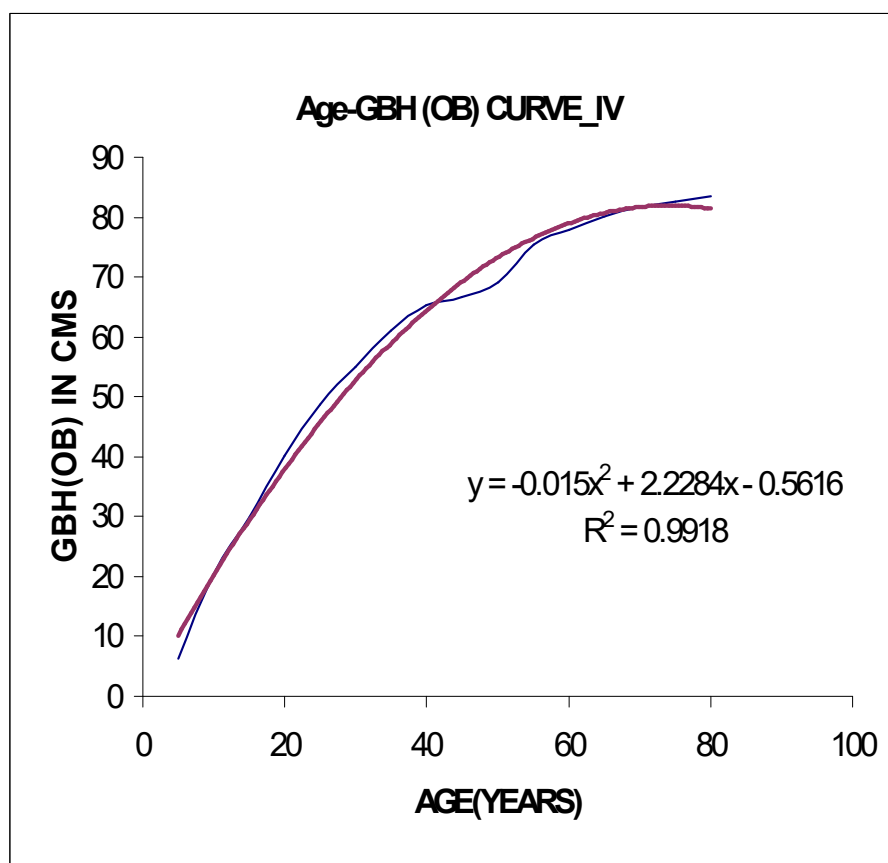
During the preparation of working plan of Pandharkawada Forest Division stump/stem analysis had been carried out by the DCF WP Yavatmal during 1999-2000. 10 Trees each from III/IV and IV of all India Teak Site Qualities were selected from Parwa, Umari and Pandharkawada Ranges and analysed. It is seen that CAI and MAI curves for III/IV and IV teak site qualities cut in the 75th and 50th years, which correspond to 98.9 cms and 73 cms g.b.h.(o.b.) with

corresponding current annual increments (c.a.i.) 0.0072 cubic meter/year and 0.0053 cubic meter/year respectively.

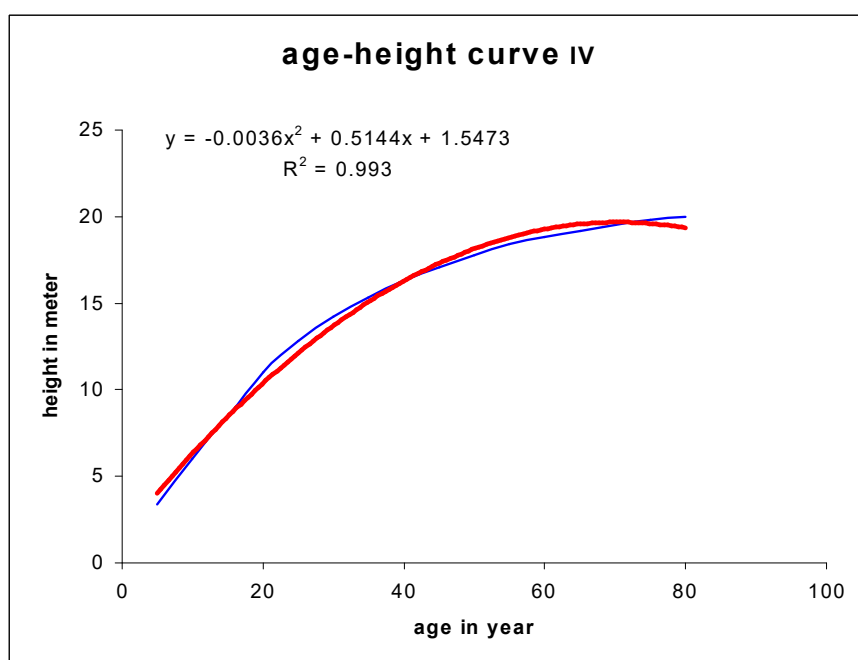
Teak Site Quality IV

Age in years	D.B.H.O. B. in cms.	G.B.H.O.B. in cms.	Ht. In Mtrs.	Volume cum	MAI Cmt/tre e	CAI Cmt/tre e
5	02.0	006.3	03.4	0.0090	0.0018	0.0018
10	06.5	020.4	06.0	0.0300	0.003	0.006
15	09.5	029.8	08.5	0.0540	0.0036	0.0108
20	12.8	040.2	11.0	0.0840	0.0042	0.0168
25	15.5	048.7	12.8	0.1125	0.0045	0.0225
30	17.5	055.0	14.2	0.1410	0.0047	0.0282
35	19.4	061.0	15.3	0.1785	0.0051	0.0357
40	20.8	065.3	16.3	0.2080	0.0052	0.0416
45	21.2	066.6	17.1	0.2385	0.0053	0.0477
50	23.2	069.1	17.8	0.2650	0.0053	0.053
55	24.0	075.4	18.4	0.2915	0.0053	0.0583
60	24.8	077.9	18.8	0.312	0.0052	0.0624
65	25.5	080.1	19.2	0.3315	0.0051	0.0663
70	26.0	081.6	19.5	0.3360	0.0048	0.0672
75	26.3	082.6	19.8	0.3375	0.0045	0.0675
80	26.6	083.5	20.0	0.3380	0.0042	0.0672

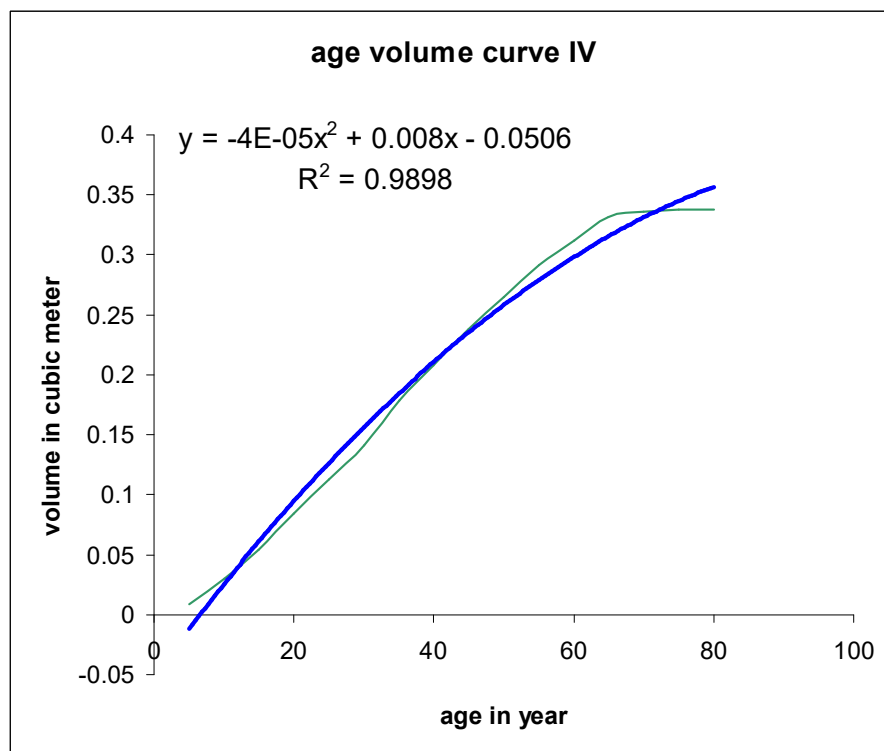
6.1.12. AGE-GBH CURVE FOR TEAK SITE QUALITY IV



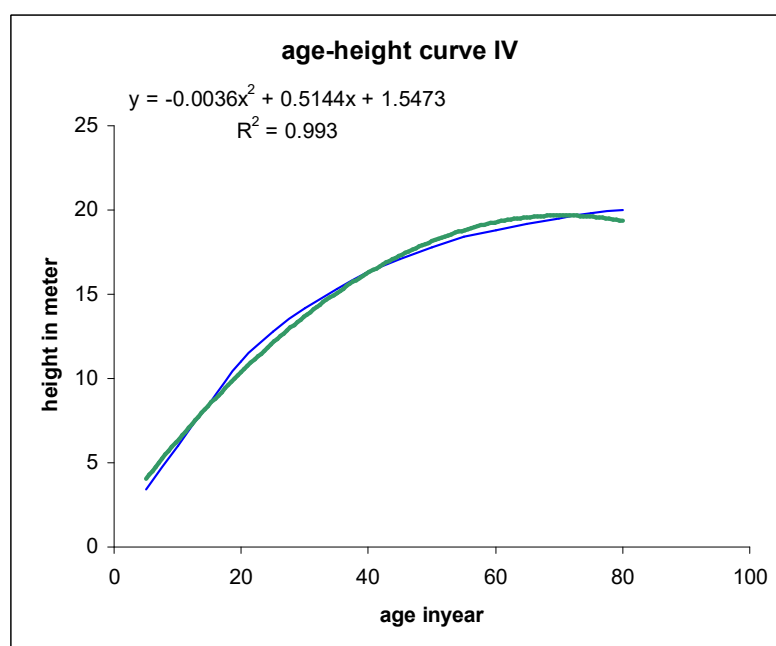
6.1.13. AGE-HEIGHT CURVE FOR TEAK SITE QUALITY IV



6.1.14. AGE-VOLUME CURVE FOR TEAK SITE QUALITY IV



6.1.15. AGE-HEIGHT CURVE FOR TEAK SITE QUALITY IV



GROWTH OF MISCELLANEOUS SPECIES:

6.1.16. In the year 1931 based on 221 borings on 57 trees from Dhaba Range was analysed in the office of the Central Silviculturist Dehradun which indicated the following rate of growth of semal.

GROWTH OF SEMAL

Age in year	DBH(OB) in cms	Number of trees
20	(14.22)	-
30	(21.59)	2
40	28.94	28
50	36.32	15
60	43.43	4
70	50.54	7
80	57.40	1
90	64.52	-

(Figures in brackets are based on extrapolation of curves.)

6.1.17. During revision of Tasdique Hussain's plan, Dashputre, in the year 1954, collected data for a wider range of representative quality classes from Aheri and Dhaba Ranges by analysing 80 semal trees by ring counting at breast height. The results obtained are reproduced as given below.

GROWTH OF SEMAL

Age in Year	DBH(OB) in cms
20	14.22
30	20.60
40	26.92
50	33.37
60	39.62
70	(47.24)

(Figure in bracket is based on extrapolation of curves.)

6.1.18. From above it is seen that the semal tree of gbh 105 cms takes about 15 years to attain a gbh 135 cms.

6.1.19. The data, collected in the year 1944, of semal by the state silviculturist, Central Province and Berar, by taking detailed measurements of 67 standing trees for estimating log out-turn is reproduced as below:

OUT TURN OF SEMAL

Girth Classes	Log out turn in cubic meter		Average
	III Quality	IV Quality	
90-120	0.565	-	-
121-150	0.878	0.537	0.702
151-180	1.132	0.821	0.976
181-210	1.868	1.557	1.712
211-240	2.067	-	-

6.1.20. The data for rate of growth of semal collected in the year 1975 from Mul Range of West Chanda Forest Division is given as below:

RATE OF GROWTH OF SEMAL

Age in year	DBH(OB) in cms
10	03.3
20	10.0
30	17.0
40	24.4
50	32.0
60	40.0
70	48.0

6.1.21. Based on the number of years required to attain the average of each girth class, using rate of growth data of 1931 and using diameter, girth conversion table for U.P., the log out-turn per year for the average of each girth class was calculated and found to be as under.

OUT TURN OF SEMAL

Girth (cm)	Log out-turn in cum/ha
106 – 68	-
137 – 16	0.2379
152 – 40	0.01822
167 – 64	0.01287

It was concluded from the above data that 137.16 cm was the size yielding highest log out-turn per hectare. Rotation for semal is, therefore, based on the above data.

6.1.22. Growth data for semal species obtained from the even aged tree increment plot in Bhandara Forest Division is reproduced as below:

(GROWTH OF SEMAL IN BHANDARA)

Age in year	GBH(OB) in cm
34	30.48
63	45.72
97	76.20
123	106.68
151	137.16

6.1.23 GROWTH OF AIN :

6.1.23. Data obtained from ring counting on 107 stumps in the year 1957 in high quality mixed forests of Dhaba Range is reproduced from Dasputre's plan as below:

GROWTH OF AIN IN DHABA

Age in year	GBH(OB) in cm
95	91.44
104	106.68
114	121.92
125	137.16
139	152.40
155	167.64

6.1.24. Rate of growth as ascertained by Donald (in 1913) by counting of rings of a few ain trees is reproduced as below :

GROWTH OF AIN

Girth in cm	Age in year	MAI (cubic meter)
15	08.50	-
30	17.00	0.225
45	25.50	-
60	47.00	0.175
75	76.00	0.125

6.1.25. Growth data of ain, as given in the working plan of East Chanda and Bhandara Forest Divisions written by Kartar Singh and Nigam; Patil and Sardar respectively and results of stem analysis of Jimalgatta Range of Sironcha Division carried out in 1990 are reproduced as below :

GROWTH OF AIN

Age in Year	Mean G.B.H. (O.B.) in Cms.		
	East Chandra	Bhandara	Jimalgatta
10	11.0	11.9	12.2
20	21.0	26.7	27.4
30	30.0	38.5	39.6
40	39.0	50.3	52.2
50	49.0	59.7	60.1
60	58.0	(70.2)	72.3
70	67.5	(80.0)	83.15
80	78.0	(91.0)	93.23
90	88.0	(102.0)	104.53
100	99.0	(112.0)	120.27

Figures in brackets are obtained from extrapolation of the curves. The MAI and CAI tend to intersect at the age of 120 years which correspond to gbh more than 135 cm

6.1.26. GROWTH OF BHIRRA, DHAWADA & TENDU :

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

GROWTH OF BHIRRA

Species	GBH incms	DBH in cms	Age in year
Bhirra	015	04.8	012
	030	09.5	024
	045	14.3	033
	060	19.1	043
	075	23.9	055
	090	28.6	067
	105	33.4	079
	120	38.2	092
	135	43.0	108
	150	47.7	120

GROWTH OF DHAWADA

Species	GBH incms	DBH in cms	Age in year
Dhawada	015	04.8	016
	030	09.5	028
	045	14.3	050
	060	19.1	052
	075	23.9	066
	090	28.6	080
	105	33.4	093
	120	38.2	107
	135	43.0	123
	150	47.7	142

GROWTH OF TENDU

Species	GBH incms	DBH in cms	Age in year
Tendu	015	04.8	012
	030	09.5	026
	045	14.3	039
	060	19.1	052
	075	23.9	066
	090	28.6	081
	105	33.4	098
	120	38.2	120
	135	43.0	154
	150	47.7	

6.1.27. GROWTH OF BIJA :

6.1.27. Growth data of bija obtained from stem analysis of 6 trees of Bhandara Forest Division carried out by Sardar during the preparation of working plan for Bhandara are reproduced as below :

GROWTH OF BIJA

Age in Year	Height in mt.	DBH (UB) cms	DBH (OB) cms	Standard stem timber volume (M ³)	C.A.I. M ³	M.A.I. M ³
10	03.00	02.70	04.00	0.002	0.0002	0.000200
20	05.90	08.00	10.00	0.015	0.0013	0.000750
30	08.50	13.22	15.70	0.550	0.0040	0.001833
40	11.10	18.20	20.90	0.130	0.0075	0.003250
50	13.30	23.00	25.90	0.237	0.0107	0.004740
60	15.60	27.75	30.80	0.385	0.0148	0.006416
70	17.75	32.02	35.20	0.598	0.0213	0.008543
80	(19.80)	35.58	38.80	0.788	0.0190	0.009850
90	(21.80)	37.90	41.20	0.900	0.0112	0.010000

Figures in brackets are based on extrapolation of curves. C.A.I. and M.A.I. intersect at the age of 91 years. Areas are capable of growing sound trees of height 21.8 m and diameter 41.20 cm in 90 years.

6.1.28. GROWTH OF SHISHAM :

6.1.28. Stump analysis was carried out in Jimalgatta Range in 1990. Results are as under.

GROWTH OF SHISHAM

Age in Year	DBH (OB) in cms
10	04.15
20	07.23
30	11.21
40	14.56
50	17.37
60	19.72
70	22.53
80	25.55
90	29.15
100	33.23
110	38.14
120	42.60

The MAI and CAI curves tend to intersect at the age of 121 years which corresponds to gbh 135 cm Above this diameter, 80% trees showed signs of hollowness.

6.1.29 .GROWTH OF KHAIR :

6.1.29. Ring counting was done on 173 khair stumps in Aheri and Dhaba ranges, the results of which are reproduced as follows :

GROWTH OF KHAIR

Age in Year	Girth in cm
20	23

25	30
30	35
35	43
40	48
45	55
50	60

The MAI and CAI curves intersect at the age of 53.5 year, which corresponds to 62 cm gbh.

6.1.30 INTRINSIC SOUNDNESS IN KHAIR TREES : Results of analysis are given as below :

GROWTH BEHAVIOUR OF KHAIR

Particulars	Girth Class in cm		
	45-60	60-90	>90
% of trees affected by fungus and other defects	24%	45%	44%
% of Trees intrinsically sound	78%	52%	56%
% of soundness in each girth class.	35%	22%	18%

Growth data of dhawada, tendu, garari, tinsa, aonla, moha, lendia and bel obtained from various working plans are reproduced as follows :

GROWTH DATA OF DHAWADA, TINSA, AONLA, BEL, LENDIA, GARARI, MOHA, AND TENDU:

Age in year	GBH(OB) in centimeters							
	Dhawada	Tinsa	Aonla	Bel	Lendia	Garari	Moha	Tendu
	Indore WP	Kandwa WP			Bhandara WP			
10	11.0	12.7	15.2	19.1	15.7	14.2	16.7	15.2
20	21.0	25.4	26.4	28.2	28.7	25.1	26.4	24.5
30	31.5	35.9	35.8	36.1	33.5	33.5	35.4	33.2
40	42.0	41.1	(43.0)	(43.2)	(37.2)	38.1	40.9	39.6
50	43.7	(48.0)	(48.0)	(39.2)	(40.6)	44.3	44.0	46.2

6.1.31. GROWTH OF ROHAN AND SALAI:

6.1.31. Growth data for rohan and salai obtained from various working plans are reproduced as below:

GROWTH OF ROHAN AND SALAI

Age in Year	Rohan [Maltland (CENTRAL PROVINCE) WP]		Salai [Indore W.P.]	
	Girth(cm)	Height (mt)	Girth(cm)	Height (mt)
05	06.6	1.98	06.3	05.1
10	13.7	3.45	09.8	07.3
15	19.6	4.51	11.4	08.9
20	25.4	5.49	12.4	10.2
25	30.0	6.45	15.2	11.3

30	34.3	6.92	(23.0)	(12.2)
35	(36.5)	(8.40)	(26.5)	(13.0)
40	(38.0)	(8.85)	(30.3)	(13.7)
45	(39.5)	(9.20)	(34.3)	(14.4)
50	(40.0)	(9.45)	(38.3)	(14.9)

6.1.32. GROWTH OF COPPICE SHOOTS OF TEAK, AIN, DHAWADA, AONLA, TINSA & TENDU :

6.1.32. The growth data for coppice shoots of different species compiled by MM Tripathi in Working Plan for East Khargon Division, Madhya Pradesh are reproduced as follows:

GROWTH DATA OF COPPICE SHOOTS OF TEAK, AIN:

Age in year	TEAK coppice quality III		AIN Quality III		AIN Quality IV a	
	Height in mt	GBH (OB) in cms	Height in mt	GBH (OB) in cms	Height in mt	GBH (OB) in cms
05	03.66	14.0	3.66	14.0	3.85	12.7
10	06.41	22.9	5.49	25.4	4.88	21.6
15	08.20	--	7.02	33.0	6.41	30.5
20	09.76	35.6	8.54	37.1	7.63	35.6
25	10.98	43.2	9.76	43.2	8.23	40.6
30	11.90	47.0	10.68	47.0	8.85	44.5
35	12.20	52.3	11.20	49.5	9.15	45.7
40	12.51	54.6	11.59	52.1	9.15	45.7
45	12.81	58.4	11.90	53.3	9.16	47.0

GROWTH DATA OF COPPICE SHOOTS OF DHAWADA, AONLA, TINSA & TENDU

Age in year	DHAWADA		AONLA		TINSA		TENDU
	Height in mt	GBH (OB) in cms	Height in mt	GBH (OB) in cms	Height in mt	GBH (OB) in cms	GBH (OB) in cms
05	3.05	08.9	1.83	06.4	1.53	3.36	17.8
10	4.27	14.0	3.36	15.2	3.05	5.19	25.4
15	4.88	17.8	4.58	22.9	4.58	6.10	27.9
20	5.49	21.6	5.80	27.9	6.10	6.41	34.8
25	6.10	26.7	6.86	34.3	6.41	7.32	43.2
30	7.31	35.6	7.63	36.8	6.71	8.54	50.8
35	8.54	40.6	8.24	39.4	7.02	9.46	54.6
40	9.46	44.5	--	--	7.02	9.46	57.2
45	9.76	47.0	--	--	--	9.76	57.2

Thus it is evident that at the age of 40 years gbh(ob) of coppice growth of teak, ain, dhawada, tinsa and tendu are 52,46,54,35,58 cms respectively.

SECTION: 6. 2: ESTIMATION OF GROWING STOCK:

6.2.1. GENERAL VOLUME TABLE:

6.2.1 Forest Survey of India has conducted the Forest Resources Survey of Ballarshah catchment areas during 1970-75. During this survey data for volume of felled trees of teak and miscellaneous species were collected and on the basis of which general volume equations were derived for the species for which felled tree data of at least 30 trees were available. Data of rest of the species were pooled together and one common equation was derived for them.

6.2.2. The following types of regression equations were tried :

$$V = a + b(D)^2 H$$

$$V/(D^2 H) = a + b/((D)^2 H)$$

$$V = a + b D^2 H + c (D^2 H)^2$$

$$\text{Log}_e V = a + b \log_e D + c \log_e H$$

$$V/D^2 = a + b/D^2 + c H^2$$

Where V = Volume (cubic meter under bark) upto 5 cm top over bark diameter

D= Diameter (mt) at breast height (1.37 mt from ground)

H = Height in meter.

Since the tract dealt which comes within the Ballarshah catchment of the above study, the general volume and the local volume equations derived by them are reproduced as follows :

6.2.3. The following general volume equations were selected taking into consideration, the standard error of the estimate, the multiple determination coefficient, applicability of the equations and meaningful interpretation of the equations for different species.

GENERAL VOLUME EQUATIONS TABLE

Sr.No .	Species	General Volume Equation
1.	Tectona grandis (59)	$\text{Log}_e V = -0.895849 + 2.048538 \text{Log}_e D + 0.945216 \text{Log}_e H$
2.	Terminalia alata (120)	$V/D^2H = 0.313861 - 0.003885/D^2H$
3.	Pterocarpus marsupium	$V/D^2H = 0.341324 - 0.006412/D^2H$
4.	(39)	$\text{Log}_e V = 0.763456 + 2.507200 \text{log}_e D + (0.583027) \text{log}_e H$
5.	Diospyros melanoxylon (87)	$\text{Log}_e V = -0.544476 + 0.34322 D^2H$
	Anogeissus latifolia (70)	
*6.	Phyllanthus emblica (23)	$V = 0.01244 + 1.912497 \text{log}_e D + 1.157706 \text{log}_e H$
7.	Lagerstroemia parviflora	$\text{Log}_e V = -1.699443 + 1.912497 \text{log}_e D + 1.157706 \text{log}_e H$
*8.	(44)	$V/D^2H = 0.36068 - 0.00761/D^2H$
9.	Boswellia serrata (36)	$V = 0.35751 D^2H$
10.	Lannea coromandelica (33)	$V/D^2 = 0.726397 - 0.009571/D^2 + 0.311692 H$
*11.	Madhuca latifolia (35)	$V = 0.01475 + 0.29820 D^2H$
12.	Buchanania lanzan (30)	$V/D^2H = 0.342201 - 0.000990/D^2H$
13.	Cleistanthus collinus (75)	$V/D^2H = 0.329134 - 0.000044/D^2H$
	Rest of species (269)	

*Based on the study of Wadsa catchment adjoining to Ballarshah catchment.

Figures in brackets after the name of species denote the number of trees on which the equations are based.

6.2.4. On the basis of the above equations the general volume tables prepared for all above mentioned species have been given in **Appendix No LXII** of Volume II.

6.2.5. LOCAL VOLUME TABLE :

6.2.5. Forest Survey of India, during their survey, volume of each sample tree was estimated using the general volume equation selected for a species. Taking this volume as dependent variable and the diameter at breast height

(1.37 m above ground level) or its function as independent variable, the following types of regression equations were tried :

$$\begin{aligned}
 V &= a + b D \\
 V &= a + b D + c D^2 \\
 V &= a + b D^2 + c D^3 \\
 V &= a + b D^2 \\
 V/D^2 &= a + b/D^2 + c/D \\
 V/D^2 &= a + b/D + c D + d D^2 \\
 V/D^2 &= a + b/D^2 + c/D + d D \\
 \text{Log}_e V &= a + \text{Log}_e D
 \end{aligned}$$

The following local volume equations were selected for different species taking into consideration the same criteria as taken for general volume equations:

LOCAL VOLUME EQUATIONS TABLE

Sr.No	Species	General Volume Equation
1.	Tectona grandis (186)	$V/D^2 = 10.116115 + 0.074892/D^2 - 0.406473/D$
2.	Terminalia alata (411)	$\text{Log}_e V = 2.343936 + 2.616301 \text{Log}_e D$ for $D > 0.38$ m $V/D^2 = 8.204564 + 0.048532/D^2 - 1.056150/D$ for $D < 0.38$ m
3.	Pterocarpus marsupium (116)	$V/D^2 = 8.033788 + 0.028252/D^2 - 0.833643/D$
4.	Diospyros melanoxylon (350)	$\text{Log}_e V = 2.719783 + 2.843920 \text{Log} D$
5.	Anogeissus latifolia (110)	
6.	Phyllanthus emblica (49)	$V/D = -2.704089 + 0.145667/D + 17.465600 D$
7.	Lagerstroemia parviflora (127)	$V/D^2 = 5.000428 - 0.013485 / D^2$
8.	Boswellia serrata (38)	$V/D^2 = 9.629971 + 0.064660 / D^2 - 1.3741984 / D$
9.	Lannea coromandelica (44)	$V/D = -2.641645 + 0.153684 / D + 15.056400 D$
10.	Madhuca latitolia (119)	$\sqrt{V} = -0.138286 + 2.729368 D$

11.	var. latifolia Buchanania lanzan (67) Cleistanthus collinus (593)	$V/D^2 = 3.561089 + 0.025091 / D^2$ $0.185618 / D + 10.801390D$
12.	Rest of species (1153)	$V = -0.00767 + 0.2654 D + 1.0385 D^2$ $+ 7.527 D^3$
13.		$V/D^2 = 13.579193 + 0.083169 / D^2$ $1.802430/D - 15.538660 D$ $V/D = -0.883760 + 0.040841 / D +$ $7.252240 D + 1.348170 D^2$ for $D < 0.4$ mt $\sqrt{V} = 0.135764 + 2.756043 D$ for $D \geq 0.4$ mt

*Based on the study of Wadsa catchment adjoining to Ballarshah catchment.

Where V = Volume in M³

D = DBH in metre.

Figures in brackets after the names of species denote the number of observations on which the equations for the species are based.

6.2.7. The local volume table for above mentioned species with the help of above regression equations was prepared while preparation of this plan which have been given in **Appendix No. LXIII** of Volume II.

6.2.8 TREE ENUMERATION:

6.2.8. Under the guidance of the Addl. Principal Chief Conservator of Forests, Working Plan-East, Nagpur Maharashtra State, tree enumeration for the areas having adequate tree cover was carried out by the team comprising the field staffs of Survey of Forest Resources Scheme, Gadchiroli under the supervision of Conservator of Forests, Working Plan Division, Gadchiroli during 2010-11. Total number enumerated plots was 1897.

6.2.9 SAMPLING METHOD: 1% systematic plot sampling method had been adopted for tree enumeration. 600 mt x 600 mt grid lines had been laid down on a map on 1: 50000 scale and at each point of grid sample plot of dimension 60 meter x 60 meter was taken and total enumeration of species present in the plot in 15 centimeter girth class interval was been carried out and for the

regeneration 20m x 20m plot was laid to ascertain the growing stock as well as status of regeneration.

The enumeration data have been analysed with the help of Chief Forest Statistical Maharashtra State, Nagpur (in the office of the PCCF.) and report of result of enumeration data have been incorporated in **Appendix No.XXIV** of Volume II.

6.2.10 EXISTING GROWING STOCK: Working circle wise and range wise growing stock per ha. have been calculated and given in **Appendix No XXIII** of Volume II

SECTION : 6. 3 : YIELD

6.3.1. The annual out turns of respective working have been discussed in corresponding working circle prescription in part II

6.3.2. COMMERCIAL VOLUME TABLE:

6.3.2. Commercial volume table which is in practice in Central Chanda Forest Division, prepared by collecting data from worked coupes and given in the working plan for previous plan of Rajura Sub Division which is applicable for future yield calculation, is reproduced as below :

COMMERCIAL VOLUME TABLE

Girth Class(cm)	Timber(cum)	FireWood(cum)	Total(cum)
15-30	0.014	0.000	0.014
30-45	0.028	0.000	0.028
45-60	0.070	0.000	0.070
60-75	0.110	0.060	0.170
75-90	0.165	0.090	0.255
90-105	0.220	0.120	0.340
105-120	0.310	0.175	0.485

120-135	0.400	0.230	0.630
135-150	0.485	0.330	0.815
>150	0.570	0.430	1.000

SITE QUALITY : Comparative statement showing top height interval in respect of CP Teak Site Quality and that of All India Teak Site Quality classification is given as under :-

Sr.No.	Site Quality	CP Teak Site Quality (Top heath in Mtr.)	All India Teak Site Quality (Top heath in Mtr.)
1	I	27 and above	30 and above
2	II	21 to 27	24 to 30
3	III	15 to 21	18 to 24
4	IV a	12 to 15	12 to 18
5	IVb	9 to 12	--

Conventiral Signs and symbol and colours used in Stock Mapping (Based on All India Teak Site Quality Classification) have been given **Appendix No. LVIII** of Volume II.

====00=====

CHAPTER – VII

ESTIMATE OF CAPITAL VALUE OF FORESTS IN TERMS OF TANGIBLE AND INTANGIBLE BENEFITS

SECTION: 7.1. Since the market rates for timber and firewood and also the production and extraction cost is increasing year after year, attempt has not been made to find out the exact capital value of the forests in terms of rupees. However, the existing growing stock per hectare is already discussed in detail in the chapter VI.

7.1.2. IN TERMS OF INTANGIBLE BENEFITS: As the forests are depleting fast, the intangible benefits of the forests are getting more and more importance day by day. During an unique research done in the Banaras Hindu University, it is found that a single tree of about fifty years of age is worthy of:

Exhales oxygen worth	Rs. 2.50 lakh.
Inhales CO ₂	Rs. 5.00 lakh
Prevents soil erosion worth	Rs. 2.50 lakh
Regulates water supply worth	Rs. 3.00 lakh
Provides shelter to wildlife worth	Rs. 2.50 lakh
Causes synthesis of proteins worth	Rs. 0.20 lakh
Total	Rs. 15.70 Lakh

7.1.3 Thus from a middle aged tree we get intangible benefits worth about Rs. 15.7 lakh. It is also estimated that well stocked wood land on one hectare of area absorbs 3.7 tonnes of CO₂ from atmosphere and give about 2.5 tonnes of life sustaining oxygen.

7.1.4 As per the guidelines issued by the Government of India in the Ministry of Environment, Forest and Wildlife wide No.11-6/85/FRY (Cons). dt 13th January, 1986 regarding cost benefit analysis for non forest use of forest land under Forest Conservation Act, 1980, thumb rule given is as follows :

One ha of fully stocked forests (Density = 1.00)

((avoids soil erosion,
((affects hydrological cycle,
((provides wildlife habitat
((improves micro climate
((and maintains ecological balance and is of worth Rs. 126.74 lakhs over a period of 50 years. This shows the tremendous value of the forests.

====00=====

CHAPTER - VIII

WILDLIFE PRESERVATION

SECTION: 8.1: GENERAL HISTORY OF WILDLIFE:

8.1.1. The tract dealt was home of a large number of flora and fauna both in number and varieties. The miscellaneous forests are ideal composition to harbour varieties of wildlife. Even today the tract dealt with boasts to host innumerable floral and faunal wildlife. Variety of animals and birds constituted the brilliant complex of nature in beauty of colours strongness of structure and the habit. In the past wild animals enjoyed large measures of protection owing to difficult access to the forest, which sustained and sheltered them. The food, water and shelter, the primary needs of the wild creatures were available in plenty. The religion and religious superstitions also provided a good deal of protection to the fauna. The wild animals were held in high religious esteem by the people. The ancient rulers also displayed keen interest in protection and preservation of wild animals. Ashoka's pillar edicts bear testimony to this. Wild animals received fair amount of protection during Moghal regime.

8.1.2. In early British Rule, wild animals became the prominent source of attraction and were being treated as a source of sports and enjoyment. Doing shikar took the shape of most prestigious sports and enjoyment. Kings of other country were invited and obliged for doing shikar. People of highest status in the society started playing and enjoying with the life of other innocent creature. Killing big animals was treated as bravery and killing more such animals became the matter of pride. Compassion for wild animals in the heart of the big personality of the society, in general, lessened to the greatest extent and they used to do shikar without any consideration of nature and ecological balance. This practice went on increasing with the accessibility in forest, development of road net works, upgradation of roads, availability of adequate transport facilities. The invention of sophisticated long range and powerful weapons, blinding flash light etc. added their might to a relentless onslaught on the wild animals. All these reduced most of the wild animals to the verge of extinction. Also ban on shikar and availability of foreign market for different parts of different wild animals at very high cost, wild animals became the prey to poachers. The ever-increasing population is engulfing and disturbing the natural habitat. The magnificent national asset is fading away and wildlife certainly sinks into oblivion unless protective and conservative measures are adopted through mass education and motivation to ensure no further destruction of the fauna. The wild animal of which the tract was once proud of, are becoming the vanishing asset of the tract. However,

even today these forests shelter a variety of wild animals, birds, reptiles' etc. but in very less numerical strength.

SECTION: 8.2: DISTRIBUTION OF WILD ANIMALS, BIRDS AND REPTILES

8.2.1. CARNIVORES: RARELY FOUND CARNIVORES ARE:

8.2.2 TIGER (*Panthera tigris*): It is commonly known as Wagh or Sher and is found in dense forests in the plains of sheltered valleys. During summer tigers are seen in the vicinity of big rivers or water holes. This species is numerically very less in the tract.

8.2.3. PANTHER (*Panthera pardus*) : It is locally known as Bibta Wagh or Tendua and is found throughout the tract. Panthers pay nocturnal visits to villages situated on the fringes of forests and lift stray dogs, goats and even poultry. This animal adopts itself to varying conditions of living. The intrusion of man in its environment is responsible for reduction in its number.

8.2.4. Commonly seen other carnivores are Wolf (*Canis lupus*), Jackal (*Canis aurens*), ox (*Vulpes bengalensis*), Jungle cat (*Felis Chaus*).

8.2.5 HERBIVORES: Rarely seen herbivores are:

8.2.5. INDIAN BISON / GAUR (*Bos gaurus*) : It is locally known as gaur and is the largest animal amongst the existing bovines. Stray herds of bison are noticed.

8.2.6. WILD BUFFALO : (*Bubalus bubalis hinnacus*) : Locally known as ran bhais was in this tract but now it is not seen at all.

8.2.7. Commonly seen herbivores are:

8.2.7. SAMBHAR (*Cervus unicolour*) is the largest animal with fine horns in deer family. The forests near cultivation are favourite habitats of Sambhar. It has a keen sense of scent and hearing but moderate sight. The hind is smaller without horns. They are nocturnal in habit. Sambhar stays are mostly solitary. Hinds may be found in small herds of three or four with their calves.

8.2.8. CHITAL OR SPOTTED DEER (*Axis axis*) : They are the most beautiful of all the deer. Smooth bright coat with profuse spots adds to the beauty of chital. They prefer fringes of forests and are found in small herds.

8.2.9. NILGAI OR BLUE BULL (*Boselaphus trago camelus*) : Commonly known as rohi and is seen in daytime in herds in the open scrub forests. It is horse like in appearance.

8.2.10 SLOTH BEAR (*Melursus ursinus*): Locally called reechh or aswal and is found in all region. This animal particularly the female with cubs attacks without any provocations.

8.2.11.WILD BOAR (*Sus scorfa*) is locally known as ran dukkar and is found all over the tract. They damage agricultural crops in the marginal and isolated fields.

8.2.12. HARES: (*Lapus nigricollia*): Locally known as sasa and is found all over the tract.

8.2.13.WILD BIRDS: Commonly seen birds are pea - fowl/mor (*Pavo cristatus*), Jungle fowl/Jungli murgi (*Gallus sonneratii*), Sandgrouse/ Bhat titar (*Pterocles exustus*), Grey Partridge/titar (*Francolinus pictus*), common quails/bater (*Couturnix couturnix*). Among water birds ducks and egret are commonly found in the tanks. In WATER BODIES during winter, variety of migratory birds visit the areas.

8.2.14. VERMINS : Commonly found virmins are wild cat/ranmanjar (*Felis chaus*) and common langoor (*Presbytis antellus*).

8.2.15. REPTILES: Amongst the reptiles, various kinds of snakes are seen in the forests.

SECTION: 8.3. PAST MANAGEMENT OF WILDLIFE AND ITS RESULTS:

8.3.1.Shooting of games in Government forests was regulated by the shooting rules framed by the then Central Province and Berar Government under Wild Birds and Wild Animals Protection Act of 1887 which was later on replaced by the Wild Animals and Birds Protection Act of 1912. The rules were given in details in Appendix - VII of the forest Manual Vol.II of the then Madhya Pradesh.

8.3.2. Management of wildlife was given special attention particularly after 1935. Shooting was permitted in the areas living abundant wildlife and areas deficient in wildlife were closed for shooting. Shooting permits granted under this system specified the kind and number of animals to be shot. The shooting blocks after hunting of permissible limit of game animals was given rest by closing the same for hunting for 1 to 3 years. Initially restrictions on number and size of meat animals i.e. deer and antelopes to be shot on individual permit were imposed. Carnivores however, were allowed to be shot without

any limit. This resulted in indiscriminate shooting of tigers and other game animals.

8.3.3. Management of wildlife was regulated under the provisions of Indian Forest Act 1927 and rules framed by the then Government of Central Province and Berar Game Act of 1935 during the initial period of Dashputre's Plan. With the reorganisation of states in 1956 and subsequent formation of Maharashtra state, Mumbai, Wild Animals and Wild Birds Protection Act, 1960 was made to operate with effect from 1.6.1961 for these forests.

8.3.4. In fact in the past in the name of wildlife management regulation of shooting and issuing of shooting permits were done till the ban on shooting other than this nothing has been done for conservation and development of wildlife in the past in this tract.

8.3.5. Since management of wildlife was not done what would be results. Due to not having any management, wildlife has reached to the verge of disappearance. The condition of naturally existing, basic needs (food, water and shelter) have deteriorated sharply and to maintain and develop them nothing has been done substantially so far.

SECTION: 8.4. LEGAL PROVISION FOR WILDLIFE PROTECTION :

8.4.1. The provisions in Hyderabad and Berar Forest Law, 1886 passed on 22nd Oct, 1886. No separate Act about the wildlife was in vogue at that time. However, under section 3, sub rule (7), the definition of the forest produce included skins, tusks, bones and horns". Under section (8) of the said Act, "any person who acts in contravention of the said Act in the State Forests was punishable with the fine which may go upto fifty rupees or when the damage resulting from this offence amounts to more than twenty five rupees, to double the amount of such damage." Under section 10, sub section (4) of the said Act "the residency by orders may regulate any part of the State Forests for the hunting, shooting, fishing, poisoning water and setting trap or snares."

8.4.2. The Berar Law, 1886 was amended by the Berar Forest Law. Here the scope of the Act was extended. The section 7(b) states that forest produce includes the following when found in, or brought from a forest, that is, to say :- Wild animals, skins, tusks, horns, bones, silkcocoons, honey and wax and all other parts or produce of animals or forest produce. Section 7 (2) (b) states that any one who hunts, shoots, fishes, poisons waters or sets traps or snares, shall be punishable with the fine which may extend upto fifty rupees or when the damage resulting from the offence amounts to more than twenty five rupees to double the amount of such damage. The section 10(4)(iii) empowered the resident to frame the rules regarding regulation of hunting, shooting, fishing, poisoning water and setting traps and snares.

8.4.3 .In the year 1911, vide Notification No.G.I.F.D.No. 2197-1-B, dated 13th Oct,1911 the Indian Forests Act, 1878 was made applicable. The section 2(b)(iii) included the wildlife in its definition of the forest produce. Under the section 25(i) of the said Act, any person in contravention of any rules which the local Government may time to time prescribe, kills or catches elephants, hunts, shoots, fishes, poisons water or sets traps or snares shall be punishable with imprisonment for a term which may extend to six months or with fine not exceeding five hundred rupees, or with both, in addition to such compensation for damage done to the forest as the convicting court may direct to be paid.

8.4.4. Prior to reorganisation of states, the wildlife conservation in this part was through the implementation of the provisions of the Indian Forest Act, 1927, and the shooting rules framed under section 26(i) and 76(d) by Ex Madhya Pradesh Government as given in Appendix VII of M.P.Forest Manual, Volume II, combined with Wild Birds and Animals Protection Act 1912 as amended by the Central Provinces Amendment Act of 1935. From 1927, shooting blocks system was started. Under this system, the Conservator of Forests in consultation with the Divisional Forest Officer used to declare certain blocks of Reserved Forests with abundant games as open for shooting. The Divisional Forest Officer used permits for shooting.

8.4.5. The Mumbai Wild Animals and Wild Birds Protection Act, 1951, for the protection of wildlife, was extended to Vidarbha region with effect from 1.6.1961. Though this Act did not propose a significant change in the management of game in Reserved and Protected Forests, yet it was important as it operated in areas out side Reserved and Protected Forests also. Under the provisions of this Act, arms liecnce holders for sports were to register themselves with the wildlife preservation officer. This Act prescribed a closed season for hunting and classified games into four categories viz small game, big game, special big game and pet animals. It also sought to control transaction in trophies and other wildlife produce. The statutory Wildlife Advisory Board was constituted under this Act to advise the Government on various important matters concerning wildlife.

8.4.6. The Indian Board of Wildlife, was constituted in 1952 with the main object of devising ways and means for Conservation of wildlife through coordinated legislative and practical measures and sponsoring the 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 any Advisory Committee to advise in constitution and declaration of National Parks and sanctuaries and fromulation of administrative policy. The Parliament then enacted the Wildlife (Protection) Act, 1972, which came into force in the State of Maharashtra with effect from 1st June, 1973. From the

commencement of this Act, every other Act relating to any matter, contained in this act, and in force in the State stood repealed. The subsequent rules made under the Act are as follows:

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 in Maharashtra with effect from 1.6.1973.)
3. The Wildlife (Protection) Rules, 1975 (became effective from 6.3.1975)
4. The Wildlife (Protection) Licensing (Additional matters for consideration) Rules, 1983 (became effective w.e.f. 13/4/1983).

8.4.7. The Wildlife (Protection) Act, 1972 is a piece of comprehensive legislation which provides for effective measures of protection and preservation of wildlife, restriction on hunting and regulation of trade in wild animal articles. Hunting of wild animals is strictly prohibited under this Act unless it is specially permitted. Wild animals have been categorised in five schedules and animals included in schedule-I and part II of schedule- II received the privilege of strict protection. Animals specified in these schedules are permitted to be hunted with special permission, if animal in schedule - I has become dangerous to human life or property, and animal in schedule - II has become so disabled or diseased as beyond recovery.

Animals specified in schedule II (Part-I), III & IV were prohibited from hunting, except under and in accordance with specific licence issued under that Act or it had become dangerous to human life or property or had become diseased or disabled beyond recovery. Only vermin included in schedule-V had been excluded from strict protection. Hunting of young female of any wild animal other than vermin or any deer with antlers in velvet is strictly prohibited unless specially permitted (Section - 15). The Act specifically requires declaration to be furnished by the individuals regarding trophies etc. in their control, custody or possession. Government of India, vide letter dated 18-9-1975 stated that the control over tanks and rivers in National Parks and Sanctuaries should be vested with management authorities and not with the fisheries or irrigation department.

8.4.8. Government of India, vide letter No. E-11011/3/75FRY9(WLF), has clarified that the certificate of legal procurement to be issued by the Chief Wildlife Warden is not necessary where an animal is not included in any schedule of the Wildlife (Protection) Act, 1972. Its export have been regulated by the Ministry of Commerce. Subsequently, the delegation of power and duties of the Chief Wildlife Warden to the Police Sub-Inspector for the purpose of section 41(1) and section 55 of the Wildlife (Protection) Act, 1972 was granted by Government Resolution No. WLP-1973/197578-FI, date 5th April, 1976. The schedules are revised by the Government on and off as it was required under section 61 of the Wildlife (Protection) Act, 1972. The Government of Maharashtra, under section 64 of the Wildlife (Protection) Act,

1972 framed rules vide letter No. WLP-1679/95507/F-5. These rules were amended further by the Wildlife (Protection) Maharashtra Rules, 1975. The wildlife Protection Act was again amended to be called as Wildlife (Protection) Amendment Act, 1986 and it came into force from 25th Nov, 1986.

8.4.9. Under Section 44 of the Wildlife (Protection) Act, 1972, the Government vide letter No. WLP/1682/100208/CR-43(1)/F-5 permitted the mapping of cobra and Russell vipers by a licenced dealer for the purpose of extracting venom. Under the power conferred under sub section (1) and sub section (2) of the section 64, the Government of India vide letter No. WLP 1682/10020(iii)/F-5 framed the new rules called Wildlife (Frog Leg Industry) Rules, 1987, and it came into force from 25th Nov, 1987. The Government of India vide Letter No. F-No.-2/91/WL/1, dated 21st Oct, 1991, further amended the Wildlife (Protection) Act, 1972. The following are the important amendments.

The plants have also been included under the purview of this Act.

The zoo and circus have been defined and included under this Act.

The game reserves have been dropped.

Section 9 of Wildlife (Protection) Act, 1972 has been amended and there is a total prohibition of hunting of animals specified in schedule I, II, III & IV , except as provided under section 11 and 12.

8.4.10. The following are restrictions on hunting as per section 17 of Wildlife (P) Act, 1972. The following acts are prohibited, i.e.

1. Hunting any wild animal, from or by means of a wheeled or mechanically propelled vehicle on water or land or by aircraft;
2. Use of mechanically propelled vehicle for the purpose of driving or stampeding any wild animals;
3. Use of chemicals, explosive, pitfalls, poisons, poisoned weapons, snares or traps, except in as far as these relate to the capture of wild animals under a Wild Animals Trapping Licence;
4. Hunting of special game or big game other than with a rifle, unless specially authorised by the licence;
5. Setting a fire to vegetation for the purpose of hunting.
6. Using artificial light for the purpose of hunting, except when specially authorised to do so under a licence in the case of carnivore over a kill;
7. Hunting during night, except when specially authorised;
 - a) Hunting any wild animals on water holes or a salt - lick or other drinking places or on path or approaches to the same, except water-birds and sand - grouse;
 - b) Hunting any wild animal on any land not owned by Government without the consent of the owner, or his agent or lawful occupier or such claim;
 - c) Hunting during closed period as per section 16;
 - d) Hunting with the help of dogs, any wild animal except water-bird, chakor, partridge or quail.

8.4.11.In 1991, the Government of India has passed the Wildlife (Protection) Amendment Act, 1991, which came into force with effect from October 2, 1991, extended the Section 35 A, 44 (ii), 55(c) , Chapter IIIA and Chapter IVA. The salient features of this amended Act in brief are as follows :

The words “game reserves, big game and small game” have been omitted from the Act.

Hunting the wild animals specified in Schedule I, II, III and IV of the Act has been banned, except as per the provisions of section 11.

A new chapter III-A has been introduced for the protection of specified plants. The specified plants have been included in a new schedule.

Section 29 of the Act has been amended and like National Parks no wildlife can be exploited or removed from a sanctuary too. This means all concentrated felling and collection of minor forest produce from sanctuaries would be stopped.

A new section has been added in the Act which provides that no new arm licences shall be issued within 10 km. of a sanctuary without prior concurrence of the Chief Wildlife Warden of the state.

A ban has been imposed on dealing the imported ivory and articles made therefrom.

A new chapter, IVA has been introduced to provide for central Zoo Authority and recognition of zoos.

The penalties for wildlife offences have been enhanced substantially. Section 39 of the Act has been amended to the effect that vehicles, vessels, weapons, tools and traps that have been used for committing an offence and have seized shall become the property of the Government. Section 61 (I) of the Act has been amended and now the power to make any change in the schedules of the Act vests only with the Central Government.

SECTION: 8. 5 : RIGHTS AND CONCESSIONS :

8.5.1. No rights and /or privileges are granted to any person over wildlife. But a number of schedule tribe can subject to the provisions of Chapter IV of Wildlife Protection Act, pick, collect or possess in the district he resides any specified plants or plant derivative thereof for his bonafide personal use. However, permits can be granted by the Chief Wildlife Warden with prior approval of the State Government for the Special purpose of education, scientific research and collection of specimen for recognised zoos, museums and similar institutions.

SECTION: 8. 6: INJURIES TO WILDLIFE:

8.6.1. The following agents are mainly responsible for injuries to wildlife.

8.6.2. POACHING/SHIKAR: Shikar is completely banned. Illicit hunting are in practice. In recent period some cases were detected by the department with enthusiastic efforts of the Deputy Conservator of Forests and other staff of the Central Chanda Division. Presently this is the main cause of threat to the wildlife. It is believed that poaching is performed by using snares, traps, poisoning or by using powerful and modern weapons.

8.6.3. FIRE: The entire forest area is susceptible to forest fire. Almost every year most of forest is subjected to some sort of fire with varying effect to damage to flora and fauna. Some areas might be exception to it but the remote areas which are the ideal habitat burns annually. The forest fire damages the natural habitat and drives animals towards human habitation to take shelter and thereby they become easy prey to poachers and local villagers.

8.6.4. WATER: Most of the streams, except a few big rivers, becomes dry during summer. Therefore, animals had to visit only a few available water holes. This fact makes the villagers and poachers easy to kill the wild animals.

DISEASES: A stray incidence of foot and mouth diseases amongst bison is occasionally noticed. In other animals injury or death due to diseases is not reported though it might be occurring. More research and monitoring works are needed in this regard.

SECTION: 8.7: OTHER MEASURES ADOPTED AND EFFORTS MADE FOR PROTECTING WILDLIFE.

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

8.7.2. Compensation is paid to the owner whose cattle is killed by a tiger in the forest areas as per the provisions contained in Government Resolution No. WLP/1570/224482-X-II, dated 30/09/1971, No. MSC-1075/113554/F-1, dated 25/03/1977 and No. WLP/1579/6200/4/F-1, dated 29.05.1979. This provision was extended to the cattle killed by panther also and the killing by tiger or panther outside the forest areas also was included vide Government Resolution No. WLP/1581/116974/F-5 dated 22.08.1984.

8.7.3. Provision has been made for compensation in case of death or injury to human life by wild animals vide Government Resolution. No. WLP/1679/105651/CR-6/F-5, dated 27.11.1986. The maximum amount of compensation in case of death is Rs. 5000/- and in case injury Rs. 2000/-. As per Government Resolution WLP/1090/CN-285/F-5, dated 17.6.1992, the compensation in case of death or permanent disability has been increased to Rs. 40,000/- in case of person supporting the family and to Rs. 20,000/- in case of minor. In case of serious injury the compensation is Rs. 6650/- and in case of minor injury it is Rs. 1000/- per injured person. Further vide Govt. of

Maharashtra Resolution No. Revenue & Forest Deptt. WLP-2012/C.R.327/F-1, dated 30.03.2013 the compensation in case of death has been increased to Rs. 5,00,000/- and in case of permanent disability to Rs. 4,00,000/-.

Futher vide Govt. of Maharashtra Resolution No. Revenue & Forest Deptt. WLP-2012/C.R.337/F-1, dated 16.01.2015 the compensation in case of death has been increased upto Rs. 8,00,000/- and in case of minor injury it is upto Rs. 15,000/- in private hospital . The Said G.R.given in Appendix No.LIV

8.7.4. In 1972, with a view to check illicit shooting of wild animals, the State Government sanctioned the grant of reward to the informants in respect of unliecned shooting provided that the information is found to be valid and leads to the conviction of the offender. In addition, the State Government has decided to sanction the rewards equal to 50% of the compensation actually recovered from the offender for illicit shooting to the Gram Panchayat or its office bearers or individuals who render cooperation in detecting such illicit shooting.

8.7.5. Besides, the ever mentioned legal provisions for protection of wildlife, public awareness for protection and preservation of wildlife is created through the celebration of wildlife week from 2nd October every year since 1951.

8.7.6. Under the purview of the aforesaid Acts Rules and G.R.'s, the efforts made for booking offences have been given in **Appendix NO LIV** of Volue II.

8.7.7. The details of cattle lifting, injuring and killing of human being within this tract have been given in **Appendix No.LIII** of Volume II.

====00====

CHAPTER - I

BASIS OF PROPOSALS

SECTION: 1.1: NATIONAL FOREST POLICY :

1.1.1. Indian Forest Policy was first enunciated by the British Crown in the year 1894 by the Resolution No.22-F, dated October 19, 1894. After Independence First National Forest Policy was formulated by the Government of India by its Resolution No. (Agri) 13/52-F, dated 12th May, 1952. Latest National Forests Policy was passed by Ministry of Environment and Forest by its Resolution No.3-1/86-FP, dated 7th December, 1988. The changes in the policy were made as per the prevalent national needs and public requirements, both of local and general. The abstracts of the above national forest policies of India are given as follows:

1.1.2. FOREST POLICY 1894 FOR INDIA:

1.1.2. The general forest policy was enunciated in the year 1894; by the Government of India vide Resolution No. 22-F, dated 19th October, 1894. As per tenants of that policy the forests were to be administered solely for the public benefit, both local and general. The outstanding principles of this policy were as under:

i) The preservation of climatic and physical conditions of the country was the foremost.

ii) The preservation of minimum amount of forest, necessary for the general well being of the country, was second to above.

On fulfillment of the above two conditions, the other priorities were as under:

(i) Cultivation to be given priority over forestry,

(ii) Satisfaction of the needs of the local people free or at non competitive rates to be given priority over revenue and

(iii) After satisfying the above requirements, the realisation of revenue to the greatest possible extent was to be considered.

1.1.3. NATIONAL FOREST POLICY OF 1952:

1.1.3. Since the enunciation of 1894 policy, considerable development of far reaching importance had taken place in the economic and political fields. The part played by forests in maintaining the physical conditions of the country came to be better understood. The country had passed through two world wars, which disclosed unsuspected dependence of defence on forests. The reconstruction schemes, such as river valley projects, development of industries and communications, leant heavily on forest produce.

1.1.4. Taking into consideration the changes which took place in the physical, economic and political fields during the intervening period, the forest policy, was reoriented in 1952, vide Government of India in Food & Agriculture, Resolution No. (Agri) 13/52, dated 13/5/1952. It was based on six paramount needs of the country, namely:

(i) The need for evolving a system of balanced and complementary land use, under which each type of land is allotted to that form of use under which it would produce most and deteriorate least.

(ii) The need for checking:

(a) Denudation of mountainous regions, on which depends the perennial water supply of the river system whose basins constitute the fertile core of the country.

(b) The erosion that is progressing with a pace along the treeless banks of the great rivers leading to ravine formation and on vast stretches of undulating wastelands depriving the adjoining fields of their fertility.

(iii) The need for establishing tree lands, wherever possible for the amelioration of physical and climatic conditions, promoting the general well-being of the people.

(iv) The need for ensuring progressively increasing supplies of grazing, small wood for agricultural implements and in particular of firewood to release the cattle dung for manure to step up food production.

(v) The need for sustained supply of timber and other forest produce.

(vi) The need for the realisation of the maximum annual revenue in perpetuity, consistent with the fulfillment of the needs enumerated above.

1.1.5. The National Forest Policy further stated that while observing these general principles, in paramount National interest the discretion of the State Government to regulate the details of forest administration in their respective territories is left unfettered to enable them to frame their policies and legislation for conserving and utilising the forest resources. Provided that the declared forest policy of a state does not impinge adversely upon the general economy and physical balance of an adjoining State and that it is in consonance with the general principles underlying the forest policy laid down by the Center for preservation and development of the nations forest resources which are so vital to its general well-being.

1.1.6 NATIONAL FOREST POLICY OF 1988:

1.1.6. Indian Constitution in its original version enshrined Forest in State List. As per 42nd Constitutional Amendment Forest has been placed under Concurrent List. So Center has greater stake in preservation of forests and Environment. Over the years, forests in the country suffered serious depletion because of relentless pressures arising from ever increasing demand for firewood, fodder and timber; in adequacy of protection measures, diversion of forest lands to non-forestry uses without ensuring compensatory afforestation and essential environmental safeguards and the tendency to look upon forests as revenue earning resources. With a view to mitigate the above problems a new Forest Conservation Policy based on preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment, was enunciated in December, 1988.

1.1.7. The basic objectives governing the National Forest Policy of 1988 are as under:

- (i) Maintenance of environmental stability through preservation and where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.
- (ii) Conserving the National heritage of the country by preserving the remaining natural forests with vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.
- (iii) Checking soil erosion and denudation in the catchment areas of rivers, lakes and reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for retardation of siltation of reservoirs.
- (iv) Increasing substantially the forest/tree cover in the country through massive afforestation and soil conservation programmes, especially on all denuded, degraded and productive lands.
- (v) Meeting the requirements of firewood, fodder, minor forest produce and small timber of the rural and tribal population.
- (vi) Increasing the productivity of forests to meet essential national needs.
- (vi) Encouraging efficient utilization of forest produce and maximizing substitution of wood.
- (vii) Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimize pressure on existing forests.

1.1.8. The forest policy further states that in the management of the existing forests and forest lands the emphasis should be on protection, improving their productivity, conservation of total biological diversity by strengthening the network of National Parks, Sanctuaries, Biosphere Reserves and other Protected Areas, providing sufficient fodder, fuel and pasture in areas adjoining forest, to prevent their depletion and protecting, improving and enhancing the production of minor forest produce which provides sustenance to tribal population. The other important features governing the management of the forests are as under:

- (i) Severe restriction on schemes and projects, which interfere with forests that clothe steep slopes, catchment of rivers, lakes and reservoirs.
- (ii) No working of forests without the Center Government having approved the management/ working plan.
- (iii) Non – introduction of exotic species without long term scientific trials.
- (iv) The rights and concessions, including grazing, to always remain related to the carrying capacity of forests.
- (v) Rights and Concessions which cannot be met from the forests to be met by development of social forestry.
- (vi) The rights and concessions enjoyed by the tribal should be protected. Their domestic requirements of firewood, fodder, minor forest produce and construction timber should be the first charge.
- (vii) Forest management/ working plan to take special care of the needs of wildlife conservation.
- (viii) Effective action to be taken to prevent encroachments on the forestland and not to regularize the existing encroachments.

(ix) Forest based industries to raise the raw material needed by them themselves in arrangement with the private cultivators.

(x) Survey of forest resources to be completed on scientific lines for updating information.

1.1.9. This National Forest Policy states “Forest should not be looked as a source of revenue, but as a national asset to be protected and enhanced for the well-being of the people and the nation.” This Policy clearly states, “The people will be actively involved in programmes of protection, conservation and management of the forests.” The document further states that non-timber forest products, “should be protected and improved and their production enhanced” to generate employment and income for the forest dwelling communities.

1.1.10. In June 1990, the Government of India passed a significant national resolution providing more specific guidelines regarding the formation, functioning, rights and responsibilities of the community forest management groups. It specifies the sharing arrangements in which village forest committees “successfully protect the forests, may be given a portion of the proceeds from the sale of trees when they mature, as well as non-timber forest products for subsistence use”. This policy clearly directs that forests be managed first as an ecological necessity, second as a source of goods for local populations and only third as a source of wood for industries and other non-local consumers.

SECTION : 1. 2: CLASSIFICATION OF FORESTS :

1.2.1. The broad and general principles for the classification of forests is embodied in the State Government vide R & FD Resolution no. MEP-1365/132211-Y, dated December 6, 1968. Taking the above principles into consideration, the forests of the state are to be classified and managed as follows:

- (i) Protection Forests,
- (ii) Tree Forests,
- (iii) Minor Forests,
- (iv) Pasture Lands and
- (v) Miscellaneous Forests.

1.2.2. PROTECTION FORESTS: This includes forests which occur on very steep slope $\geq 25^\circ$ (25 degree and over) or along river banks, and forests that have become depleted through maltreatment, and further harvesting of which will accelerate soil erosion and adversely affect the productivity of agricultural lands in the lower regions. The management should be aimed at rapidly conserving these forests so that they may once again exert their beneficial influence on the soil, the water regime and the physical and climatic factors of the locality.

1.2.3. TREE FORESTS: This includes forests which are situated in remote tracts that are prominently suited for growing large sized timber and other products of commercial value.

1.2.4. MINOR FORESTS: This includes forests that are interspersed with cultivated lands and are capable for producing small timber and firewood and providing grazing, which are the indispensable needs of the adjoining agricultural population.

1.2.5. PASTURE LANDS: These are open forests or scrub lands that have ceased to yield even small timber but which are conveniently situated for providing grazing to the cattle used on agricultural works.

1.2.6. MISCELLANEOUS FORESTS: These include:

a) **GRASS RESERVES:** These are small blocks of forests situated almost intensively tracts carrying scrubby growth and capable of producing good fodder grasses which are in short supply.

b) Remaining areas which are needed for other purpose.

1.2.7. CLASSIFICATION: On the above functional basis forests of the tract dealt with are classified as under:

CLASSIFICATION OF FORESTS

Sr. No	Class of Forest	Area in Ha			Total area in ha	% of total area
		RF	PF	UF		
1	Tree Forest	43556.646	763.166	2808.075	47780.134	43%
2	Minor Forest	10410.209	11758.220	105.505	22701.507	20%
3	Miscellaneous	36856.079	5524.207	125.225	41426.416	37%
	Total	90822.934	18045.593	3039.480	111908.057	100%

Miscellaneous forests contain protection forest too. Small and scattered patches of protection forests which are interspersed with the other forests have been included in respective working circles for the area and separate prescriptions to treat them have been given for them in respective Working Circles.

SECTION: 1. 3: FACTORS INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT:

1.3.1. The National Forest Policy, 1988 is the guiding principles to decide the general objects of management. This policy recognises the services rendered by the forest to all living creatures. The services (indirect benefits) given to the society by the forest through its existence are indispensable and have more weightage than physical benefits in terms of timber and firewood coming from felling of trees. The existence of life on any planet simply can not be imagined without the existence of the vegetation. Therefore, taking out direct benefits from the forests can not be the primary objectives of the forest management. However, the direct benefit will also come through operations required to maintain the forests in healthiest conditions. On achieving these conditions of the forests, automatically both direct and indirect benefits will

be optimum. Thus the orientation of the management is to have first the forest in balance and healthiest condition so as to have optimum perpetual benefits from it.

1.3.2. So far we followed the path and policy of management decided by the British Administration, whose main objective was to have maximum revenue. The basics of management were side tracked. The basic principle of management is to use the interest while maintaining principal intact. The optimum level of balanced stocking in any site is the principal; however, this could not be quantified. Without its quantification it is not possible to identify interest and distinguish interest from principal.

1.3.3. Forest with balanced distribution of age classes is called normal forest. In such a state of forest, there is a balanced movement of stems from lowest to the highest girth classes in a very natural way. This is the ultimate state of the forest, which is to be achieved and maintained.

1.3.4. The distribution of the number of stems/ha in different girth classes forms a structure of the forest. In a normal forest this structure is inverse J-shaped curve. With reference to this structure we can have an attempt to achieve that structure which should be the ultimate goal.

1.3.5. Forest crop is a dynamic biological entity, which keeps on changing and putting on increment. The rate of increment depends on the site quality, age, species and stocking of the individual entity in the crop. The optimum stocking varies with age of the crop and corresponds to maximum increment. In an all aged crop, optimum stocking implies the balanced distribution of stems of all ages. Total increment falls off as the stocking changes from the optimum level.

1.3.6. The main object of management is to obtain an optimum level of stocking and to extract the optimum increment periodically, on a sustained basis, without harming the future crop. Thus there are two aspects of the management:

- (i) To visualize the ideal state of the forest i.e. optimum stocking, distribution of stems and species in different age classes etc.
- (ii) To devise means to take out optimum increment periodically, without disturbing the future crop.

The achievement of what is desired of is the essence of any scientific management system

1.3.7. The achievement of goal corresponds to the state of optimum production. However, this optimum production is in terms of quantity of the species existing in the crop. To optimise the production in both in terms of quality and quantity, modification in crop composition is needed. The change in composition of the crop can be brought about in two steps:

(A) In first step, crop composition should be improved by way of giving preferential treatment, in the existing crop while carrying out silvicultural

operations. However, this cannot bring the crop composition to the desired level because of the two limitations:

- (i) Fixed number of seedlings of preferred species in the existing crop, that number cannot be assessed and
- (ii) The number of stems surplus in that girth class against which preference is to be given to the desired species cannot be assessed. That it is unknown to us the exact number of stems of a particular species at a given point of time to have the optimal composition.

(B) In the second step, if the existing seedlings of preferred species are less than the desired numbers, gap plantings of those species in required number should be initiated. The experiment of gap planting should be started with only one or two silviculturally suitable species. For this local valuable species should be preferred. On getting success, the number of species may be increased upto desired level. After introduction, the principle of preferential treatment should be kept on applying to maintain them.

1.3.8. The tribal people, being the part and parcel of the forest, their welfare should have one of the considerations of the management. The management of non wood and medicinal forest produce on scientific lines has the direct bearing with the welfare of the tribal and local villagers and therefore, this aspect is to be taken into consideration.

SECTION: 1.4: GENERAL OBJECTS OF PRESENT MANAGEMENT:

1.4.1. On the basis of National Forest Policy 1988, points discussed above and experience gathered on past management practices as discussed in Chapter V in part I of this plan, the general objects of management decided are as follows:

- (i) As far as possible to bring normalcy in the forest.
- (ii) To preserve forest cover on steep slopes, along nala banks and water courses to check soil erosion and to preserve site and environment.
- (iii) To meet the requirement for small timber, firewood, fodder and non-wood and medicinal forest produce of the local population on top priority.
- (v) Consistent with above objectives, to produce large sized timber on sustained yield basis.
- (v) To take up activities aiming at welfare of the tribal and local villages and thereby to increase the production of non wood and medicinal forest produce and to manage the same scientifically to utilize the potential to the optimum possible extent on sustained yield basis.
- (vi) To take up measures to protect, develop and conserve wild animals in this tract.

SECTION: 1. 5: METHODS OF TREATMENT TO BE ADOPTED:

1.5.1. National Forest Policies have laid down the emphasis on conservation of biodiversity and meeting the demands of local people. Accordingly, the objects of management of the forests have been fixed. To achieve these objectives of the management comprehensive approach has been adopted in

the management of the forests. For the conservation of biodiversity and the site, soil and moisture conservation works will be taken. These works will be conducive to watershed development and for that sequencing of coupes will be from ridge to valley. Natural regeneration will be preferred over the artificial regeneration, in areas where it is adequate. Suitable soil working and tending operations will be carried out to stimulate and enhance the growth of naturally regenerated seedlings. To meet the local demand of the people, an assessment of their requirements will be made by the executive machinery and efforts will be taken to meet these requirements to the possible extent. Active participation and involvement of local people in protection, regeneration and development of forests will be sought for through participatory forest protection and joint forest management. Special emphasis on protection of forests from fire, grazing and illicit cutting will be given.

1.5.2. Tract dealt with contains mainly tree forests, minor and miscellaneous forests. Protection forests, being interspersed with protection, cultivation in form of encroachment have been clubbed with miscellaneous forests. Some areas of “Zudpi Jungle” or private land have been taken over by the Department under compensatory afforestation scheme has been shown under miscellaneous forests. Protected Forests included in this plan has been shown under respective category depending upon their structure. Taking into consideration the above aspects besides the growing stock and condition of the site has made the functional classification of forests. The various types of forests will be treated as follows:

1.5.3. PROTECTION FORESTS: Most of these areas lie along the steep slopes of Manickgarh hills, Garlapeth, Siddheshwar and other hillocks, along the nala banks, along the river banks and other water bodies and are found in continuity or scattered. They will be treated under the category 'A' of the respective coupe in each working circle. No felling of trees is prescribed in these areas. Soil and Moisture Conservation works will be taken up with artificial regeneration with seed sowing on the bunds created for that.

1.5.4. TREE FORESTS: These forests are mainly of better quality, timber producing and less prone to erosion. They belong to all India Teak and Mixed Site qualities II, II/III, III, III/IV, and IV. The trees are generally straight boled. These forests have been being managed on commercial lines which has affected the status of natural regeneration. Establishment of naturally regenerated seedlings in such forests are of varying proportions: great successes to dismal successes. These areas are required to be developed and maintained as rich and healthy normal forests. The management prescriptions will be as per the site quality and it will be oriented to give more importance to Cut Back Operations, Cleaning, Thinning etc. silvicultural operations along with extraction of silviculturally available material ensuring eternal future crop. Therefore, during this plan period Selection Cum Improvement or Treatment for Old Plantation have been prescribed for betterment of hygiene

of natural or plantation forest respectively and meeting the requirement of the population.

1.5.5. MINOR FORESTS: These forests are comparatively of low quality and badly treated in the past by prescribing inappropriate silvicultural system, which has reduced the proportion of valuable and important trees in the crop. They were worked under Coppice With Reserve in Khisti's plan period and Afforestation Working Circle under Dr. Nand Kishor's plan. Crop is young with scattered middle aged and rare mature and over mature trees. Mature trees, which are rarely seen, are mainly fruit trees species, which had been selected as reserve for long time. Among such species, moha is prominent. The regeneration status of some of miscellaneous species is very good in the areas, which are away from villages and where grazing and firewood pressure is comparatively less. Basically, the area is highly capable to be regenerated naturally. However, due to excessive grazing, weed growth and repeated fire some parts have become incapable to be regenerated naturally. These forests are also to be managed to bring normalcy in them. Since forests are badly disturbed and so during this plan period only appropriate silvicultural operations at an appropriate intervals has been prescribed. Special thoughts and measures have been prescribed to solve the problems of grazing and fire, which are main hurdles in the way of achieving normalcy.

1.5.6. MISCELLANEOUS FORESTS: Mainly protected forests of Ballarshah, Kothari, and Dhaba forest ranges of this division, newly acquired Reserved Forests of Rajura Sub Division of this division and "Zudupi Jungle" taken for compensatory afforestation have been included in this type of forests. These types of forests have been taken for scientific management for the first time in this plan. Also the area of earstwhile Rajura Sub Division which are under encroachment for cultivation or for mere possession where the forestry operation taken by the department are vehemently opposed by the villagers has been brought under this category. By and large these areas are open and highly prone to encroachment. Survey and Demarcation of areas by RCC Pillars as per the direction given by Office of Principal Chief Conservator of Forests, Maharashtra State vide his Letter No 68 dated 29.5.2001(Marathi) and people participation in the form of Joint Forest Management will be actively sought in the management of these forests.

1.5.7. OTHER FORESTS: Under this category "Zudupi Jungle" taken over by this division has been included. In these areas survey and demarcation of the areas will be first priority. Since the areas are mostly open and under tremendous pressure of biotic interference due proximity to habitation and age old practices of free grazing or use as camping ground for local cattle, the vegetation cover is sparse or dismal. Afforestation is to be taken. Besides these to develop the areas under forests cover soil and moisture conservation works will be emphasized. The functioned classification is given below:

Sr. No	Class of Forest	Area in Ha			Total area in ha	% of total area
		RF	PF	UF		
1	Tree Forest	43556.646	763.166	2808.075	47780.134	43%
2	Minor Forest	10410.209	11758.220	105.505	22701.507	20%
3	Miscellaneous Forest	36856.079	5524.207	125.225	41426.416	37%
	Total	90822.934	18045.593	3039.480	111908.057	100%

SECTION: 1.6: ANALYSIS AND VALUATION OF THE CROP:

1.6.1. Old stockmaps of all the compartments of Dhaba, Kothari, Rajura, Wirur, Wansadi and Ballarshah forest ranges have been for the preparation of draft working plan report. The stock mapping of compartments of earstwhile Dhaba Range comprising compartments of Ballarshah, Kothari and Dhaba Ranges was carried out during 1949-50. No fresh stockmapping was carried out during Khisti's Plan. Some informations such as density, age, erosion status and regeneration of prominent species have been incorporated on stock maps. The satellite imageries have been used for density stratification GIS Cell at the office of Conservator of Forests, Working Plans, Chandrapur.

1.6.2. For Rajura Sub Division comprising Rajura, Wansadi and Wirur Forest Ranges of Central Chanda Forest Division stockmapping was carried out during Bhogle's plan for Rajura, Chicholi, Garlapeth, Siddheshwar and Manickgarh blocks. During Kulkarni's plan stock mapping of all the areas was done. During the preparation of Dr. Nand Kishor's plan stock mapping of 189 compartments was done. However, stock mapping of Compartment No. 180, 181, 190, 191, 192, 193, 194, 195, 196, 197, and 198 could not be carried out as most of the areas were found under cultivation or encroachment and boundary pillars not found on the ground. Similarly, Compartment No 201, 202, 203 and 134A were not stock mapped. All those stock mapping were shown on topo sheets of scale 2" = 1 mile (RF: 1: 31680). Quality classification based on the height of mature tress had been adopted to show the site qualities. Three site qualities III (15-21m), IV a(12-15m) and IV b(upto12m) were recognised. The all India Site Quality is being contemplated in this plan to bring the uniformity at national level. Site qualities are determined by measuring the top height of trees at the age of 50 years as follows: IV (12.2m-18.3m), III (18.3m-24.4m), II (24.4m-30.5m) and I (30.5m-36.6m). The types of forests viz. teak, mixed, salai, undercooked areas, eroded areas (particularly from Rajura and Wirur Ranges), site quality, density, and occurrence of important species have been shown on the stockmaps. Occurance of bamboo is also indicated. This plan is using those stock maps as that information are still valid as those are of not so old that they can be discarded and site quality of the area remains unchanged unless drastic changes are made to alter it through external activities.

1.6.3. During this plan preparation all the compartments of the whole tract have been covered along with Reserved Forests, Protected Forests, Proposed

Reserved Forests, Zudupi Jungle taken by Division and areas acquired under Compensatory Afforestation Scheme for enumeration of growing stock after sorting the areas with the help of satellite imageries maps and density of stock therein. Area under less than 0.4 density and steep slope have not been taken under enumeration. In the remaining area 1% sampling have been carried out for enumeration. Results have been shown on available maps.

1.6.4. Under this plan the density maps for the tract dealt with have been prepared by digital image processing by Regional Director, Forest Survey of India, Nagpur Region, Nagpur.

SECTION: 1. 7: WORKING CIRCLES:

1.7.1. The extent of areas under each working circle have been given in **Appendix No XXV** of Volume II Constitution of working circles along with number of compartments and area incorporated therein have been given there in. The extent of areas working circle and range wise have been given below.

NAME OF RANGE	Total area	SCI	IWC	AWF	FWC	TPL	MWC	BOWC
Balarshah	15,829.315	2106.230	9259.848	3253.842	171.652	1037.743	0.00	11272.926
Kothari	11,599.490	1107.666	5601.405	2092.321	1817.300	980.798	0.00	4993.373
Dhaba	5,341.204	1308.110	914.597	2083.873	642.928	391.700	0.00	0.00
Rajura	10,376.132	679.710	3642.785	1038.300	182.190	4833.147	0.00	0.00
Wirur	19,961.269	2536.550	10577.750	3945.464	1098.350	733.550	1069.605	10676.339
Wansadi	20,592.362	0.00	10810.302	3691.053	1509.064	293.000	4288.943	0.00
Jioti	28,208.285	0.00	6422.626	826.000	0.00	160.000	20799.659	0.00
TOTAL	1,11,908.057	7738.266	47229.313	16930.853	5421.484	8429.938	26158.207	26942.638

SECTION : 1.8: BLOCKS AND COMPARTMENTS:

1.8.1. The forests of Ballarshah, Kothari and Dhaba Forest Ranges are not divided into Blocks whereas those of Rajura, Wirur, jioti and Wansadi are divided into Blocks. The entire forest areas included into this plan is 1,11,908.057 hectare out of which 90822.934 hectare of Reserved Forests, 18045.593 hectare of Protected Forests and 3039.480 hectare of Unclassed Forests. This excludes the area already leased to Forest Development Corporation of Maharashtra a Maharashtra State Government Undertaking which is being managed under respective management plan duly sanctioned by the competent authority. New compartment numbers have been given to the areas covered under this plan for the first time treating each separate polygon of forest as distinct compartment. Similarly, old compartments which have more than one polygon have been renumbered for the sake of computer compatible identity for each forest area for computer compatible data creation and report generation. The statement of forest areas village wise, survey number wise or block wise as per notification for afforestation have been given in the **Appendix No. VI** of Volume II.

The range wise extent of Reserved Forest and Protected Forests is given below:-

Range	Range area Area (ha)	RF Area (ha)	PF Area (ha)	UF Area (ha)	FDCM Area (ha.)
Ballarshah	15,829.315	11272.926	4556.389	0	226.00(PF)
Kothari	11,599.490	5325.215	6274.225	0	17494.579(RF)
Dhaba	5,341.204	2954.945	2377.219	9.040	13640.069 (RF)
Rajura	10,376.132	10270.010	106.122	0	0
Wirur	19,961.269	19961.269	0	0	0
Wansadi	20,592.362	15860.724	4731.638	0	0
Jioti	28,208.285	25177.845	0	3030.440	0
Total	111,908.057	90822.934	18045.593	3039.480	31360.648

SECTION: 1. 9: PERIOD OF THE PLAN: 2015-16 to 2024-25.

1.9.1. The period of the plan is fixed as 10 years after final sanction from competent authority after that it will be revised. Mid term review of the prescriptions of the working plan may be taken after expiry of 5 years of operation after which if required necessary amendment in prescriptions may be incorporated. After completion of plan period this plan will be revised.

====00=====

CHAPTER - II

WORKING PLAN FOR SELECTION CUM IMPROVEMENT WORKING CIRCLE.

SECTION: 2.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE :

2.1.1. This working circle includes the forest areas of Ballarshah, Kothari and Dhaba Forest Ranges worked under Coppice with Reserve system and the untackled areas as Conversion Working Circle in khisti's plan and also other miscellaneous and teak forests. This working circle, also includes the forest areas of Rajura, Wirur and Wansadi Forest Ranges worked under Selection Cum Improvement W.C. in Dr. Nandkishor,s plan and areas having very good forests as well as the areas of new reserved forests. The total forest areas included in this working circle is 7738.266 ha. The range wise distribution of this area is as follows:

RANGEWISE DISTRIBUTION OF AREA IN SCI WC.

Range	Range area in ha.	Area as per Old W.P. in SCIWC.	Area as per Current W.P. in SCIWC.	% area with respect to range area.	% Area of W.C. with respect to total area of W.C. in division.
Ballarshah	15,829.315	9256.716	2106.230	13.30	27.22
Kothari	11,599.490	214.983	1107.666	9.54	14.31
Dhaba	5,341.204	5461.257	1308.110	24.49	16.91
Rajura	10,376.132	5615.819	679.710	6.55	8.79
Wirur	19,961.269	10248.759	2536.550	12.70	32.77
Wansadi	20,592.362	15242.613	0.000	0.00	0.00
Jioti	28,208.285		0.000	0.00	0.00
Total	111,908.057	46040.147	7738.266	66.58	100%

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

2.2.1.The areas allotted to this working circle are having miscellaneous and teak forests which are capable of producing both large and small sized timber. The crop consists predominantly of miscellaneous species. The occurrence of teak, bija, shisham is very less and their proportion is very low. Teak forests occur in small patches except in few compartments where the percentage of teak is about 60%. The growing stock is characterized by the presence of Teak, Bhirra, Dhawada, Lendia, Surya, Rohan, Garari, Moha, Ain, Kasai, Kakai, Amaltas, Papad, Dhaman etc. The density of the crop varies from 0.4 to 0.6. The site quality varies from III, III/IV and IV of all India Site Quality Types with predominance of site qualities of III, III/IV and IV. Better site qualities are confined to the nala and along areas of better soil. Some area of old comptt No. 446 new comptt no.72 of umari Beat is swampy and the rest is

grass land. The crop is generally young to middle aged with scattered matured trees. Matured trees or big sized trees are generally Moha and other fruit trees which have been reserved during the past working. At some places crop consists of young poles and is congested. Area is badly infested with climbers such as Kukuraji, Eroni, etc. The natural regeneration of Teak, Bhirra, Surya, Kasai, Dhawada, Garari, Lendia, Ain, Rohan, Achar, Moha, Tendu, Bel, Biba, Khair etc. is very satisfactory in areas away from the villages irrespective of site qualities. The regeneration suffers even in better site quality areas where grazing pressure is more. The over all status of natural regeneration is satisfactory. The natural regeneration of Bija is deficient that of Shisham is scattered and that of teak not upto the mark. The bad regeneration is probably due to selection of bad silvicultural system in the past and improper attending of other silvicultural operations prescribed. Tendu regeneration is profuse but surprisingly established regeneration is rare. Big Tendu trees are badly pollarded for large flush of Tendu leaves production which are yearly plucked by Licence Holder for Tendu Leaves collection given by State Government every year. This gives the indication of threat to future seed bearer. The sorry status of Tendu is mainly due to the part of the policy of Tendu Leaves collection. The provision of pruning in the policy is mainly responsible for this sorry state of Tendu. Bamboo regeneration is profuse in some hilly areas. The formation of clump is getting momentum with passage of time after gregarious flowering in mid 1986-88. The advantage of the satisfactory status of natural regeneration is to be taken as a tool to regenerate these areas. To bring the balance condition and increase productivity, some of important species like Bija, Shisham, Teak etc will be introduced by way of gap planting and seed sowing and they will be given preferential treatment while carrying out the silvicultural operations.

SECTION: 2. 3: BLOCKS COMPARTMENTS AND FELLING SERIES :

2.3.1. 34 Compartments have been allotted to this working circle. The working circle area 7738.266 hectares have been divided in to 4 felling series having 20 coups in each series. Average area of the coupes is 97 ha. The distribution of the compartments along with the area is given in **Appendix No. XXVI.** of Volume II.

SECTION: 2.4: SPECIAL OBJECTS OF MANAGEMENT :

2.4.1. As per the National Forest Policy, the main object of the management is to have ecological balance. This implies to restore the normal condition in the forest. Thus the ultimate aim of the management is to bring normalcy in the forest which will take care of balanced condition of ecosystem. The state of balanced ecosystem means the balanced dependence for eternity of all the members of the ecosystem among themselves to remain undisturbed in perpetuity. Other objectives are for short term physical benefits of the forest produce.

2.4.2. On the above considerations the special objects of management decided are as follows:

- (i) To increase the value and productivity of the area to the silvicultural and ecological possible extents and
- (ii) To obtain big and small sized timber, poles and firewood on sustained basis by way of improvement operations to meet the local requirement to the possible extent and ensure the sustained yield of aforesaid produce together with large sized timber in future.
- (iii) To restore the conducive habitat for wild animals.

SECTION:2. 5: ANALYSIS AND VALUATION OF THE CROP :

2.5.1. STOCK MAPPING: Stock mapping of the reserved forests of Ballarshah, Kothari and Dhaba Forest Ranges were carried out during 2009-10 and that of Rajura, Wansadi, Wirur and Jioti Ranges were carried out during 2010-12.

2.5.2. ENUMERATION: The 1% enumeration by the systematic sampling in 1897 plots method work was carried out by Survey of Forest Resources, Gadchiroli under the guidance of Conservator of Forests, Working Plan, Gadchiroli from April 2010 to Jan. 2011. The entire Central Chandra Forest Division's area was considered for sampling enumeration plan. 1897 no. of plots taken for enumeration.

Statement showing girth class wise nuber of trees per hectare, basal area in square meter per hectare and growing stock in cubic meter per ha. As computed on the basis of enumeration from April 2010 to Jan. 2011 is listed below.[138 no. of plots falls in 34 compartment taken for enumeration in SCIWC]

STATEMENT SHOWING NO OF TREES GIRTH CLASSWISE, BASAL AREA/HA AND VOLUME/HA Stocking in SCI

Sr no	Species	15-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151 up	TOTAL
1	Ain	5.70	3.91	2.62	1.52	1.78	1.49	1.46	1.11	0.87	0.67	21.15
2	Ali	1.25	1.19	0.78	0.31	0.11	0.01	0.04	0.00	0.00	0.00	3.70
3	Amti	1.58	0.78	0.08	0.04	0.00	0.01	0.00	0.00	0.03	0.00	2.53
4	Anjan	0.16	0.00	0.24	0.37	0.57	0.53	0.45	0.45	0.53	0.49	3.79
5	Aola	1.02	0.83	0.73	0.40	0.22	0.33	0.19	0.00	0.01	0.00	3.74
6	Apta	0.80	0.71	0.22	0.07	0.00	0.05	0.00	0.00	0.00	0.00	1.85
7	Arjun	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Bahawa	0.34	0.34	0.40	0.04	0.20	0.20	0.00	0.00	0.00	0.00	1.53
9	Behada	0.80	0.46	0.98	0.26	0.16	0.02	0.07	0.09	0.12	0.69	3.67
10	Bel	0.36	0.33	0.55	0.12	0.12	0.19	0.11	0.00	0.00	0.00	1.77
11	Bhera	7.82	5.09	3.73	2.72	2.37	1.41	1.05	0.67	0.34	0.42	24.56

12	Biba	0.49	0.24	0.08	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.90
13	Bija	0.52	0.55	0.55	0.91	0.41	0.83	0.62	0.54	0.75	0.60	6.27
14	Bor	0.08	0.16	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.41
15	Char	1.71	1.62	0.78	0.40	0.43	0.26	0.16	0.03	0.00	0.00	5.39
16	Chichwa	0.34	0.78	1.05	1.10	0.74	0.34	0.60	0.28	0.19	0.30	5.73
17	Chinch	0.00	0.00	0.04	0.20	0.20	0.16	0.16	0.29	0.24	0.53	1.83
18	Dhaman	2.72	2.43	0.73	0.20	0.34	0.10	0.00	0.03	0.24	0.00	6.80
19	Dhawda	2.06	1.43	1.41	1.28	1.37	1.24	1.08	0.70	0.56	0.39	11.51
20	Dhoban	0.22	0.26	0.61	0.36	0.31	0.38	0.49	0.36	0.32	0.96	4.28
21	Garari	11.50	6.55	3.63	2.49	1.33	0.70	0.40	0.01	0.00	0.00	26.61
22	Gongal	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
23	Haldu	0.38	0.50	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.16	1.37
24	Hirda	1.23	0.33	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
25	Eaktendu	0.08	0.33	0.16	0.16	0.08	0.08	0.00	0.08	0.00	0.00	0.98
26	Jambul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	Kakai	0.99	1.39	0.81	0.44	0.47	0.26	0.16	0.00	0.00	0.10	4.63
28	Kalamb	0.80	0.87	0.45	0.57	0.49	0.82	1.22	0.77	0.83	1.49	8.30
29	Karai	2.22	1.29	0.89	0.64	0.49	0.06	0.22	0.05	0.04	0.11	6.01
30	Karanj	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24
31	Karu	0.90	1.14	0.98	0.00	0.00	0.08	0.00	0.00	0.04	0.00	3.14
32	Kateyen	0.29	0.76	0.29	0.23	0.11	0.03	0.00	0.12	0.01	0.00	1.85
33	Kawath	0.52	0.83	0.72	0.86	0.12	0.41	0.05	0.14	0.08	0.00	3.72
34	Kavi	0.33	0.71	0.60	0.05	0.46	0.05	0.07	0.31	0.00	0.08	2.66
35	Khair	3.84	3.14	2.60	1.32	0.57	0.26	0.15	0.21	0.01	0.02	12.09
36	Kumbhi	0.08	0.12	0.24	0.08	0.16	0.12	0.04	0.00	0.00	0.00	0.86
37	Kusum	0.08	0.02	0.10	0.20	0.08	0.04	0.08	0.16	0.02	0.00	0.79
38	Lendia	8.23	3.12	1.34	1.22	0.47	0.07	0.01	0.02	0.03	0.00	14.50
39	Medsing	1.35	0.73	0.08	0.00	0.04	0.08	0.04	0.16	0.00	0.04	2.53
40	Moha	1.14	1.11	0.70	0.88	0.90	1.19	0.69	0.94	0.72	1.54	9.81
41	Mowai	0.98	1.09	1.48	0.91	1.03	1.01	1.45	1.39	0.67	0.66	10.67
42	Pakad	0.08	0.16	0.08	0.00	0.08	0.08	0.00	0.08	0.00	0.00	0.57
43	Palas	6.00	2.55	1.96	1.51	0.86	0.40	0.29	0.27	0.12	0.05	14.00
44	Parad	0.37	0.26	0.43	0.18	0.12	0.22	0.10	0.02	0.00	0.16	1.87

45	Pimpal	0.00	0.08	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.16
46	Rohan	1.69	1.38	1.71	1.26	1.17	0.79	0.55	0.20	0.23	0.51	9.49
47	Salai	0.16	0.59	0.96	1.08	2.11	2.60	1.65	1.49	0.88	1.59	13.10
48	Semal	0.10	0.10	0.40	0.21	0.34	0.22	0.36	0.13	0.46	0.41	2.73
49	Shisham	0.35	0.85	0.45	0.61	0.32	0.44	0.14	0.21	0.03	0.09	3.48
50	Shiwan	0.12	0.08	0.37	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.61
51	Surya	4.15	3.18	2.36	1.24	0.96	0.31	0.04	0.02	0.01	0.00	12.26
52	Teak	23.36	26.24	19.15	11.82	10.13	6.83	5.66	3.94	2.33	2.50	111.94
53	Tendu	21.14	4.50	1.42	0.74	0.53	0.54	0.31	0.15	0.14	0.40	29.87
54	Tiwas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	Others	65.39	34.83	17.30	10.66	6.10	3.00	2.05	1.38	1.16	1.33	143.20
Trees/ha		185.82	119.97	77.72	49.84	39.07	28.26	22.21	16.80	12.03	16.53	567.17
B.A./Ha.		0.748	1.37	1.73	1.83	2.14	2.15	2.25	2.19	1.96	3.28	19.65
Vol/Ha.		2.60	3.36	5.44	8.47	9.96	9.6	10.77	10.58	9.8	16.53	87.11

2.5.3. DENSITY AND AGE CLASSES: The crop is young to middle aged with scattered mature trees of fruit species. Density generally varies from 0.4 to 0.6. Some under stocked and blank patches of more than one hectare are also included

2.5.4. REGENERATION: Natural regeneration of miscellaneous species is satisfactory where grazing incidence is less. Regeneration in forest around villages where incidence of grazing is high is invariably from poor to absent. The regeneration of Bija, Teak, Shisham is poor due to lack of seed bearers that resulted mainly due to wrong application of silvicultural system. Coppice regeneration of Garari is very good through out the area and that of teak in scattered patches.

SECTION: 2 .6: HARVESTABLE GIRTH:

2.6.1. The following table shows the harvestable girth of different species, according to its sity quality.

SPECIES	TEAK (Tectona grandis)				
SITE QUALITY	II	II/III	III	III/IV	IV
Teak Harvestable girth	135	120	105	90	75
GROUPS	MISCELLANEOUS SPECIES				
A: Ain, Bija, Haldu, Kusum	165	150	135	120	105
B: Others	150	135	120	105	90
C: Khair, Lendia, Garari	45	45	45	45	45

2.6.2. Lendia and garadi should be completely removed above exploitable girth. Except for group –A , all trees of group-B above exploitable girth will be removed, provided, these are silviculturally available.

SECTION 2. 7: STRUCTURE AND SILVICULTURAL SYSTEM:

2.7.1. In the case of all aged forests, trees of all ages (and sizes) are found mixed together on every smallest unit of area. Smaller and younger trees occur either under older and larger trees in gaps or openings in the upper canopy. The oldest and largest trees are scattered everywhere. Besides, certain species can not grow in healthy condition beyond certain limits and therefore, these are to be selected first for the number of stand to be removed from girth classes corresponding to the aforesaid limits and above. Under such circumstances the only answer for the management system is selection. But at the same time felling is to be done in all girth classes aiming at both regeneration and improvement of the crop. Thus, the most suitable silvicultural system for all aged forest is "Selection Cum Improvement System".

2.7.2. The present selection system is different from traditional selection system. In traditional selection silvicultural system of management, single harvestable girth is decided for entire area of the working circle irrespective of site qualities. But the matter of fact is that the growth and silvicultural maturity of any species are the function of site quality and age. If the harvestable girth decided corresponds to site quality I, hardly any tree of this girth could be available in II/III, III, III/IV and IV site quality areas and consequently marking based on it, done in such areas, will leave even mature and over mature trees standing. On the contrary if the harvestable girth corresponds to site quality IV, trees of the same girth in areas having site quality higher than IV will be silviculturally immature but on marking, based on this girth, they will also be marked. This has been done away with in the present selection system. Since in all aged forests, trees of all age up to the age of rotation are found mixed together on every smallest unit of area and are scattered everywhere and therefore the working will be diffused over all over area. The felling will be selective in nature and the crop will be harvested according to the harvestable girth permitted for each species according to its site quality

2.7.3. The condition of miscellaneous forests seldom suits to strong light demander species, such as teak, khair etc. and therefore, such species are rarely found in good proportion in miscellaneous forests. Besides, it is not advisable to disturb the nature and so to the greatest extent our approach of management should be to remain as close as possible to the natural process. Changing the crop composition by artificial means amounts to interference with the nature. But introducing the species which were the local species of area in the past but not available at present will not violate the normal process. Therefore, to improve the productivity of the forest we need to have such valuable species in considerable proportion. For doing so, an artificial regeneration will be resorted. In the gap, created by the main felling, planting of suitable species can be taken but atleast 5 years such environment will have to be provided to planted seedlings to facilitate their establishment. Otherwise, such proposition can not be successful. The experiment should be started with teak and teak polypot seedling could be tried.

SECTION 2.8: CHOICE OF SPECIES:

2.8.1. Teak, Shisham, Bija, Haldu, Ain Tiwas are important trees species with reference to their financial values and demand of the people. Therefore, they will have edge over others. Besides, other species producing Non Timber Forest Produces will also be given due weightage. The rare species will be given top priority. They will be preserved. Unknown plants will not be felled without identifying them. In areas of inferior site quality Rohan, Bhirra, Khair, Garari, Lendia, Dikamali, Nirmali etc. will be favoured. The percentage, as decided for II/III site in above table, will be decided as per their social, ecological and financial importance. The shade and fruit bearer species in optimum number will be favoured to meet the requirement of the wildlife. The area with inadequate teak population will be facilitated with teak planting in suitable areas whereas in areas with high proportion of teak non teak population is to be increased with planting of non teak species of favouring the natural regeneration of non teak.

SECTION: 2. 9 : FORMATION OF FELLING SERIES AND COUPES:

2.9.1. The total number of 4 felling series carved out of total areas of this working circle . Each felling series will be divided into 20 annual coupes. The coupes will be laid down from ridge to valley to have watershed approach compatible. The sequence of working will be given in **Appendix No.XXVII.** of Volume II.

SECTION: 2. 10: REGULATION OF YIELD:

2.10.1. In a balanced normal forest, the yield always remains sustained. The normality is achieved after a rotation in general. However, looking into the crop composition and statistics of growth, it is quite possible that the forests of this working circle can be brought to normalcy within a four felling cycles with some efforts. The annual yield will be regulated by area by making coupes as far as equiproductive in each felling series.

SECTION: 2.11. : YIELD CALCULATION:

2.11.1. Yield calculation has been done with the help of K.P. Sagreiya's modification of Brandies formula for selection felling. Sequential steps involved for yield calculation are as follows.

- (i) The number of trees in Class I (Exploitable Girth Class) is S_1 ;
- (ii) The number of trees in classes II, III ... are $s_2, s_3, \dots$;
- (iii) The fraction of the trees of classes II, III, ... that survive and are eventually available for harvesting as class trees are $x_2, x_3, \dots$, so that $x_2 s_2 = S_2$; $x_3 s_3 = S_3$; ...
- (iv) The trees take $Y_2, Y_3, \dots$ years in classes II, III, ..., so that the average annual recruitments in the class periods are-
$$S_2 / Y_2 = R_2$$

- $S_3/Y_3 = R_3, \dots$
- (v) The overall average annual recruitment for the entire enumeration period, i.e.,
 $(S_2 + S_3 + \dots) / (Y_2 + Y_3 + \dots) = S/Y$ is say R .
- (vi) The felling cycle adopted is f years and
- (vii) The accruing average annual recruitment during the 1st, 2nd, ... Cycles is R' , R'' , ... , so that the recruitments, accruing in successive cycles, i.e. $f R'$, $f R''$, ... are given by as follows:

$$f R' = a R_x + (f - a) R_{x+1}$$

$$f R'' = b R_y + (f - b) R_{y+1}, \dots$$

Then the realizable recruitments $R_{r1}, R_{r2}, \dots$ in cycles I, II, ... Will be.....

$$R_{r1} = \frac{1}{2} [f R' - a (R' - R_x)],$$

$$R_{r1} = \frac{1}{2} [f R'' - a (f R'' - R_y)], \dots$$

Therefore, the prescribed yield should be –

$$I/f [S_1 + f R'/2 - a (R' - R_x)/2],$$

$$I/2f [S_2 + f (R' + R''/2) - b (R'' - R_y)/2], \dots$$

According as the stock in hand has to be liquidated in 1, 2, ... cycles, to obtain the maximum sustained yield, while the actual recruitment is still less than R .

From this it follows that if the overall annual recruitment R is to be realized on a sustained basis even while the realizable recruitment in a cycle is less than R , there must be a stock in hand of –

$$S_I = f [R - R'/2] + a (R' - R_x)/2],$$

$$S_{II} = f [2R - (R' + R''/2)] + b (R'' - R_y)/2],$$

....

According as the deficiency continues for 1, 2, 3, ... felling cycles.

GROUP A (Ain, Bija, Haldu, Shisham, Teak, **Tiwas**)

For the tract dealt with, in Selection Cum Improvement Working Circle consisting of all aged forests, we have girth wise distribution of trees,

years to cross the class according to stem analysis of teak tree of Site Quality – III and selection girth fixed is 135 cm.

Table No- 1
Enumeration data

Species	16-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151& up	Total
Ain	5.70	3.91	2.62	1.52	1.78	1.49	1.46	1.11	0.87	0.67	21.15
Bija	0.52	0.55	0.55	0.91	0.41	0.83	0.62	0.54	0.75	0.60	6.27
Haldu	0.38	0.50	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.16	1.37
Shisham	0.35	0.85	0.45	0.61	0.32	0.44	0.14	0.21	0.03	0.09	3.48
Teak	23.36	26.24	19.15	11.82	10.13	6.83	5.66	3.94	2.33	2.50	111.94
Tiwas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	30.31	32.05	23.01	14.94	12.64	9.59	7.87	5.80	3.98	4.03	144.21

Table No-2

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
I	Over 135		
II	120-135	9	Y_2
III	106-120	10	Y_3
IV	91-105	10	Y_4
V	76-90	10	Y_5
VI	61-75	10	Y_6
VII	46-60	9	Y_7
VIII	31-45	10	Y_8
IX	15-30	14	Y_9
Total enumeration period		82	Y

Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

Table No- 3

**TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES
REACHING TO HARVESTABLE GIRTH CLASS**

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	150 & up	4.03					
I	135-150	3.98		100%			
II	120-135	5.80	S ₂	69%	X ₂	4.00	S ₂
III	106-120	7.87	S ₃	51%	X ₃	4.01	S ₃
IV	91-105	9.59	S ₄	42%	X ₄	4.03	S ₄
V	76-90	12.64	S ₅	31%	X ₅	3.92	S ₅
VI	61-75	14.94	S ₆	27%	X ₆	4.03	S ₆
VII	46-60	23.01	S ₇	17%	X ₇	3.91	S ₇
VIII	31-45	32.05	S ₈	12%	X ₈	3.85	S ₈
IX	15-30	30.31	S ₉	13%	X ₉	3.94	S ₉
	Total	144.21				31.69	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y, say R is $31.69 / 82 = 0.386$ per ha. The average annual recruitment during the size class period namely, $S_2 / Y_2 = R_2$, $S_3 / Y_3 = R_3$, ... will be as following table:

Table No- 4

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP A

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
I	Over 135	8.01*				
II	120-135	4.00	9	Y ₂	0.444	R ₂
III	106-120	4.01	10	Y ₃	0.401	R ₃

IV	91-105	4.03	10	Y_4	0.403	R_4
V	76-90	3.92	10	Y_5	0.392	R_5
VI	61-75	4.03	10	Y_6	0.403	R_6
VII	46-60	3.91	9	Y_7	0.435	R_7
VIII	31-45	3.85	10	Y_8	0.385	R_8
IX	15-30	3.94	14	Y_9	0.281	R_9
		31.69	82	Y	0.393	R

It is obvious that although there is stock in hand of 8.01 class I trees/ha and there will be a recruitment of 31.69 trees/ha in the 82 years and thus theoretically annual yield of $(31.69 + 8.01) / 82 = 0.48$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$. Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2 / 2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the felling have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2 / 2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before felling commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2 / 2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2 / 2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-5

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP A SPECIES

(For Proposed Plan Felling Cycle of 20 years; n th year of operation; No of trees per ha)

S.No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand = S_1	Realizable Recruitment =	Accruing Recruitment =
1	I	1	1	8.01	$\frac{1}{2} R_2 = 0.222$	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 8.884$
2	II	1	2	8.01	$R_2 + \frac{1}{2} R_2 = 0.666$	$15R_2 + 3 R_3 + \frac{1}{2} R_3 = 8.483$
3	III	1	3	8.01	$2R_2 + \frac{1}{2} R_2 = 1.11$	$15R_2 + 2 R_3 + \frac{1}{2} R_3 = 8.082$

4	IV	1	4	8.01	$3R_2 + \frac{1}{2} R_2$ =1.554	$15R_2 + R_3 + \frac{1}{2} R_3$ =7.681
5	V	1	5	8.01	$4R_2 + \frac{1}{2} R_2$ =1.998	$15R_2 + \frac{1}{2} R_3$ =7.28
6	VI	1	6	8.01	$5R_2 + \frac{1}{2} R_2$ =2.442	$14R_2 + \frac{1}{2} R_2$ =6.83
7	VII	1	7	8.01	$6R_2 + \frac{1}{2} R_2$ =2.886	$13R_2 + \frac{1}{2} R_2$ =6.358
8	VIII	1	8	8.01	$7R_2 + \frac{1}{2} R_2$ =3.33	$12R_2 + \frac{1}{2} R_2$ =5.886
9	IX	1	9	8.01	$8R_2 + \frac{1}{2} R_2$ =3.774	$11R_2 + \frac{1}{2} R_2$ =5.414
10	X	1	10	8.01	$9R_2 + \frac{1}{2} R_2$ =4.218	$10R_2 + \frac{1}{2} R_2$ =4.662
11	XI	1	11	8.01	$10R_2 + \frac{1}{2} R_2$ =4.662	$9R_2 + \frac{1}{2} R_2$ =4.218
12	XII	1	12	8.01	$11R_2 + \frac{1}{2} R_2$ =5.414	$8R_2 + \frac{1}{2} R_2$ =3.774
13	VIII	1	13	8.01	$12R_2 + \frac{1}{2} R_2$ =5.886	$7R_2 + \frac{1}{2} R_2$ =3.33
14	XIV	1	14	8.01	$13R_2 + \frac{1}{2} R_2$ =6.358	$6R_2 + \frac{1}{2} R_2$ =2.886
15	XV	1	15	8.01	$14R_2 + \frac{1}{2} R_2$ =6.83	$5R_2 + \frac{1}{2} R_2$ =2.442
16	XVI	1	16	8.01	$15R_2 + \frac{1}{2} R_3$ =7.28	$4R_2 + \frac{1}{2} R_2$ =1.998
17	XVII	1	17	8.01	$15R_2 + R_3 + \frac{1}{2} R_3$ =7.681	$3R_2 + \frac{1}{2} R_2$ =1.554
18	XVIII	1	18	8.01	$15R_2 + 2 R_3 + \frac{1}{2} R_3$ =8.082	$2R_2 + \frac{1}{2} R_2$ =1.11
19	XIX	1	19	8.01	$15R_2 + 3 R_3 + \frac{1}{2} R_3$ =8.483	$R_2 + \frac{1}{2} R_2$ =0.666
20	XX	1	20	8.01	$15R_2 + 4 R_3 + \frac{1}{2} R_3$ =8.884	$\frac{1}{2} R_2$ = 0.222
	Total	20	20		91.76	91.76
			Average	8.01	4.59	4.59

Thus overall average number trees per ha will be $8.01+4.59+4.59 = 17.19$. Out of which available for selection felling would be $8.01+4.59 = 12.60$. Percentage removal would be $12.60/17.19 \% = 73.29 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 %. For sake of simplicity say 50% of silviculturally available tree i.e. on average 50% of $17.19 = 8.59$ say 9 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 135-150 as timber = 0.485 cubic meter. We will have average yield = $9 \times 0.485/20 = 0.21$ cubic meter per hectare per annum of timber. For fuel wood average yield will be $= 9 \times 0.330/20 = 0.15$ fuel wood per ha per annum.

Group B (Other species: Selection Girth =120 cms)

Sr.no	Species	15-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151 up	TOTAL
1	Anjan	0.16	0	0.24	0.37	0.57	0.53	0.45	0.45	0.53	0.49	3.79
2	Dhaman	2.72	2.43	0.73	0.2	0.34	0.1	0	0.03	0.24	0	6.8
3	Dhawda	2.06	1.43	1.41	1.28	1.37	1.24	1.08	0.7	0.56	0.39	11.51
4	Mowai	0.98	1.09	1.48	0.91	1.03	1.01	1.45	1.39	0.67	0.66	10.67
5	Salai	0.16	0.59	0.96	1.08	2.11	2.6	1.65	1.49	0.88	1.59	13.1
19	Shiwan	0.12	0.08	0.37	0.04	0	0	0	0	0	0	0.61
20	Surya	4.15	3.18	2.36	1.24	0.96	0.31	0.04	0.02	0.01	0	12.26
	Other species	12.74	11.19	10.12	6.93	6.05	4.51	4.39	2.77	2.44	4.33	64.48
	Total	23.09	19.99	17.67	12.05	12.43	10.3	9.06	6.85	5.33	7.46	123.22

Table No-6

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
	>135		
I	120-135		
II	106-120	13	Y ₂
III	91-105	14	Y ₃
IV	76-90	14	Y ₄
V	61-75	12	Y ₅
VI	46-60	12	Y ₆
VII	31-45	12	Y ₇
VIII	15-30	16	Y ₈
Total enumeration period		93	Y

2.11.1.4. Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

Table No-7

**TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES
REACHING TO HARVESTABLE GIRTH CLASS**

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	>135	12.79					
I	120-135	6.86		100%			
II	106-120	9.06	s_2	76%	x_2	6.89	S_2
III	91-105	10.30	s_3	67%	x_3	6.90	S_3
IV	76-90	12.44	s_4	55%	x_4	6.84	S_4
V	61-75	12.05	s_5	57%	x_5	6.87	S_5
VI	46-60	17.69	s_6	39%	x_6	6.90	S_6
VII	31-45	20.01	s_7	34%	x_7	6.80	S_7
VIII	15-30	23.09	s_8	30%	x_8	6.93	S_8
	Total	123.22				48.13	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is $48.13 / 93 = 0.517$ per ha. The average annual recruitment during the size class period namely, $S_2/ Y_2 = R_2$, $S_3/ Y_3 = R_3$, ... will be as following table:

Table No- 8

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP B

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
I	>120	19.65*				
II	106-120	6.89	13	Y_2	0.530	R_2
III	91-105	6.90	14	Y_3	0.493	R_3
IV	76-90	6.84	14	Y_4	0.489	R_4
V	61-75	6.87	12	Y_5	0.572	R_5
VI	46-60	6.90	12	Y_6	0.575	R_6

VII	31-45	6.80	12	Y_7	0.567	R_7
VIII	15-30	6.93	16	Y_8	0.433	R_8
	Total	48.13	93	Y	0.457	R

It is obvious that although there is stock in hand of (12.79+6.86)=19.65 class I trees/ha and there will be a recruitment of 48.13 trees/ha in the 93 years and thus theoretically annual yield of $(48.13 + 19.65) / 93 = 0.73$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$. Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2/2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2/2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2/2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2/2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No- 9

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP B SPECIES

(For Proposed Plan Felling Cycle of 20 years; nth year of operation; No of trees per ha)

Sr.No	Coupe No	For coupe area in ha	n th year of operation	Class I at hand= S_1	Realizable Recruitment =	Accruing Recruitment=
1	I	1	1	19.65	$\frac{1}{2}R_2$ =0.265	$15R_2 + 4R_3 + \frac{1}{2}R_3$ =10.169
2	II	1	2	19.65	$R_2 + \frac{1}{2}R_2$ =0.795	$15R_2 + 3R_3 + \frac{1}{2}R_3$ =9.676
3	III	1	3	19.65	$2R_2 + \frac{1}{2}R_2$ =1.325	$15R_2 + 2R_3 + \frac{1}{2}R_3$ =9.183
4	IV	1	4	19.65	$3R_2 + \frac{1}{2}R_2$ =1.855	$15R_2 + R_3 + \frac{1}{2}R_3$ =8.69

5	V	1	5	19.65	$4R_2 + \frac{1}{2} R_2$ =2.385	$15R_2 + \frac{1}{2} R_3$ =8.197
6	VI	1	6	19.65	$5R_2 + \frac{1}{2} R_2$ =2.915	$14R_2 + \frac{1}{2} R_2$ =7.685
7	VII	1	7	19.65	$6R_2 + \frac{1}{2} R_2$ =3.445	$13R_2 + \frac{1}{2} R_2$ =7.155
8	VIII	1	8	19.65	$7R_2 + \frac{1}{2} R_2$ =3.975	$12R_2 + \frac{1}{2} R_2$ =6.625
9	IX	1	9	19.65	$8R_2 + \frac{1}{2} R_2$ =4.505	$11R_2 + \frac{1}{2} R_2$ =6.095
10	X	1	10	19.65	$9R_2 + \frac{1}{2} R_2$ =5.035	$10R_2 + \frac{1}{2} R_2$ =5.565
11	XI	1	11	19.65	$10R_2 + \frac{1}{2} R_2$ =5.565	$9R_2 + \frac{1}{2} R_2$ =5.035
12	XII	1	12	19.65	$11R_2 + \frac{1}{2} R_2$ =6.095	$8R_2 + \frac{1}{2} R_2$ =4.505
13	VIII	1	13	19.65	$12R_2 + \frac{1}{2} R_2$ =7.155	$7R_2 + \frac{1}{2} R_2$ =3.975
14	XIV	1	14	19.65	$13R_2 + \frac{1}{2} R_2$ =6.358	$6R_2 + \frac{1}{2} R_2$ =3.445
15	XV	1	15	19.65	$14R_2 + \frac{1}{2} R_2$ =7.685	$5R_2 + \frac{1}{2} R_2$ =2.915
16	XVI	1	16	19.65	$15R_2 + \frac{1}{2} R_3$ =8.197	$4R_2 + \frac{1}{2} R_2$ =2.385
17	XVII	1	17	19.65	$15R_2 + R_3 + \frac{1}{2} R_3$ =8.69	$3R_2 + \frac{1}{2} R_2$ =1.855
18	XVIII	1	18	19.65	$15R_2 + 2 R_3 + \frac{1}{2} R_3$ =9.183	$2R_2 + \frac{1}{2} R_2$ =1.325
19	XIX	1	19	19.65	$15R_2 + 3 R_3 + \frac{1}{2} R_3$ =9.676	$R_2 + \frac{1}{2} R_2$ =0.795
20	XX	1	20	19.65	$15R_2 + 4 R_3 + \frac{1}{2} R_3$ =10.169	$\frac{1}{2} R_2$ =0.265
	Total	20	20		105.54	105.54
			Average	19.65	5.277	5.277

Thus overall average number trees per ha will be $19.65 + 5.27 + 5.27 = 30.19$. Out of which available for selection felling would be $19.65 + 5.27 = 24.92$. Percentage removal would be $24.92/30.19 \% = 82.54 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 % of 30.19 = 15.09 say 15 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 120 as timber = 0.400 cubic metre, we will have average yield = $15 \times 0.400/20 = 0.30$ cubic meter per hectare per annum of timber. For fuel wood average yield will be $= 15 \times 0.230/20 = 0.17$ fuel wood per ha per annum.

Group C (Garari and Lendia Selection Girth =45 cms)

S.N	Species	15-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151 up	TOTAL
1	Garari	11.50	6.55	3.63	2.49	1.33	0.70	0.40	0.01	0.00	0.00	26.61
2	Lendia	8.23	3.12	1.34	1.22	0.47	0.07	0.01	0.02	0.03	0.00	14.50
Trees/ha		19.73	9.66	4.97	3.72	1.80	0.78	0.41	0.03	0.03	0.00	41.11

Table No-10

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
	>60		
I	46-60	..	..
II	31-45	10	Y ₂
III	15-30	7	Y ₃
Total enumeration period		17	Y

2.11.1.4. Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

Table No-11

TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	>60	6.75					
I	46-60	4.97					
II	31-45	9.66	S ₂	51%	x ₂	3.28	S ₂
III	15-30	19.73	S ₃	35%	x ₃	5.92	S ₃
	Total	41.11				9.20	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is 9.20 /17 = 0.541 per ha. The average

annual recruitment during the size class period namely, $S_2/Y_2 = R_2$, $S_3/Y_3 = R_3$, ... will be as following table:

Table No- 12

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP B

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
	>60	6.75*				
I	46-60	4.97				
II	31-45	9.66	10	Y_2	0.966	R_2
III	15-30	19.73	7	Y_3	2.819	R_3
		34.36	17	Y	1.890	R

It is obvious that although there is stock in hand of (6.75+4.97)=11.72 class I trees/ha and there will be a recruitment of 9.20 trees/ha in the 17 years and thus theoretically annual yield of $(11.72 + 9.20) / 17 = 1.23$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only ($S_1 + R_2$). Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2 / 2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2 / 2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2 / 2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2 / 2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-13

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP C SPECIES

(For Proposed Plan Felling Cycle of 20 years; n th year of operation; No of trees per ha)

Sr.No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_1	Realizable Recruitment =	Accruing Recruitment=
1	I	1	1	11.72	$\frac{1}{2}R_2 = 0.483$	$15R_2 + 4R_3 + \frac{1}{2}R_3 = 27.175$
2	II	1	2	11.72	$R_2 + \frac{1}{2}R_2 = 1.449$	$15R_2 + 3R_3 + \frac{1}{2}R_3 = 24.356$
3	III	1	3	11.72	$2R_2 + \frac{1}{2}R_2 = 2.415$	$15R_2 + 2R_3 + \frac{1}{2}R_3 = 21.537$
4	IV	1	4	11.72	$3R_2 + \frac{1}{2}R_2 = 4.347$	$15R_2 + R_3 + \frac{1}{2}R_3 = 18.718$
5	V	1	5	11.72	$4R_2 + \frac{1}{2}R_2 = 2.385$	$15R_2 + \frac{1}{2}R_3 = 15.899$
6	VI	1	6	11.72	$5R_2 + \frac{1}{2}R_2 = 5.313$	$14R_2 + \frac{1}{2}R_2 = 14.007$
7	VII	1	7	11.72	$6R_2 + \frac{1}{2}R_2 = 6.279$	$13R_2 + \frac{1}{2}R_2 = 13.041$
8	VIII	1	8	11.72	$7R_2 + \frac{1}{2}R_2 = 7.245$	$12R_2 + \frac{1}{2}R_2 = 12.075$
9	IX	1	9	11.72	$8R_2 + \frac{1}{2}R_2 = 8.211$	$11R_2 + \frac{1}{2}R_2 = 11.109$
10	X	1	10	11.72	$9R_2 + \frac{1}{2}R_2 = 9.177$	$10R_2 + \frac{1}{2}R_2 = 10.143$
11	XI	1	11	11.72	$10R_2 + \frac{1}{2}R_2 = 10.143$	$9R_2 + \frac{1}{2}R_2 = 9.177$
12	XII	1	12	11.72	$11R_2 + \frac{1}{2}R_2 = 11.109$	$8R_2 + \frac{1}{2}R_2 = 8.211$
13	VIII	1	13	11.72	$12R_2 + \frac{1}{2}R_2 = 12.075$	$7R_2 + \frac{1}{2}R_2 = 7.245$
14	XIV	1	14	11.72	$13R_2 + \frac{1}{2}R_2 = 13.041$	$6R_2 + \frac{1}{2}R_2 = 6.279$
15	XV	1	15	11.72	$14R_2 + \frac{1}{2}R_2 = 14.007$	$5R_2 + \frac{1}{2}R_2 = 5.313$
16	XVI	1	16	11.72	$15R_2 + \frac{1}{2}R_3 = 15.899$	$4R_2 + \frac{1}{2}R_2 = 4.347$
17	XVII	1	17	11.72	$15R_2 + R_3 + \frac{1}{2}R_3 = 18.718$	$3R_2 + \frac{1}{2}R_2 = 3.381$
18	XVIII	1	18	11.72	$15R_2 + 2R_3 + \frac{1}{2}R_3 = 21.537$	$2R_2 + \frac{1}{2}R_2 = 2.415$
19	XIX	1	19	11.72	$15R_2 + 3R_3 + \frac{1}{2}R_3 = 24.356$	$R_2 + \frac{1}{2}R_2 = 1.449$
20	XX	1	20	11.72	$15R_2 + 4R_3 + \frac{1}{2}R_3 = 27.175$	$\frac{1}{2}R_2 = 0.483$
	Total	20	20		216.36	216.36
			Average	11.72	10.818	10.818

Thus overall average number trees per ha will be $11.72+10.81+10.81 = 33.34$. Out of which available for selection felling would be $11.72+10.81 = 22.53$. Percentage removal would be $22.53/33.34 \% = 67.57 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 % of 33.34 = 16.67 say 17 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 60 as timber = 0.070 cubic metre, we will have average yield = $17 \times 0.070/20 = 0.059$ cubic meter per hectare per annum of timber.

Group D (Khair Selection Girth =75 cms)

Sr.no	Species	15-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151 up	TOTAL
1	Khair	3.84	3.14	2.60	1.32	0.57	0.26	0.15	0.21	0.01	0.02	12.09
Trees/ha		3.84	3.14	2.60	1.32	0.57	0.26	0.15	0.21	0.01	0.02	12.09

Table No-14

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
	>90		
I	76-90		
II	61-75	14	Y_2
III	46-60	12	Y_3
IV	31-45	10	Y_4
V	15-30	7	Y_5
Total enumeration period		43	Y

2.11.1.4. Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

Table No-15

TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	>90	0.65					
I	76-90	0.57		100%			

II	61-75	1.32	s_2	43%	x_2	0.75	S_2
III	46-60	2.60	s_3	22%	x_3	1.01	S_3
IV	31-45	3.14	s_4	18%	x_4	1.07	S_4
V	15-30	3.84	s_5	15%	x_5	1.15	S_5
	Total	12.09				3.99	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is $3.99/43 = 0.092$ per ha. The average annual recruitment during the size class period namely, $S_2/Y_2 = R_2$, $S_3/Y_3 = R_3$, ... will be as following table:

Table No- 16

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP B

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
	>91	0.65				
I	76-90	0.57				
II	61-75	1.32	14	Y_2	0.094	R_2
III	46-60	2.60	12	Y_3	0.217	R_3
IV	31-45	3.14	10	Y_4	0.314	R_4
V	15-30	3.84	7	Y_5	0.549	R_5
		12.09	43	Y	0.147	R

It is obvious that although there is stock in hand of $(0.57+0.64)=1.21$ class I trees/ha and there will be a recruitment of 3.99 trees/ha in the 43 years and thus theoretically annual yield of $(3.99 + 1.21) / 43 = 0.120$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$. Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2/2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2 / 2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2/2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2 / 2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No- 17

**TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS:
GROUPC SPECIES**

(For Proposed Plan Felling Cycle of 20 years; n th year of operation; No of trees per ha)

Sr.No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_1	Realizable Recruitment =	Accruing Recruitment=
1	I	1	1	1.21	$\frac{1}{2}R_2 = 0.265$	$15R_2 + 4R_3 + \frac{1}{2}R_3 = 10.169$
2	II	1	2	1.21	$R_2 + \frac{1}{2}R_2 = 0.795$	$15R_2 + 3R_3 + \frac{1}{2}R_3 = 9.676$
3	III	1	3	1.21	$2R_2 + \frac{1}{2}R_2 = 1.325$	$15R_2 + 2R_3 + \frac{1}{2}R_3 = 9.183$
4	IV	1	4	1.21	$3R_2 + \frac{1}{2}R_2 = 1.855$	$15R_2 + R_3 + \frac{1}{2}R_3 = 8.69$
5	V	1	5	1.21	$4R_2 + \frac{1}{2}R_2 = 2.385$	$15R_2 + \frac{1}{2}R_3 = 8.197$
6	VI	1	6	1.21	$5R_2 + \frac{1}{2}R_2 = 2.915$	$14R_2 + \frac{1}{2}R_2 = 7.685$
7	VII	1	7	1.21	$6R_2 + \frac{1}{2}R_2 = 3.445$	$13R_2 + \frac{1}{2}R_2 = 7.155$
8	VIII	1	8	1.21	$7R_2 + \frac{1}{2}R_2 = 3.975$	$12R_2 + \frac{1}{2}R_2 = 6.625$
9	IX	1	9	1.21	$8R_2 + \frac{1}{2}R_2 = 4.505$	$11R_2 + \frac{1}{2}R_2 = 6.095$
10	X	1	10	1.21	$9R_2 + \frac{1}{2}R_2 = 5.035$	$10R_2 + \frac{1}{2}R_2 = 5.565$
11	XI	1	11	1.21	$10R_2 + \frac{1}{2}R_2 = 5.565$	$9R_2 + \frac{1}{2}R_2 = 5.035$
12	XII	1	12	1.21	$11R_2 + \frac{1}{2}R_2 = 6.095$	$8R_2 + \frac{1}{2}R_2 = 4.505$
13	VIII	1	13	1.21	$12R_2 + \frac{1}{2}R_2 = 7.155$	$7R_2 + \frac{1}{2}R_2 = 3.975$
14	XIV	1	14	1.21	$13R_2 + \frac{1}{2}R_2 = 6.358$	$6R_2 + \frac{1}{2}R_2 = 3.445$
15	XV	1	15	1.21	$14R_2 + \frac{1}{2}R_2 = 7.685$	$5R_2 + \frac{1}{2}R_2 = 2.915$
16	XVI	1	16	1.21	$15R_2 + \frac{1}{2}R_3 = 8.197$	$4R_2 + \frac{1}{2}R_2 = 2.385$
17	XVII	1	17	1.21	$15R_2 + R_3 + \frac{1}{2}R_3 = 8.69$	$3R_2 + \frac{1}{2}R_2 = 1.855$
18	XVIII	1	18	1.21	$15R_2 + 2R_3 + \frac{1}{2}R_3 = 9.183$	$2R_2 + \frac{1}{2}R_2 = 1.325$
19	XIX	1	19	1.21	$15R_2 + 3R_3 + \frac{1}{2}R_2$	$R_2 + \frac{1}{2}R_2$

					$R_3 = 9.676$	$= 0.795$
20	XX	1	20	1.21	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 10.169$	$\frac{1}{2} R_2 = 0.265$
	Total	20	20		20.33	20.33
			Average	1.21	1.01	1.01

Thus overall average number trees per ha will be $1.21 + 1.01 + 1.01 = 3.32$. Out of which available for selection felling would be $11.72 + 10.81 = 2.22$. Percentage removal would be $2.22/3.32 \% = 66.86 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 % of 3.32 = 1.66 say 2 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 75 as timber = 0.165 cubic metre, we will have average yield $= 2 \times 0.165/20 = 0.0165$ cubic meter per hectare per annum of timber. For fuel wood average yield will be $= 2 \times 0.090/20 = 0.009$ fuel wood per ha per annum.

ABSTRACT OF YIELD CALCULATION

Group of species	A	B	C	D	For one ha	Total area allotted is 7738.266 ha
Number of stem/ha	9	15	17	2	43	
Selection Girth class	135	120	45	75	--	
Form Factor Timber	0.485	0.400	0.070	0.165	--	
Form Factor Fuel wood	0.330	0.230	0.000	0.090	--	
Timber	0.218	0.300	0.059	0.0165	0.5935	5211.00 Cu..m.
Fuelwood	0.150	0.172	0.000	0.009	0.331	2905.00 Cu..m.
TOTAL	0.368	0.472	0.059	0.0255	0.9245	8116 Say 8100 Cu..m.

SECTION 2. 12: AGENCY FOR HARVESTING:

2.12.1 The felling of coupes, after marking, will either be done departmentally or through FLCS or through JFM Committee. However, subsidiary silvicultural operations, soil and moisture conservation works, planting and fire protection works will be carried out departmentally.

SECTION 2.13: DEMARCATION OF COUPES PREPARATION OF TREATMENT MAP & MARKING TECHNIQUE:

2.13.1. Demarcation of every coupe as per prescriptions is very much essential. The coupe lines should be treated as fire lines for that year. It will help to check encroachments also. It is also necessary to take S.M.C. work, plantation and regeneration work etc.

Coupes will be demarcated one year in advance of working (felling etc) as per the procedure laid down under Other Important Regulations. After demarcation, within the coupe, area will be divided into quality classes if the extent of any quality area is more than 2 ha.

PREPARATION OF TREATMENT MAP:

2.13.2. A broad treatment map will be prepared in GIS all showing unworkable area, buffer and various density class. The finer details will be elaborated by R.F.O. and checked by A.C.F.

2.13.3. TYPE - A: PROTECTION AREAS:

This will include

Areas on slopes more than 25 degree;

20 meter (One chain) wide area on either side of banks of nallas and river courses.

2.13.4. TYPE - B: UNDERSTOCKED AREAS:

This will include all areas below 0.4 densities.

2.13.5. TYPE - C : GROUP OF YOUNG POLES:

This will include areas having group of young poles an extent of minimum 2 ha at a place.

2.13.6. TYPE - D: WELL STOCKED AREAS:

This will include all areas above 0.4 density.

To facilitate the preparation of treatment map each coupe, in general, will be divided into 4 sections. Each type of area will be demarcated of its extent at one place is minimum 2 ha Except the nalla banks etc. which will be marked irrespective of its extent. On receipt of the treatment map, the same will be

scrutinised by an ACF and approved by the Dy. Conservator of Forests, No area will be treated as unworkable as some kinds of work will be carried out in each type of the area mentioned above.

2.13.7. Guidelines for carrying out Demarcation, CBO and Cleaning works and Natural regeneration and Grids laying in coupes for accurate treatment map are issued vide PCCF (HOFF) M.S. Nagpur vide letter No. D-14/WP/721, dated 25.10.2013 and letter No. 338, dated 2.7.2010 is given in **Appendix No. XXVIII-A** of Volume II.

SECTION 2.14: MARKING TECHNIQUE AND MARKING RULES

2.14.1. MARKING TECHNIQUE : The trees in harvestable and preharvestable class will be enumerated. The trees shall only be removed from the harvestable girth, starting from above.

2.14.2. MARKING RULES : Marking, technique has been described, in detail, in the Other Most Important Regulations. The marking rules and climber cutting for each type of area will be as follows:

2.14.3. TYPE – A : PROTECTION AREAS:

In protection area, no marking will be done.

2.14.4. TYPE – B : UNDERSTOCKED AREAS:

No. marking will be done, except

All dead trees after retaining 2 dead trees/ha

All live high stumps

All but one vigorously growing shoot/stool.

2.14.5. TYPE – C : GROUPS OF YOUNG POLES:

In such areas thinning marking will be done on the basis of normal stand table for the given site. First of all 10% enumeration of area by point sampling will be done. The abstract of the enumeration will tell the number of stems in different girth classes. The corresponding numbers are seen from normal stand table for the given site quality. If the abstract shows only 3 girth classes

in that case the number of stems required in those girth classes will be obtained by multiplying the normal stand table no. by 10/3. In general the multiplication factor will be 10/n where n ranges from 1 to 10 and signifies the girthclass.

Poles will be spaced to a distance of one third of the dominant pole in the patch. All malformed poles will be cutback

2.14.6. TYPE – D : WELL STOCKED AREAS:

All edible fruit and flower yielding species which are capable of attaining girth more than highest harvestable girth i.e. 135 cm will be retained till attain the same. All trees above highest selection girth and approach class will be enumerated, before marking, in 15 cm girth classes. The following rules will be followed for marking.

i) Only identified and silviculturally available tree species will be marked. Unidentified species shall not be marked until its identification is done and separate orders are obtained from the Chief Conservator of Forests(T). This is important for preservation of rare species & their identification.

ii) All dead and malformed trees, irrespective of species and girth, after retaining 2 dead trees/ha will be marked. A tree will be treated as malformed if it does not have a clean bole upto atleast 2 m above breast height.

iii) All live high stumps will be marked for felling.

iv) All but one vigorously growing coppice shoot per stool, where density is less, will be marked.

v) The cultivate girth of Khair, Garari and Lendia is 45 cm. Therefore, all trees of these species will be marked in 60 - 75 and other higher girth classes. In 45 - 60 among surplus, these species will be marked first. Then, if required, other species will marked to remove congestion.

vi) The cultivate girth for other species is 120 cm Therefore, all such species in > 135 cm Girth class will be first marked. In 120- 135 girth class among surplus, these species will be marked first. Then, if required, other species will be marked to maintain balanced condition.

The harvestable girth of teak and superior miscellaneous species and edible fruit trees is 135 cm In this class, teak and superior miscellaneous species will be marked first against surplus number. Marking will be done from higher girth. The following shall be removal above the harvestable girth, provided it is silviculturally available.

Group	Yield Prescribed
1) Group-I	5 out of 10 trees shall be marked for felling.
2) Group-II	5 of 10 trees shall be marked for felling.

SECTION 2 .15: SOIL AND MOISTURE CONSERVATION WORKS:

2.15.1. On approval of treatment map, soil and moisture conservation work will be started with marking and will be completed before the onset of monsoon in the next year. This will be done subject to the availability of the funds. Details of these works are given in the Other Most Important Regulations.

SECTION 2. 16: METHODS OF REGENERATION:

2.16.1. In the next year of marking, soon after the monsoon is over, a treatment map will be prepared, which will show the following.

- i) Areas with adequate natural regeneration and
- ii) Areas with inadequate regeneration.

AREAS WITH ADEQUATE REGENERATION:

2.16.2. In the next year of main felling, the naturally regenerated seedlings will be cleared off all undergrowth and will be spaced out uniformly so that the number of seedlings per ha is equal to the no. given in normal stand table. The miscellaneous species to be favoured are Bija, Shisham, Haldu, Tiwas, Ain , Kalam, Dhawada, Bhirra, Rohan, Garari and Lendia in order of

priority. These seedlings will be treated at par with planted seedlings. Teak stumps will be planted in the openings created by felling of large sized trees. The number of stumps/ ha for gap planting will be decided by subtracting the existing no. of seedling from required number in normal condition (obtained from normal stand table). The teak stump should be prepared out of best quality seed. The length of the stump should be 9" (8" root + 1" shoot above collar). Stumps should not be less than thumb thick. Intensive care will be taken for stumps planted for continuously five years. Any species interfering with the growth of teak will be removed. Teak seedlings will be kept absolutely free from climbers; shrubs etc. over lapping branches of neighbouring big trees can also be cut. Application of fertilizer should also be used to boost up growth. Suitable fertilizer can be used also for superior miscellaneous species whose growth is slow and which are lagging behind in growth. Three weedings and soil working will be carried out around all the plants of height below 1m. Tending, singling cleaning will be done to seedlings for three years from the year of planting.

2.16.3. Both NR & AR will be protected rigidly from fire. Coppice shoots interfering with established NR & AR will be removed. The seedlings will be cleared of weeds within a radius of 1 m. The mulching should be done by spreading, around the seedlings in a radius 0.5 m, the twigs and debris to the extent of six inches thick layer, followed by layer of leaves, burnt up material and sufficient earth over it. This will facilitate protection from fire, drips from the nearby overgrowth and also lead to mulching.

Weeding, soil working and mulching will be carried out continuously for three years. In each second and third year only two weedlings and soil working will be carried out. The young recruits coming during these years and interfering with weeded plants will be removed.

AREAS WITH INADEQUATE NATURAL REGENERATION :

2.16.4. In such areas, planting will be done in the following year of the main felling. The premonsoon works will be taken up just after felling and removal.

In plantation upto 20% teak and rest other superior miscellaneous species may be preferred.

2.16.5. In suitable areas, underplanting of bamboo will be done. Suitability of the site will be certified by an ACF. Details of planting technique have been given in Other Important Regulations.

2.16.6: At the time of preparation of treatment map, blank area not less than 2 ha. Should be marked and taken for meadow development.

SECTION: 2. 17: SUBSIDIARY CULTURAL OPERATIONS:

2.17.1. The following works will be carried out in the following year of the main felling and in the subsequent years:

CUTTING BACK OPERATIONS:

2.17.2. These will be done in the following year of main felling. This will include following operations:

Felling of standing trees, marked for felling but not felled.

Felling of damaged trees, damage caused during felling, which are not likely to be recovered.

Cutting of climbers other than that of medicinal importance.

Cutting of all coppice shoots where natural regeneration is adequate.

Cutting of all malformed regeneration upto 15cm gbh.

CLEANING:

2.17.3 : It will be carried out during the 3rd and the 6th year of the main felling in D type areas as per the following rules:

- i) All inferior species including the undesirable under growth interfering or likely to interfere with the growth and development of seedling regeneration of teak and other valuable misc. species will be cut back.
- ii) Only the most promising coppice shoots out of the two kept previously, will be retained. All other newly risen teak coppice shoots will be removed.
- iii) The established seedling regeneration of teak and other miscellaneous species will be spaced out suitably. All teak coppice shoots found interfering with the growth & development of seedling regeneration of teak & other valuable misc. species will be cut back.

- iii) All climbers all over the coupe other than of medicinal importance will be cut.

SECTION: 2. 18: OTHER REGULATIONS:

PROTECTION:

2.18.1. The success of regeneration will depend upon the protection of all areas from fire and control on grazing. The vulnerable areas will be protected from illicit cutting also.

FIRE PROTECTION:

2.18.2. Special attention is needed to control the fire. The main felling coupe will be rigidly and effectively fire protected for a period of 5 years from the year of main felling. It is established fact that fire is the foremost reason of non establishment of natural regeneration. Grazing comes next. The details of fire protection measures are given in Other Important Regulations and NTFP working circle.

CLOSURE TO GRAZING:

2.18.3. The main felling coupes will remain closed to grazing for a period of 5 years from the year of main felling. The closed coupes will specifically be mentioned in the grazing license and the villagers will be made aware of them by regular drum beating in the villages. The suggestion given in misc. regulations to solve the grazing problem should be tried.

ENHANCEMENT OF CARRYING CAPACITIES:

2.18.4. In order to increase the availability of grass in the areas open to grazing, sowing of superior grasses, like Paonya, Sheda, marvel may be done in the suitable patches near villages but away from the closed coupes. These areas will remain closed to grazing from July to November, during which the seeding of grasses will be over. This closure will be done only during the first year of sowing. To have success in this work the villagers will have to be taken into confidence to ensure their cooperation.

====00====

CHAPTER-III

WORKING PLAN FOR IMPROVEMENT WORKING CIRCLE

SECTION: 3.1: GENERAL CONSTITUTION:

3.1.1. The areas which require improvement through silvicultural operations and/or artificial regeneration have been included in this working circle. The main aim is to improve the status of the crop and land. Therefore obtaining produce of any kind is neither expected nor regulated. However, through silvicultural operations like singling and cutting back, poles and firewood will be obtained. The area included in this working circle has a basal area between 4 to 8 sq meter per ha. except for few patches having harvestable growth. The area allotted to this working circle is 47229.313 ha.

RANGE WISE DISTRIBUTION OF AREA IN IWC

Sr. No	Range	Area of Range	Area as per Old W.P. in IWC	Area as per Current W.P. in IWC	% W.R.T. Range area	% W.R.T. W.C. area
1	Ballarshah	15,829.315	735.586	9259.848	58.50	17.28
2	Kothari	11,599.490	2495.466	5601.405	48.29	10.45
3	Dhaba	5,341.204	0.00	914.597	17.12	1.71
4	Rajura	10,376.132	0.00	3642.785	35.11	6.80
5	Wirur	19,961.269	2526.654	10577.750	52.98	52.98
6	Wansadi	20,592.362	5608.557	10810.302	52.65	52.50
7	Jioti	28,208.285		6422.626	22.76	22.76
	Total	111,980.057	11366.263	47229.313	42.18s	100%

SECTION: 3.2: GENERAL CHARACTER OF THE VEGETATION:

- 3.2.1.** Site quality -- IV and even quality III with young crop.
Density -- less than 0.4 to 0.5 or even more at places.
Major specie -- Teak
Other species -- Salai, Dhawada, Mowai, Ain, Hirda, Behada, etc.
Age of the Crop -- Young to middle aged.

3.2..2. The area in general supports the poor coppice crop of stunted teak trees which are largely malformed and crooked. Teak constitutes more than 60 % of the stock.

SECTION: 3.3: SPECIAL OBJECTS OF MANAGEMENT:

3.3.1. The forests allotted to this working circle are degraded in quality. Due to various adverse factors which resulted in maltreatment of the forest in the

past, these are not in a normal state. At present, the crop is generally young to middle aged. Therefore the prime object of management will be to prepare crop to be managed under SCI in future. Thus the special objects of management of these forests are.

- i) To improve the crop and bring normalcy as soon as possible.
- ii) To check the soil erosion and conserve soil and moisture.
- iii) To restore the quality and density of the forests.

SECTION: 3.4: COMPARTMENTS AND WORKING SERIES:

3.4.1. 181 Compartments have been allotted to this Working Circle. The Working Circle areas 47229.313 ha. divided into 25 felling Series having 20 coupes in each series. Average area of the coupe is 94.50 ha.

SECTION: 3.5: ANALYSIS AND VALUATION OF THE CROP.

3.5.1. STOCK MAPPING:- It has been done with the help of satellite imageries. The abstract is included in **Appendix No. XXIII** of Volume II.

AGE: - The crop is generally young to middle aged.

DENSITY:-It varies from 0.4 to 0.5 along with scattered natural blanks, barren patches and understocked areas.

3.5.2. ENUMERATIONS: - One percent enumerations have been carried out by SOFR Scheme Gadchiroli under the guidance of C.F.Working Plan, Gadchiroli and the field staff of Central Chandra Forest Dn. The results are analyzed and the abstract is given below –

**Statement showing number of trees girth class wise, Basel area/ha.
and volume per ha.**

Stocking in IWC

Local Name	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total
Ain	7.46	5.05	3.65	2.43	2.05	1.39	0.92	0.55	0.34	0.19	24.02
Ali	1.67	1.46	0.91	0.41	0.29	0.16	0.02	0.00	0.00	0.00	4.92
Amdi	0.35	0.34	0.23	0.06	0.02	0.02	0.00	0.00	0.01	0.00	1.03
Anjan	1.53	0.78	0.70	0.19	0.23	0.13	0.14	0.09	0.15	0.54	4.47
Aola	1.01	0.78	0.46	0.34	0.44	0.14	0.04	0.01	0.00	0.00	3.22
Apta	0.78	0.69	0.55	0.17	0.08	0.02	0.00	0.00	0.00	0.00	2.28
Behada	1.20	1.29	1.04	0.58	0.45	0.31	0.18	0.09	0.09	0.11	5.32
Bel	0.67	0.45	0.42	0.32	0.22	0.05	0.14	0.04	0.05	0.01	2.38
Bhera	10.52	6.64	3.55	2.65	2.34	1.53	0.83	0.43	0.31	0.25	29.06
Biba	0.48	0.33	0.32	0.09	0.18	0.05	0.00	0.00	0.01	0.00	1.47
Bija	0.56	0.59	0.52	0.47	0.63	0.45	0.48	0.35	0.19	0.29	4.52
Char	2.47	2.58	1.55	0.81	0.51	0.15	0.05	0.04	0.00	0.00	8.15
Chichwa	0.82	1.36	1.55	1.21	1.15	0.76	0.47	0.26	0.24	0.22	8.05
Chinch	0.06	0.02	0.00	0.10	0.10	0.08	0.08	0.06	0.06	0.27	0.82
Dhaman	1.34	1.19	0.65	0.18	0.10	0.02	0.01	0.00	0.00	0.00	3.49
Dhawda	3.98	2.72	2.08	1.96	1.76	1.23	0.92	0.49	0.28	0.21	15.61

Dhoban	0.58	0.77	0.84	0.89	0.83	0.75	0.54	0.46	0.28	0.41	6.34
Garari	15.24	8.22	5.06	2.63	1.27	0.42	0.17	0.03	0.01	0.02	33.10
Gongal	0.07	0.01	0.07	0.01	0.01	0.00	0.00	0.08	0.00	0.00	0.27
Haldu	0.25	0.24	0.16	0.12	0.16	0.07	0.05	0.04	0.00	0.03	1.13
Hirda	0.75	0.32	0.05	0.02	0.06	0.00	0.00	0.01	0.00	0.00	1.20
Eaktendu	0.06	0.11	0.07	0.06	0.03	0.03	0.03	0.03	0.03	0.01	0.45
Kakai	1.06	1.01	0.53	0.66	0.30	0.10	0.05	0.00	0.00	0.00	3.71
Kalamb	0.89	0.66	0.60	0.63	0.60	0.46	0.73	0.34	0.38	0.52	5.80
Karai	4.52	2.56	1.13	0.82	0.40	0.20	0.21	0.06	0.02	0.01	9.94
Karanj	0.07	0.01	0.08	0.09	0.03	0.00	0.00	0.00	0.00	0.01	0.30
Karu	0.35	0.48	0.49	0.11	0.16	0.08	0.00	0.00	0.06	0.04	1.78
Kateyen	0.68	0.69	0.63	0.53	0.26	0.10	0.10	0.08	0.03	0.07	3.18
Kawath	0.65	0.37	0.42	0.40	0.23	0.24	0.17	0.03	0.06	0.00	2.56
Kavi	0.33	0.55	0.21	0.10	0.12	0.03	0.08	0.11	0.06	0.04	1.62
Khair	5.34	4.05	2.72	1.32	0.67	0.17	0.09	0.07	0.03	0.01	14.46
Kumbhi	0.35	0.84	0.42	0.37	0.14	0.11	0.09	0.02	0.00	0.01	2.35
Kusum	0.05	0.14	0.07	0.14	0.13	0.09	0.01	0.09	0.03	0.11	0.84
Lendia	5.95	4.23	2.53	1.88	1.01	0.33	0.18	0.08	0.07	0.03	16.28
Medsing	0.63	0.29	0.18	0.01	0.06	0.03	0.01	0.00	0.00	0.00	1.21
Moha	1.42	1.25	1.01	1.03	1.37	1.17	1.03	0.64	0.60	1.01	10.52
Mowai	1.05	1.48	1.55	1.48	1.42	1.06	0.92	0.67	0.44	0.31	10.38
Pakad	0.49	0.23	0.35	0.13	0.21	0.08	0.02	0.01	0.00	0.09	1.62
Palas	4.27	2.59	1.90	1.13	0.72	0.28	0.19	0.09	0.06	0.02	11.22
Parad	0.90	0.62	0.46	0.37	0.38	0.25	0.15	0.09	0.04	0.01	3.26
Pimpal	0.00	0.07	0.00	0.00	0.01	0.00	0.01	0.07	0.03	0.03	0.23
Rohan	2.62	1.91	1.44	1.41	1.29	1.03	0.52	0.23	0.22	0.22	10.89
Salai	0.26	0.47	1.33	1.94	3.41	3.37	2.59	1.96	1.29	1.16	17.78
Semal	0.13	0.37	0.30	0.49	0.92	0.55	0.48	0.16	0.06	0.26	3.61
Shisham	0.23	0.36	0.45	0.43	0.35	0.16	0.07	0.04	0.00	0.00	2.09
Shiwan	0.38	0.60	0.29	0.13	0.12	0.03	0.16	0.00	0.01	0.08	1.79
Surya	11.57	9.73	5.04	2.77	1.51	0.56	0.22	0.05	0.01	0.01	31.46
Teak	23.50	18.07	12.40	6.24	4.34	1.86	0.97	0.41	0.16	0.12	68.06
Tendu	13.15	4.04	1.36	0.75	0.72	0.54	0.34	0.27	0.15	0.16	21.48
Tiwas	0.31	0.84	0.29	0.31	0.12	0.05	0.00	0.00	0.00	0.00	1.92
Others	70.03	36.40	19.08	11.03	7.02	3.20	1.19	1.16	0.79	1.16	151.05
Tree/ha	203.02	130.85	81.69	52.39	40.89	23.87	15.63	9.78	6.65	8.07	572.69
Vol/ha	2.84	3.66	5.72	8.91	10.43	8.12	7.58	6.16	5.42	8.07	66.91
B.A./ha	0.82	1.50	1.83	1.93	2.24	1.82	1.59	1.27	1.08	1.60	15.68

SECTION:3.6: SILVICULTURAL SYSTEM :

3.6.1. To achieve the special objectives of management, "Improvement fellings supplemented by planting and tending of the crop " shall be adopted.

SECTION: 3.7: WORKING CYCLE & HARVESTABLE GIRTH:

3.7.1. Working cycle has been fixed at 20 years. Since it is intended to restore to improvement felling only, no regular yield has been fixed. Marking rules are

envisaged to remove the trees above exploitable girth as prescribed in SCI and those trees not likely to survive till next felling cycle. Marking will also be a thinning marking and congested poles will be removed to provide space for other trees to grow.

SECTION: 3.8: CHOICE OF SPECIES.

3.8.1 The species to be favoured in order of preference are Teak, Bamboo, Ain, Bija, Tiwas, Dhawada, Lendia, Rohan, Bhirra & Kalam.

SECTION: 3.9: FORMATION OF WORKING SERIES AND COUPES:

3.9.1. Area is divided in 26 Working Series. Each Working Series contains 20 coupes having an average area of 90.00 ha. per coupes working series as given in **Appendix no.XXIX** of Volume II.

SECTION: 3.10: REGULATION OF YIELD:

3.10.1. The crop is generally young to middle aged. The fellings are limited to improvement of the crop only. Therefore the yield will vary and will consist of small wood, poles and firewood only. Hence no yield regulation is prescribed.

SECTION: 3.11: AGENCY FOR HARVESTING:

3.11.1. Felling will be done by the department only. However protection and plantation works may be done as per the Govt. directions under Joint Forest Management

SECTION: 3.12: DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAP AND MARKING RULES.

DEMARCATION: -. Demarcation of every coupe as per prescriptions is very much essential. The coupe lines should be treated as fire lines for that year. It will help to check encroachments also. It is also necessary to take S.M.C. work, plantation and regeneration work etc.

Coupes will be demarcated one year in advance of working (felling etc) as per the procedure laid down under Other Important Regulations. After demarcation, within the coupe, area will be divided into quality classes if the extent of any quality area is more than 2 ha.

3.12.1. TREATMENT MAP:- The basic treatment map will be generated in Geomedia cell at C.F.W.P.Chandrapur, which will exhibit the features like steep slope (with slope more than 25^0), 20 meter wide width around nallah understocked area, and well stocked area (density between 0.4 to 0.6 and above). The finer details like regeneration status, the group of young pole shall be shown on the map by the RFO and will be checked by ACF. A sample checking will be done by the DCF himself.

TYPE: A: PROTECTION AREAS: i.e.

- i) Steep slopes above 25 degrees
- ii) Nala banks and river courses 20 meter wide on either side and at the top.

TYPE: B: UNDERSTOCKED AREAS:- These areas will include areas with density below 0.4 including barren lands and natural blanks.

TYPE: C: GROUPS OF YOUNG POLES.

Includes patches of well - grown pole crop of Teak and other species suitable for retention as a future crop. The patch should not be less than 2 ha.

IV) Area 'D' - WELL STOCKED AREAS: Includes areas with crop density more than 0.4 Area will be delineated on the basis of site quality.

TREATMENT:-The various treatments proposed are as under. Soil and water conservation works like gully plugging nala bunding and WATs shall be carried out wherever feasible as per the treatment map over the entire coupe area. where ever required.

I Area 'A': No felling shall be done.

II Area 'B' :-

Teak and suitable miscellaneous species will be planted in well drained areas having good soil depth. There are species, which show the preference for a particular soil. The only one phase plantation has been proposed, as the soil condition are usually good and do not require a restorative measures. Nala bunds and gully plugging works will carried out wherever required

ii) Malformed trees will be cut back .

iii) Singling will be done wherever needed.

III Area 'C' :- No plantation will be done in this area, except CBO will be carried out in a year after main felling . The congested pole crop will be thinned to one third of the height of the dominant pole crop. The crop will be thinned and spaced out.

IV Area 'D' No planting is envisaged.

MARKING RULES:- They will be as below:

TYPE: A: No marking will be done.

TYPE: B:

1. All dead trees after retaining 2 trees per ha. shall be marked for felling.
2. All live high stumps to be cut as close to the ground as possible and dressed.
3. Malformed seedlings to be cut back.
4. The established multiple coppice shoots and poles will be reduced to one per stool retaining the vigorous one.
5. The undesirable under-growth which is preventing or likely to prevent the development of seedling regeneration of the desired species will be removed.

TYPE: C: Poles will be spaced to a distance of one third of the dominant pole in the patch. All malformed poles will be cutback.

TYPE: D: All dead and malformed trees all live high stumps and all but one vigorously growing coppice shoots per stool will be marked for felling. In addition to above, the following removals will be affected.

1. All dead trees after retaining 2 trees per ha. shall be marked for felling.
2. All live high stumps to be cut as close to the ground as possible and dressed.
3. Malformed seedlings to be cut back.
4. The established multiple coppice shoots and poles will be reduced to one per stool retaining the vigorous one.
5. The matured trees of teak, ain and other important species above 135 cm. girth and trees of other inferior species above 120 cm. girth will be removed, provided it does not create permanent gaps in canopy. However the fruit trees will be reserved against the felling.

ARTIFICIAL REGENERATION AND CHOICE OF SPECIES:

3.12.2. The choice of the species to be planted will depend upon the area suitability of the species and its local demand and will be decided upon in close consultation with the local village communities. The species indigenous to the area like, Teak, Bamboo, Ain, Arjun, Shivan, Chinch, Jaman, Ber, Sitafal, Moha, Neem, Maharukha, Awala, Biba, Anjan, Amba, Apta etc. will be preferred. The plantation will be such that no single species will exceed 50% of the planted stock.

SECTION: 3.13: SUBSIDIARY SILVICULTURAL OPERATIONS:

3.13.1 CUTTING BACK OPERATION: In type D areas following operations will be carried out one year after the main felling in the coupes as per the following rules.

- i) All left over established multiple coppice shoots and poles will be reduced to one per stool. Side shoots will be preferred for retention.
- ii) The newly rising multiple teak coppice shoots will be reduced to two per stool, retaining the most promising ones.

3.13.2 CLEANING: It will be carried out during the 3rd and the 6th year of the main felling in D type areas as per the following rules:

- iv) All inferior species including the undesirable under growth interfering or likely to interfere with the growth and development of seedling regeneration of teak and other valuable misc. species will be cut back.
- v) Only the most promising coppice shoots out of the two kept previously, will be retained. All other newly risen teak coppice shoots will be removed.
- iii) The established seedling regeneration of teak and other miscellaneous species will be spaced out suitably. All teak coppice shoots found interfering with the growth & development of seedling regeneration of teak & other valuable misc. species will be cut back.
- iv) All climbers all over the coupe other than of medicinal importance will be cut.

SECTION: 3.14: OTHER REGULATIONS:

FIRE PROTECTION: Main felling coupes will be fire traced and rigidly fire protected for a period of five years from the year of main felling.

3.14.1. The area will be cleared off, of all the dry and cut remains of bushes, leaves etc. by end of February to avoid fire hazards to standing crop as well as to the NR. Effective protection against fire for a period between February 15 to June 15 is a must to ensure survival and establishment of NR of all species for developing it into the further growing stock. Comprehensive fire fighting scheme will be chalked out.

CLOSURE TO GRAZING AND RAISING OF FODDER:

3.14.2. Main felling coupes will remain closed to grazing for a period of 5 years from the year of main felling.

====00====

CHAPTER –IV

WORKING PLAN FOR OLD TEAK PLANTATION WORKING CIRCLE

SECTION:4.1:GENERAL CONSTITUTION OF THE WORKING CIRCLE :

4.1.1. This working circle comprises of old teak plantations of 8429.93 ha area, scattered in all seven ranges. Teak plantations (8429.93 ha.) were taken in previous plans. Besides, some plantations, both of teak and miscellaneous species, were also taken under different schemes in the past. However this working circle includes those areas where teak has been planted by clearfelling the vegetative growth. There may be some admixture of miscellaneous species along with teak. It also includes the area, where teak has been planted in the blanks. The working circle has been created as, such areas require a different management practices. Areas included in this working circle are not in a consolidated block rather in scattered patches, spread over in all seven ranges.

The rangewise statement is since below.

RANGEWISE DISTRIBUTION OF AREA IN OTPL WC.

Range	Range area in ha	Area as per Old W.P. in TPWC	Area as per Current W.P. in TPWC	% of area with respect to range area.	% of the area with respect to w.c. area
Ballarshah	15,829.315	1138.001	1037.743	6.55	12.31
Kothari	11,599.490	1432.147	980.798	8.45	11.61
Dhaba	5,341.204	341.481	391.700	7.33	4.64
Rajura	10,376.132	4569.073	4833.147	46.58	57.31
Wirur	19,961.269	1126.89	733.550	3.67	8.68
Wansadi	20,592.362	596.80	293.000	1.42	3.57
Jioti	28,208.285		160.000	0.56	1.90
Total	111980.057	9204.392	8429.938	7.53	100%

SECTION: 4. 2 : GENERAL CHARACTER OF THE VEGETATION :

4.2.1. Mostly teak plantations are successful. Site quality varies from IV to II. The area is fully stocked. Crop is uniform. In teak plantations, the subsequent silvicultural operations have been carried out to some extent but not such operations have been observed in plantations of teak and miscellaneous species. The rangewise distribution of areas allotted to this working circle has been given in **Appendix no XXXIX** of volume II.

SECTION: 4. 3 : BLOCKS AND COMPARTMENTS :

4.3.1. The range wise details of compartments and their areas allotted to this working circle have been given in **Appendix no XXV** of volume II.

SECTION: 4. 4: SPECIAL OBJECTS OF MANAGEMENT :

4.4.1. The main objective of teak plantation in conversion working circle was to have the teak crop with growth parameters comparable to those in the yield table. For this, it was essential to follow all silvicultural operations, prescribed in the scheme, after doing plantation which could not be observed meticulously.

(i) To improve the crop, doing required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.

SECTION: 4. 5: ANALYSIS AND VALUATION OF THE CROP :

4.5.1. STOCK MAPS : All Teak plantations have been shown on stock map on 1:15,000 scale, generated in Geomedia cell, W.P. Chandrapur

4.5.2. DENSITY : Generally crop is fully stocked.

4.5.3. ENUMERATION : 1% systimatecally plot enumeration has been carried out for entire crop of a compartment that also includes old plantations. Enumeration has been carried out with the help of field staffs of Central Chanda Forest Division under the supervision of Conservator of Forests, Working Plan, Gadchiroli.

4.5.4. AGE AND QUALITY : Plantations taken right from Hussain's, Bhogale's Khisti's, Kulkarni's, Dr Nandkishor's and R.S.Yadav & G.P.Garad plans have been included. The site quality varies from II. to IV

SECTION: 4.6: TREATMENT MAP :

4.6.1. Treatment map, classifying total area in following three types, will be prepared by the R.F.O. and checked by an A.C.F.

4.6.2. TYPE-I: This will include fully stocked areas i.e. the portion of plantation which is successful.

4.6.3. TYPE-II: This will include the patches where plantation is failure.

4.6.4. TYPE-III : This will include the portion of plantation which is partially successful & not completely failure i.e. the areas having *teak* stems not conforming to stand table i.e. less than that.

SECTION : 4.7 : SILVICULTURAL OPERATIONS :

4.7.1. Silvicultural operations will be taken as per types shown on treatment map. Silvicultural operations to be taken are as follows :

4.7.2. THINNING : Thinning will be carried out in Type-I and Type-III areas. The thinning schedule for all plantations have been given in **Appendix no XXXIX-A** of volume II.

4.7.3. The statement showing the distribution of stems in different girth classes for a given site quality and age at an interval of five years have been given in **Appendix No. XXXIX- C** of volume II. This will provide reference for thinning marking. If the difference in number of stems/ha between the actual and those as per yield table is large, the decision for retaining the number of stems per hectare should be taken judiciously. In this case if thinning is done as per yield table, large opening may be created. Teak, being shallow rooted, is susceptible to uprooting by strong winds and therefore, the actual number of stems/ha required have been achieved gradually. To carry out thinning in such plantations weighted average of diameter/girth can be used. To break the mono-culture some valuable miscellaneous species, such as Shisham, bija, shivan, ain and fruit trees will also be retained. But the distribution of stems in different girth classes will be maintained as per yield table. In older plantations, the populations will be reduced to the desired number as per the yield table. The deficiency in any girth class should be adjusted from the nearest girth class on the basis of basal area/volume.

4.7.4. First thinning will be done in 10th year and second thinning in 15th year and subsequent thinnings will be at an interval of 10th years as per the yield table/stand table of teak. The first thinning should be carried out mechanically to provide space on purely silvicultural consideration. The subsequent thinnings will be executed so that normalcy condition is achieved in the long run.

4.7.5. CLEANING : Cleaning will be carried out in all types I, II and III areas. Cleaning schedule for all plantations have been given in **Appendix No. XXXIX- A** of Volume II. The cleaning operations will be done in next year after thinning. The following operations will be carried out.

1. Climbers will be cut all over the area.
2. Inferior species interfering or likely to interfere with planted healthy seedlings or healthy natural growth of superior miscellaneous species will be cut.
3. Superior miscellaneous species will be preferred to damaged teak plants.
4. Damaged seedlings will be cut.
5. Coppice growth will be removed.

4.7.6. PLANTING: In Type-II area planting with appropriate spacing decided by Deputy Conservator of Forests and duly sanctioned from Chief Conservator of Forests (T) will be carried out after ascertaining the reasons for failure. In case the failure is due to soil condition, no plantation may be affected. Planting will be carried out in the next year of thinning. P.P.O. will be done during the year of thinning.

4.7.7. PRUNNING: In Type II & III areas pruning of existing sapling/poles will be carried out. This will be carried out annually with the help of watchman in the supervision of forest guard in charge of the area.

SECTION : 4. 8 : WORKING CIRCLE :

4.8.1. Total area is to be covered under appropriate thinning during this plan period i.e. in 10 years. In new plantations 1st and 2nd thinnings will be carried out in 10th and 15th year respectively and subsequent thinning will be at an interval of 10 years in the teak plantations. In older teak plantations after attaining the age of 50 years thinning will be at the interval of 10 years and shall be B grade thinning.

SECTION: 4. 9: WORKING SERIES :

4.9.1. Total areas under this working circle will be worked under one working series. Total plantations included in this working circle have been grouped upto thinning & cleaning schedule. Not necessary of equal extent of area in a every year. Schedule of working in each group have been given in **Appendix no. XXXIX-A** of Volume II.

SECTION: 4.10: METHODS OF EXECUTING THINNING:

Mechanical thinning:

4.10.1. Teak is traditionally planted at a spacing of 2mx2m i.e. 2500 seedlings per hectare and in ideal conditions, would have required a thinning at a age of 5 years of its formation as at that age, the canopy starts interfering and accordingly, two mechanical thinning of removing alternate rows were prescribed in the earlier text, before the start of Silvicultural C (low) grade thinning. The Indian Forest Record 1957 has prescribed for two mechanical thinnings at plantation age of 5 and 10 years. It prescribed following standard.

Year	No./ha. (For site quality-III)	Spacement
1 st year	2500	2mx2m
5 th year	1767 (after 1 st Mechanical thinning of removing alternate digonal)	2x2√2m
10 th year	1256 (after 2 nd Mechanical thinning of removing alternate digonal)	2√2x2√2m

4.10.2 It has been found, through the experience, that the teak plantations do not follow the growth in a copy book fashion. The plantation of teak which is supposed to have survived 100% till its 5th year of existence, survives by only 65-75% and the rest of the seedlings are eliminated in its race for survival. The canopy competitions really does not start at this stage. There are limiting factors due to moisture and root completion. Referring to the sigmoid growth curves of teak, between Age (X) and Volume (Y), it will be observed that the

growth follows a moderate slope till 10th year and then picks up a steep growth in next 50 years and hence a first mechanical thinning at the age of 10 years of the plantation has been prescribed. The end result of this thinning would be that the poles in the plantations are free from canopy interference. At this stage, the poles are even saleable.

(1) DEMARCATION, PREPARATION OF TREATMENT MAP AND CLEANING:

4.10.3 (a) Demarcation: The thinning area should be properly demarcated.

(b) Treatment Map: Described in section 4.6 of treatment map in this chapter

CLEANING: Teak is highly susceptible to root competition and hence it is essential that the thinning area is cleansed of all unwanted root competition. The removal will also allow the productive capacity of soil, distributed in few promising and potential stems rather than distributed in many unpromising stems. The plantation at the stage contains lot of bushes and weeds and these are invariably required to be removed, and therefore, a cleaning of these plantations will be required and rate of such cleaning will be fixed by Chief Conservator of Forests (Territorial). The cleaning of plantation should include the removal of

- i) Bushy weeds
- ii) Garadi, lendia or any other pioneering species. Trees/poles of spp. Amaltas will not be removed as this is the natural biological parasites of teak- defoliators and teak- skeletonisers. Damaged or badly shaped poles/trees will be flushed to the ground.

CLIMBER CUTTING:- The climber will be cut at two places. The cleaning will be done all over the areas of the plantation. The cleaning may not be required in older plantations.

(2) PROCEDURE FOR MECHANICAL THINNING:

4.10.4 (A) Three Triangular rows will be considered and one out of three poles (if surviving), which is the least promising shall be removed, provided it is not going to leave a permanent gap in the canopy. If one of these three poles is not surviving no pole will be removed. This way a mechanical thinning will be carried out. While removing coppice shoots, poles of less important economic value, will be removed first. The wolf, forked and poles of less important economic value, will be removed first. The wolf, forked and poles with epicormic branches and deformed poles will be preferred while removing. If the initial survival is 75% , the removal of 1/3 poles will leave nearly 1256 poles after 1st mechanical thinning. At the end of this thinning each pole will have a free canopy around it. The poles will be serially numbered. Those marked for felling will be given the digital number and properly recorded. The marketable poles should be brought to depot for

sale. The area should be strictly fire protected. At the stage of its formation, the canopy run parallel and differentiation in the canopy had not started and hence a mechanical thinning is sufficient to provided the growth stimoulation. However, at subsequent stage, it will be observed that the canopy starts distinguishing themselves as predominant, co-dominant, dominated suppressed whips and hence all subsequent thinnings will be Silvicultural thinnings and will be of C-grade thinnings. Thinning in good quality may proceed by 2 to 3 years, but in the poorer quality, it should be done at the age of 10 years.

4.10.4 (B) SILVICULTURAL THINNING:

This low grade thinning shall be done after 1st mechanical thinning carried out in 10th year of its formation. C-grade ordinary (low) thinning will be carried out. It will require the removal of all diseased, dead and mori bund trees suppressed trees, dominated trees, whips, trees with defective stems and crowns. Only trees with normal crown development and good stem forms should be retained. All coppice crop should be removed, if Silviculturally available and if all coppice crop is required to be retained, it should be of side origin and not of callous origin. The C-grade thinning includes removal of dominated suppressed, diseased, dead and mori bunds, and also the removal of dominated trees with defective stem and crown. This is needed to promote a mixed undergrowth beneath the crown, so that the soil is protected. When thinning is completed, all crowns should have as far as possible, a clear space all around them. The first Silvicultural thinning will be at the age of 15 years and then after every ten years. However in poor site quality, it may be deferred if it is not corresponding a required basal area at that age with the yield table.

(1) DEMARCATION, PREPARATION OF TREATMENT MAP AND

CLEANING:

a) DEMARCATION: The thinning area should be properly demarcated.

(b) TREATMENT MAP: Treatment map will be prepared, showing the extent of area, to be thinned, and the understocked area, which is not to be thinned.

(c) CLEANING:

4.10.5. Teak is highly susceptible to root competition and hence it is essential that the thinning area is cleansed of all unwanted root competition. The removal will also allow the productive capacity of soil, distributed in few promising and potential stems rather than distributed in many unpromising stems. The plantation at that stage contains lot of bushes and weeds and these are invariably required to be removed, and therefore, a cleaning of these plantations will be required and rate of such cleaning will be fixed by Chief Conservator of Forests (Territorial). The cleaning of plantation should include the removal of –

i) Bushy weeds, ii) Garadi, lendia or any other pioneering species. Trees/poles of spp. Amaltas will not be removed as this is the natural biological parasites of teak- defoliators and teak skeletonisers. Damaged or badly shaped poles/trees will be flushed to the ground.

CLIMBER CUTTING:-

4.10.6 (1) The climber will be cut at two places. The cleaning will be done only in the areas of the plantation, under thinning, as these are usually devoid of under growth, mainly due to closed canopy and often due to un-established allelopathic effect, where ever it is required. The cleaning may not be required in older plantations.

(2) PROCEDURE OF CARRYING OUT SILVICULTURAL THINNING.

The following shall be the procedure of carrying out Silvicultural thinning.

(a) REMOVAL:

4.10.7 The average diameter of the crop should be calculated, by taking all trees in plot (5 chain x2 chain). At the time of removal, the maximum number of removal should be from the trees below this average girth. All suppress, dominated and coppice should be removed first, if they are silviculturally available. Trees above the average diameter should be least removed. While removing, non teak coppice irrespective of species will be marked first, followed by coppice teak and then non teak species of seed origin. The fruit trees will not be marked. Subsequently seed origin teak poles/tree above the norms of C-grade thinning of higher diameter should always be retained. This may cause a normal increase in the basal area. The number of trees should be then reduced, but the basal area should be protected. The end result of thinning would be that each tree should have a clear crown around it, but not enough to activate a dormant epicormic shoot.

(b) SUBSEQUENT THINNING – THIRD THINNING:

4.10.8 Third thinning will be after 25th year of the formation of plantation, and fourth thinning will be carried out at the age of 35 years, i.e. at an interval of 10 years till 65 years. This is done after analyzing sigmoid growth curve, which indicates that the growth is very steep during this period till 80 years and then stabiles to some extent.

(c) THINNING IN VERY OLD PLANTATION:

4.10.9 Heavy thinning should be avoided in very old plantation (Age 60 years) These plantations are near almost to exploitable size and heavy thinning may lead to epicormic branching, which will devalue the timber. Thinning in such plantations should therefore consists of removing all suppressed, dominated trees. Among dominants, only those dominants should be opened, which have got a well developed crown and which is not likely to produce any epicormic branches. In very old plantation, therefore, a light thinning should be carried out.

(1) CLEANING:

A cleaning operation will be carried out in the 5th year commencing from the year of main felling.

- i) All climbers other than of medicinal importance will be cut over the whole area of the coupe, if necessary.
- ii) Damaged and malformed sampling and coppice shoots will be cut back.
- iii) Multiple coppice shoots will be reduced to two or three per stool. Shoots to be retained should be most vigorous, well growth and well spaced. Persistent side branches will be cut 15 cm away from the plant without damaging the stem.
- iv) Fast growing inferior species and bamboo interfering or likely to interfere with the reproduction of teak and other valuable species will be cut.
- v) In thick patches of teak advance growth and established regeneration of other valuable species, a spacing between samplings to be retained, should vary from 2 meter to 2.59 meter depending on the height growth.

SECTION: 4. 11 : AGENCY FOR EXECUTION :

4.11.1. All the operations will be carried out exclusively by the Department under the strict supervision of the Assistant Conservator of Forest and the Deputy Conservator of Forests.

SECTION: 4. 12 : OTHER REGULATIONS :

4.12.1. FIRE PROTECTION : Plantation will be rigidly protected from fire taking all measures. Local villagers will have to be taken into confidence to ensure success in this mission.

4.12.2. GRAZING : The current thinning coupes will remain closed to grazing for a period of three years from the year of working. The local people will be persuaded to graze their cattle in areas other than closed areas. For co-operation extended by them in protecting area from grazing, they should be allowed to cut grasses from the closed coupes free of cost. Repeated dialogue with local villagers should be continued to have better understanding with them. Besides, the suggestions and measures to control grazing given in Other Important Regulations have been followed.

====00====

CHAPTER-V

WORKING PLAN FOR AFFORESTATION WORKING CIRCLE

SECTION: 5.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

5.1.1. Areas included in this working circle are as follows:

All protected forest areas which have not been planted or having unsuccessful plantation under any scheme, area under Afforestation Working Circle in G.P.Garad and R.S.Yadav plan not tackled.

5.1.2.Total area included in this working circle is 16930.853 ha The distribution of area by ranges is given below:

RANGEWISE DISTRIBUTION OF AREA IN AWC

Range	Range area in ha	Area as per Old W.P. in AWC	Area as per Current W.P. in AWC	% of area with respect to range area.	% of the area with respect to w.c. area
Ballarshah	15,829.315	0.00	3253.842	20.55	19.22
Kothari	11,599.490	4771.944	2092.321	18.03	12.36
Dhaba	5,341.204	0.00	2083.873	39.01	12.30
Rajura	10,376.132	0.00	1038.300	10.00	6.31
Wirur	19,961.269	1221.48	3945.464	19.76	23.30
Wansadi	20,592.362	16108.488	3691.053	17.93	21.80
Jioti	28,208.285		826.000	2.93	4.89
Total	111980.057	22101.912	16930.853	15.12	100%

SECTION : 5.2 : GENERAL CHARACTER OF THE VEGETATION :

5.2.1. Forests included in this working circle are mostly Protected Forests areas in Wansadi Range which has been taken by division and covered in the previous plan is Proposed to be Reserved Forest. Since areas included are protected forests and near cultivation and therefore, are almost blank or under stocked. These areas were not brought under management so far and therefore, no silvicultural operations were carried out. Crop deteriorated is to the great extent. Presently, khirni and a few scattered trees are seen wherever there is any vegetation in these forest areas. Due to over grazing the condition of soil is not in a position to regenerate naturally. Special efforts are required to be taken to regenerated these areas. To improve soil condition even ripping of the soil will have to be done. Besides, due to lack of care, demarcation of these areas is not available on the ground from which the extent of encroachment could be assessed.

5.2.2.The areas which are in the immediate vicinity of human habitations are under tremendous biotic pressure. Most of the areas in Jioti, Wansadi and Wirur ranges and some of the areas in other ranges have been encroached upon for cultivation. Due to heavy biotic interference like grazing and illicit

cutting for fire wood, the crop has been reduced to scrubby growth. The status of natural regeneration is very poor. The heavy pressure of grazing has resulted in compaction and erosion of soil. Due to this many patches have become almost blank. However, in some patches very good miscellaneous crop of 0.4 density are noticed. Common species found in such patches are bhirra, dhaoda, ain, tinsa, tiwas, lendia, mowai, palas, tendu, bija etc. The area needs soil and moisture conservation and afforestation works.

SECTION: 5. 3 : BLOCKS AND COMPARTMENTS :

5.3.1. This working circle includes 88 compartments of Reserved Forest and Protected Forests, covering an area of 16930.853 ha divided into 8 felling series. Average area of coupe is 106 ha. The details of compartments allotted to this working circle has been given in **Appendix No. XXXII** of volume II.

SECTION: 5.4 : SPECIAL OBJECTS OF MANAGEMENT :

5.4.1. These areas have been degraded due to heavy grazing, illicit cutting and fire. Keeping in view these factors, special objects of management for these areas will as follows :

- I. To reclaim the area by intensive soil and moisture conservation and afforestation works and to enhance the productivity through planting of indigenous species of small timber, firewood, bamboos and fodder value to meet the local demand.
- II. To involve the local people in afforestation works under the scheme of people's participation in forest management.
- III. To meet the demand of local people for small timber, firewood and fodder to the maximum possible extent.

SECTION: 5. 5 : ANALYSIS AND VALUATION OF THE CROP :

5.5.1. STOCKS MAPS : The forests under this working circle have been stock mapped on 1:15000 scale. The results of the stock mapping has been given in **Appendix no. XXIII** of Volume II. The crop contains mostly middle aged to mature trees.

5.5.2. DENSITY : The density of the crop varies from 0.4 to under stocked and blank except a few small patches of density more than 0.4.

5.5.3. ENUMERATION : A part Enumeration has been done in these areas and full enumeration is not needed as most of the areas is under stocked, cultivation, blank and below 0.4 density.

**Statement showing number of trees Girth-class wise, Basel area/ha.
and volume per ha.
Stoking in AWC**

Local Name	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total
1	2	3	4	5	6	7	8	9	10	11	12
Ain	7.40	4.24	2.33	1.83	1.81	1.23	1.01	0.35	0.31	0.19	20.71
Ali	1.47	1.33	0.51	0.24	0.22	0.10	0.00	0.00	0.00	0.00	3.87
Amti	0.68	0.78	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.89
Anjan	2.04	1.11	0.86	0.19	0.25	0.06	0.18	0.06	0.12	0.37	5.24
Aola	0.49	0.50	0.18	0.36	0.35	0.32	0.10	0.02	0.00	0.00	2.33
Apta	0.46	0.12	0.25	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.99
Behada	1.13	1.16	1.13	0.68	0.44	0.21	0.10	0.05	0.18	0.19	5.27
Bel	0.58	0.07	0.38	0.20	0.09	0.05	0.02	0.03	0.03	0.09	1.55
Bhera	14.67	8.21	3.59	2.34	2.11	1.44	0.61	0.55	0.30	0.09	33.90
Biba	0.41	0.25	0.07	0.00	0.31	0.12	0.00	0.00	0.00	0.00	1.16
Bija	0.92	1.46	0.70	0.32	0.53	0.43	0.29	0.20	0.13	0.31	5.31
Char	3.48	2.64	1.96	1.14	0.25	0.08	0.07	0.00	0.01	0.00	9.63
Chichwa	0.83	1.01	1.36	0.87	1.05	0.69	0.31	0.18	0.21	0.50	7.02
Chinch	0.06	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.06	0.18
Dhaman	0.94	0.67	0.40	0.08	0.04	0.00	0.00	0.00	0.00	0.09	2.22
Dhawda	3.77	3.46	2.49	1.76	1.74	1.09	0.78	0.26	0.12	0.12	15.59
Dhoban	0.10	0.47	0.79	0.69	0.57	0.63	0.75	0.42	0.22	0.55	5.19
Garari	13.95	8.49	4.09	2.44	0.75	0.31	0.09	0.00	0.00	0.00	30.12
Gongal	0	0	0.25	0	0	0	0	0	0	0	0.25
Haldu	0.32	0.42	0.22	0.18	0.07	0.03	0.00	0.00	0.00	0.00	1.24
Hirda	0.43	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49
Eaktendu	0	0.11	0.09	0.05	0.01	0.19	0.07	0.07	0.15	0.02	0.76
Kakai	0.32	0.36	0.47	0.20	0.07	0.15	0.02	0.06	0.00	0.00	1.66
Kalamb	0.40	0.31	0.15	0.56	0.35	0.36	0.54	0.26	0.13	0.63	3.69
Karai	4.37	4.35	1.69	0.69	0.65	0.21	0.09	0.06	0.07	0.00	12.19
Karanj	0	0	0	0	0	0	0	0	0	0.06	0.06
Karu	0	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.06	0.00	0.25
Kateyen	0.45	0.69	0.71	0.72	0.19	0.06	0.06	0.06	0.00	0.06	2.99
Kawath	0.29	0.40	0.20	0.00	0.06	0.12	0.22	0.08	0.00	0.00	1.36
Kavi	0.18	0.42	0.20	0.12	0.03	0.01	0.07	0.05	0.06	0.03	1.19
Khair	7.94	4.88	2.54	1.00	0.58	0.13	0.12	0.02	0.01	0.00	17.22
Kumbhi	0.43	1.37	0.60	0.32	0.31	0.14	0.06	0.00	0.00	0.06	3.29
Kusum	0.12	0.12	0.00	0.25	0.06	0.08	0.00	0.07	0.02	0.22	0.94
Lendia	5.63	4.04	1.68	1.54	0.69	0.28	0.17	0.08	0.07	0.03	14.21
Medsing	0.37	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
Moha	1.53	1.49	1.19	0.97	1.08	1.13	0.77	0.71	0.51	1.07	10.44
Mowai	0.92	2.06	1.75	1.68	1.22	1.18	0.83	0.64	0.23	0.21	10.10
Pakad	0.09	0.09	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Palas	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Parad	1.10	0.79	0.34	0.36	0.19	0.06	0.11	0.23	0.00	0.00	3.19
Pimpal	0	0.12	0	0	0	0	0	0	0	0.12	0.25
Rohan	3.53	2.54	0.76	0.96	0.75	0.53	0.22	0.06	0.26	0.07	9.68
Salai	0.31	0.28	0.86	1.59	2.64	2.43	2.50	2.15	1.07	1.05	14.86
Sernal	0.09	0.46	0.53	0.60	0.93	0.25	0.20	0.02	0.16	0.06	3.31
Shisham	0.10	0.38	0.22	0.25	0.22	0.12	0.04	0.00	0.00	0.00	1.32

Shiwan	0.43	0.80	0.31	0.03	0.03	0.00	0.00	0.00	0.06	0.00	1.66
Surya	14.11	13.13	9.25	4.39	2.00	0.79	0.18	0.01	0.00	0.02	43.87
Teak	34.28	19.05	10.77	4.80	2.47	0.92	0.38	0.28	0.17	0.15	73.28
Tendu	13.08	2.82	1.30	0.70	0.53	0.28	0.23	0.18	0.08	0.11	19.30
Tiwas	0.62	0.71	0.31	0.09	0.03	0.00	0.00	0.00	0.00	0.00	1.76
Others	68.25	33.79	20.26	9.92	6.26	3.76	0.96	1.30	0.90	1.06	146.45
Tree/ha	213.11	132.22	78.52	45.31	32.00	19.97	12.23	8.52	5.64	7.58	554.49
Vol/ha	2.98	3.70	5.50	7.70	8.16	6.79	5.93	5.37	4.60	7.58	58.32
B.A./ha	0.86	1.52	1.75	1.67	1.75	1.53	1.24	1.11	0.92	1.51	13.85

SECTION: 5.6: SILVICULTURAL SYSTEM :

5.6.1. The primary object of management in these areas is to restore the soil fertility and increase the productivity. Therefore, intensive soil and moisture conservation works will be taken up and the areas will be afforested with suitable species. No regular silvicultural system will be applied. The existing growth will be tended by suitable operations. The root-stocks present in the area which have been constantly hacked for firewood will be redressed properly to achieve the vigorous growth. The species to be planted in these areas will be decided in consultation with local Gram Panchayat or the Forest Protection Committee by taking into consideration the local requirement. The suitability to the soil shall be the most important factor.

SECTION: 5.7: CHOICE OF SPECIES :

5.7.1. The choice of species will depend upon its soil type, depth, drainage and local requirement. However, indigenous species of small timber, firewood and fodder will be preferred. In areas suitable for teak, 50% teak and 50% indigenous edible fruit and flower yielding trees of local economic importance like aonla, biba, hirda, beheda will be planted. Ficus species may be planted at the rate of two trees per ha for wildlife. Bamboo will be planted in suitable area in the fourth year of plantation. For the sake of guidance, the species to be planted may be selected from teak, neem, semal, beheda, tendu, shiwan, babul, chinch, moha, aonla, achar, sitaphal bamboo etc. However, the selection of species in general will be the discretion of the Deputy Conservator of Forests. There are species which have shown the preference for the particular type of soil, planting species on these soil will enhance the chance of survival. The evaluation reports as given by C.F. (evaluation) will also form a basis of selection of species in the area. The staff will be explained to identify the different types of soil. The chart is given below.

Sr.No.	Soil type	Suitable species
1	2	3
1	Sandy loam soil	Grewia, Ber, Kala Siris, Albizzia odoratisima, Tamarindus indica, Dalbergia sisoo, Pongamia pinnata, Anthocephalus kadamba, Ain, Shiwan, Teak
2	Clayey loam soil	Kala Siris, Dalbergia latifolia, Pterocarpus marsupium, Adina cordifolia, Mitragyna parviflora.
3	Black Cotton soil	Neem, Soyimida febrifuga (Rohan) Buchanania lanzan, Acacia auriculiformis, Khair, Hiwar (Acacia leucophloes), Acacia nilotica, Kala Siris, Albizzia peocera, Dalbergia latifolia, Quercus oogenensis,

		<i>Lagerstroemia parviflora</i> .
4	Stiff Clay soils	<i>Aegle marmelos</i> , <i>Semicarpus anacardium</i> , <i>Cassia fistula</i> , <i>Cassia siamea</i> , <i>Adina cardifolia</i> , <i>Mahua</i>
5	Riverain soil	<i>Xylia xylocarpa</i> , <i>Dalbergia sisoo</i> , <i>Bombax ciba</i>
6	Sandy soil	<i>Khair</i> , <i>Terminalia arjuna</i> , <i>Casuarina sp.</i>
7	Hilly tract with good soil	<i>Proposis juliflora</i>
8	Water logged area	<i>Terminalia arjuna</i> , <i>Jamun</i>
9	Hilly tract with poor soil	<i>Ailanthus excelsa</i> , <i>Melia azadirach</i> , <i>Buchanania lanzan</i>
10	Gravelly soil	<i>Rohan</i> , <i>Acacia auriculiformis</i> , <i>Khair</i> , <i>Mahua</i> , <i>Annona squamosa</i> , <i>Dhawada</i> , <i>Bauhinia variegata</i> , <i>Cassia siamea</i> , <i>Terminalia chebula</i>
11	Shallow soil	<i>Sterculia urens</i> , <i>Ailanthus excelsa</i> , <i>Melia azadirach</i> , <i>Khair</i> , <i>Hiwar</i> , <i>Xylia xylocarpa</i> , <i>Bauhinia variegata</i> , <i>Cassia fistula</i> , <i>Cassia siamea</i> , <i>Hardwickia binnata</i> , <i>Dhawada</i> , <i>Terminalia chebula</i>
12	Lateritic soil	<i>Accacia auriculiformis</i> , <i>Xylia xylocarpa</i> , <i>Terminalia belerica</i> , <i>Terminalia chebula</i> , <i>Neem</i> , <i>Karanj</i> , <i>Mahua</i> (oil bearing seeds)
13	Swampy soil	<i>Acacia nilotica</i> , <i>Albizzia procera</i> , <i>Samania saman</i> , <i>Mitragyna parviflora</i> , <i>Terminalia arjuna</i> .
14	Grassy Blank soil	<i>Samania saman</i> , <i>Bombax ceiba</i> .

SECTION: 5.8: FORMATION OF COUPES :

5.8.1. 8 Felling series have been formed. Each felling series will be divided into 20 annual coupes. The sequencing of coups will be from ridge to valley so that watershed development concept will be adhered to. The sequences of working and allotment of compartments to annual coupes have been given in **Appendix no.XXXII** of Volume II. About 200 ha. will be planted every year.

SECTION: 5.9: REGULATION OF YIELD :

5.9.1. Since most of area is degraded, no appreciable yield will be available. However, the small timber and firewood removed during the working may be given either free or at concession rate to the members of Forest Protection Committee if they take up the responsibility for planting and protection of the forest area. Firewood and small timber can be given on nistar to the local people as well, if surplus.

SECTION: 5.10 : AGENCY FOR WORKING :

5.10.1. The demarcation, marking and felling will be done departmentally. The small timber and firewood extracted out of the coupe during the felling and subsequent operations will be given to the local people at concession rates. For the afforestation works the committee of local people will be formed. The Forest Protection Committee of local people under the purview of G.R. in respect of people's participation will be formed who will undertake the soil and moisture conservation and plantation works. The protection work is also be entrusted to this committee as per Government Resolution. But the over all supervision will be of the Department.

On failure of people's participation or no participation at all the plantation and other allied works will be carried out by the Department.

SECTION: 5.11: DEMARCATION OF COUPE, PREPARATION OF TREATMENT MAP :

5.11.1.DEMARCATION : Demarcation of every coupe as per prescriptions is very much essential. The coupe lines should be treated as fire lines for that year. It will help to check encroachments also. It is also necessary to take S.M.C. work, plantation and regeneration work etc.

First and second coupes will be demarcated in first year of operation. Rest of the coupes will be demarcated one year before the year of operation of plantation.

5.11.2. PREPARATION OF TREATMENT MAP : Soon after demarcation of the main working coupe a treatment map will be prepared, after thoroughly inspecting the area by the RFO and will be verified by the ACF. The maps provided of Geomedia cell will show, protection Area, under stocked and fully stocked area. The patch of advanced growth will have to be demarcated. The treatment map will show the following areas distinctly.

5.11.3.TYPE A :- PROTECTION AREA : This will include :

Steep slopes above 25°.

20 meter buffer on either side of well defined nala banks and river courses. Groves around temple or worship place.

5.11.4.TYPE B :- UNDER STOCKED AREAS : All areas upto 0.4 density including blanks.

5.11.5.TYPE C :- Groups of young poles.

5.11.6.TYPE D :- WELL STOCKED AREAS : Well stocked areas with density above 0.4.

5.11.7. To facilitate the preparation of treatment map each coupe will be divided, in general, into four sections. Each type of area will be marked only if its extent at one place is more than 2 ha. The treatment map will be submitted by the RFO to the Deputy Conservator of Forests through Assistant Conservator of Forests. The Deputy Conservator of Forests will get it checked through Assistant Conservator of Forests and a few by himself as a test case. After careful scrutiny, the same will be approved by the Deputy Conservator of forests and will be sent to the RFO. No area will be treated as unworkable as some kinds of work will be required in each type of area mentioned above. A basic treatment map showing these four classes will be provided by Geomedia cell at Chandrapur. In this working circle major area will fall under type (B).

5.11.8.MARKING RULES : Marking technique is described in detail in Other Important Regulations. Marking rules for each type of area besides climber cutting and tending of naturally regenerated seedlings will be as follows :

5.11.9.TYPE A :- PROTECTION AREAS : No tree will be marked for felling in these areas.

5.11.10.TYPE B : UNDER STOCKED AREAS : (1) All dead trees will be marked for felling, after retaining two dead trees per ha. The retention of two dead trees will be from inferior species as far as possible.

All live high stumps will be marked for felling.

All the marking shall be verified by the RFO before commencement of works.

5.11.11.TYPE C : In this area thinning marking of advanced girth will be done so as to a distance of 1/3 of the top height of dominant crop.

5.11.12.TYPE D : WELL STOCKED AREAS : In this area, edible fruits and flower yielding trees will be reserved. The dead trees will be marked for felling, after retaining two trees per ha for the purpose of wildlife. The retention of two dead trees will be from inferior species as far as possible. Only 30% of the trees above exploitable girth, according to SCI rules, shall be removed. The removal of the trees shall be from the higher girth class. The felling will open the canopy to induce regeneration.

Note :- A TREE WILL BE CONSIDERED AS :-

Dying : When it has more than one third of its crown dead:

Unsound : When its bole emits a hollow sound when struck with the back of the axe or when it has not got any marketable timber:

Malformed : When it is defective or abnormal either in crown, or bole, and includes conditions like stagheadedness, gnarl, twists, or constrictions by climbers beyond recouperment or crookedness etc.

Otherwise defective : Means of conditions other than the above such as heavily burnt by fire at its base and likely to fall down within a couple of years with general cavities dug in its stem for taking cut honey or has many ant-poles or fungus, rots or other diseased portions.

SECTION: 5.12 : SOIL AND MOISTURE CONSERVATION :

5.12.1. Soil and moisture conservation works will be taken all over the area along with the marking and will be completed before the onset of monsoon in next year. The details of these works has been given in Other Important Regulations.

REGENERATION :

5.12.2. The artificial regeneration mainly will be resorted for regeneration of the area as major area is under stocked and degraded. However, natural regeneration through coppice and natural seedling will be treated as supplementary to artificial regeneration in the case of afforestation of degraded areas and will be properly tended. In case the area to be afforested is the area already planted earlier, the reasons of failure of plantations will be examined and unless the factor responsible for such failure have been eliminated, no area will be planted.

5.12.3.(I) COPPICING : After felling is over, the stools will be dressed at 10 to 15 cm height above the ground with a sharp axe. This will encourage side shoots.

5.12.4.(II) ARTIFICIAL REGENERATION : Soon after the receipt of approved treatment map for marking a detailed treatment map for planting will be prepared by the RFO under the guidance of an ACF in consultation with Forest Protection

Committee, formed for the afforestation works. The treatment map will show the following details in aforesaid types of areas.

5.12.5.TYPE :A and C : Areas suitable for Bamboo planting. Seed sowing of neem, Maharukh will be restored to. In good soil the stump plantig of sisoo will be carried out.

5.12.6.TYPE B : Areas suitable for various types of plantations along with good soil depth not more than 20 ha.per coupe of such area will be planted in a year. The plantation will be in a single phase.

5.12.7.TYPE D : Areas suitable for bamboo planting and gap planting of teak and miscellaneous species along with the good soil depth. The minimum area for gap planting will be 5 ha.

5.12.8. The treatment map will be completed along with the marking. After preparation of treatment map, the availability of area for various types of planting including fodder and grass will be discussed with the local committee for afforestation and the species to be planted in various types of areas will be finalized. Bamboo planting will be done in all suitable areas in the 4th year of planting.

5.12.9.(III) BOOSTING NATURAL REGENERATION : Methods suggested in Other Important Regulations should be tried.

SECTION: 5.13 : PLANTING TECHNIQUE :

5.13.1. BAMBOO PLANTING: Bamboo planting in all suitable areas will be done. Besides, interplanting in 4th year from the year of planting at the spacing of 6m x 6m in pits of size 45 cm x 45 cm x 45 cm. Dandro calamus strictus will be planted.

5.13.2. PLANTING OF TEAK AND MISCELLANEOUS SPECIES : The planting will be taken in the next year of main working with spacing of 2m x 2m for both teak and miscellaneous species. Planting of teak with standard technique and that of miscellaneous species in pits of size 30 cm x 30 cm x 30 cm will be followed. Raising teak in root trainer will be preferred. The plantation technique has already been standardised. In all 2500 seedling will be planted each ha. Local species will be preferred. The choice of species shall be according to its likely success.

5.13.3.PLANTING OF GRASS : Planting of grass will be taken in the year of planting itself either through seed sowing or through tussocks planting. The details of planting technique has been given in the miscellaneous regulation. Introducing sabai and khus grasses can be thought of. The details of planting of sabai grass has been given in Non Timber Forest Produce Working Circle.

5.13.4. Seed sowing of suitable species should be done over the mound of contour trenches. The choice of such species will be based on site and soil of the site and solely on the discretion of DCF with consultation of local people. Besides, seed sowing of Dhencha (*Sisbania acualata*), Glaricidia, Jatropa and grass can be taken on mound. The root sucker will be encouraged by injuring the root system of such species.

SECTION: 5.14 : SUBSIDIARY SILVICULTURAL OPERATIONS :

5.14.1.The following works will be carried out in the next year of main working and in the subsequent years.

5.14.2.CUTTING BACK OPERATION.

- I.
- II. All standing trees and live high stumps marked for felling but not felled will be felled.
- III. All trees damaged during main working which are not likely to recover will be felled.
- IV. All climbers except of medicinal values will be cut.
- V. Dressing of stumps will be done.

5.14.3.CLEANING : In the third and sixth year from the year of main working the following operations will be carried out :

Climbers will be cut all over the area.

Inferior species, interfering or likely to interfere with natural growth as well as planted seedlings, will be cut.Damaged seedlings or trees damaged by wildlife and illicit cutting will be cut.Coppice shoots on each stump will be reduced to one vigorous shoot.

5.14.4.THINNING : Though 1st thinning is carried out in the 10th year of main felling, however, it depends on the proper growth of seedlings and accordingly decision will be taken by the Deputy Conservator of Forests in consultation with the Conservator of Forests. In the 10th year, from the year of main working following works will be carried out.Climbers will be cut all over the area.All dead trees or badly damaged trees will be felled.Coppice shoots on each stumps will be reduced to one vigorously growing shoot.The sequence of subsidiary silvicultural operation has been given in **Appendix no. XXXIII** of voume II of this plan.

SECTION: 5.15: OTHER REGULATIONS :

5.15.1.FIRE PROTECTION : Main working coupes will be rigidly fire protected for a period of five years from the year of main felling. If possible, the local Forest Protection Committee will be made responsible for this work. Fire tracing will be done in plantation areas. To control fire suggestions and measures given in Other Important Regulations will be followed.

5.15.2.GRAZING : Areas of main working coupes will remain closed to grazing for a period of five years from the year of planting. To control grazing suggestions and measures given in Other Important Regulations should be followed.

5.15.3.The local people should be made aware of the importance of protection of the area from fire, grazing and illicit cutting. Unless the area is regenerated and strictly fire protected no meaningful results can be achieved. For this purpose, regular camps should be arranged of the local afforestation committee to explain to the people about the benefits of afforestation and the importance of the protection.

====00====

CHAPTER – VI

WORKING PLAN FOR BAMBOO (OVERLAPPING)

WORKING CIRCLE

SECTION: 6.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE :

6.1.1. This working circle includes all types of areas where bamboo is present in workable quantity. Workable means that there are sufficient bamboo clumps which require independent working usually the presence of 12 clumps per ha. is considered as workable. Area with scattered bamboo has not been included in this working circle. These areas will be covered under irregular harvesting. The area of the working circle is spread over Ballarshah, Wirur and Kothari Range of the tract. The area extent and a rangewise distribution of area has been given below.

RANGE WISE DISTRIBUTION OF AREA IN BOMBOO (OVERLAPPING) WC.

Sr. No.	Name of Range	RANGE AREA	Bamboo Comptt Area	Area under Bamboo	Area of Bamboo Plantation	Total Bamboo Workeble Area.
1	2	3	4	5	6	7
1	BALLARSHAH	15829.315	11272.926	11268.876	0	11268.876
2	KOTHARI	11599.490	4993.373	3609.256	0	3609.256
3	WIRUR	19961.269	10676.339	2829.236	317.540	3146.776
4	DHABA	5341.208	0	0	0	0
5	RAJURA	10376.132	0	0	0	0
6	WANSADI	20592.362	0	0	0	0
7	JIWATI	28208.285	0	0	0	0
TOTAL		111908.061	26942.638	17707.368	317.540	18024.908

SECTION: 6. 2 : GENERAL CHARACTER OF THE VEGETATION

6.2.1. The general character of the vegetation in the area included in this working circle has been described in the respective working circles. Only the condition of bamboo in this tract has been described here. Species of bamboo commonly found is *Dendrocalamus strictus*, locally known as manvel. It is also known as male bamboo. This species is found almost everywhere either planted or naturally occurring. The concentration of bamboo in Ballarshah, Kothari and Wirur Ranges is more. The gregarious flowering of bamboo took place in the year 1984 in Ballarshah and Kothari ranges and in 1986-1988 in Wirur and range. Excellent natural regeneration came up but it could not be given required silvicultural treatment due to which clump

formation started slowly and is in progress in some areas. Bushy growth of bamboo is seen in some of the forest. It appears that if it is left as such clump formation will not take place in the near future, due to paucity of stored food material, enough to accelerate culm formation. Therefore, to boost up establishment of clump formation, appropriate silvicultural operations are required to be initiated without losing further time.

6.2.2. *Dandrocalamus strictus* is the only species of bamboo occurring in the tract. It is found in north eastern hilly areas on the gentle slopes. Bamboo forms undergrowth in better quality areas. Difference in quality and growth of bamboo and frequency of its occurrence are noticed due to variation in soil, altitude and drainage. *Bambusa arundinacea* (Katang Bamboo) is rare and is usually planted. It is found in the moist locality.

SECTION:6 .3: LOCAL AND COMMERCIAL DEMAND :

6.3.1. Bamboo is used in a variety of ways by the local Tribals and “Burads”. Burads make tattas, baskets and so many other articles of bamboo. Local Tribals use bamboo in hut construction, temporary walls of hut, compound fencing, cattle shed etc. Apart from local demand there is heavy commercial demand of bamboo.

6.3.2. Local demand for bamboo is very high, considering the population and variety of its uses. There is a vast gap between demand and supply of bamboo in this tract. Presently, village communities are being supplied bamboos by bringing them from other Divisions for bonafide use. Crop being young, harvesting of bamboo in this tract is not possible for the present. With a view to utilize the optimum potential of bamboo forests, it's working must be on scientific and silvicultural lines.

6.3.3. To protect rights of the villagers and make them enjoy their rights properly a provision need be made in terms and conditions of lease that lessee should make available bamboos for bonafide domestic and village industry's requirements, at a place and within given period of time as specified by local Range Forest Officer. The department should do exhaustive exercise to assess the village and family wise bonafide requirements of the local people and the period during which it is required.

6.3.4. Accordingly, the nistar will be distributed by the Forest Department well in time to the local people as per directives issued by the Government from time to time. In case there is delay in supply of bamboo by the lessee, then the -`Chief Conservator of Forests should issue necessary order to the Deputy Conservator of Forests regarding harvesting of the bamboo from the due coupes.

SECTION: 6.4 : BLOCKS AND COMPARTMENTS :

6.4.1. 9 felling series have been formed in BOWC. In Ballarshah, Kothari and Wirur range tract in all 87 compartments are having bamboo with a total area of 26942.638 ha. Out of this area Working Circle is 18024.908 ha covered under this working circle is exclusively Reserved Forests. The following

statement shows the name of Range, total number of compartments allotted and the forest area.

ABSTRACT OF BAMBOO AREA IN CENTRAL CHANDA FOREST DIVISION

SR. NO.	NAME OF RANGE	RANGE AREA IN HA	INCLUDE OF COMPARTMENT BAMBOO O.W.C.	BAMBOO COMPARTMENT AREA IN HA	AREA UNDER BAMBOO IN HA	AREA OF BAMBOO PLANTATION IN HA	BAMBOO WORKABLE AREA IN HA.
1	2	3	4	5	6	7	8
1	BALLARSHAH	15829.315	41	11272.926	11268.876	0.00	11268.876
2	KOTHARI	11599.490	22	4993.373	3609.256	0.00	3609.256
3	DHABA	5341.208	0.00	0.00	0.00	0.00	0.00
4	RAJURA	10376.132	0.00	0.00	0.00	0.00	0.00
5	WIRUR	19961.269	24	10676.339	2829.236	317.54	3146.776
6	WANSADI	20592.362	0.00	0.00	0.00	0.00	0.00
7	JIWATI	28208.285	0.00	0.00	0.00	0.00	0.00
TOTAL		111908.061	87	26942.638	17707.368	317.54	18024.908

The allotment of compartments to felling series will be given in **Appendix no. XLI** of Volume II. In case of Dhaba, Rajura, Wansadi and Jioti ranges the bamboo clump formation is yet to be completed. Unfortunately in the current plan no specific stress is being given in treatment of young clump so that clump formation may be expedited. The extent of area in the compartment and their distribution will be given in **Appendix no XL** of Volume II.

6.4.2. Bamboos are used for mats, partitions, baskets, rafters, roofing, and fencing and for such other purposes by the local population. In view of the increased local demand for nistar, felling series have not been divided into nistar and commercial felling series. On harvesting the coupe either by Department or lessee first nistar requirement should be met and the balance should be supplied to or taken by the lessee.

SECTION: 6.5: SPECIAL OBJECTS OF MANAGEMENT:

6.5.1. The special objects of management of this working circle are as follows:

- I. To boost up clump formation.
- II. To harvest bamboo from all over area scientifically to get the optimum sustained annual yield.
- III. To meet the nistar demand of the local population and commercial demand of village industries.
- IV. To meet the growing demand of bamboo based industries.
- V. To improve the crop to increase the productivity of the areas.

SECTION 6.6: METHODS OF TREATMENT:

6.6.1. Since crop is young and clumps are yet to form, in general. Therefore, in the first phase efforts will be made to boost up clump formation. Harvesting will be done as per the standard method given in PARA 6.12.2. The crop will be treated on clump basis i.e. each clump will be treated independently as per the requirement.

SECTION 6.7: CHOICE OF SPECIES :

6.7.1. Depending upon suitability, the following bamboo species shall be planted.

1.Dendrocalamus strictus. 2.Oxytenanthera stocksii. 3.Bamboosa balkowa. 4.Bamboosa bambusa. 5.Bamboosa tulda. 6.Bamboosa vulgaris Schrad.

SECTION: 6.8: CUTTING CYCLE:

6.8.1. The harvesting of bamboo will be done on a cutting cycle of 3 years. Each cutting series will be divided into 3 coupes, viz A, B and C and one of the coupes from each cutting series will be worked annually. Allotment of compartments to the different coupes and sequence of felling will be given in **Appendix NO.XLI** of Volume II.

SECTION: 6.9: ANALYSIS AND VALUATION OF THE CROP :

6.9.1. STOCK MAPPING: The bamboo areas have separately been stock mapped. Details of bamboo bearing areas will be given in **Appendix No.XXIII** of Volume II.

6.9.2. ENUMERATION: 1% systematic plot sampling method has been adopted. In each sample plot, all clumps have been counted and in the area of regeneration survey all bamboo cutting have been counted meticulously.

SECTION: 6.10: IDENTIFICATION OF AGE OF BAMBOO:

6.10.1. Since the marking of bamboo is highly selective, it is necessary to distinguish current year, previous year and mature culms from one another.

6.10.2. CURRENT YEAR: Culm sheath is present on lower half of the culm, branches are present throughout the length of the culm and bloom (white powdery dust) is present abundantly and comes off easily when touched.

6.10.3. SECOND YEAR: Culm sheath absent, branches are present practically at all nodes. Bloom is patchy and does not come off easily.

6.10.4. THIRD YEAR: Culm sheath absent, branches are present practically at all nodes, white bloom is absent and it becomes blackish grey.

SECTION: 6.11: AGENCY FOR HARVESTING:

6.11.1. Since there is heavy local demand of bamboo, therefore, all coupes shall be worked by any one Agency as per norms prescribed by the Forest Department for bamboo felling series.

SECTION: 6.12: METHODS OF EXECUTING THE TREATMENT

6.12.1. The coupes due for working will be demarcated in April/May (before the onset of monsoon) in the year in which they become due for harvesting by erecting poles at suitable intervals. On the poles, compartment number, coupe number and name of cutting series will be written.

6.12.2. Soon after the demarcation, the entire coupe due for working will be thoroughly inspected by the R.F.O and 10% checking will be done by an A.C.F. The inspection will be carried out compartment wise and the area containing bamboo will be shown on the map. In this area sample enumeration of bamboo will be done and on its basis, estimate of bamboo clumps will be made. As per the enumeration the estimate of various works and yield of bamboos will be made.

SECTION: 6.13 : METHODS OF WORKING :

6.13.1. The methods of working will be different for both regeneration and established clumps as given below:

6.13.2. FOR REGNERATION: Following operations will be carried out to boost up clump formation of regeneration in the area which flowered in the year 1984 or 1986-88.

Healthy, vigorous and promising bamboo seedlings @ 300 to 400 per ha are to be identified. Around identified seedlings, a radius of 1 metre will be cleared off all other seedlings even of bamboo other than identified one. Soil of the cleared areas will be ripped and roots of other species if existing will be taken out. On the periphery of the cleared area a circular trench of width 30 cm and depth 20 cm will be dug and dug up soil will be heaped on root of the identified seedlings. On slope half moon shaped trench of above specification will be taken instead of circular trench. Every year, individual fire tracing will be taken till the establishment of the clumps. Thinning and cleaning will be carried out annually till the formation of clumps.

FOR ESTABLISHED CLUMPS:

- (i) No harvesting works should be permitted between 15th June to 30th Sept.
- (ii) No clump should be considered fit for harvesting unless it contains more than 12 mature culms (one year as well as more than one year old culms but having among them some culms at least two years old).
- (iii) No culms below the age of two years will be felled.
- (iv) Following culms shall be removed from all clumps;
 - (a) All dead, decayed and dry bamboos.
 - (b) Culms whose half or more top part is broken or damaged.
 - (c) Twisted or malformed culms.
- (v) In a mature clump the following types of culms (Green and living) will be retained:
 - (a) All culms below age of two years.

- (b) From the culms of age more than one year, equal in number to the current season's (i.e. less than one year old) culms or 8 whichever is more. The remaining culms will be considered available for harvesting.
- (vi) Culms should be cut 15 cm to 45 cm above ground level i.e. above the first internode above the ground with a sharp instrument. The cut should be slanted. This to avoid drying of bamboo rhizome by capillarity.
- (vii) In case of any flowering, no culm from flowered clump shall be felled in the year of flowering.
- (viii) Harvesting of bamboos shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two years old are retained on periphery for the purpose of support to the new culms.
- (ix) Following acts will be strictly prohibited:
 - (a) Digging of rhizomes.
 - (b) Lopping of bamboo culms for fodder.
 - (c) Use of tender bamboo culms for bundling.
- (x) Climbers interfering with growth of bamboo clumps shall be cut.
- (xi) After cutting, the debris will be removed away from the clump and will be stacked at a distance not less than 2 m from the outer periphery of each clump.

Cutting should be supervised by forest officers knowing the rules of felling.

SUGGESTION: 1. It has been observed that in the past there was a profuse regeneration of bamboo in the forests and proper silvicultural operations were not carried out to reduce the density of the bamboo clumps and as a result of which lot of congestion has taken place as compared to normal bamboo forests.

2. It is suggested that prescriptions should be made for carrying out silvicultural operations in order to reduce the density of bamboo clumps in the forest and also conduct suitable experiments to enhance better clump formation. Special efforts are required for cleaning in congested clumps by allocating special budget provision.

6.13.3 It is suggested that while sporadic flowering no seed will be collected from this area and no where the same will be used for regeneration as gregarious flowering will happen near soon.

SECTION: 6.14: BAMBOO FLOWERING AND TREATMENT TO GREGARIOUSLY FLOWERED AREA:

6.14.1. The gregarious flowering in the tract dealt with happened in the year 1984 and 1986-88. During this plan there is no chance of it occurring again in the next. But operations necessary to be followed after flowering are required to be known. Therefore, operations to be followed in sequence are given hereunder:

6.14.2. Since in gregarious flowering all bamboos dry simultaneously and as dry bamboo is vulnerable to fire hazard, its quick removal is essential. But the volume of work is so much that to carry out this operation advance planning and preparation is essential. As soon as the gregarious flowering occurs in any locality its extent should be found out and recorded in the compartment histories . The same will immediately be reported to the Chief Conservator of Forests, Silviculturists Nagpur and Conservator of Forests, Working Plan Gadchiroli. As soon as bamboo starts flowering gregariously, the entire area will be effectively closed to grazing and strictly fire protected for a period of 8 to 10 years from the year following the year of flowering, so that the seeds falling on ground could germinate, germinated seedlings could establish and clump formation could start. The dry culms after seeding should be cut and disposed of as soon as possible.

6.14.3. After seeding profuse regeneration of bamboo comes up in the following monsoon. It takes nearly 8 years for new regeneration to reach the harvestable size, but often it takes considerably more time if proper tending operations are not carried out on time.

COLLECTION OF SEEDS AND IT' S DISPOSAL:

6.14.4. The fresh seed of bamboo will be collected from clumps. The seed so collected will either be sent to the silviculturist for storage and further distribution among various divisions or be used locally as per the requirement. Since the viability of these seeds is very short, these should not be stored for a long.

TENDING OPERATIONS:

6.14.5. After completion of seeding it is essential to properly look after the young regenerated crop till the start of clump formation. The following operations will be carried out in the natural regeneration of bamboo.

CROP OF AGE BETWEEN 1 AND 3 YEARS:

6.14.6. During this period the area will normally contain thick seedlings crop and the clump formations does not start. For timely formation of clumps the following tending operations will be carried out. The area will be thoroughly gone over and 0.8 m diameter focii, at the rate of 300 per ha distributed evenly over the whole area will be formed.

All the rank growth of grasses, weeds and even bamboo seedlings upto a distance of 1.5 metre all around the focii formed as above, will be cleared so that the growth of the bamboo seedlings in the selected focii is not hampered. All climbers within and around the focii upto 1.5 metre distance will completely be removed. The whole area will be strictly protected from fire and grazing.

CROP OF AGE BETWEEN 3 AND 8 YEARS:

6.14.7. During this period clump formations starts but the crop is yet immature for harvesting. During this period following operations will be carried out.

- I. All badly grown, twisted and damaged culms from the selected focii will be removed.
- II. All weeds, grasses and climbers, within and around the focii upto a distance of 1.5 metre will be completely removed.
- III. Tree growth of species, other than teak, ain, shisham, bija, tinsa, tiwas, dhawada, haldu, kalam, semal, mowai and bhirra over topping the clumps will be removed.
- IV. The whole areas will be strictly protected from fire and grazing.

CROP OF AGE ABOVE 8 YEARS :

6.14.8. When the crop age is 8 years, the clump formation is normally completed and clumps are mature enough for harvesting. The treatment during this period will be of the nature of harvesting-cum-tending. The felling rules, already described in the earlier paragraphs, will be applied.

Area with switchy growth: - There are large extent of areas, where the bamboos have been well established but growth is switchy due to insufficient food. These areas are to be left as such, till such time, when these clumps gather enough stored food to produce a healthy and a marketable culm.

SECTION: 6.15: CYCLE OF TENDING OPERATIONS:

6.15.1. The operations, as prescribed under above, will be carried out annually. When it is not possible due to administrative reasons, these operations, except fire protection, will be carried out alternate years or at the most in a cycle of 3 years. This will be decided by the Chief Conservator of Forests. The fire protection will be carried out every year and the grazing will remain closed till completion of clump formation.

SECTION: 6.16 INJURIES DUE TO INSECTS AND THEIR CONTROL :

6.16.1. The insects known to attack the bamboo culms are *Estigmina Chinensis* (Chrysomelidae colioptera) which attacks new culm and make galleries inside the inter nodes. *Cryptotrachelus longipes* which is responsible for destroying the growing terminal bud causing branchy growth. The damage caused by insects are not reported so far in this tract.

6.16.2. The attack of these insects can be controlled by taking up the following measures :

- i) All the infected culms will be cut and burnt during winter when the insects hybernate.
- ii) To cause light ground fire run through the infected areas in winter as the insects hide under the debris and taking advantage of the insectivorous birds.

SECTION: 6 .17: OTHER REGULATIONS :

6.17.1. FIRE PROTECTION: The new shoots of bamboo are badly affected by fire and therefore, bamboo area will be protected completely from fire.

GRAZING: In flowering areas grazing will be strictly prohibited.

6.17.2: JOINT FOREST MANAGEMENT: – The best method of treating the area with the switchy growth is to get the work done through JFM committee. The members of these committee may be allowed to remove the switchy growth of bamboo from the inbetween the spacing left out. After the formation of focii of radius 1.0 meter at the interval of 1.0 meter, the inbetween growth will be removed. The switchy growth removed shall be used for their self use. These works will be done under the supervision of a forest guard.

====00====

CHAPTER – VII

WORKING PLAN FOR NON-TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

SECTION:7.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

7.1.1. This is an overlapping working circle covering the entire forest area of the tract dealt with. Thus the total forest area included in this working circle is 111908.05.ha. This working circle is in recognition of the growing values to non timber forest species basically the plants of medicinal importance and other minor forest produce like tendu etc. These species are basically traded locally. There is not much revenue realised by the Government except for tendu , but there is substantial return to the tribals.

1	Ballarshah	15,829.315
2	Kothari	11,599.490
3	Dhaba	5,341.204
4	Rajura	10,376.132
5	Wirur	19,961.269
6	Wansadi	20,592.362
7	Jioti	28,208.285
	Total	111,908.057

SECTION: 7.2: NON TIMBER FOREST PRODUCE OF THE TRACT :

7.2.1. There are numerous Non Timber Forest Produces available in this tract and are found in almost all ranges with varying extent. Tendu and Bamboo contribute a sizeable revenue to the State exchequers other produce generate employment for local people during their lean season. These play an important role in rural economy.

7.2.2. The important Non Timber Forest Produces, found in this tract are Moha flower and Fruits, Bamboo, Tendu, Myrabolons, Gum, Broom, Grass etc. As a matter of practice only timber species of medicinal importance is enumerated by the forest survey units. The non timber species is usually ignored. The reliable data of its quantum of presence is unknown. There is also destructive mode of its harvesting with the result, there abundance has decreased considerably.

SECTION : 7.3: SPECIAL OBJECTS OF MANAGEMENT :

7.3.1. As per the National Forest Policy, 1988 the development of Non Timber Forest Produce (NTFP) has been one of the objectives in the forest management. Therefore, consistent with the above policy, the special objects of management decided are as follows:

1. To manage NTFP scientifically to utilise the existing potential optimally and thereby to enhance the productivity and production of the same.
2. To take measures for its sustained yield.
3. To generate employment for local people thereby improving their financial status through participatory management.
4. To provide better and improved quality of life and culture supporting items to the local people.

SECTION :7.4 : METHODS OF TREATMENT :

7.4.1. The treatment to be given will be different for different types of NTFP. Therefore, each NTFP will have separate treatment as follows :

MOHA :

7.4.2. MOHA FLOWER:

7.4.3. 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, sal seeds, 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.

7.4.4. 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.

7.4.5. A 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.

7.4.6. Nutrition analysis of flower showed digestible crude protein 3.08 %, total digestible nutrients 73.7% and starch equivalent to 55.1 % . The flesh of animals particularly of pigs, fed on moha flowers, acquires delicate flavours.

7.4.7 MOHA FRUIT :

7.4.7. USE AND NUTRITIVE VALUE: A ripe fruit has cream coloured epicarp, which is edible. Moha berries were eaten raw or cooked. They are also eaten by cattle, sheep, goats, monkey and parrots. They have medicinal value as well. Fruits felled on the ground are easily attacked by insects and ants thus becomes unfit for human consumption.

7.4.8. The moha seed yield 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.

7.4.9. 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.

7.4.10. The yield of oil from the seeds depends on the efficiency of the equipment's 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.

7.4.11. Moha oil should have a set of characteristics. For this purpose ISI standards have been prescribed which are as below :

MOHA OIL PROPERTIES:

Sr.No	Characteristics	Grade		
		I	II	III
1.	Moisture and insoluble impurities% by mass max.	0.10	0.25	0.50
2.	Color in a ¼ in a cell on the Loviband scale expressed are Y + 5R not deeper than.	0.20	30	50
3.	Refractive index at 40°C	1.459	To	1.460
4.	Sp.gravity at 90°F /30°C	0.862	To	0.875
5.	Saponification value	187	To	196
6.	Iodine value	58	To	70
7.	Unsaponification matter % by mass	2.0	3	3.0
8.	Acid value max	0.5	20.0	>20

7.4.12. YIELD: Moha trees starts bearing flowers and fruits between 10th to 15th years of planting. A study with reference to the yield of moha flowers and fruits has been conducted by the MVSS, Chandrapur in comptt.No.195 in Tadgaon Range of Bhamragarh Forest Division, District Gadchiroli in the year 1992. The trees of different shapes and girths were selected for the purpose of this study. Results obtained are as below :

YIELD OF MOHA FLOWER AND FRUITS:

Weight in Kg.			
Sr.No.	G.B.H.in Cm	Flower	Seed
1.	076 - 090	08.00	1.20
2.	091 - 105	10.00	1.00
3.	106 - 120	11.25	2.00
4.	136 - 150	13.30	2.75
5.	151 - 175	13.00	3.80
6.	176 - 190	15.00	4.00
7.	206 - 220	20.00	4.30
	Average	12.94	2.72

As per year 1992 was not a good seed year, the average obtained above is on lower side.

7.4.13. The rates of royalty in Rs/Qtl. Of Moha flower and seed as decided by the T.D.C. in the year, 2006-07, 07-08, 08-09, 09-10, 10-11.

RATE OF ROYALTY OF MOHA FLOWER AND FRUIT GIVEN BY TDC.

Sr.No.	Produce	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Moha Flower	5.00	5.00	5.00	5.00	5.00
2.	Moha seed	5.00	5.00	5.00	5.00	5.00

7.4.14. As per the tree enumeration carried out by the SOFR Unit Gadchiroli II, the number of Moha trees/ha having gbh>45 cm is 7.31. On the basis of the study mentioned above expected yields of flower and seed come to 94.59 kg/ha and 19.74 kg/ha respectively. However, the phenological character of the species is that flowering and fruiting generally occur alternate years or twice in three years.

7.4.15. FORMATION OF UNITS AND COUPES:

7.4.15 The range will 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.

7.4.16. AGENCIES FOR COLLECTION:

7.4.16 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 Panchayat Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that 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 other agency under terms and conditions as decided by the Government.

7.4.17. MARKET :

7.4.17 Moha flower and seed come under monopoly Act and so the collection of moha flower and seed is done by people and purchased by the TDC.

7.4.18 OTHER REGULATIONS:

7.4.18 Compartment wise list of moha trees should be prepared and maintained at beat, round and range levels.

7.4.19 As it is a bare fact that 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 and fruits. Therefore, before the start of flower falling, the ground under the moha tree crown should 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 should be viewed very seriously.

7.4.20. The measures for enhancing the production and productivity by local means should be explored and taken. Local people may be of great help in this regard.

7.4.21 GUM:

7.4.21 USE AND VALUE: Dhawada (*Anogeissus latifolia*) and Salai (*Boswellia serrata*) gums are the main sources of gum production in this tract. These are

used in medicines, chemicals, cosmetics and food industries. Salai gum is mostly used as an 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. Dhawada gum is very good for the preparation of many food articles.

7.4.22. 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 is very important from protection of forest from the fire point of view.

7.4.23. TAPPING RULES: The rules for tapping, derived by the FRI, Dehradun, are as follows:

1. The tapping season will commence from November to end of May each year. No tree below 90 cm in girth will be tapped.
2. 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.
3. Only trees above 90 cm in girth at breast height will be tapped.
4. Each tree will be tapped continuously for 3 years and will be given a rest for 3 years thereafter. The second tapping cycle will begin in the 7th year after the commencement of tapping season and will continue for another period of 3 years.
4. 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.
5. Blaze may be made horizontally leaving approximately equal space between the blazes. The blazes should not have any loose fiber. The lower surface of the blaze should be slightly slopping outwards to avoid lodging of guggul in the blazed pocket in case initial blazing is done by edge.
6. 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 upto May. Thus 12 freshening may be required to be made during the year.
7. 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 freshening. This means that about 0.3 cm should be scraped off either side in width in each freshening.

8. The lowest row of blazes will be at one meter above the ground level. The next row of blazes will be made at the height of 60 cm from the lower i.e. at a total height of 1.6 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.
9. The number of blazes to be made on each tree will depend on its girth at breast height as given below:

NO OF BLAZES ON EACH TREE

Sr.No	Girth at breast height	Max. No. of blazes to be made on each tree
1.	1.00m to 1.3 m	2
2.	1.3m to 2.0 m	3
3.	2.0m to 3 m	4
4.	Over 3 m	1 blaze for every 45 cm girth in addition to category 3 above

- 10 No fresh blaze will be made on the partially healed up surface or old wounds.
11. 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.
12. 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.
13. 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.
14. In the second cycle i.e. in the 7th year (after three years rest) new blazes will be made in the same way in the 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.

7.4.24 FORMATION OF UNITS AND COUPES: Range is the unit. Each unit will be divided into three annual coupes details of which will be given in **Appendix N0. XXV** of Volume II. The working cycle will be of three years.

7.4.25 AGENCY: As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that 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 other agency under terms and conditions as decided by the Government.

7.4.26. MARKET: There is monopoly purchase by TDC under the provisions of Monopoly Act. Besides, the export of raw or finished goods should also be thought of :

7.4.27 OTHER REGULATIONS:

1. The compartment wise list of such trees should be prepared and maintained at beat, round and range levels.
2. Cleaning around the trees to facilitate gum collection and to avoid fire, should be done.
3. To increase the population of salai trees, soil should be dug up in the form of a ring with radius 1.5 times that of crown. By doing so root suckers are injured and from which profuse shoots come out. Singling and tending them will increase the population of this species.
4. Gum producing trees should be reserved from felling.
5. A strict watch is necessary to enforce tapping rules and check unauthorized collection of gum and tapping during the period of rest.

7.4.28.TENDU:

7.4.28. USE: This is one of the most important NTFP of the tract which gives handsome revenue. This is used for manufacture of bidi. Presently people benefit from this NTFP only by way of getting wages for collection of leaves. But by setting cottage industry for bidi manufacture will provide the maximum benefit from tendu to the people. Bidi making is such an activity which can be started without any costly infrastructure. Besides, bidi making can be done at any leisure time.

7.4.29. YIELD: The estimated yield of tendu leaves is approximately 42000 standard bags. The details of production and royalty received by the Division will be given **Appendix No.XI** of volume II

7.4.30. No scientific efforts are seen to have been made to augment the tendu leaves production in this tract so far. On the contrary, every year pruning is carried out officially to get good flush of leaves. Besides, this clandestine burning after pruning is got done by the contractors to get good flush off leaves. Both these operation are detrimental to the future production of the leaves. During pruning all small size plants, whether of seed origin seedlings or coppice origin seedlings, are cut every year resulting into a threat to future seed bearers. If such types of operations continue, the seed bearer will go on diminishing season after season. Besides, in the greed of flush of leaves, yearly entire forest is burnt which cause much more damage as compared to the benefits obtained out it. This is undisputed fact that this is the most important reason of forest fire. This practice so far called augmentation of leaves production is required to be stopped forthwith.

7.4.31. FORMATION OF UNITS: The tract dealt has been divided into 26 tendu units. Which has been divided into 23 working units/groups.

7.4.32. AGENCY: With the enactment of “Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969” the trade in tendu leaves has been nationalised. Now tendu has been excluded from the list of minor forest produce after due amendment to this Act by the government of Maharashtra. Tendu is covered under the Nationalized Produce and accordingly the collection and disposal of tendu leaves is being done by State Government through Addl. Chief Conservator of Forests (U&N) MS Nagpur. Under this Act, tendu units are sold by tender. Prior to 1991 the standard bag system was in practice. But after that the lumpsum system has been adopted. In the new system the pronounced illicit cutting of tendu trees was observed. This is because of the fact that the contractors want to have more and more leaves by hook or crook. The system has now been revised.

7.4.33. MARKET: Under the present system the units are sold by tender. As per the present proposition under this plan, instead of selling units, units should be auctioned by tender for collection of leaves on commission basis. The final disposal should be done departmentally in open auction or by tender as has been discussed above.

7.4.34. OTHER REGULATIONS:

1. To augment the tendu tree population, soil should be dug up 15 to 20 cm deep around the tree, in a circular ring of diameter equal to that of the crown so as to cause injuries to the root suckers. The trees of gbh more than 45 cm could be selected for such operation. This will cause injuries to the root suckers to stimulate growth of seedlings through them. The tending and singling of shoots from root suckers will increase the population of the tendu tree.
2. Pruning should not be done yearly. It should be done at an interval of 3 years, during which some seedlings could establish and become the future seed bearer. Pruning should strictly and exclusively be of branches and not of seedlings irrespective of their origin.

7.4.35.. BAMBOO :

7.4.35. USE: This is one of the important (non)timber forest produce of this tract. As the bamboo is timber from the definition of timber as per the definition given in Indian Forest Act, it is not treated as minor forest produce and has been excluded from the list of minor forest produces. This is popularly known as poor man's timber. The local people make use of it in a variety of ways. People eat tender rhizomes as vegetable during the monsoon. Besides, it is used by Burads to prepare bamboo articles and local people in construction of huts, houses, cattle sheds and fencing. This is used by outsiders in a number of industries such as Paper and Pulp, Ice cream etc.

7.4.36 YIELD : This has been discussed in detail in Bamboo Overlapping Working Circle.

7.4.37 FORMATION OF COUPES: The details of it are given in bamboo overlapping working circle.

7.4.38 AGENCY: This has been discussed in detail in Bamboo Overlapping Working Circle.

7.4.39 VILLAGE INDUSTRIES: Marking bamboo tatta is one of the important and potential propositions. This should be encouraged, alongwith the other activities with bamboos by the local people. There is huge demand of the same in this area by many agencies, one of them is Western Coal Field limited. This will increase sharply the economic status of the local people. The raw material will be supplied by the department in the manner described in the Bamboo Overlapping Working Circle.

7.4.40. MARKET: The general market for the bamboo has been described in detail in Bamboo Overlapping Working Circle. So far as 'bamboo tatta' is concerned, for its contracts should be made with Western Coal Field limited , by assessing its requirement. The supply to the concern should be made at the rate, terms and conditions as decided by the Government.

7.4.41. OTHER REGULATIONS: A list of firms requiring bamboo tatta and its quality should be prepared and maintained at range and division levels.

7.4.42. MYRABOLONS, DIKAMALI AND NIRMALI FRUITS:

7.4.42. USE: These NTFP are used in many ways. Hirda, Beheda and Aonla are most common amongst myrabolons. 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. Dikamali and Nirmali fruits are used in chemicals and other industrial uses.

7.4.43. YIELD: So far no study has been conducted to know the yield of fruits for trees of such species.

7.4.44. FORMATION OF UNITS AND COUPES: The range will be the unit. Since working is annual and covers the entire area and so unit will also be the coupe.

7.4.45. AGENCY FOR HARVESTING: As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that 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, the units should be given on lease. The lessee will collect the same as per the direction of the Dy. C.F. concerned. The lease period should be from 1st July to 30th June. Lease should be given for one year

by calling tender at division or circle level. On failure of tender, Departmental harvesting can be thought of, if it is profitable and market is surveyed and assured.

7.4.46. MARKET: Market should be surveyed and recorded so that in case of departmental working the same could be used.

7.4.47. OTHER REGULATIONS:

The detailed list of such species should be prepared and maintained at beat, round and range levels.

These species should be excluded from felling.

7.4.48. BROOM GRASS:

7.4.48. USE: This grass is used in preparation of broom which is usually used in houses. It is a seasonal crop and localised one.

7.4.49. YIELD: So far no study has been conducted to assess the yield of this grass.

7.4.50. FORMATION OF UNIT: The range will be the unit.

7.4.51. AGENCY: As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that 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, the unit will be sold by calling tender.

7.4.52. OTHER REGULATIONS:

1. The areas suitable for this grass should be sown.
2. The compartments wise details should be prepared and maintained at beat, round and range levels.
3. The area should be fire protected.

7.4.53. SABAI GRASS (*Eulaliopsis binata*)

7.4.53. USE: This is very good soil binder and comes up well in Wasteland as well. This is good for soil as well as quick-yielding cash crop. This is used in making ropes.

7.4.54. PLANTING PATTERN: This is planted at a close spacing of 45 cm x 45 cm in the intervening space in plantation. In the areas selected for plantation by people's participation, this can be introduced on experimental basis.

7.4.55. YIELD AND RETURN: Sabai grass is not available in this tract and so study for yield and return has not been made. However, a successful study has been conducted in Kendbona village in West Bengal, the results of which published in Vol. 118 of Indian Forester, for the month of December, 1992, is

reproduced as follows : “The sabai, planted in 1989, in 17 ha areas was cut back, more by way of a tending operation than regular harvest, to induce better growth, in 1990. The total beneficiaries were 48 families. Each beneficiary received as share of Rs. 135/- . In 1991, each received a share of Rs. 1000/- during the month of September, which is the leanest month of the year for the village people. The yield of sabai continues to increase reaching its peak around the 7th year after planting, and the area has to be replanted on the 8th or 9th year. Sabai when made into ropes, fetched a price of Rs. 6/- per Kg as against Rs. 2/- per Kg for the grass. Hand operated rope making machine that can be operated by a team of two, has been designed and fabricated in West Bengal.”

7.4.56. FORMATION OF UNIT AND COUPE: The range will be the unit and coupe will overlap with coupes in which plantation is to be taken in any Working Circle.

7.4.57. AGENCY: The Forest Protection Committee will be formed under the umbrella of G.R. No. SLF-109/C.N.119/F-II, Mantralaya, Bombay dated 16th March, 1992 in view of people's participation in forest management. The same will be motivated to take the scheme. If the people fail to come forward, on an experimental basis department should take such plantation on an appropriate size in suitable area. The above committee should be involved right from the time of formulation of the scheme. Frequent discussions are also required to be held with them regarding the management of the assets so created. Ladies should also be encouraged to take part in it.

7.4.58. MARKET: Market for sabai rope can easily be available. All the nearby cities will serve the role of the market. Besides, this will be used in large scale for bundling of bamboos in bamboo working coupes of this tract and nearby divisions.

7.4.59. OTHER REGULATIONS:

1. The market survey with respect to price and demand of the sabai rope should be made and record should be maintained at range and division levels.
2. The training for making ropes to a few selected villagers, on an experimental basis, should be imparted.
3. Z.P. should be involved for solving financial bottleneck.

7.4.60. KHAIR :

7.4.60. The khair tree is distributed more or less in all ranges of the division. Due to its prominent occurrence a separate Khair Working Circle was formed in the previous plan. But harvesting could not be done possibly due to lack of demand. Presently, this is not being properly used. As this is very valuable species, its proper use is essential to increase the productivity of the area hence taking it under the purview of scientific management is must. Keeping in view the past bottleneck in management, practical proposition has been made hereunder.

7.4.61. PROPERTIES: Khair is known to occur on granite, gneiss, schist, quartzite, basalt, trap, limestone, conglomerate and laterite. It grows best on porous alluvium composed of sand and shingle. It also occurs on black cotton soil. Khair is strong light-demander. It is capable of growing in dry situations where almost every other species fail to survive. The tree coppice well upto moderate size and produces root suckers, particularly where the roots have been exposed. This character can be used for its propagation as has been suggested for Tendu. Coppice shoots, however, require complete light for their development. Root and shoot cuttings are also possible mode of propagation.

7.4.62. The wood is very hard and heavy. The average weight at 12% moisture is about 1010 kg/m³ (ranging from 880 to 1170). The density of khair is 0.875. Growth rings are formed and are fairly distinct, demarcated by a fine, interrupted line of parenchyma occasionally accompanied by somewhat larger vessels. The timber is very hard and strong, very steady and moderately tough. The sap wood is not durable. The heartwood is very durable and is described by Pearson “one of the most durable Indian Woods which is seldom, if ever, attacked by white ants and fungi”

7.4.63. USE OF KHAIR: The khair heartwood is chiefly used for the production of katha and cutch since very long time. It is valuable structural timber due to its natural durability of heartwood. This species has been classified as “Super group” timber suitable for large span more than 12 m and is placed as the first choice of selection for management structure (ISI : 1962). It is eminently suitable for tools and tool handles, specially for mallets and plane bodies. It is used for all kinds of agricultural implements and is excellent for making spokes and hubs of cart wheels. It is used for posts in house construction and for making rice pastels, oil expellers, gun butt etc. The spent heartwood is also used as fuel in the Katha-boiler and Katha bhatties. The charcoal of dead khair wood is much valued and used by goldsmiths. The calorie values of moisture free sapwood and heartwood are 5142 and 4946 calories respectively. The exhausted Khair heartwood shavings can economically be utilized for making partition boards and decorative boards and also can be used as top of table for drawing room.

7.4.64. The results of experiments in FRI on sapwood and spent heartwood of khair showed the profitable utilization of the same for producing bleached cellulose, which will find use in multifarious cellulose base industries, like carboxy ethyl cellulose, cellulose acetate and even for paper and paper boards if made available in large quantities.

7.4.65. Khair gum is considered to be very good and it is a good substitute for gum arabic. It is advisable that the khair trees should be tapped for some years to obtain gum prior to felling for katha production.

7.4.66. The bark has a stringent taste and it is useful in the treatment of snake bites and the paste of the bark is also useful in conjunctivitis. The juice of the fresh bark is given with asafoetida in haemoptysis (spitting of blood).

7.4.67. YIELD: The khair is the species mainly of degraded miscellaneous forests. The yield of khair has not been estimated separately.

SECTION: 7.5: RESEARCH WORKS:

7.5.1. There are so many Non Timber Forest Produce in the forest which are unidentified and untapped. The efforts of the department should be to explore them and manage them scientifically. The identification of medicinal plants is the field to be taken for study immediately. This has wide scope in future. Dr. M.N. Padhye of Nagpur and his team have been conducting a survey of medicinal plants in the forests of Gadchiroli and Chandrapur Districts. Over 150 such plants have been identified so far. The list of plants will be given in Volume I. This is not the exhaustive list of medicinal plants. It is open to add more names of such plants. Besides, quantification and localization of the same are the fields for future study. Innovation and research works should always be carried out and the same be recorded and reported properly so that those could be of use to those who come next.

SECTION: 7.6: OTHER IMPORTANT PRINCIPLES AND PROCEDURES:

7.6.1. The following are important principles and procedures:

The annual estimates for collection of Non Timber Forest Produce shall be based upon the experience.

1. The annual estimates for collection of NTFP shall be approved by the Conservator of Forests.
2. 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.
3. The Non Timber Forest Produce lease units should have distinct boundaries.
4. NTFP collection estimates shall be based upon the inventories of forest resources.
5. Scheme shall be formulated for improving yield of Non Timber Forest Produce e.g. plantations, protection against disease etc.
6. Measures shall be taken to maintain and improve the present output of the Non Timber Forest Produce.

====00====

CHAPTER –VIII

WORKING PLAN FOR WILDLIFE (OVERLAPPING) WORKING CIRCLE

SECTION: 8.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

8.1.1. This is an overlapping working circle and covers the entire area of the tract. The total area included in this working circle is 111,908.057 hectares. The nature of crop covered under the working circle has already been discussed in chapter-II related to forests.

Range	Range area in ha
Ballarshah	15,829.315
Kothari	11,599.490
Dhaba	5,341.204
Rajura	10,376.132
Wirur	19,961.269
Wansadi	20,592.362
Jioti	28,208.285
Total	111,908.057

SECTION: 8.2: GENERAL CONDITION OF FAUNA AND FLORA:

8.2.1. The tract dealt with has been the natural habitat of a variety of wild animals. The numerical strength present has reduced to the alarming extent mainly due to excess biotic interference. The description of fauna has been given in Chapters VIII in Part I of this plan. The flora description of the tract has been given in Chapter II of Part I.

The wildlife Population figures as per summer - 2015 estimation is depicted below-

Sr.No.	Name of Wild animals	Camera Trap Data	Water hole data	Line transect data
1	Tiger	12	2	--
2	Wild Pig	--	517	--
3	Moneky	--	420	--
4	Sambar	--	33	--
5	Nilgai	--	33	--
6	Barking deer	--	40	--
7	Peacock	--	25	--
8	Wild Hen	--	15	--
9	Wild Cat	--	4	--
10	Rabbit	--	6	--
11	Cheetal	--	481	--

12	Ghorpad	--	1	--
13	Bear	--	7	--
14	Bison	--	5	--
15	Bhedki	--	8	--
16	Wild Dog	--	15	--
17	Sayal	--	2	--
18	Fox	--	1	--
19	Mungus	--	1	--

Note – As reported by DCF Central Chanda Chandrapur Line transect data is not available with him. The information in inform of software was submitted by them to APCCF (WL) East Nagpur

SECTION : 8.3: SPECIAL OBJECTS OF MANAGEMENT :

8.3.1. The priority of National Forest Policy is ecological balance and therefore, management of forests is to be done for the same. Since wild animals are the part of the eco-system and therefore, their management is essential. So far management has economic considerations and so wild animals were ignored and they were managed for entertainment. On recognizing the fact that wild animals are essential for the survival of living being as becoming an important part of eco-system, the orientation of management of wildlife is changing very fast. Due to some limitations, the intensive management practices are confined to Protected areas only. However, time has come to realize the fact and to manage it in a rational way is essential in areas other than protected areas as well.

Following are the special objectives of management.

- a) To educate and sensitize people about wildlife conservation.
- b) To protect, preserve and improve the existing wildlife stock in this tract.
- c) To ensure the maintenance of viable population of wildlife.
- d) To conserve & preserve biodiversity of the area.
- e) To improve the habitat of wildlife existing in this tract.

8.3.2. The conservation and protection measures are required to be taken through out the forest areas. Keeping this aspect into view, the special objects of management decided are as follows :

- (i) To preserve and develop the existing wild animals in this tract.
- (ii) To develop infra structure for existence and development of wild animals, such as water holes, anicuts, salt lick etc.
- (iii) To educate and motivate people for protection and conservation of wild animals and thereby providing an environment of security to the wild animals.

SECTION: 8.4: METHODS OF TREATMENT:

8.4.1. No regular schemes are being prescribed for the management of wild animals in this tract. However, following prescriptions are being given for the

protection of wild animals, creation of environment of security to them, increasing infrastructure for wildlife management and trying to restore the status of wild animals in this tract:

- (i) People should be made to realize the reasons of depletion of wild animals to such an extent in this tract and the way to restore the status through repeated dialogue with them.
- (ii) Teaching and motivating them for conservation. This principle should be taught to them through stories like the teaching in Panchatantra to bring attitudinal change. This will be more effective because they are not educated to read and understand any literature. How the wrong doing of them is affecting and likely to affect adversely to their life and life style is to be stressed and they should be convinced.
- (iii) Besides, by persuading, teaching and motivating people should be made aware of the Acts and their coverage for the protection of the wild animals.

Gram Panchayat will give the name of offender who will be prosecuted under the provision of the Acts. People will be made aware of the penalties for which offenders can be liable.

- (i) The villagers as well as our people should keep a vigilant watch over poacher. As soon as any incidence of poaching in this tract is noticed all possible measures should be taken to completely close the door for poachers. Poachers from outside will not dare to enter in this area if the protection is done jointly by villagers and our staff.
- (ii) Strict checking at the checking gates erected to check or prevent illicit transport of forest produce.
- (iii) The provisions of rewards to the informed or informer in respect of unlicensed or without permit shooting are required to be followed and payment of reward should be made promptly. Besides, giving two advance increment to the staff as a reward is also being proposed.
- (iv) For development of basic amenities for wild animals the following works will be carried out:
 - (a) While preparing the treatment map of a coupe for felling in any of the working circles potential habitat of wild animals and existing waterholes will also be identified and will be shown on the treatment map.
 - (b) Marking of dead trees in any felling coupe will be done only if their number is more than 2 / ha. These trees will be required to provide snag and den trees for nesting and resting of the wild animals. Trees of commercially low utility are used for this purpose.
 - (c) During harvesting, some unsound and hollow logs of commercially low utility, not exceeding 3 per ha will be left in the forest to serve as shelter for wild animals.

- (d) In the plantations, few fruit trees will also be planted provide food to some wild animals. The choice of species will be the discretion of the Dy. Conservator of Forests.
- (e) The waterholes which are frequently visited by wild animals will be excluded from grazing by making a special mention of such areas in the grazing permit license.
- (f) The existing waterholes will remain maintained and at possible sites new waterholes will be created to make the waterholes distributed evenly through out the tract so far as possible.
- (g) Suitable locations will be identified where forest tank will be constructed to provide water to the wild animals.
- (h) Hoardings on the importance of wild animals and its protection will be exhibited at strategic locations.
- (i) The labour camps and transit depots will be established away from the areas having high density of wild animals.
- (j) At the selected important places blocks of salt lick will be kept.

SECTION 8.5. IDENTIFICATION & DOCUMENTIFICATION OF RESOURCE BASE

- a) It is prescribed that the division will undertake compilation of floral & faunal resources, ecologically sensitive sites and create a comprehensive database for the division
- b) The division will carry out the survey of floral species of wildlife significance such as browse, fodder resources, wildlife cover, etc and map and record them for purpose of habitat management.
- c) The division will also carry out survey of riparian zones, mesic sites, perennial water holes, saltlicks, natural wallows, breeding and nesting sites, etc. and map them for purpose of their protection and management.
- d) The division will also maintain a meticulous record of these sites in a register. This "Register of the Special Wildlife Habitat" will be filled regularly and updated, fortnightly by an officer not below the rank of Range Forest Officer.
- e) The Division will undertake traditional annual census survey for estimation of the wildlife population as well as by transect method given by Wildlife Institute of India.

8.5.1. EXISTENCE OF WILDLIFE IN FOREST: Existence of particular wild animals in a particular forest can be identified from the following observations.

- i) **BY ACTUAL SIGHTING:** In the early morning or evening, near water holes, grazing sites or on the roads, we can see the wild animals.

- ii) **PUG MARKS:** By keen observation of these pug/hoof marks we can identify the category of wild animals, their sex and age.
- iii) **GRAZING MARKS:** The method of grazing of different herbivores is different. We can identify the category of herbivore by the nature of grazing and browsing.
- iv) **BY EXCRETA:** By the examination of excreta we can know the category of wild life, their numbers, way of walking and, quantity of food etc.
- v) **ANTLERS MARKS (on the stem of tree):** Before falling of antlers, Spotted Deers and Sambers rub their antler to some stem. In Spotted Deer and Samber this habit can be observed.
- vi) **BY SMELL (odour):** Many animals having the smell glands. In Hyena these glands are found in his Anus and in case of Black Buck they are found below their eyes.
- vii) **BY SALT LICKING PLACES:** In forest some soil contains more percentage of salt and minerals and wild animals use to lick this soil to get the necessary amount of salt.
- viii) **BY SOUND:** In forest we can hear different types of sounds of wild animals. Some wild animals give signal of danger to other animals with the help of different sounds. for ex. Deer, Samber, Monkey etc.
- ix) **BY WALLOWING SIGHTS:** Samber, Wild Boars etc like mud and they wallow in mud. By this they clean their skin and protect it from insects.
- x) **NAIL MARKS:** Tiger and Bear with the help of their Claws/Nails scratch the Bark of some trees..



SECTION 8.6. GENERAL HABITAT & POPULATION MANAGEMENT

The specific objective of this working circle is to ensure wildlife protection and conservation in the managed forests of the division. Following prescriptions are being made for achieving above objects.

- a) While preparing the treatment map of a coupe for felling in any of the working circles, potential habitat of wild animals and existing waterholes will also be identified and will be shown on the treatment map.
- b) In the plantations, few trees of local fruit species like Ber, Bel etc will also be planted to provide food to the wild animals.
- c) The waterholes, which are frequently visited by wild animals, will be excluded from grazing by making a special mention of such areas in the grazing permit/license.
- d) The existing waterholes will be maintained and at suitable sites new waterholes will be created to make the waterholes distributed evenly throughout the tract as far as possible. Strict vigilance and monitoring will be done on such waterholes.
- e) Suitable locations will be identified where forest tank will be constructed to provide water to the wild animals. These tanks / waterholes should be near good JFM village or Forest Guard naka who can monitor them.
- f) Signages on the importance of wildlife and its protection and also about minimizing man animal conflict will be exhibited at strategic locations.
- g) The labour camps and transit depots will be established away from the areas having high density of wild animals.
- h) Monitoring will be done fortnightly to know the status and movement of wild animals. The Proforma for monitoring will be given in the Appendices.
- i) Annual consolidation of all fortnight report and monitoring should be done and shown on the suitable maps of the division.
- j) It has been observed that tigers from Ballarshah forest areas of Central Chanda Division cross the Wardha River and enters into the Rajura Range of Central Chanda Division, because of rich herbivora population. In order to provide effective corridor for free movement of wildlife from the Tadoba Tiger Reserve corridors will be identified and special habitat management treatment will be given.
- k) The division shows exceptionally high population of wolf. Special monitoring will be carried out to confirm their presence and dynamics. Hunting of small herbivores will be discouraged to make available prey base for this carnivore.

SECTION 8.7. GENERAL MANAGEMENT

- 1) The field staff should be trained in anti-poaching activities and dealing with offence cases related to wildlife. Forest check posts should be made sensitive to the wildlife offences to check its illicit transport.

- 2) The Central Chanda Division has a record of visits by Bahelias who are notorious in poaching of Tigers, in the past Regular watch on Railway station is suggested. Besides meticulous checking of Musafiri registers maintained by police patils needs to be checked by the field staff for tracking the movement of such people.
- 3) The areas near sensitive water holes frequented by the wildlife may be excluded from grazing, and specially mention in the grazing license.
- 4) Every person residing in or within 10 km. of these forests and possessing a fire arm will register his name with the Deputy Conservator of Forests.
- 5) Adequate provisions should be made in the budget for payment of compensation to the villagers on account of killing of, or injury to any person or his livestock and the Deputy Conservator of Forests concerned shall not make any delay in payment of compensation to the affected people.
- 6) The village forest protection committees under Joint Forest Management Program shall be made accountable for detection of offences related to the wildlife.
- 7) The forest produce harvesting and collection will be discouraged in potential wildlife and conflict sites.

SECTION 8.8 MEASURES SUGGESTED TO BE TAKNE TO AVOID WILD-LIFE ATTACKS ON HUMAN BEING AND DOMESTIC CATTLE.

In Central Chanda Division, most of the incidences of man-animal conflict takes place in Ballarsha, Dhaba, Kothari ranges. Hence, more importance was given to these ranges in terms of preventive measures to reduce man-animal conflict. The prevention measures taken by the forest department to avoid attack by wild life on human beings and domestic animals are as under:

- i) Through Joint Forest Management Committees, awareness was created among the people not to enter forest area alone in the areas prone to man-animal conflict.
- ii) Many boards indicating the presence of carnivores in the particular area were displayed in forests.
- iii) Awareness is created among the students of schools & colleges by showing video films
- iv) Whenever the incidence of attack by wild animals comes into notice, the frontline staff will caution the villagers by distributing pamphlets, announcement through kotwal to prevent the people from entering forest for a few days
- v) People were advised to make use of toilets in their houses, instead of attending nature calls in the forest area. In this regard,

a letter has been written to Chief Executive Officer, Zilla Parishad to instruct the field staff and members of local bodies to create awareness among the people.

- vi) Whenever the wild animals attack human beings, serious attention is paid to see that the compensation is paid within a month.
- vii) To create adequate prey base for the carnivores, water holes have been taken on a large scale through MGNAREGA scheme.

8.8.1. DEGRADATION OF HABITAT: Due to various human activities the habitat of various wild animals are degrading very fast and is manifested in the form of reduced population of many animal and bird species. The main factors adversely affecting the wild habitat are:

- Heavy biotic pressures, like over grazing, encroachments on forest lands, large scale human and cattle movement in the forest areas, forest fires etc. are responsible for the general degradation of these habitats.
- Large scale diversion of Forest Land for **projects like, irrigation dams and canals** are also adversely affecting the wildlife habitat by fragmenting the forest areas and creating permanent barriers for the movement of wild animals on one hand and risk to their lives, specially for the young ones, on the other hand. The Forest department should convince the Irrigation department to construct suitable passages for wild animals at suitable regular intervals. This could have been avoided, had the Dy.C.F. put the condition for these passages in the proposal of the project under Forest (Conservation) Act, 1980.



8.8.2. FIRES: Forest fires are of common occurrence these days. The fires in the interior of the forests, besides destroying the natural habitat of the forest fauna drive them to take shelter near the human habitation and make them easy targets of poacher's guns or local villager's weapons. Due to fire even the young ones of big and strong animals may perish, besides other animals,

reptiles and birds, who live on ground and can not escape the fire and its heat. In case if they survive, their food, grasses, herbs and shrubs are destroyed which is already insufficient to meet the requirements of cattle as well as the wild animals. The whole tract experiences water scarcity in summer. These fires aggravate the already existing water scarcity and expose these animals to above mentioned risks. It increases the man animal conflict.

8.8.3. STANDING ORDER (WILDLIFE) NO. 001.

The PCCF (WL) MS, Nagpur has issued a standing order (Wildlife) No.001 **Appendix No.LV** of Volume II. This order prescribes duties and lists measures for the protection and conservation of the wildlife outside PAs. Following are the general prescriptions, majority of which are based on the guidelines under this Standing Order, for the protection of wildlife in the areas outside the Protected Areas. The territorial staff of the Central Chanda Division shall scrupulously implement these prescriptions.

1. Duties of Forest Guard, Forester, RFO and ACF include-

- Keeping information of waterholes, particularly in summer and watch on the same, that is, special vigilance at all the water holes in the Division is prescribed.
- Keeping a watch on the electric lines passing through forests.
- Ensuring registration of arms licenses as required under Wildlife (Protection) Act 1972.
- Cognizance of cases of injury due to wild animals as per Govt. Orders from time to time.
- Keeping a track of animals like Tiger, particularly Tigress with cubs and a watch on such vulnerable animals.
- Proper disposal of carcass of wild animals found dead or killed.

Local staff shall maintain record of sensitive wildlife areas such as areas with heavy wild animal concentration.

A network of information system shall be established. A cell under RFO (MS) of the Division and also under DFO (Vigilance) in the office of CCF (Territorial) for handling wildlife offence cases, shall be established. There shall be regular short-term training/ workshops in anti-poaching activities and legal requirements in dealing with wildlife offence cases. Forest check posts shall be sensitized for keeping a watch on wildlife offences. Any transit of wildlife articles etc. from these check posts should be scrupulously stopped.

2. Nature education programme in the villages adjoining forests and in schools and colleges shall be arranged.
3. Ecologically sensitive habitats shall be identified and protected.

4. Antler trade is now banned; hence, no collection of shed antlers is to be allowed.
5. The involvement of Honorary Wildlife Warden be encouraged for nature education programme, as well as in establishing network of informers and in eliciting people's participation.
6. It will be insured that cattle grazing in forests near the important wildlife habitats are inoculated against contagious diseases.

8.8.4. CREATION OF DATA BASE: It is prescribed that the Division will undertake compilation of data of floral and faunal resources, as well as ecologically sensitive sites in the Division and creates a comprehensive database for the Division.

The Division will also carry out survey of riparian zones, mesic sites, perennial water holes, saltlicks, natural wallows, resting places, breeding and nesting sites, etc. and map them (with GIS) for the purpose of their protection and management. The staff will also identify the areas where these sites are under stress and threat. The Division will also maintain a meticulous record of these sites on a register the "Register of the Special Wildlife Habitat" and update it annually by an officer not below the Range Forest Officer.

The Division will undertake census survey for estimation of the wildlife population, including the migratory and other rare birds, at the frequency decided by the Chief Conservator of Forests (Territorial); in addition to All India Tiger and Panther Census. Special note should be taken if any nesting site of endangered birds like Vultures is noticed.

8.8.5. DELINEATION AND MAPPING OF SPECIAL HABITAT AREAS: Delineation of the special wildlife habitat sites including natural water seepage sites (mesic sites), water holes, natural wallows and saltlicks used by the wildlife, breeding sites, dens or nesting sites of animals and birds appearing in the Schedules of the Wildlife (Protection) Act, 1972 shall be carried out and marked on the Divisional/range maps. For instance, the Mango and Jamun groves on moist sites are generally the mesic sites. **A strip of 50-meter around special habitat sites shall also be delineated and mapped to serve as buffer for the site.**

While preparation of treatment map of coupe for working in the area-specific working circles the special wildlife habitat sites given above shall be identified and marked on the map along with its buffer of **50 metre width strip around.**

8.8.6 DEVELOPMENT OF NESTING SITES: Central Chanda Division has many water bodies, small and large and lots of water birds are found in these water-bodies. To provide suitable nesting places to these birds, seed sowing of species like Babul and takes planting of species like Banyan and other Ficus spp. should be done near water-bodies and in the riparian areas.

SECTION: 8.9. CORRIDOR AND ITS MANAGMENT

As per Tiger Conservation Plan the corridor of Central Chanda Division and its management is as follows.

8.9.1 Natural Habitat Corridors:-

The Forest of Central Chanda Forest Division including FDCM division is distributed over Ballarshah, Pombhurna and Gondpipari tahsils of Chandrapur District. The area is connected to Tadoba Andhari Tiger Reserve towards North and contiguous to Chaparala Sanctuary towards South. With a crop of good Mixed Deciduous Forest and availability of plenty of water, the area serves as a good natural habitat for the wild fauna and a corridor to local wild life of TATR and Chaparala Sanctuary.

8.9.2 Regenerated & Planted Habitat Corridors:-

Area has been planted with Teak, miscellaneous tree species and Bamboo, Raising Teak, mixed, Bamboo and Fodder plantations as per provision of sanctioned Working Plan. Besides adequate number of fruit trees are retained which not only provide succor to the fauna, including avifauna, but also result in a multi level, multi species crop. Presence of wild animals such as Tiger, Leopard, Sambar, Spotted Deer and other fauna proves that the plantations are not detrimental to bio-diversity conservation but providing a good habitat for the local wild life.

8.9.3 Disturbances in Habitat Corridors:-

Chandrapur-Allapalli road, Mul-Gondpimpri road, Chichpalli-Ballarshah road, Rajura-Gadchandur-Adilabad road, Rajura-Lakkadkot-Asifabad road and railway line from Nagpur to Kazipeth, are passing through the forest area of Central Chanda division so cause of disturbances in this habitat.

8.9.4 Stepping Stones:-

Area is covered by a good crop of Mixed Deciduous Forests interspersed with grassy blanks and a network of perennial water sources to support wild life.

8.9.5 Major Land use Classification in the Area:-

The Adjoining area consists of mainly forest, agriculture land, industrial area, mining area and village/town/cities.

8.9.6 Forest:-

The forests are of type Southern Tropical Dry Deciduous Forests and under forestry working by territorial division and FDCM.

8.9.7 Agriculture Land:-

The agriculture land generally belongs to small marginal farmers. The main crop is Paddy, Soyabin and Cotton. Irrigation facility is available only to very small agricultural land.

8.9.8 Village/ Towns/ Cities:-

There are large townships within the adjoining landscape namely Ballarshah, Rajura, Gondpipri and Korpana. Following table shows taluka wise villages present in the Tadoba Andhari Landscape out side Core and Buffer zone :-

Sr.No.	Tahsil	Total villages	Sr.No.	Tahsil	Total villages
1	Ballarpur	35	5	Rajura	111
2	Gondpipri	98	6	Korpana	113
3	Pombhurna	71	7	Jiwati	83
Total					511

8.9.9: Other Uses:-

The district is rich in minerals especially coal and limestone. There is heavy pressure of mining. Many coal mines (Open cast and under ground) are operating in the area. Other industries are Paper mill, Cement factories.

8.9.10: Quality of Habitat:-

The area is covered with pristine Dry Deciduous Forests having a good crop of mixed vegetation including varieties of fruit trees. Bamboo is found to occur all over in these forests except heavily eroded areas and exposed rock. Streams passing through the tract drains in to Wainganga & Wardha River and its tributaries.

Diverse landscape and vegetation as well as round the year availability of water make the areas an ideal wild life habitat.

8.9.11: Distribution and Abundance:-

The major predator "Tiger" is distributed almost all over the adjoining area. There may be seasonal variation depending upon the presence of water and prey species. Panthers are co-predators of Tigers found in this area.

Distribution and abundance status of Tigers and its Co-predators as per 2012 is as under:

Sr. No.	Division	No. of Tigers	No. of Panthers
1	Central Chandra (T)	10	9
2	Central Chanda (FDCM)	7	1

8.9.12: Prey-Predator Relationships

The prey base is satisfactory. The prey consist of Cheetal, Sambar, Barking deer, Blue bull, Wild boars, Langur.

The food habit study indicates that large prey like Sambar contributes about 70% of Tiger diet. Medium sized prey like Cheetal and wild Boar contributes 20% and remaining prey species contributes about 10% of the diet. Sambar,

Cheetal and Wild Boar forms important prey for all the three top predators. Tiger prefers large prey like Sambar and Blue Bull.

MANAGEMENT STRATEGIES :

8.9.13: Delineations of Corridors and other habitat used by Tigers and co-predators

The Buffer area has contiguity with forests of Central Chanda, Forests Divisions. The corridor exists to Chaprala and Bhamragad Wildlife Sanctuaries. This corridor extends to forests of Andhra Pradesh State in the South. The corridor is broken at some places.

Actual evaluation and delineations of above corridors has not been done as detailed systematic long term studies were not done. A project titled “Long term monitoring of Tiger, Co-predators and prey species in Tadoba-Andhari Tiger Reserve and adjoining landscape” is being implemented by Wildlife Institute of India [funded by NTCA (75%) and State Government (25%)] from 2013-14 and will be continued up to 5 years and can further extend up to 10 year. This scientific research project will give sufficient data for delineations of corridor.

Wildlife Conservation Trust, Mumbai and Wildlife Trust of India, Noida have studied the corridors connecting Tadoba Andhari Tiger Reserve the source population, which is very important therefore is incorporated as below:

Background:-

Tadoba-Andhari Tiger Reserve (TATR) and its immediate surroundings (buffer zone and Brahmapuri division) forms an important source population in the larger central Indian landscape and the area with 69 tigers (Jhala *et al*, 2011) forms the biggest population of tiger in the landscape (2nd All India Tiger Estimation) (Jhala *et al*, 2011).

As per the Wildlife (Protection) Act, 1972, corridors for dispersal of tigers are defined as “ecologically compatible land uses in the tiger reserve and areas linking one protected area or tiger reserve with another for addressing the livelihood concerns of local people, so as to provide dispersal habitats and corridors for spill over population of wild animals from the designated core areas of tiger reserves or from tiger breeding habitats within other protected areas”.

8.9.14: CORRIDOR :

Tadoba-Andhari Tiger Reserve to Kanhargaoon to Tipeshwar Wildlife Sanctuary

Please see Compartment list for Corridor (TT) for a list of the compartments comprising this corridor.

There is a bottleneck with a width of 2 km between compartment no. D-447, Manora Beat, Ballarshah Range, Central Chanda Division.

Most of the areas falling within Wirur Range and Wansadi Range of Central Chanda division are along a narrow ridgeline and at some places as thin as 1 km.

In the area joining the Central Chanda Division and the FDCM compartments under the proposed Kanhargaon WLS, there is a state highway with very heavy traffic passing from Ballarshah to Kothari to Gondpipri. Appropriate mitigation measures along this crucial linkage need to be put in place.

8.9.15 Gap / Disruptions:

The first disruption is between Wirur Range, Central Chanda Division and Dhaba Range and FDCM-Central Chanda Division, which falls under the proposed Kanhargaon WLS. Along the river Wardha, Rajura Range the area falling under the Central Chanda Division is completely isolated from the proposed Kanhargaon WLS due to human settlements and agricultural fields along the river.

Second gap is between Tejapur Beat, Mukutban Range-Pandharkawda Division and Jambuldhara and Mandwa Beats, Wansadi Range-Central Chanda Division.

Third gap is between Hirapur Beat, Mukutban Range-Pandharkawda Division and Durghadi and Rupapeth Beats, Wansadi Range-Central Chanda Division. There is a very narrow area under the Pandharkawda Division but shows tiger presence and therefore restoration plans in this area are crucial.

8.9.16 Prioritization of Linkages

After the study of Wildlife Institute of India linkages will be confirmed and in next plan prioritization can be possible.

8.9.17 Habitat Management and restoration:-

The present habitat though good needs to be improved as much as possible. By better protection measures the shelter or cover will automatically improve. The other two important factors in Habitat Improvement are making available sufficient quantity of fodder and water. Following activities have been proposed in this respect.

8.9.17 (a) Deepening/ desilting of existing water holes:-

A survey of existing water hole should be done. All the existing water holes should be deepened/ desilted every 5 years depending on site eligibility, while deepening/desilting the approaches should be made proper so that wild animal can access the water hole. The work of deepening/desilting should be done just before rains.

8.9.17 (b) Creation of new water holes:-

New water holes should be created in the form of *nala plugs*, dug out ponds or small forest tanks. Site selected for new water holes should be deep inside the forest, where domestic cattle should not reach. The site should be selected on the basis of one water hole in 2.5 Sq.km. areas.

8.9.17(c) Construction of temporary earthen bunds:-

Some *nalas* in the forest flow perennially but some *nalas* stops flowing after December/January. Small earthen bunds should be constructed across the *nalas* after December/January at suitable site where impermissible strata exist. These earthen structures should be constructed every year in the month of December/January before *nalas* stops flowing.

8.9.18 Meadow Development:-

It is very difficult to develop the meadow for wild herbivores and keep it free from grazing of cattle in the non protected area forest. But the meadow/grass lands are very essential constituent of habitat especially for animals like Spotted deers. Though the grass in plantations where grazing of cattle is prohibited serves as meadow, it is necessary to develop some grass land at secluded place deep inside the forest. The work can consist of selection of site with minimum number of trees, shrubs and good soil depth. The area should be well demarcated. All grasses e.g. Bhurbhusi grass, Broomgrass, Tarota, Parthenium, Bhutganja should be uprooted. All tree growth except fruit tree, browsable species tree and few big trees for shadow should be removed. The areas should be controlled burnt in month of December /January. The area without grasses should be ploughed and local grass species like Sheda, Pawanya should be broadcasted at the beginning of Monsoon. At least 5 ha of such area should be selected every year in each range.

JOINT FOREST MANAGEMENT AND LIVELIHOODS

8.9.19 Constitution of Conservation Area Management Committee

To facilitate coordination and main streaming of biodiversity concern the JFM committees already existing at range level, division level and district level will be used for this purpose.

8.9.20 Formation of Joint Forest Management Committees and supporting institutional frameworks

As the adjoining area does not fall within category of wildlife protected area constitution of Eco Development Committees will not be possible. Existing JFM committees can be entrusted with the work of JFMC's.

8.9.21 Livelihood Support Initiatives through village Micro plans.

- Village level micro plans already prepared for JFMC's can be suitably modified to incorporate activities of JFMC's. This should include training for creation of value-added products of Bamboos and other local material viz. handicraft articles etc. So that more employment can be generated.
- Now a days man animal conflict issues has become sensitive as there is increase in Human injuries and deaths due to wild animals, livestock depredation by carnivores, crop depredation by wild ungulates. It is essential to provide timely compensation to the people

who are put to loss. Even providing solar power fencing to field of villagers can be thought of.

- To minimize the dependence of villagers on the forest, some measures like supply of LPG connections, solar light panels, and improved *chullas* will be taken up.

The list of compartments falling in the corridor of Central Forest Division is given as below.

ID	Beat Name	Compt. Area	Range	Round	Status	Compt. No
17	Pomburna	227.10	Kothari	Pomburna	RF	D95
18	Kemara	73.30	Kothari	Pomburna	RF	D99
20	Ganeshpipari	125.80	Dhaba	Gondpipari	RF	D155
33	Karwa	283.00	Ballarshah	Ballarshah	RF	D489
34	Ghanoti	298.40	Kothari	Pombhurna	RF	D92
35	Ghanoti	210.40	Kothari	Pombhurna	RF	D91
37	Pomburna	176.70	Kothari	Pomburna	RF	D96
38	Chintaldhaba	202.90	Kothari	Pomburna	RF	D97AB
39	Pomburna	230.80	Kothari	Pomburna	RF	D98
40	Satara Komti	537.50	Ballarsha	Manora	RF	D454
41	Satara Komti	226.20	Ballarsha	Manora	RF	D453
42	Manora	321.80	Ballarshah	Manora	RF	D452
43	Manora	320.40	Ballarshah	Manora	RF	D449
44	Umari	270.90	Ballarshah	Manora	RF	D442
45	Umari	204.70	Ballarshah	Manora	RF	D439
46	Satara Komti	304.30	Ballarsha	Manora	RF	D443
47	Satara Komti	327.10	Ballarsha	Manora	RF	D506
48	Kinhi	390.10	Ballarshah	Manora	RF	D507
49	Kinhi	362.90	Ballarsha	Manora	RF	D508
51	Kinhi	214.20	Ballarshah	Manora	RF	D511
52	Kinhi	545.60	Ballarshah	Manora	RF	D521
53	Manora	393.00	Ballarshah	Manora	RF	D447
54	Karwa	355.00	Ballarshah	Ballarshah	RF	D499
55	Karwa	239.70	Ballarshah	Ballarshah	RF	D500
56	Karwa	214.80	Ballarshah	Ballarshah	RF	D495A
57	Ballarsha	266.60	Ballarshah	Ballarshah	RF	D495B
58	Ballarshah	185.40	Ballarshah	Ballarshah	RF	D496
59	Lawari	426.60	Ballarshah	Ballarshah	RF	D497
60	Lawari	411.70	Ballarshah	Ballarshah	RF	D498
61	Kinhi	258.00	Ballarshah	Manora	PF	D512
63	Lawari	147.90	Ballarshah	Ballarshah	RF	D514
64	Ballarshah	224.80	Ballarshah	Ballarshah	RF	D494
65	Satara Komti	253.40	Ballarsha	Manora	RF	D440
70	Ghanoti	235.40	Kothari	Pombhurna	RF	D87
71	Ghanoti	176.90	Kothari	Pombhurna	RF	D89
76	Kemera	309.40	Kothari	Pombhurna	RF	D100
79	Manora	145.70	Ballarshah	Manora	RF	D451
80	Manora	224.40	Ballarshah	Manora	RF	D450
81	Umari	331.10	Ballarshah	Manora	RF	D446
82	Umari	278.10	Ballarshah	Manora	RF	D445

83	Lawari	466.80	Ballarshah	Ballarshah	RF	D515
84	Gondpipari	164.90	Dhaba	Gondpipari	RF	D145
85	Gondpipari	153.40	Dhaba	Gondpipari	Rf	D144
86	Gondpipari	136.10	Dhaba	Gondpipari	RF	D143
88	Sukwasi	208.70	Dhaba	Gondpipari	RF	D156
89	Karanji	303.70	Kothari	Kanargaon	RF	D126
93	Umari	333.80	Ballarshah	Manora	RF	D441
136	Ghanoti	227.60	Kothari	POmburna	RF	D88
137	Kawadjai	306.80	Kothari	Kothari	RF	D104
138	Ballarshah	324.70	Ballarshah	Ballarshah	RF	D493
139	Karwa	338.00	Ballarshah	Ballarshah	RF	D490
140	Karwa	332.90	Ballarshah	Ballarshah	RF	D491
141	Sukwasi	231.40	Dhaba	Gondpipari	RF	D157
142	Sukwasi	164.20	Dhaba	Gondpipari	Rf	D158
143	Sukwasi	115.20	Dhaba	Gondpipari	RF	D159
144	Dongargaon	155.90	Dhaba	Dhaba	RF	D160
145	Dongargaon	134.60	Dhaba	Dhaba	RF	D161
146	Dongargaon	169.70	Dhaba	Dhaba	Rf	D162
147	Dongargaon	195.80	Dhaba	Dhaba	Rf	D163
148	Gojoli	129.20	Dhaba	Gondpipari	RF	D151
149	Gojoli	101.00	Dhaba	Gondpipari	RF	D150
150	Ganeshpipari	176.00	Dhaba	Gondpipari	RF	D153
151	Chiwanda	251.5	Kothari	Kanhargaon	RF	D138
159	Karanji	300	Kothari	Kanargaon	RF	D127AB
160	Karanji	157.7	Kothari	Kanargaon	RF	D71
161	Akasapur	211.9	Kothari	Kanhargaon	RF	D125
177	Gojoli	82.9	Dhaba	Gondpipari	PF	D563Bb
181	Manora	226.4	Ballarshah	Manora	RF	D444
216	Karwa	482.7	Ballarshah	Ballarshah	RF	D492
229	Kemara	60.4	Kothari	Pomburna	RF	D112
260	Chintaldhaba	162.7	Kothari	Pomburna	RF	D119
315	Chintaldhaba	192.5	Kothari	Pomburna	RF	D110
317	Manora	528.8	Ballarshah	Manora	Pf	D567
331	Kothari	277.4	Kothari	Kothari	Pf	D539
333	Kothari	389.2	Kothari	Kothari	Pf	D540
334	Kothari	131	Kothari	Kothari	PF	D541A
359	Wejgaon	501.3	Dhaba	Tohagaon	PF	D557B
363	Wamanpalli	375.3	Dhaba	Tohagaon	PF	D559
364	Wamanpalli	84.6	Dhaba	Tohagaon	PF	D560Aa
381	Parsodi	253.3	Kothari	Kanhargaon	PF	D530
439	Parsodi	222.1	Kothari	Kanhargaon	Pf	D532
445	Pachgaon	218.8	Kothari	kanhargaon	PF	D535
446	Pachgaon	245.4	Kothari	Kanhargaon	PF	D536
447	Pachgaon	293.6	Kothari	Kanhargaon	PF	D537
448	Pachgaon	331	Kothari	Kanhargaon	PF	D534
481	Kinhi	146.1	Ballarshah	Manora	PF	D570CB
483	Lawari	177.8	Ballarshah	Ballarshah	RF	D571A
485	Lawari	274.5	Ballarshah	Ballarshah	RF	D572
486	Lawari	357.4	Ballarshah	Ballarshah	RF	D573
489	Visapur	348.2	Ballarsha	Ballarsha	PF	D578
492	Visapur	412.2	Ballarsha	Ballarsha	PF	D580
493	Visapur	341.2	Ballarsha	Ballarsha	PF	D582

494	Visapur	189.10	Ballarsha	Ballarsha	PF	D581
501	Dhaba	74.60	Dhaba	Dhaba	PF	D587C
532	Manora	26.00	Ballarshah	Manora	PF	D568C
549	Manora	158.20	Ballarshah	Manora	RF	D448
554	Wedgaon	91.00	Dhaba	Dhaba	PF	D561B
560	Dhaba	166.30	Dhaba	Dhaba	PF	D562A
578	Ballarsha	308.10	Ballarsha	Ballarsha	PF	D576
580	Ballarsha	294.70	Ballarsha	Ballarsha	PF	D577
581	Dhaba	54.60	Dhaba	Dhaba	PF	D587A
585	Tohagaon	38.10	Dhaba	Tohagaon	PF	D28A
598	Satara Komti	157.70	Ballarsha	Manora	RF	D455
605	Karwa	133.90	Ballarshah	Ballarshah	RF	D509
2	Wansadi	383.50	Wansadi	Wansadi	RF	R021
4	Nizamgondi	267.30	Wansadi	Wansadi	RF	R029
5	Bambezari	430.70	Wansadi	Gadchandur	RF	R37
6	Nokari	522.00	Wansadi	Gadchandur	RF	R32
7	Warzadi	414.40	Wansadi	Gadchandur	RF	R39
8	Kowadgondi	412.20	Wirur	Dewada	RF	R42
9	Kawadgondi	513.50	Wirur	Dewada	RF	R44A
10	Dewada	400.90	Wirur	Dewada	RF	R47
11	Pakadiguddam	312.50	Wansadi	Wansadi	RF	R15
12	Patan	387.70	Jiwati	Patan	RF	R57
13	Nagapur	356.30	Jiwati	Shengaon	RF	R60
16	Nizamgondi	240.20	Wansadi	Wansadi	RF	R028
23	Nokari	279.20	Wansadi	Gadchandur	RF	R034
27	Shengaon	259.50	Jiwati	Shengaon	RF	R093
90	Jambuldhara	484.90	Wansadi	Korpana	RF	R003
91	Durghadi	379.10	Wansadi	Pardi	RF	R001
92	Rupapeth	473.30	Wansadi	Pardi	RF	R002
95	Dhanakdevi	324.40	Wansadi	Wansadi	RF	R17
96	Pakadiguddam	240.10	Wansadi	Wansadi	RF	R19
97	Nagarala	357.30	Jiwati	Jiwati	RF	R025
98	Warzadi	340.00	Wansadi	Gadchandur	RF	R38
101	Kakban	337.20	Jiwati	Shengaon	RF	R63
102	Kakban	629.10	Jiwati	Shengaon	RF	R62
103	Kakban	516.80	Jiwati	Shengaon	RF	R61
104	Bambezari	470.00	Wansadi	Gadchandur	RF	R35
106	Shengaon	360.90	Jiwati	Shengaon	RF	R92
107	Nagapur	602.60	Jiwati	Shengaon	RF	R86
119	Ganeri	250.50	Wirur	Dewada	RF	R50B
120	Lakhadkot	202.40	Wirur	Sidheshwar	RF	R49
121	Ganeri	474.40	Wirur	Dewada	RF	R50A
130	Kowadgondi	351.20	Wirur	Dewada	RF	R43
132	Chikhali	552.50	Wirur	Dewada	RF	R40
134	Warzadi	360.70	Wansadi	Gadchandur	RF	R056
162	Lakhadkot	130.40	Wirur	Sidheshwar	RF	R124
164	Nizamgondi	346.70	Wansadi	Wansadi	RF	R024
166	Gadpandharwani	480.60	Jiwati	Jiwati	RF	R067
168	Subai	320.60	Wirur	Wirur	RF	R125
169	Kostala 2	370.10	Wirur	Sidheshwar	RF	R128
170	Subai	356.10	Wirur	Wirur	RF	R129
171	Kostala 1	435.40	Wirur	Sidheshwar	RF	R126

172	Antargaon 1	435.70	Wirur	Wirur	RF	R134 B
173	Chunala	417.30	Rajura	Rajura	RF	R158
175	Patan	447.70	Jiwati	Patan	RF	R58
176	Sidheshwar	299.70	Wirur	Sidheshwar	RF	R150
179	Nokari	465.60	Wansadi	Gadchandur	RF	R033
183	Lakhadkot	387.90	Wirur	Sidheshwar	RF	R151
184	Sidheshwar	517.10	Wirur	Sidheshwar	RF	R148
185	Vihirgaon	324.50	Rajura	Vihirgaon	RF	R170
186	Vihirgaon	323.20	Rajura	Vihirgaon	RF	R171
187	Vihirgaon	503.00	Rajura	Vihirgaon	RF	R172
188	Rajura	361.00	Rajura	Rajura	RF	R165
189	Rajura	305.90	Rajura	Rajura	RF	R155
190	Rajura	481.20	Rajura	Rajura	RF	R156
191	Somthana	309.20	Rajura	Rajura	RF	R153
192	Chunala	431.20	Rajura	Rajura	RF	R157
193	Chanakha	299.00	Rajura	Rajura	RF	R161
194	Chanakha	304.70	Rajura	Rajura	RF	R159
195	Chanakha	451.70	Rajura	Rajura	RF	R160
197	Mandwa	564.70	Wansadi	Korpana	RF	R006
198	Yergawhan	459.80	Wansadi	Wansadi	RF	R011
199	Yergawhan	455.90	Wansadi	Wansadi	RF	R012
206	Yergawhan	344.80	Wansadi	Wansadi	RF	R14
207	Gadchandur	347.30	Wansadi	Gadchandur	RF	R027
208	Wansadi	391.40	Wansadi	Wansadi	RF	R022
209	Dhanakdevi	294.70	Wansadi	Wansadi	RF	R16
214	Lakkadkot	273.80	Wirur	Siddheshwar	RF	R048
215	Sawalhira	303.40	Wansadi	Korpana	RF	R010
217	Dewada	332.40	Wirur	Dewada	RF	R45
219	Dewada	218.00	Wirur	Dewada	RF	R46B[b]
220	Dewada	45.50	Wirur	Dewada	RF	R46B[a]
221	Ganeri	204.70	Wirur	Dewada	RF	R51A[b]
222	Ganeri	17.90	Wirur	Dewada	RF	R51A[a]
223	Ganeri	162.70	Wirur	Dewada	RF	R51B[b]
224	Ganeri	17.30	Wirur	Dewada	RF	R51B[a]
225	Nagapur	204.30	Jiwati	Shengaon	RF	R87
226	Shengaon	203.40	Jiwati	Shengaon	RF	R90
230	Sidheshwar	434.00	Wirur	Sidheshwar	RF	R142
231	Bhendala	405.20	Wirur	Sidheshwar	RF	R143
232	Kostala 2	702.40	Wirur	Sidheshwar	RF	R202
233	Antargaon 2	996.20	Wirur	Wirur	RF	R203
234	Kostala 1	399.10	Wirur	Sidheshwar	RF	R127
235	Subai	397.60	Wirur	Wirur	RF	R130
236	Subai	352.10	Wirur	Wirur	RF	R131
237	Subai	338.80	Wirur	Wirur	RF	R132
238	Chincholi	319.20	Wirur	Wirur	RF	R141
239	Antargaon 1	372.00	Wirur	Wirur	RF	R133
240	Chincholi	160.10	Wirur	Wirur	RF	R140
241	Chicholi	307.00	Wirur	Wirur	RF	R138
242	Chicholi	462.10	Wirur	Wirur	RF	R139
243	Wirur	612.10	Wirur	Wirur	RF	R137
244	Wirur	221.10	Wirur	Wirur	RF	R136
245	Wirur	371.60	Wirur	Wirur	RF	R135

246	Khambada	331.00	Rajura	Vihirgaon	RF	R177
247	Khambada	525.20	Rajura	Vihirgaon	RF	R178
248	Nalfadi	568.10	Rajura	Vihirgaon	RF	R179
249	Khambada	393.20	Rajura	Vihirgaon	RF	R176
250	Tembhurwahi	368.30	Rajura	Vihirgaon	RF	R169
251	Tembhurwahi	402.20	Rajura	Vihirgaon	RF	R168
252	Nalfadi	337.80	Rajura	Vihirgaon	RF	R175
253	Nalfadi	617.90	Rajura	Vihirgaon	RF	R174
254	Vihirgaon	257.60	Rajura	Vihirgaon	RF	R173
255	Somthana	181.90	Rajura	Rajura	RF	R166
256	Tembhurwahi	295.00	Rajura	Vihirgaon	RF	R167
257	Rajura	359.40	Rajura	Rajura	RF	R164
258	Tembhurwahi	308.20	Rajura	Vihirgaon	RF	R163
259	Chunala	138.70	Rajura	Rajura	RF	R162
261	Bhendala	566.90	Wirur	Shideshawer	RF	R144
269	Bambezari	363.50	Wansadi	Gadchandur	RF	R036
270	Sawalhira	480.50	Wansadi	Korpana	RF	R009
313	Nalfadi	331.50	Rajura	Vihirgaon	RF	R200
367	Jambuldhara	442.20	Wansadi	Korpana	RF	R004
368	Mahapandharwani	417.10	Jiwati	Jiwati	RF	R068
369	Gadpandharwani	252.10	Jiwati	Jiwati	RF	R066
374	Yelapur	315.10	Jiwati	Wani	RF	R005
375	Mahapandharwani	393.40	Jiwati	Jiwati	RF	R069
377	Bhendala	510.90	Wirur	Shideshawer	RF	R145
378	Sidheshwar	627.40	Wirur	Sidheshwar	RF	R149
379	Kostala 1	393.90	Wirur	Sidheshwar	RF	R201
384	Dhanakdevi	318.80	Wansadi	Wansadi	RF	R018
385	Warzadi	296.10	Wansadi	Gadchandur	RF	R055
386	Yergawhan	434.90	Wansadi	Wansadi	RF	R013
387	Nizamgondi	331.31	Wansadi	Wansadi	RF	R023
388	Mahapandharwani	399.70	Jiwati	Jiwati	RF	R070
389	Pakadiguddam	310.60	Wansadi	Wansadi	RF	R020
390	Nagarala	370.60	Jiwati	Jiwati	RF	R026
391	Nagarala	309.80	Jiwati	Jiwati	RF	R065
396	Antargaon 1	211.10	Wirur	Wirur	RF	R134A
397	Lakhadkot	521.90	Wirur	Sidheshwar	RF	R147
398	Bhendala	476.70	Wirur	Shideshawer	RF	R146
399	Sumthana	468.40	Rajura	Rajura	RF	R152
546	Chanakha	6.23	Rajura	Rajura	UF	R594
547	Wirur	6.50	Wirur	Wirur	PF	R595
574	Chincholi	17.20	Wirur	Wirur	PF	R596A
575	Wirur	30.90	Wirur	Wirur	PF	R597AB
576	Antargaon 1	26.30	Wirur	Wirur	PF	R598A
589	Nalfadi	39.61	Rajura	Vihirgaon	PF	R590
590	Nalfadi	124.10	Rajura	Vihirgaon	PF	R593
591	Sawalhira	405.00	Wansadi	Korpana	RF	R008
593	Somthana	306.50	Rajura	Rajura	RF	R154
594	Chunala	0.40	Rajura	Rajura	PF	R592A
595	Chunala	0.40	Rajura	Rajura	PF	R592B
596	Chunala	3.50	Rajura	Rajura	PF	R591A
597	Chunala	3.50	Rajura	Rajura	PF	R591B

SECTION: 8.10. COMPENSATION AIDS

8.10.1. With respect to man-animal conflict, more incidences of injury to and killing of human beings by leopard were reported in entire division. There are incidence of crop damage and domestic animals killed by wild animals. The compensation was paid to the affected persons as per Govt. resolution. The no. of wild life compensation cases from the year 2004-05 to 2014-15 is as follows.

Sr. No	Year	No. of persons injured	Compensation paid for injury (Rs. In Lac)	No. of persons killed	Compensation paid regarding human death cases (Rs. In Lac)
1	2004-05	9	1.31	1	2.00
2	2005-06	14	0.99	0	0
3	2006-07	40	3.37	0	0
4	2007-08	26	1.86	2	4.00
5	2008-09	31	3.33	5	10.00
6	2009-10	39	4.72	0	0
7	2010-11	64	6.77	2	4.00
8	2011-12	35	9.38	0	0
9	2012-13	14	5.15	0	0
10	2013-14	33	18.77	1	5.00
10	2014-15	23	16.48	5	25.00

Details of the cattle kill cases and the compensation paid is given in **Appendix No LII** Of Volume II.

8.10.2: SITE FOR WETLANDS & WATER HOLES

In forest and non forest area more number of man-made wetlands (Village Irrigation Tank, Mati nala bunds and cement plugs) are there. It attracts both animals and birds. The construction of water holes was carried out in forest areas to supply water for wild animals. The soil & water conservation works were carried out in forest areas to increase the water level.

Information regarding water holes range-wise is as follows.

Range	No. of water hole	Perenial	Seasonal
Ballarshah	28	18	10
Kothari	50	25	25
Dhaba	32	16	16
Rajura	20	09	13
Wirur	18	09	09
Wansadi	26	13	13
Jioti`	2	1	1

8.10.3 The list of cement plugs, loose boulder structures, nala bund, water storage tank and mati nala bunds constructed under MREGS/Plan/Non Plan/CAMPA is as follows.

Name of item	Nos
Loose bolder structure	118
Nala bund	84
Cement plugs	49
Mati Nala bunds(Van talaos)	51

SECTION: 8.11: CREATION OF WATER HOLES

8.11.1. Water:- The typical geomorphological character of the area restricts the availability of surface water especially during summer. However by using improvised methods, the availability can be enhanced even in summers. The water is available in plenty till January end. During summer, the water is extremely scarce and is available at various places. The water conservation measures taken by Melghat Tiger Reserve should be adopted here also.

Borewells are constructed to provide water to wild life. Solar pump can be used to fetch water from borewells.

The following steps will be taken to improve water supply to animals.

8.11.2 TREATMENT OF WATERHOLES:- The storage capacity of waterholes should be improved by deepening it. This should be done by desilting or blasting. Cleaning of selected waterhole should also be carried out occasionally.

8.11.3 JHARA OPENING:- Oftenly in the sand river beds, there is an under current of water. This can be successfully harnessed by digging a pit around one meter in bed. This should be done at places where the water table is high.

8.11.4 IMPROVISED USED OF HUME PIPE:- Where the water flow beneath the river is deep, much beyond the reach of wild animals, an improvised method of collecting water by using hume pipe should be under taken. This work should be taken during second week of February. A hume pipe of 1 meter hight and 1.5 meter dia is held vertically on the sandy bed and sand is removed from between, the pipe sinks gradually under its own weight and it strikes the water within, a depth of 1 meter. During the month of summer, a fire watcher or a chaukidar should be assigned with the job of pulling few bucket of water and filling the saucer. The hume pipe should be covered with a bamboo mat or a tin plate.

8.11.5 RESERVOIRS AND SMALL PONDS:- An anicut should be built across a drainage to store the water or alternatively water should be diverted to a small basin by constructing a diversion canal. At least one masonry anicut should be taken once in a year. At other places, the earth filled anicut should be constructed.

8.11.6 TAPPING OF SEEPS:- Oftenly a small seep of water comes out continuously at places. These water holes can not be utilized by wild animals, but can be made available by some improvised technique. By making channel or by using P. V. C. pipe of one inch diameter, this water should be drained to a small saucer and from there to another saucer, 50 meters away, with the help of a P.V.C. pipe.

8.11.7 COVER IMPROVEMENT:- Development of cover is an important ingredients of the wildlife management. In absence of cover, its sparseness or its poor distribution can limit the use of an area by the wildlife. The work of cover improvement will be taken. Snag, den and caves shall be maintained. The felling of trees which foliate in summer has been prohibited. The technique of managing snag has been prescribed in the separate section.

SECTION: 8.12: GENERAL MEASURES FOR PROTECTION :

8.12.1. Area will be strictly and effectively fire protected.

8.12.2. Constant vigilance will be kept on the waterholes during summer where animals expose themselves as easy prey due to shortage of water. Every person residing in or within 10 km of these forests and possessing a fire-arm shall register his name with the Deputy Conservator of Forests.

8.12.3. There are many villages within and nearby the forest. They are dependent on agricultural and forestry works. These villages, with large number of live stock, are threat to the wild animals as they share the same water bodies and grazing grounds. Due to common grazing and drinking water at same places, many contagious diseases may spread in the wild animals. To protect the wild animals from such contagious diseases, forest department with the help of Veterinary doctors, should take the following preventive measures in such villages:

8.12.4. VACCINATION OF VILLAGE CATTLE: All cattle of adjoining villages should be vaccinated every year for Foot and Mouth disease.

8.12.5. REGULAR HEALTH CHECKUP FOR CATTLE: Forest staff, with the help of veterinary doctor of the area, should organize annual cattle health checkup camps in villages. Required vaccination should be done and if required, proper treatment to sick animal should be given.

8.12.6 PROPER SENSITIZATION OF STAFF: The field staffs of the Division should be trained in day to day wildlife management and protection works. They should work in close cooperation with the Wildlife wing, i.e. Staff of Nagzira Sanctuary and Navegaon National Park.

8.12.7. PROTECTION FROM POACHING AND TRADE: The forest staff shall develop an intelligence system with the help of local people, specially with Joint Forest Management Committee, to gather information about any activities related to poachers and traders of wild life.

- ❖ Regular patrolling by the staff shall be carried out in the areas where the population of wildlife is more, specially during summer when these animals become more vulnerable due to shortage of water in the forest areas.
- ❖ Poaching of birds is also common and it is not given due importance. The aquatic migratory birds are to be protected from the fishermen.
- ❖ The fishery department and the local villagers should be convinced to use fishing nets of such size so that small fishes are left in the tank for these water birds.
- ❖ The forest staff shall also be vigilant in the towns' market where at times birds like Parakeets, Partridges, Quails, Water-Birds, Monitor lizards, Tortoise, Turtles etc. are brought for sale.

8.12.8. PROTECTION OF FOREST FROM OVER-GRAZING AND FIRE:

After poaching, uncontrolled grazing and fire are the most important factors, adversely affecting the wildlife. To restrict illegal grazing , by cattle including goat, sheep etc., and during the fire season, to prevent the forest fires, patrolling parties should carry out regular patrolling in the sensitive areas of the forest.

8.12.9. SUPPLY OF BOOKS: Books, related to Wild animals disease, treatment, tranquilization, wildlife management etc. should be supplied to the field staffs to improve their management skills. Short period training of tranquilization of wild animals, to the forest staff and Veterinary Doctors, will be given by the wild life staff. This will facilitate safe capture and transportation of wild animals in trouble. Tranquilization capture and rescue should be done as per SOP

8.12.10. MARKING RESERVATIONS, OTHER RESTRICTIONS: The following, prescriptions have been made for implementation along with coupe operations and other treatment prescriptions, in the wildlife area-specific coupes.

- ❖ No felling of trees or harvesting of any sort shall be allowed on these sites and in 50 metre wide buffer strips around them.
- ❖ While marking of dead, wind fallen and malformed trees in annual coupes, 2 trees per hectare shall be kept reserved, as snags and dens to provide for nesting and resting of wildlife. No fruit tree of wildlife importance shall be marked for felling in the annual coupes.
- ❖ While harvesting at least 2 dead trees, of low commercial value, per hectare shall be reserved for shelter of wildlife.

- ❖ Tendu collection centres or labour camps shall not be allowed near water holes frequented by the large mammals or other important wildlife species. The labour camps shall be established away from areas of high wildlife density.
- ❖ Special vigilance is prescribed at water holes during summer season because of vulnerability of wildlife to poaching. Anti-poaching intelligence network of the wildlife wing should be used and supplemented to prevent wildlife offences in the Division.
- ❖ The field staff should be trained in anti-poaching activities and dealing with offence cases related to wildlife. Forest check posts should be made sensitive to the wildlife offences to check its illicit transport.
- ❖ The areas near sensitive water holes frequented by the wildlife may be excluded from grazing, and specially mentioned in the grazing license. Inoculation of cattle grazing near sensitive wildlife habitat sites and waterholes frequented by wildlife.
- ❖ The special wildlife habitat sites shall be effectively protected from fire, grazing and other adverse influences.
- ❖ Removal of flower, fruit and other medicinal parts and harvesting of herbs shall not be allowed in ecologically sensitive areas. The NTFP harvesting should be watched and monitored to prevent loss of genetic material from the forest area.
- ❖ Any person possessing a firearm and residing within 10 kms of the forests will register his name with the Deputy Conservator of Forests.
- ❖ Joint patrolling with police on the identified wildlife sensitive routes has been taken up in all the ranges.
- ❖ There is growing trend in killing the wild animals by electrocution. Normally the farmers take electric current illegally by attaching wire to the overhead line wire in the night. The animals get killed due to electric current due to tripping. MSEB officials are involved in Tiger Cell meeting. Tripping prone areas identified where vigilance is increased.

SECTION: 8.13. DEVELOPMENT OF FODDER AND BROWSE.

- ❖ The carrying capacity for grazing is determined after excluding the forest area required to meet fodder requirements of the wild animals and ecologically sensitive sites and special habitat sites for wildlife in the area.

- ❖ Habitat improvement is proposed at places having high density of wildlife and the areas frequented by both domestic animals and wildlife.
- ❖ Plantations prescribed in various working circles shall include at least 10 percent of fodder and fruit species of wildlife importance. Ficus spp. (Vad, Gular, Umbar), Ber, Anjan, etc. are recommended for this purpose..
- ❖ At least 2 ha. area should be developed as meadows in each coupe.

SECTION: 8.14. ECO-DEVELOPMENT, AWARENESS GENERATION AND ECO-TOURISM:

8.14.1 Effective protection and management of sensitive ecological and special habitat sites/areas is not possible without active involvement and support of village communities in the vicinity. Their help and support can only be ensured if their genuine needs and concern are given due consideration by the department. If the people living around are poor and anguished, the objective in question can not be achieved. Thus, to seek their willing support and goodwill it is proposed to undertake eco-development works by the Division in villages around these sites. It is also proposed to promote and encourage eco-tourism in the Division by extending and developing camping and nature interpretation facilities at sites/spots, rich and unique in natural and cultural beauty and diversity. It is, in accordance with, the current policy focus of the State and Government of India on eco-tourism. The forest department should be in touch with the MTDC for the development of such sites.

8.14.2 The prominent **water bodies and specific habitat sites** in the Division are proposed as sites for creation of **Eco-centres** with facilities of nature interpretation and eco-tourism and to serve as centres for awareness generation and dissemination of issues and concerns of forestry and wildlife.

The villages adjoining sensitive sites are proposed to be taken up under eco-development program for their overall development. Eco-development plans shall be prepared with the help of local communities.

It is also prescribed to delineate sacred sites/grooves and worship sites, including, sites for tribal deities with involvement of the local village communities. They are marked on the Division/range maps.

8.14.3 Archeologically important sites identified as such by the Archaeological Survey of India or the State Department of Culture shall be delineated to serve as focal sites for eco-tourism.

8.14.4 The Division will maintain record of sacred and cultural sites on a register the “Register of the Cultural Sites” and verified and update it annually by an officer not below the Range Forest Officer.

8.14.5 Awareness generation campaign be taken up to involve local villagers in the wildlife conservation programme. Village Panchayats and JFMCs shall be involved actively to further the cause of wildlife protection.

Teaching institutions viz. schools, colleges, etc. and NGOs shall be involved through nature camps, wildlife film shows, exhibitions, seminars, competition, etc.

SECTION: 8.15. MAJOR ISSUES IN MANAGEMENT OF WILDLIFE

8.15.1. MAN-ANIMAL CONFLICT: Total 411 villages in this division out of which 265 villages are adjoining to Forests of Central Chanda Division. Hence, the incidence of wildlife attacks on human as well as cattle is more in this tract.

The extent of man-animal conflict can be gauged from the number of incidences in which compensation was given.

The details are given in the following table

Year	Incidence			
	Human Death	Human Injury	Cattle Kill	Crop Damage
2007-08	2	26	157	709
2008-09	5	31	80	534
2009-10	0	39	103	686
2010-11	2	64	282	770
2011-12	0	35	212	809
2012-13	0	14	143	927
2013-14	1	33	200	2019
2014-15	5	23	146	1338

It is observed that population of Tiger, Leopard are more in Dhaba Kothari and Ballarshah Range of this Division. Hence Human death and injury incidences are more in this area. Incidences from year 2010-11 to 2014-15 shows that Human death/injury cases happened in Phulari Heti, Hiwara, Tohgaon, Gujari, Chek Ghanoti, Gondpipari, Sargaon and Wejgaon of Dhaba Range; Kothari, Chintaldhaba, Chek Thana, Borgaon, Bondla, Kemara, Ghanoti, Pombhurna, Kudesaoili villages of Kothari Range; Manora, Bamni, Palasgaon, Chunabhathi, villages of Ballarshaha Range.

Likewise Cattle kill/injury incidences are more in Dhaba, Kothari, Ballarshaha, Rajura and Virur Ranges of this Division. Data of Cattle Kill/injury cases of above period shows that maximum cases happened in Wejgaon, Sarandi, Kude Nandgaon, Chek Talodhi, Gajoli, Chek Pipri villages of Dhaba Range. Kothari, Parsodi, Ghanoti, Kemara, Deulgaon, Sonapur, Aksapur, Kanhargaoon villages of Kothari Range. Etoli, Satara bhosale, Juni Daheli, Karwa, Umari Poddar, Bamni, Visapur, Banjarheti villages of Ballarshaha Range; Tulana, Vihirgaon, Sumthana, Nalphadi, Chandala, Satari villages of Rajura Range and Navegaon, Koshtala, Siddheshwar, dongargaon, Chichala, Dewala villages of Virur Range.

Crop damage incidences are more in Rajura, Virur, Wansadi, Ballarshah, Kothari Ranges. Data of crop damage from 2010-11 to 2014-15 shows that maximum incidences happened in Arvi, Rajura, Tembhurvahi, Chanakha, Murti, Vihirgaon villages of Rajura Range, Ranveli of Virur Range, Naranda, Hathloni, Wanoja village of Vansadi Range, Ghosari, Chinthali – Dhaba, Kanhalgaon villages of Kothari Range. Itoli, Visapur, Manora of Ballarshah Range.

8.15.2. Following measures may be undertaken for mitigation of man-animal conflict :

Monitoring :

- ❖ Patrolling by staff should be done where there are presence of wild animals like Tiger, Panther, Bear etc. Collect all evidences and all information from villages.
- ❖ Send fortnightly report to higher office.
- ❖ Cattle kill information & camera trap photo information should be collected.

After analysis of above information :

- ❖ Declare the area as “ Danger Zone” using Red Flags.
- ❖ Sensitize of people through poster, handbills, meetings.
- ❖ Sensitize field level staff about monitoring, movement of wild animal by keeping constant touch with villagers.
- ❖ If found any existence of Wild animal, trace pugmark, take GPS reading, install camera trap and inform higher Office.
- ❖ If found any existence of Wild animal inform immediately to Police Patil, Sarpanch and inform villagers by Munadi & keep note.
- ❖ Inform Villagers not to go in forest where there existence of Wild animals.
- ❖ Care should be taken that people should not go in forest from 9 .00 am to 4.00 pm & keep record of villagers who are going in forest.
- ❖ Install camera where there is cattle kill and try to take photo of Tiger / Leopard .
- ❖ Sensitize people that trespass in forest is offence vide IFA 1927 and avoid to go in “Danger Zone” if any bad incidence happened no compensation will be paid .
- ❖ Slogan regarding “Wildlife and care” should be written on wall of Government building near by.

In case of Human Death :

- ❖ As soon as information about incidence received, immediately inform Police Department and reach the spot with them along with camera trap, cages etc.
- ❖ Inform Sub- Divisional officer (Rev) to issue order that Sec.144 is applicable and implement the same through police Department.

- ❖ Announcement about Sec.144 should be done repeatedly using audio system .
- ❖ Inform R R Unit to reach the spot along with all equipments eg. handheld sets, smart phone, post-mortom kit , torches, folding ladder, ropes, net, mobile, sound system, camera, etc.
- ❖ Panchnama will be done by Police Department and forest Department will help them.
- ❖ Range level meeting of Police station officer, Tahsildar will be arranged and contents of sop should be explained.
- ❖ Awareness at village level should be done by Talathi, Gramsevak, Police Patil & Forest guard.
- ❖ Reasons for incidence should be analysed.
- ❖ Immediate some amount should be given to concern. (part compensation)
- ❖ Ask CEO to inform Medical Officer & Collector to inform to Civil Surgeon to issue post mortom report.
- ❖ Like wise ask Collector to inform Talathi, Tahsildar to issue family certificate immediately.
- ❖ Swab should be taken from wound.
- ❖ Video shooting should be done.

General Measures :

- ❖ Increase density of water hole.
- ❖ Deepening of natural water holes should be done.
- ❖ Using tanker to supply water in crunch period.
- ❖ Use Solar pump where Bore wells are there.
- ❖ Regular patrolling near water holes and area of presence of wild animals should be done.
- ❖ Timely payment of compensation should be done.
- ❖ Supply of firewoods on Nistar to villagers.
- ❖ LPG supply to minimize the dependency on forest, which help to minimize man- animal conflict.
- ❖ Awareness through posters / handbills.
- ❖ Regular patrolling by RR Unit.

8.15.3 MONITORING OF WILDLIFE :

- ❖ The movement of Tigers & Leopards outside the protected area is being continuously monitored through recording in registers, Camera Traps, evidences of direct sighting, Pugmarks, incidences of cattle & natural kill etc.
- ❖ Strict watch is being kept on the activities of suspected offenders in connection with wild life, especially Pardhis and Bahelias. Poaching
- ❖ There is arising trend to use electric transmission lines for poaching of wild boar, spotted deer, nilgai. Coordination with officials of MSEDCL is being improved and vigilance in vulnerable areas is being enhanced.
- ❖ Plot yearwise data of cattle kill, Human death, Human injury on a map.

- ❖ Plot water holes on a map showing natural/artificial, barmahi/hangami with different colour.
- ❖ Attach attribute data of JFM village to special data.
- ❖ Plot pugmark with longitude / latitude on map likewise camera trap plots with longitude / latitude
- ❖ These above data will help to monitor tiger scientifically.
- ❖ Analysis pray base and then develop meadows accordingly.
- ❖ Wildlife monitoring register should be maintain at beat level.
- ❖ Abstract of same will be submitted by Round Officers to Range level and then to Division office.
- ❖ Tiger should be given unique ID for monitoring.

====00====

CHAPTER - IX

WORKING PLAN FOR FODDER WORKING CIRCLE

SECTION: 9.1: GENERAL CONSTITUTION:

9.1.1. The areas included in this circle are conveniently located adjoining to the villages and can meet the local demands for fodder to a large extent. These areas are mostly denuded and understocked due to heavy grazing. The compactness of soil has resulted in a complete failure of regeneration of the timber species. It is intended to develop these areas as fodder resources, consisting both of gram sses legumes. These pasture land are intended to develop on rotational basis. The stall feeding will be encouraged.

The extent of the area allotted to this working circle is 5421.848 ha.

RANGEWISE DISTRIBUTION OF AREA IN FWC

Sr. No	Range	Area of the Range	Area as per Old W.P. in FWC	Area as per Current W.P. in FWC	% wrt Range Area	% wrt W.C. Area
1	Ballarshah	15,829.315	4908.683	171.661	1.08	3.17
2	Kothari	11,599.490	4270.882	1817.30	15.67	33.52
3	Dhaba	5,341.204	173.40	642.928	12.03	11.84
4	Rajura	10,376.132	168.22	182.190	1.75	3.37
5	Wirur	19,961.269	1937.129	1098.35	5.50	20.26
6	Wansadi	20,592.362	9085.826	1509.064	7.32	27.84
7	Jioti	28,208.285		0.00	0.00	0.00
Total		111980.057	20544.140	5421.848	4.84	100%

SECTION : 9.2: GENERAL CHARACTERS OF THE VEGETATION :

9.2.1. The areas included in this circle belong to site quality IV and are mostly devoid of any appreciable tree growth or are sparsely wooded with species like Hiwar, Palas, Teak, Bor, Khair etc. Majority of the areas generally have grasses of less fodder value like Kusal (*Andropogan contortus*) and Bhurbhshi(*Eragrostis tennela*). Good fodder grasses like Sheda, Pauniya and Marvel etc. are sparsely met with. The details of the vegetation are given under local subtype 'Degraded Scrub Forests' of chapter II 'The Forest'.

SECTION: 9.3: SPECIAL OBJECTS OF MANAGEMENT:

Special objects of management of this working circle will be as follows :-

- To improve the quality and quantity of fodder grasses by introducing the better varieties of fodder grass tree species suitable for the locality.
- To meet the local demand for fodder and to reduce the heavy grazing pressure on the forests.
- To augment the production of fodder grass.
- To regulate the exercise of grazing rights and concessions as laid down in government orders and settlement records.

- (v) To control and regulate grazing and lopping by professional grazers.
- (vi) To maintain and improve the area so as to ensure sustained supply of the required produce.
- (vii) To protect areas vulnerable to soil erosion by maintaining adequate soil cover.

SECTION : 9.4 : COMPARTMENT AND WORKING SERIES :

9.4.1. 93 Compartments with area 5421.848 ha. are kept for rotational grazing. The details are given in **Appendix No. XXXV** of Volume –II.

SECTION 9:5: DEMARCATION OF COUPES PREPARATION OF TREATMENT MAP:

9.5.1. Demarcation of every coupe as per prescriptions is very much essential. The coupe lines should be treated as fire lines for that year. It will help to check encroachments also. It is also necessary to take S.M.C. work, plantation and regeneration work etc.

9.5.2. Coupes will be demarcated one year in advance of working (felling etc) as per the procedure laid down under Other Important Regulations. After demarcation, within the coupe, area will be divided into quality classes if the extent of any quality area is more than 2 ha.

PREPARATION OF TREATMENT MAP:

9.5.3. A broad treatment map will be prepared in GIS all showing unworkable area, buffer and various density class. The finer details will be elaborated by R.F.O. and checked by A.C.F.

SECTION: 9. 6 : ANALYSIS AND VALUATION OF THE CROP : STOCK-MAPPING –

9.6.1. These areas have been stocked mapped using satellite imageries. The areas having grey values between 41 to 70 in NDVI has been chosen for allotted to this working circle.

AGE AND DENSITY: - The area is mostly under stocked and barren.

Statement showing number of trees girthclass wise, Basel area/ha. and volume/ha.

Local Name	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total
Ain	5.11	1.76	1.61	1.10	0.58	0.74	0.39	0.18	0.09	0.08	11.65
Ali	2.36	1.70	0.62	0.00	0.00	0.18	0.00	0.00	0.00	0.00	4.85
Anjan	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.00	0.37
Aola	0.00	0.18	0.34	0.18	0.00	0.09	0.00	0.09	0.00	0.00	0.89
Apta	0.18	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
Behada	0.00	0.92	0.92	0.37	0.18	0.00	0.18	0.00	0.00	0.00	2.59
Bhera	7.53	1.71	1.15	0.66	0.64	0.25	0.32	0.18	0.22	0.25	12.91
Bija	0.25	0.00	0.40	0.34	0.46	0.22	0.65	0.15	0.09	0.18	2.74
Char	0.37	0.83	0.28	1.02	0.18	0.00	0.00	0.00	0.00	0.00	2.68
Chichwa	0.22	0.43	0.46	0.52	0.80	0.95	0.18	0.31	0.03	0.00	3.91
Dhaman	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Dhawda	6.07	2.58	1.28	1.24	0.75	0.38	0.43	0.16	0.18	0.04	13.11
Dhoban	0.12	0.00	0.09	0.06	0.12	0.43	0.48	0.15	0.05	0.23	1.74
Garari	14.40	5.60	2.06	0.79	0.15	0.11	0.00	0.09	0.00	0.00	23.20
Haldu	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Eaktendu	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.18
Kakai	0.37	0.18	0.37	0.18	0.00	0.00	0.00	0.00	0.00	0.00	1.11

Kalamb	0.00	0.00	0.00	0.00	0.18	0.18	0.18	0.09	0.00	0.00	0.65
Karai	0.54	0.67	0.85	0.50	0.07	0.04	0.07	0.04	0.00	0.00	2.77
Kateyen	0.00	0.18	0.56	0.37	0.18	0.00	0.00	0.00	0.00	0.00	1.29
Kawath	2.41	0.56	0.18	0.18	0.18	0.00	0.00	0.00	0.18	0.00	3.70
Kavi	2.22	0.56	0.55	0.18	0.18	0.00	0.00	0.00	0.18	0.00	3.89
Khair	2.14	4.49	1.39	0.62	0.07	0.02	0.00	0.00	0.00	0.00	8.73
Kumbhi	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.00	0.00	0.00	0.37
Kusum	0.00	0.00	0.00	0.18	0.00	0.00	0.18	0.18	0.00	0.00	0.55
Lendia	9.57	3.83	1.71	0.88	0.39	0.00	0.00	0.00	0.00	0.00	16.38
Moha	0.00	0.00	0.31	0.03	0.28	0.40	0.22	0.55	0.25	0.68	2.71
Mowai	0.09	0.92	0.77	0.99	0.31	0.65	1.42	0.80	0.37	0.18	6.50
Palas	3.27	3.15	1.23	0.80	0.25	0.06	0.00	0.00	0.00	0.00	8.76
Parad	0.00	0.37	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
Rohan	2.37	0.22	0.18	0.52	0.44	0.41	0.22	0.37	0.18	0.55	5.47
Salai	0.18	0.20	2.08	4.99	3.35	2.23	1.40	0.89	0.84	0.81	16.97
Semal	0.00	0.00	0.00	0.00	0.46	0.28	0.09	0.09	0.18	0.00	1.11
Shisham	0.46	0.37	0.28	1.02	0.65	0.18	0.00	0.00	0.00	0.00	2.96
Shiwan	0.00	0.18	0.28	0.37	0.28	0.28	0.00	0.00	0.00	0.00	1.39
Surya	9.26	8.42	2.50	0.74	1.02	0.74	0.00	0.00	0.00	0.00	22.67
Teak	22.77	13.95	8.88	7.25	4.75	2.17	1.17	0.99	0.29	0.63	62.85
Tendu	14.93	4.86	0.81	0.55	0.55	0.21	0.32	0.06	0.06	0.06	22.42
Others	29.55	17.66	8.48	1.99	2.15	0.39	0.23	0.09	0.46	0.63	61.62
Tree/ha	136.92	77.42	40.79	28.63	19.80	11.80	8.51	5.47	3.85	4.33	337.52
Vol/ha	1.92	2.17	2.86	4.87	5.05	4.01	4.12	3.45	3.14	4.33	35.92
B.A./ha	0.55	0.89	0.91	1.05	1.06	0.90	0.86	0.72	0.16	0.86	7.96

SILVICULTURAL PPPP SYSTEM:- Silvicultural system has been applied for is management.

FELLING SERIES:- 3 felling series has been prescribed.

DEVELOPMENT OF FODDER RESOURCES IN THE CLOSED AREA:- The following treatment has been prescribed for the development fodder resources.

About 10 ha. of the coupe area will be selected for grass development. This area will be lightly ploughed and soil pulverised. Seeds sowing of grasses will be done on this area. In some area standered size raised beds should be prepared. The weeds shall be removed.

PLOUGHING AND BROADCAST SOWING, UPROOTING OF WEEDS.

SOWING PROCEDURE - It may be done in two ways.

by Broad casting

by sowing in line

9.6.2.In case the soil is deep, clayey in nature and sloppy either, the grass should be raised by broadcasting. In case it is decided to sow grass and legume by lines, it should be kept 10 Cm. away in line and when grass and legume is sown together, it should be kept 30 cm. away. Between the two rows of grasses the legume is sown. In case of broad casting, the seed is spread over the bed and then spread with the leaf branch. This allows a small cover of soil over these seeds. In case of line sowing, seeds should be sown 0.4 to 0.8 cm. below soil, while the legume is sown 0.8 to 1.2 cm below soil. The heavy seeds are sown 3 to 4 mm in depth. Sowing by forming pillets is more advantageous. Seeds of grass / legume are made upto pillets of size 0.5 to 1.0 cm. The material mixed is seed, gober, black cotton soil and sand in a ratio 1:1:3:1 with adequate water.

QUANTITY OF SEEDS IN EACH BED:

Type	Species	Quantity per Bed.
Lighter seeds	Cenchrus Ciliaris, Dicanthium annulatum, Panicum maxicum, Stylo hemala.	6-10 gm/bed
Middle sized seeds	Etylosia scroeroides, Macropititium altropurpurem, Deshmonthes virgates, Despondium spes.	15-20 gm/bed
Big sized seeds	Dolichos lableb, Clitoria ternates, Lablab puspureus.	20-30 gm/bed

TIME OF SOWING: - July.

9.6.3 PRETREATMENT OF SEEDS: Legume seeds need pretreatment due to its hard coat and it is essential to soften it before sowing. The pretreatment is by putting in hot water. Stylo seeds are kept inside the boiling water for 60 to 90 seconds and then sown, when the germination percentage achieved is 60 to 100. Grass seeds usually have the viability of 9 to 24 month and it is found to germinate very well, when it is sown after soaking in water for 6 to 8 hours. The seeds of legume should be sown with rhizobium culture, which is good for growth legume seeds before sowing and after pretreatment is kept in a pot, with a mixture of Juggary, so that the seeds just get submerged. The rhizobium is then added and every thing is then mixed thoroughly and dried in sunshed and not in sun as it may kill rhizobium.

9.6.4. Sowing of mixed seed:- Very oftenly there is a less rain, the way there are season of high rain. In such cases, the mixed seed, of grasses are sown like the mixture of Cenchrus citijeris, Dicanthium annulatum, Cenchrus culeories, when rain fall is less gets established and when rainfall is high Dicanthium annulatum is established. In the medium rains all grass gets established. Seeds will be spread on the nala banks, where the moisture regime is good and the grass easily gets established. Grasses are poor in protein but high in yield. The legumes are rich in protein but poor in production.

9.6.5. CHOICE OF GRASSES: The choice of species in grass will in favour of those, which are nutritive grasses giving high yields in low rainfall areas. Such species are:

MARVEL - (DICHANTHIUM ANNULATUM) : It is a perennial grass and it contains 7% of protein. The yield per ha. is about 26 quintals.

SHEDA (ISCHAEMUM LAXUM) : It is perennial grass and it contains 6 to 7% of protein. The yield per ha. is about 18 quintals.

PAVNIA (SCHIMA NERVOSUM) : It is perennial grass and it contains 5% of protein. The yield per ha. could be about 31 quintals in favourable conditions.

9.6.6. At present reseeding with Sehima nervosum and Dicanthum annulatum is being carried out all over Kurans irrespective of soil conditions. S.nervosum is the natural climax on the hill slopes, red murromy and well

drained soils, *Chrysopogon fulvus* provide higher yield on red and medium soils and *D.annulatum* performs better from medium to heavy soil. In order to achieve better success it is necessary that the choice of Grass species should be according to the soil type met within a Kuran.

9.6.7. The light ploughing should be restored to, for obtaining better germination and optimum grass production, light ploughing and seeding at a rate of four to six kg/ha after pelleting the seeds with silt or clay mixed with cow dung and sand (1:3:1:1 ratio) in lines 50 cm apart need to be resorted to. The most important point to be borne in mind is the depth of sowing of seeds, which under no circumstances should be deeper than 0.8 cm in the case of grass and 1.2 cm in the case of legumes. While planting, a width of 4 meters shall be sown with the grass followed by a two meter width of stylo species, again a four meter width of grass, followed by a meter width of subabbual and so on. This will increase fodder production.

The list of grass/legume with their local name is given below.

The grazing should be permitted only after the seeds have fallen.

Local Name		Status
<i>vtu ?kkl</i>	<i>Cenchrus ciliaris</i>	Grass
<i>dsyk ?kkl</i>	<i>Dicanthium annulatum</i>	Grass
<i>fxuh</i>	<i>Panicum maxicum</i>	Grass
<i>oudqYFkh</i>	<i>Etylosia screvoides</i>	Legume
<i>Fijtkts</i>	<i>Macroptilium atropurpureum</i>	Legume
<i>;FkjFk?kkl</i>	<i>Deshmanthes virgates</i>	Legume
<i>fMleksfM;e</i>	<i>Desmodium</i>	Legume
<i>QhYVq ohu</i>	<i>Lablab purpureus</i>	Legume
<i>/koy</i>	<i>Chrysopogon fulrus</i>	Grass
<i>lsou</i>	<i>Conchris culeories</i>	Grass
<i>/kkeu ?kkl</i>	<i>Cenchrus citejeris</i>	Grass
<i>uUnh ?kkl</i>	<i>Citeria specileta</i>	Grass
<i>lsu ?kkl</i>	<i>Schima nurvosum</i>	Grass

SECTION: 9.7 : METHOD OF TREATMENT :

9.7. FOR ROTATIONAL GRAZING:

9.7.1. One coupe from each fodder series will be taken up each year for special improvement operations & will remain closed to grazing for a period of 2 years. A statement showing sequence of coupes which will be taken up for special improvement works & will remain closed to grazing for a period of 2 years, is given in **Appendix No.XXXVI** of Volume II. Thus in the first year coupe 'A' will remain closed to grazing while coupe B to F will remain open for grazing. In the second year coupes A & B will remain closed to grazing & coupes C to F will remain open to grazing. In the third year coupe A & Coupes D to F will remain open to grazing while coupes B & C will be closed to grazing. In the fourth year coupes A, B, E & F will remain open to grazing while coupes C & D will remain closed to grazing. In this way after every six years the cycle will be repeated.

9.7.2. In the 1st year of operation Treatment Map shall be prepared for the closed coupe to be treated and following works shall be taken up.

i) The area needs extensive soil and moisture Conservation measures. Therefore nala bunding and gully plugging shall be undertaken.

ii) All obnoxious weeds and thorny shrubs and bushes will be uprooted., The unpalatable grasses such as kusal, Bhurbhusi etc. will also be eradicated in the pre - flowering stage only.

iii) The fodder/legume shall be developed as described above.

iv) The fodder grasses raised will not be permitted to cut during the first three years of their introduction so as to allow them to seed and multiply.

v) All existing trees will be retained except the dead trees.

vi) The coupe under treatment will be effectively fire-traced every year. It will be closed to grazing for two consecutive year after treatment. Controlled grazing will only be allowed after October 31st to 31st May in the 4th year onwards.

SECTION:9.8: FORMATION OF COUPES FOR ROTATIONAL GRAZING :

The details are given in the **Appendix No XXXVI** of Volume II.

SECTION: 9.9: IMPLEMENTING AGENCY :

All the prescriptions will be carried out by the department itself.

SECTION: 9.10: SOIL AND MOISTURE CONSERVATION WORKS:

Gully Plugging & nala bunding LCTs & WATS shall be done as per the requirement of the site.

SECTION: 9.11: REGENERATION:

9.11.1: NR of teak and other miscellaneous tree species will be taken care of as prescribed under section 2.16 of Chapter on 'SCI Working Circle.' of Part II.

SECTION: 9.12: OTHER REGULATIONS:

9.12.1. Main working coupes will be fire traced every year and will remain completely closed to grazing as mentioned above.

9.12.2. During the monsoon i.e. 1st July to 31st October, extraction of grass from the closed area will be prohibited. Experimental cutting may be permitted under the orders of the Chief Conservator of Forests in limited areas.

9.12.3. JOINT FOREST MANAGEMENT:- These area after development of fodder resources shall be handed over to JFM committees for the effective management and protection. The JFM committee may collect the fees in lieu of grazing by the cattle, subjected to the cattle unit permitted, as per grazing settlement.

====00=====

Chapter X

WORKING PLAN FOR JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE

SECTION-10.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE

10.1.1 Joint Forest Management (Overlapping) Working Circle covers entire area of 111908.057 ha. of the Central Chanda forest division. The area is over burdened with heavy cattle and human population and is subjected to biotic pressure to meet the requirement of fodder, fuel, small timber and timber. Illicit felling and grazing is more common. Cutting of young pole crop for the purpose of firewood and poles and selling the same in the semi-urban areas is common feature to earn the daily wage by the local poor and unemployed people. Control of these illegal activities and protection of forest and wildlife is become a difficult task in the recent past. The staff available for the purpose of protection of forest and wildlife is very meager when compared to the extent of area. Encroachments in forest area are also a common feature. In totality about 10530.390 ha forest area was encroached as per available records of the Division. For the better protection and management of forest resources the joint forest management is one of the best options left with the forest department.

SECTION: 10.2: NEED FOR JOINT FOREST MANAGEMENT

10.2.1: National Forest Policy 1988 emphasizes the importance of the traditional rights of forest dwellers and the importance of their role in protecting the forest. Priority for the use of forest products is given to forest dwellers in respect of meeting the requirements of fuelwood, fodder, minor forest products and small timber. It also envisages creating a massive people movement with involvement of women in protection, management of forests and minimizing pressure on existing forests.

10.2.2 National Forest Policy, 1988 also mentions that forests should not be looked upon as a source of revenue, but as a national asset to be protected and enhanced for the well being of the people and the nation.

10.2.3 As per F.A.O. (Food and Agriculture Organization) forestry project with rural people's participation has been defined as "as set of inter connected actions and works executed primarily by local community residents to improve their own welfare: those may be outside inputs....extension, training, guidance, technical help, financing etc. - but its basic focus is on community involvement in doing something for itself."

10.2.4: The Government of India vide letter No 621/89-PP dated 1st June,1990 conveyed to all the State Governments, a framework for creating massive people's movement through involvement of village communities for

the protection, regeneration and development of degraded forest lands. Govt of India vide Ministry of Environment and Forests, Forest Protection Division Circulars No 22-8/98-FPD dated February 10, 2000 and No22-8/2000-JFM(FPD) dated February 21, 2000 has issued detail guidelines for the Joint Forest Management Programmes to be taken up by the States.

10.2.5: Government of Maharashtra vide Resolution No SLF-1091/PK119/F-11 Mantralaya, Mumbai dated March 16,1992 realizing the fact that illegal felling of Forests can not be controlled and checked without the active participation and cooperation of local people in the management, protection and regeneration of forests, issued guidelines and instructions for the preparation of plans for the management of Forest areas with the active participation and cooperation of local population living in and around Forest areas.

10.2.6: The guidelines and instructions contained in the Government of Maharashtra Resolution dated March 16,1992 encouraged the preparation of Management plans for degraded areas in the State involving the local inhabitants from adjoining areas to Forests and seeking their participation through JFM. The said Govt.Resolution upheld by new G.R. dated 5..10.2011

10.2.7: The selection of areas will be done on the basis of guidelines and instructions contained in Govt of Maharashtra Resolution dated March 16, 1992. The Deputy Conservator of Forests, Central Chandra Division, Chandrapur will take all efforts to motivate villagers to participate in the Joint Forest Management plan. The areas allotted to Joint Forest Management programmes will be under stocked mostly open with crop density less than 0.4. The new guideline issued vide G.R. dated 5..10.2011

10.2.8: The Government of India vide its subsequent reference No 22-8/2000-JFM(FPD) dated 21/02/2000 issued further instructions to the State Government mainly related to participation of women in JFM Committees and the extension of JFM programmes to the good forest area. The GOI, in the above reference has stated that at least 50% of the members of the JFM general body should be women, and the presence of 50% of woman member is a pre requisite for holdings general body. Besides that 33% of the Executive Committee members should be women. It has further stated that the JFM activities may be extended even to good areas which were till, confined to poor areas only. According to the circular, the JFM activity in good areas is to confine to NWFP activities only, and under no circumstances, the silvicultural prescriptions should be altered. The sharing mechanism should be different, than usual and sharing of profit from timber will be only when the Committee protects the area for at least 10 years and sharing percentage not to exceed 20% of final harvest. The JFM area extending to good forests shall not exceed

100 ha and within 2 km. It further says that JFM in good area shall be on a pilot basis and should be done, only after the degraded areas have exhausted. New guidelines issued vide G.R. dated 5.10.2011

10.2.9. Forests around the human habitation i.e. around villages are to somewhat degraded. These forests need rehabilitation to increase their productivity.

SECTION 10.3. GENERAL CONSTITUTION AND BACKGROUND OF THE JOINT FOREST MANAGEMENT:

10.3.1 Degradation of forests is a continuing process, besides, very heavy pressure of human and live stock, population, alienation of rural communities from forest resources protection and management is an important factor responsible for degradation of forests. In the past, local communities enjoyed free access to the forests. With the bringing of forests under Govt. control & consequent, reservation of forests permitting only specified usufructory concessions, local communities were denied access to forest resources. Forest reservation policy came in conflict with the interest of local communities dependent on these forests to meet their basic needs of forest products. The forests were managed as govt. property in larger national interest as provided for in the National Forest Policy 1952 which stated that the use of forests by village communities in their neighborhood should in no event be permitted at the cost of national interest. Such policy of managing forest only in larger national interests, overlooking the basic needs of local communities did not succeed and forests were degraded as a result of over use. Forest Deptt. could not effectively protect the forests whose degradation continued.

Forest conservation necessitated active participation of local communities. The National Forest Policy, 1988 accordingly provided for creating a massive people who suffer the most as a result of forest degradation.

10.3.2 The National Forest Policy, 1988 emphasized that domestic requirements of the tribal and other poor people living within and near the forest for fuel wood, fodder, NTFP and construction timber should be the first charge on forest produce and the holders of customary rights and concession in forest areas should be motivated to identify themselves with the protection and development of forest from which they derive benefits. In pursuance to the National Forest Policy the Ministry of Environment and Forests decided to ask the State Govts. To adopt the JFM system for the protection and rehabilitation of degraded forest. The Govt. Resolution No.SIF-1091/199/F-11,

dt.16th March 1992. JFM approach was adopted for degraded forest areas of this state and now new guidelines have been issued vide G. R. No. MSC/2000/C. NO. 143/F-2, dated 25.4.2003 which again modified vide G.R. dated 5.10.2011

10.3.3 JFM is a concept under which Forest Deptt. and village committee jointly protect and manage the forest. The starting point of JFM has to be the realization of the need of JFM both by Forest Deptt. and the local people. Generally, the scarcity of forest products such as fuel wood, fodder etc. as a result of degradation of forest on which the local communities depended, forces the people to think of steps for the protection and improvement of degraded forests. The people are usually reluctant to participate in JFM where sufficient forest areas are still available to meet their requirements. On the part of Forest Deptt., the problems in protecting forest without the help of local people make the Forest Deptt. staff realize the need of JFM. The JFM program succeeds where the initiative comes from the people's side and it usually fails where it is forced from Forest Deptt. side as a govt. driven and target oriented program. Villagers themselves are required to voluntarily participate in the program. Forest Protection Committee (FPC) is to be formed in each village. Each Forest Protection Committee constitutes a Managing Committee consisting of members elected from general body and ex-officio members representing concern Govt. Deptt. at village level and with local forester as the member secretary. The managing committee is a responsible to implement the decision of general body with regard to the execution of JFM works in partnership with Forest Deptt. Memorandum of Understanding (MOU) is signed between Forest Deptt. and managing committee clearly specific the duties and responsibilities of both parties. Entitlement of FPC members to the share in forest produce is subject to the fulfillment of conditions of MOU.

The members of the FPC will help in protection and development of forests and they will receive in turns of share in the usufructs at out put 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 the member of the FPC. These micro plans shall contain the details of forest and village developments. This has to be sustainable, should cater to needs of local communities and the same time, the silvicultural requirements of the forest are to be made properly.

10.3.4 Later the Govt. of India also advised the State Govt. to take up the JFM in well stocked areas on experimental basis and accordingly guidelines dated 25 th April, 2003 mentioned above have authorized the forest deptt. in the state in this in this respect. Summary of these guidelines is as follows:

- i) 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 forest are to be brought under it.
- ii) JFM is to be implemented with the help of Gram Panchayat and forest produced available is to be provided on priority to meet bona fide local needs. (Hence local rights as enshrined in Nistar Patrak and Wajib-ul-Arz are not to be curtailed).
- iii) Non forest land available in the village, which has agreed to participate in the program, may be brought under the scheme if villagers and the Panchayat agree to do so.
- iv) Help of institution of local self-govt. NGO, environmental experts, if any available locally, may be solicited.
- v) The scheme though does not intend to facilitate agriculture based professions but non irrigated horticulture scheme in (private) wastelands may be encouraged if approved in micro plan.
- vi) The program underlines conservation of forests and wildlife and therefore any activity/agreement etc. that is not in accordance with the Forest (Conservation) Act, 1980 should not be incorporated in the micro plan.
- vii) All JFM activities should be in conformation to the silvicultural prescriptions of the working plan.

SECTION: 10.4: ROLE OF FOREST OFFICIALS

10.4.1 Role of forest official in JFM is as the facilitator.

- (a) They are supposed to give technical input and support for the activities prepared under JFM for ensuring scientific forest management.
- (b) They are expected to create awareness amongst the villagers about the role and benefits of forests and need to sustain the same.
- (c) All matters related to duties and benefits of local people, JFMCs and staff should be specified and formalized through an agreement by the officials concerned.

10.4.2 Site specific, social, economic and ecological factors combine together to provide both opportunities and limitations on the type of management options that may be available in a particular area and the village. The status of regeneration and ecological viability of the forest is influenced by a range of biological conditions including species compositions, utilization history, soil and climate. Participating forest department and communities require greater institutional capacity to make collaborative forest protection activities success and final end in getting the economic returns and regenerating the forests. The efforts must yield sufficient income to sustain the management activities over the time. Thus, forest officials have to take adequate measures in

formalizing participatory forest management in a particular village or forest areas.

SECTION 10.5: PRESENT EXPERIENCE WITH THE JFM IN THE DIVISION.

10.5.1 Objective of the JFM working circle on multi pronged strategies for developing forest resources, water resources and human resources in the JFM villages, they are as follows:

- I. To develop the degraded forest resources by promoting natural and artificial regeneration (through plantation activity) with active participation of the villagers. It also aims to provide effective protection.
- II. To empower village communities to play a crucial role in forest resource conservation and enable them to resolve their issues and problems.
- III. This JFM approach should be widely applied even at places where formal JFM committees have not been constituted.
- IV. JFM should be evolved on the basis of its capacity to generate sustainable employment.

POTENTIAL AREAS FOR JFM:

The following area priority wise prescribes one selected for JFM program.

- I. Areas prescribed under the Afforestation Working Circle are the potential areas for undertaking JFM program.
- II. Areas under miscellaneous management, especially the zudpi jungles suitable for afforestation are proposed to be covered under JFM.
- III. Areas under Improvement Working Circle, Selection Cum Improvement Working Circle, Fuel-wood, Fodder and Pasture Working Circle are also proposed to be included in JFM.
- IV. Regeneration and protection of NTFP areas and collection, grading, value addition and marketability of various NTFPs in the division are proposed to be given focus for working under JFM program.

SECTION 10.6: PRESENT STATUS OF JFM COMMITTEES:

10.6.1. JFM concept has been introduced in this division in the year 1998. So far 142 villages over a period of 16 years have been covered and rest of the villages are under process. The present status of the committee formed in this division is as under:

RANGE WISE AREA DISTRIBUTION UNDER JFM COMMITTEES:

Sr. No	Range	No of villages adjoining to forests	Total forest area in Sq. Km. (he.)	Committees formed			No of villages to be deleted
				Name of scheme	No of JFM committees formed	Area Handed over to committee (in ha .)	
1	Ballarshah	36	158.29	FDA,JFM, District Scheme & State Scheme & etc	15	4738.94	-
2	Kothari	40	115.99	-- ,--	27	4339.451	-
3	Dhaba	48	53.41	-- ,--	29	4011.907	-
4	Rajura	39	103.76	-- ,--	14	4540.91	-
5	Wirur	33	199.61	-- ,--	30	11722.25	-
6	Wansadi	35	205.92	-- ,--	13	4830.106	-
7	Jioti	34	282.08	-- ,--	14	1069.36	-
Total		265		-- ,--	142	35252.924	-

Total Area in ha of Central Chanda Division is = 35252.924

10.6.2 RECOMMENDATIONS:

- I. JFM Micro-plans will be prepared for each village through the process of participatory rural approach. Micro plans are linked with the working plans objective oriented site specific planning adopted for the assigned areas. Villages & watershed development planning shall be given utmost importance.
- II. Silvicultural management, maintenance of forest boundary, removal of forest encroachment and control over illicit cutting , illicit grazing and fire should receive high priority.
- III. Forest protection can not be viewed in isolation. The forest department may be designated as Nodal agency for all developmental works in the villages, recommended in the micro plans.

- IV. In carrying out the developmental activities, the expertise of NGOs has to be fully utilized.

SECTION 10.7. DEVELOPMENT OF JFM UNDER THE MAHARASHTRA FORESTRY PROJECT

10.7.1 Under Maharashtra Forestry Project 9 villages were undertaken namely Satara Bhosale, Tulana, Sirsi, Mahapandharwani, Rupapeth, Khadki-Raipur, Durgadi, Chincholi, Sukwasi.

10.7.2. There are 411 villages in Central Chanda Division division. Out of which 265 villages are adjoining to forest out of this 68 villages are unfit for formation of FPC due to high population and hence deleted. So far 142 FPCs have been formed. At the district level Forest Development Agency (FDA) has been registered under Societies Registration Act, 1860 by Assistant Registrar of Cooperative Societies, Central Chanda Division vide registration in 112 villages of this district. Micro plan of each village proposed and approved by competent authorities. It is envisaged to protect and treat the forest area 35252.924 ha covering 142 villages and to take up 2755 ha area under plantation and different models. Under Entry Point Activities the villagers in the Gram-sabha propose village developmental works

10.7.3. AREA COVERED AND COMMITTEES FORMED UNDER FDA: The Government of India started direct funding to the division in charge for the developmental works in the forest with the participation of the Villagers under the JFM programme. The table below shows the area covered in various ranges and villages under this scheme.

AREA COVERED AND COMMITTEES FORMED UNDER FDA:

Sr. No	Forest Range	Villages	Details of Forest Land		
			RF (ha)	PF (ha)	Total
1.	Ballarshah	8	289.00	0	289.00
2	Kothari	7	269.00	0	269.00
3	Dhaba	5	194.00	0	194.00
4	Rajura	7	320.00	0	320.00
5	Wirur	13	554.00	0	554.00
6	Wansadi	9	349.00	0	349.00
7	Jioti	3	150.00	0	150.00
	Total	52	2125.00	0	2125.00

Detail of this column information is given in **Appendix No. XLVII** of volume II

10.7.4 MICROPLANNING: After the project is approved by GOI. Funds earmarked for microplanning would be released to enable the FDA to

undertake the micro planning exercise and to develop the work program. For forest areas included in the project, FDAs would ensure that the microplans are not in conflict with the existing and operational working plans for those areas.

The FDAs are to be registered as Federation of all JFMCs, within a territorial division under the society registration act, with the following structure.

General Body	Executive Body
Chairperson- Chief Conservator of Forests (T)	Chairperson-Chief Conservator of Forests (T)
Members	Member Secretary cum Chief Executive Officer -Divisional Forest officer../ Deputy Conservator of Forests
Presidents of JFMC General Bodies, not more than 50 at any time, to be nominated by Chairperson on rotational basis for a period of one year, of which 20 would be women representative. In the event adequate numbers of women chairpersons are not available, the women representative will be drawn from the members of the General Bodies of JFMCs.	Members- Ex-Offico Members (Without voting rights) District Development Officer, District level officers of Agriculture, Rural Development, and Animal husbandry, Soil Conservation, Tribal Welfare, Industries, Public health & Engineering and Education Departments.
One non-official representative to be nominated by the apex institutional framework of Pancharats.	ADM/AC to be nominated by DC/DM2
Range Forest Officer, ACFs/SDFs.	One non-official representative to be nominated by the apex institution frame worked Pranchayats. Fifteen nominees from the JFMCs, to include minimum.

10.7.5 ACTIVITIES OF FDAS.

- (i) Implementation of centrally sponsored afforestation schemes.
- (ii) Other beneficiaries oriented activities like agro forestry, avenue plantations.
- (iii) Take steps for value addition and marketing of produce.
- (iv) Inventorisation of land other natural resources.

- (v) Environmental education.
- (vi) Awareness and active association in protection against poaching and illicit felling of timber.
- (vii) Establishment and management of decentralized nurseries with marketing arrangements.
- (viii) Assist in management of CPRs.
- (ix) Address socio-economic needs of people.
- (x) Management of existing captive water resources in the village.
- (xi) Active involvement in forest fire fighting operations.
- (xii) Monitoring of activities of local NGOs.

10.7.6. FUNCTIONS OF FDAS.

- (i) Approve plans for all afforestation related activities in forest fringe villages, including the micro plans.
- (ii) Provide support and assistance to JFMCs for micro planning.
- (iii) Organize training and awareness programmes.
- (iv) Implementation of water harvesting and soil conservation measures with appropriate approvals.
- (v) *Inter se* prioritization for scheme and activity-wise financial outlays.
- (vi) Decide entry point activities.
- (vii) Formulate guidelines for utilization sharing of usufruct.
- (viii) Evolve rules for use of funds created.
- (ix) Improvise technological improvements.
- (x) Develop Guidelines for employment generation opportunities.
- (xi) Establish and maintain decentralized nurseries.
- (xii) Coordinate and Monitor activities of their constituent JFMCs.
- (xiii) Conceptualize innovative schemes, viz establishment of botanical gardens, sacred groves etc.
- (xiv) Deal with contingencies such as drought, flood and forest fires.
- (xv) Coordinate with DRDAs and other relevant government departments to dovetail their schemes and programmes with afforestation schemes so that watersheds can be developed in a holistic manner.

SECTION 10.8 JFM UNDER ITDP SCHEME:

10.8.1 Integrated Tribal Development Project can be implemented in the tribal areas of Central Chandra Division in 142 villages through participatory forest management with the involvement of tribal people by adopting JFM approach. It covers 35252.924. ha of forest area out of which 35252.94 ha assigned to FPC for protection. As well as plantation under different models like medicinal plants, fodder development, bamboo plantation, mixed plantation on 2755 ha would be taken. G.R. dated 25th. April 2003, and modified vide G.R. dated 5.10.2011 shall be applicable for benefit sharing in such areas. The aim of the project is to enhance the economic and social status of the tribal people by taking various plantation activities, soil moisture and conservation works. This project will have a great impact on about 5553.

Families i.e. about 16659 tribal people and will generate self employment about 206272 man days.

SECTION 10.9: RESULT OF IMPLEMENTATION OF JFM COMMITTEE:

10.9.1 SOIL & MOISTURE CONSERVATION: - Nala Bunds, Stone Bunds., Soil Bunds, Cement Bunds and other soil and moisture conservation activities carried out by various forest protection committee in there allotted forest areas. The material required for various activities carried by forest protection committee are to be collected by following rules and regulation prescribed by State Govt.

10.9.2. FOREST PROTECTION: - There are various formation of group - batches for protection of allotted forest area by JFM committees. The groupe includes male and women members. There is a patrolling records maintain by is committee. If there is any illegal activities found in a patrolling then the action would be taken against accused persons with the help of forest staff. The programme of the patrolling was published on public placed and it is strictly followed by committee members decided the batches and batches of members are prepared for protection work. A quarter petrolling programme is prepared and displayed the public places. Many committees have seized material, vehicles and confiscated to government.

10.9.3. FIRE AND FOREST PROTECTION: - As per working plan norms, there are various types of fires lines (Class-I, II, & III). The special fire lines scheme prepared at range and division level it is submitted to C.C.F. Office, and permission granted by same office. As per fire lines scheme, the work of cutting and burning of lines was given to concern forest protection committees and committees members are carried out fire cutting and burning work in there allotted forest areas. The committee members are taking every care to protect the forest from fires. Incidentally if there is incidence of forest fires then that is to be extinguish is by committee members. At the time of collection of Moha flowers and other NTFP, the every care is taken to clear the land by fire and it should not be spread to other place.

10.9.4. FOREST ENCROACHMENT BANNED: - The Committees members are taking every care to banned encroachments on forest land and if there is any incidence of encroachment then that to be evicted by taking help of forest officers. No encroachments were noticed after the formation of JFM committee

10.9.5. ILLEGAL GRAZING BANNED: - The villagers were appraised with ill-effects and losses due to heavy grazing by domestic animal. The grazing is totally banned in closed areas. The cattle's were allowed to graze in reserved areas. Some times the agricultural fields are used for grazing purpose. Stall feeding is also necessary to protect the forest from illegal grazing.

10.9.6 WILDLIFE PROTECTION: - The committee members have effectively controlled the illegal hunting. The hunters are not allowed to camp in the village area. The committee member protected various type of birds verities, bio-diversity and various type of wild life species in schedule-I to

Schedule-VI list. The area is well protected by forest committees members. There is citation of many endanger wild life and wild animals species like as Panther, nilgai, sambar, chital wild sloth hare.

10.9.7 WATER HOLES FOR WILD LIFE AND BIRDS: - Vantalao's and water tank are constructed in the JFM area which supplies water to wild animals and birds. The JFM committee has constructed water hole through people's participation, at the free of cost.

10.9.8 PEOPLE PARTICIPATION: - All the committee members are highly enthusiastic in all development and protection activities. The member is taking active part in protection and development of forest. All the members are present on going works.

10.9.9 WOMEN PARTICIPATION: - As per Govt. policy the participation of women is essential in forest protection and other development activities carried out in allotted areas. There are many Women Saving Grope which are taking activities part in Gramsabhas and other other development activities.

10.9.10 FUEL CONSUMPTION (OTHER THAN FROM FORESTS):- Many committee members have gobar gas, LPG Gas and no smoke chulhas. Women members use the dried cakes prepared from cow- dungs. The people used fuel wood from babul trees from the agricultural fields and some times they are taking fuel wood as nistar from Govt. The committees members are persuade to use non conventional energies and solar energies to minimize use of fuel wood.

10.9.11 RECORD KEEPING :- Up to date record is kept by committee members e.g. meeting register village fund (member fee) register, visit book, nistar supply register, fuel wood supply register, katipet supply register, and cash book, Saving account monthly quarterly reports, eco-socio, status report, MOU registration etc.

10.9.12 INNOVATION IDEAS: - committee believes in development of village through JFM.A schemes planned to prepare wormy compost fertilizer etc. The committees are coming forward to take agarbatti preparation from bamboo, lac production from palas and other trees, the collection and disposal of NTFP through saving groups. The used of natural resources are taken for forest and village development under the lac cultivation inoculation of ethylene product for gum production is also to be considered.

10.9.13 AWARENESS: - JFM committee organizes different programmes like Forestry Day, Environment Day and Wildlife Day plans with of officers and dignitaries and thereby creates awareness among villagers. These programmes are given publicity through news papers. It creates awareness among committee members. JFM committee organized eassy competition and speeches on 'forest and wild life protection and conservation'.

10.9.14: Forts in the Forest Area. As per National Forest Policy, 1998, involvement of local people in Forest Protection and Forest Development is to be required. As per Govt. of Maharashtra Resolution No. FDM 2011/CR 100/F-2, dated 05.10.2011 the maintainance of Forts through JFM Committees is to be required. The said G.R. incorporated in **Appendix No. XLVI** of Volume II.

SECTION 10.10.: INFORMATION REGARDING J.F.M. COMMITTEE RECEIVED AWARD:-

Year	Name of J.F.M. Committee	Sant Tukaram Award	Award Price
1	2	3	4
2006-07	Sukwasi	YES	District Award Third Prize Rs.7000
2009-10	Satara Bhosale	YES	Dist Award First Prize Rs. 51000
2010-11	Satara Bhosale	YES	State Level Second Prize Rs. 125000
2011-12	Satara Bhosale	YES	State Level Third Prize Rs. 75000
2012-13	Kapangaon	YES	District level Third Prize Rs.11000

SECTION 10.11: SHARING OF BENEFITS:

Sharing of benefits among the members of the JFM committee will be as per the standard instructions given in the Government guidelines. Government of Maharashtra Revenue and Forest department G.R. FDM 2011/C.NO. 143/F-2 Mumbai Dated 5 Oct 2011 given in **Appendix No. XLVI** of Volume II.

Sr. No.	Year	Name of JFMC	sharing		
			Govt. Acctt.	JFMC Acctt.	Total
1	2012-13	JFMC Karva	132185	132185	264370
2	2012-13	JFMC Satara Tukum	342292	342292	684584
3	2012-13	JFMC Satara Bhosale	91405	91405	182810
4	2012-13	JFMC Ambedhonara	70989	70989	141978
5	2012-13	JFMC Umri Potdar	70355	70355	140710

6	2012-13	JFMC Bamni	2207	2207	4414
7	2012-13	JFMC Kemara	63585	63585	127170
8	2012-13	JFMC Devai	52746	52745	105491
9	2012-13	JFMC Karva	2752	2752	5504
10	2012-13	JFMC Manora	1324	1324	2648
11	2012-13	JFMC Mohadi	1809	1809	3618
12	2012-13	JFMC Itoli	785	785	1570
13	2012-13	JFMC Kem Tu.	716	716	1432
14	2012-13	JFMC Satara Komti	2947	2947	5894
15	2012-13	JFMC Kinhi	281	281	562
16	2012-13	JFMC Satara Komti	10536	10536	21072
17	2012-13	JFMC Satara Bhosle	8531	8531	17062
18	2012-13	JFMC Umri Potdar	808	808	1616
19	2012-13	JFMC Umri Tu.	488	488	976
20	2012-13	JFMC Satri	4567	4567	9134
	Total -		861308	861307	1722615

====00=====

CHAPTER XI

MISCELLANEOUS WORKING CIRCLE

SECTION-11.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE

11.1.1 : This working Circle includes 26158.207 ha. of area. Based on the stock map details most of the area included are under encroachment only.

Maximum area was previous identified by Manikgarh Block and was Reserve Forest. Meanwhile encroachers comes from Nanded District of Maharashtra State & adjoining Telangana State and encroach on plane part of Forest Area for Cultivation. Being Topography of this area is not plain some forest is still on top of hills or on stiff slopes where agriculture is not possible. Therefore these forest lands cannot be managed under any silvicultural system, hence no treatment is prescribed for these area. However it is recommended to survey and demarcate these area and protect the remaining forest. The Range wise area allotment of this working circle is given in Appendix No XXXVIII of Volume II. The range wise distribution of area is given in the table as below.

Range wise Distribution of Area in Misc.

Range	Range Area	Area (in Ha.)	% of area with respect range area	% of area with respect division area
Ballarshah	15,829.315	0.00	0.00	0.00
Kothari	11,599.490	0.00	0.00	0.00
Dhaba	5,341.204	0.00	0.00	0.00
Rajura	10,376.132	0.00	0.00	0.00
Wirur	19,961.269	1069.605	4.09	0.96
Wansadi	20,592.362	4288.943	16.40	3.83
Jioti	28,208.285	20799.659	79.51	18.58
Total	111980.057	26158.207	100%	23.35%

Dy. Conservator of Forests, Central Chanda Division, Chandrapur will prepare demarcation scheme for five years to survey & demarcate the balance forest on hills or on stiff slopes and will submit to the Chief Conservator of Forests Chandrapur Circle for approval. After approval the same will strictly followed by Dy. Conservator of Forest Central Chanda Division, Chandrapur. The surveyed area should be transfer on management plan using GIS.

11.1.2 : Mean while village settlement was done on this area. Now this area is in dispute (with respect to forest department). Hon'ble High court Mumbai Bench at Nagpur issue the order to prepare the map showing forest

land, revenue land and dispute land in Writ Petition No. 3669/2009 in Bommewar case. The brief note by Dy. Conservator of Forest Central Chanda Division, Chandrapur regarding Writ Petition is given below.

SECTION-11.2: ENUMERATION : A part enumeration has been done in these area and full enumeration is not needed as most of the area is understock, cultivation and blank area.

Statement showing number of trees Girthclass wise, Basel area/ha. and volume per ha.

Stoking in MWC

Local Name	15 30	31 45	46 60	61 75	76 90	91 105	106 120	121 135	136 150	151 up	Total
1	2	3	4	5	6	7	8	9	10	11	12
Ain	2.80	1.32	0.68	0.60	0.49	0.34	0.28	0.15	0.09	0.07	6.83
Ali	0.47	0.61	0.32	0.20	0.12	0.06	0.00	0.00	0.00	0.00	1.77
Amit	0.02	0.13	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.24
Anjan	0.09	0.00	0.07	0.04	0.02	0.13	0.04	0.07	0.04	0.22	0.73
Aola	0.85	0.68	0.42	0.16	0.12	0.04	0.01	0.03	0.00	0.00	2.31
Apta	0.26	0.12	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.51
Arjun	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02
Behada	0.10	0.36	0.26	0.14	0.04	0.03	0.06	0.06	0.01	0.02	1.08
Bel	0.09	0.10	0.03	0.05	0.06	0.03	0.04	0.00	0.02	0.02	0.45
Bherra	5.93	3.45	1.69	1.09	0.74	0.37	0.21	0.08	0.05	0.06	13.67
Biba	0.01	0.09	0.06	0.04	0.01	0.00	0.00	0.02	0.00	0.00	0.23
Bija	0.24	0.12	0.19	0.11	0.09	0.16	0.08	0.09	0.06	0.10	1.23
Char	1.05	1.05	0.54	0.36	0.19	0.04	0.01	0.03	0.01	0.00	3.29
Chichwa	0.12	0.24	0.27	0.25	0.31	0.13	0.10	0.09	0.02	0.06	1.59
Chinch	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.09
Dhaman	0.19	0.19	0.27	0.03	0.02	0.04	0.00	0.00	0.00	0.00	0.74
Dhawda	2.32	1.19	0.84	0.73	0.69	0.37	0.24	0.11	0.08	0.04	6.61
Dhoban	0.50	0.26	0.26	0.46	0.29	0.34	0.30	0.25	0.07	0.12	2.84
Garari	10.07	4.13	2.18	0.70	0.27	0.12	0.03	0.00	0.00	0.00	17.50
Gongal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04
Haldu	0.14	0.07	0.08	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.33
Hirda	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Eaktendu	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.07
Jambul	0.00	0.07	0.00	0.03	0.12	0.02	0.00	0.00	0.00	0.00	0.24
Kakai	0.07	0.19	0.11	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.45
Kalamb	0.14	0.23	0.15	0.20	0.23	0.17	0.16	0.05	0.03	0.08	1.44
Karai	0.64	0.37	0.25	0.15	0.08	0.00	0.07	0.00	0.00	0.00	1.56

Karanj	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Karu	0.01	0.01	0.10	0.12	0.08	0.01	0.00	0.00	0.00	0.00	0.33
Kateyen	0.06	0.17	0.23	0.19	0.11	0.00	0.03	0.00	0.02	0.02	0.83
Kawath	0.11	0.12	0.02	0.07	0.08	0.02	0.00	0.04	0.00	0.00	0.47
Kavi	0.00	0.11	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.00	0.29
Khair	3.09	1.79	1.08	0.43	0.14	0.06	0.06	0.03	0.01	0.03	6.71
Kumbhi	0.04	0.04	0.02	0.00	0.16	0.02	0.00	0.02	0.00	0.04	0.35
Kusum	0.00	0.07	0.13	0.07	0.13	0.04	0.02	0.02	0.02	0.04	0.55
Lendia	3.42	1.67	0.82	0.48	0.40	0.11	0.04	0.01	0.02	0.00	6.96
Medsing	0.11	0.17	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Moha	0.44	0.55	0.49	0.55	0.44	0.37	0.39	0.31	0.22	0.32	4.08
Mowai	0.45	0.48	0.66	0.72	0.81	0.43	0.37	0.32	0.11	0.05	4.40
Pakad	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Palas	1.09	1.17	0.54	0.30	0.24	0.10	0.06	0.06	0.02	0.00	3.58
Parad	0.18	0.12	0.11	0.08	0.04	0.00	0.00	0.00	0.01	0.02	0.57
Pimpal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04
Rohan	1.38	0.54	0.27	0.22	0.28	0.12	0.11	0.03	0.02	0.12	3.09
Salai	0.13	0.23	0.58	0.56	1.37	1.46	1.13	0.72	0.43	0.46	7.05
Semal	0.09	0.09	0.03	0.15	0.10	0.04	0.02	0.00	0.02	0.03	0.57
Shisham	0.08	0.18	0.14	0.15	0.07	0.04	0.01	0.00	0.00	0.00	0.66
Shiwan	0.07	0.04	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Surya	6.13	3.59	1.28	0.96	0.76	0.16	0.03	0.01	0.00	0.00	12.93
Teak	12.43	7.74	5.90	3.41	1.58	0.70	0.25	0.15	0.06	0.05	32.27
Tendu	4.75	1.31	0.48	0.20	0.19	0.16	0.08	0.08	0.06	0.04	7.35
Tiwas	0.02	0.20	0.17	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.54
Others	22.08	11.87	7.26	3.57	2.06	0.65	0.27	0.16	0.19	0.39	48.50
Tree/ha	82.32	47.28	29.23	17.84	13.08	6.95	4.59	3.17	1.74	2.43	208.61
Vol/ha	1.15	1.32	2.05	3.03	3.34	2.36	2.23	2.00	1.42	2.43	21.33
B.A./ha	0.32	0.54	0.65	0.66	0.72	0.53	0.47	0.41	0.28	0.48	5.07

SECTION-11.3 : Note Regarding Writ Petition No. 3669/2009 :

Note Regarding Action taken by Hon'ble High court Mumbai Bench at Nagpur in Writ Petition No. 3669/2009 Ulhas Vasant Bommewar Versus Maharashtra Government and others.

Collector Chandrapur, grand the lease for digging bolder and murum in village Nanduri Khu. Survey No. 53 Area 0.80 about 13.77 Ha. allotted to Shri Sudhakar Tulsiram Rohankar On Deted 12.4.2004 and 1.80 Ha. Area allotted to Smt. Nilima Sudhakar Rohankar on dated 11.4.2008.

Collector Chandrapur dismissed the above lease order on dated 7.2.2009 because this lease was granted on Zudpi jungle area, therefore, the prior permission of the Government Of India is necessary.

Lease holder submit the Petition to the Collector, Chandrapur that above lease area is under Revenue Department, that the area is not a Zudpi jungle. Therefore Collector, Chandrapur cancel the above order and again grant the lease on dated 20.6.2009

Shri Ulhas Vasant Bommewar submitted the Writ Petition No. 3669/2009 against Maharashtra Govt., Collector Chandrapur, Chief Conservator of Forest Chandrapur, and others in High court bench Nagpur. In this case reply was file on dated 13/07/2010 on behalf of Forest Department by the Divisional Forest Officer Chandrapur, thr Advocate Shri Satish R. Deshpande Nagpur.

In this case Hon'ble High court issue the order on dated 13/10/2010 and instructed to Collector Chandrapur, prepare the map through Maharashtra Remote Sensing Application Centre Nagpur. In this map show the forest land and revenue land and other category of land and disputed land as per the available Govtrnment records and submit to the High Court. Collector Chandrapur call a meeting and instructed Revenue Department and Forest Department. As per instructions of collector, Chandrapur concern Tahsildar and RFO did the combine data entry in given proforma by MRSAC for preparing the map.

As per data entry MRSAC prepared a map, but error are comes in the map. The Following general errors are in the map.

- 1) As per the Government notification said land is forest land but, did not shown forest land or disputed land in this map.
- 2) Some parcels are not show the number. and forest land showing the private land.
- 3) Revenue land showing the private land.
- 4) Some parcels of forest area are not showing particular colours in the map.
- 5) Some parcel are forest area but showing the map of private area, and revenue area.
- 6) Some Talukas map not received from MRSAC.

In this case Collector Chandrapur, call the meeting on dated 21.12.2013 and 30.12.2013 and discus about the disputed area, and instructed to both depts. Goes As per the notifications and Government records of forest land verify, and search the forest land use in non forest purpose. before and after the 1980. And this information collect in given proforma and

submitted to MRSAC. As per above instructions RFO and Tahsildar search the disputed forest area. details are as follow

Taluka	Range	Information of Disputed area		
		Total Villages	Total sur. No.	Reason of Disput
1	2	3	4	5
Rajura	Rajura	5	7	Disputed area notified under the Hyderabad state notification No.1286 dated 13.12.1939 declared the Reserved forest as Rajura forest Block. and plantation work done by forest department on this area.
	Wirur	4	17	Disputed area notified under the Hyderabad state notification No.16 dated 06.02.1347 Fasli declared the Reserved forest as Chincholi forest Block. and notification No. 49 & 278 dated 26 Abban 1354 Fasli declared the Reserved Forest Block of Garlapeth.
	Wansadi	5	221	Three survey No. of Village Sonapur are disputed. this disputed area involve in comptt. No.39 Hyderabad state notification No. 260 dated 25.09.1953 are declard as Manikgarh Reserved Forest .
218 Sur. No. of Village Hirapur, Chicholi, Nimbala, Mangi Khu, are disputed and this area comptt No. 196,197 are declared by Hyderabad state notification No. 1286 (vol 77) dated 30.12.1945 as a protected forest of Talodhi Block				
Total		4	245	
Jiwati	Jiwati	59	7433	7106 survey No. of 55 Villages are

				disputed. This disputed area involve in Hyderabad state notification No. 260 dated 25.09.1953 are declard as Manikgarh Reserved Forest
				327survey No. of 4 Villages are disputed. this disputed area transferred by Revenue Department to Forest Department on dated 30.04.1993
	Wirur	7	386	This disputed area involve in Hyderabad state notification No. 260 dated 25.09.1953 are declard as Manikgarh Reserved Foret.
	Wansadi	5	168	This disputed area involve in Hyderabad state notification No. 260 dated 25.09.1953 are declard as Manikgarh Reserved Forest
Total		71	7987	
Korpana	Wansadi	49	1127	This disputed area involve in Hyderabad state notification No. 260 dated 25.09.1953 are declard as Manikgarh Reserved Forest, and Notification No. 21 dated 04.05.1951 Reserved Forest of Asan Block, Notification No. 198 dated 22.07.1952 Reserved Forest of Pardi Block, Reserved Forest and Notification No. 1286 (vol77) Mangalhira and Talodhi Block, Notification No 274 Dated 16.11.1951 Chanai Barsa Block No 1 , Notificatio No, 11 5 Dated 08.02.1952 Irie Block, Notofication No. 345 Dated 21.12.1951 Jsitapur Block of Protected Forest .

Total		49	1127	
Gondpipri	Dhaba	--	--	
	Kothari	--	--	
Total		--	--	
Ballarshah	Ballarshah	14	43	In disputed area pattas was granted by the Revenue department. This disputed land are declared government notification No. 3056-1216 XI Dated 04.06.1955 as a protected forest .
	Kothari	1	3	
Total		15	46	
Pomburan	Ballarshah	--	--	
	Kothari	--	--	
Total		--	--	
Mul	Kothari	--	--	
Total		--	--	
Total		149	9405	

Collector, Chandrapur submitted the last affidavit in Hon'ble High Court Nagpur on dated 31.03.2015. Final order yet to be received.

SECTION-11.4 : HON'BLE HIGH COURT DECISION REGARDING WRIT PETITION NO. 3669/2009 :

Hon'ble High Court Decision Regarding Writ Petition No. 3669/2009 On dated 12.08.2015 the dispute land 33486 hectare should be treated as Forest Area. Copy of decision given in **Appendix No LXX of Volume II.**

CHAPTER XII

ECOTOURISM IN THE TRACT

SECTION: 12.1. WHY ECOTOURISM`

12.1.1. Ecotourism is new arena in forest management of the tract. The tract has enormous potential for ecotourism. The tract is rich in flora and fauna and its variation, natural water resources, distinct social and cultural groups of tribals, natural landscape etc. Keeping in view the potential resources as above, it has been contemplated to have a chapter on Ecotourism.

12.1.2. As per “Eco-Tourism in India – Policy and Guidelines, 1998”, Ministry of Tourism, Government of India: Eco-Tourism can be defined as follows: “The activities of persons traveling to and staying in places outside their usual place of residence for not more than one consecutive year for leisure, business or other purposes constitute tourism. Such visits for being close to enjoy its enormous creations, both biotic and abiotic, in most environment - friendly manner, without any adverse impact on the ecosystem, is particularly known as ecotourism.” The tract dealt with presents an ideal environment in the form of distinct vegetal covers, enchanting mountains ranges and bewitching river flows and above all unique tribal population and their distinct cultural social chores.

12.1.3. According to World Tourism Organization (WTO), “Tourism that involves traveling to relatively undisturbed natural areas with specified object of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects (both of the past or the present) found in these areas” is defined as ecotourism. Nature tourism (ecotourism) is distinguished from mass tourism or resort tourism by having a lower impact on the environment and by requiring less infrastructure development.

12.1.4. The key elements of ecotourism include a natural environment as the prime attraction, an optimum number of environment-friendly visitors, activities which do not have any serious impact on the eco system and the positive involvement of the local community in maintaining the ecological balance.

12.1.5. Forest Ecotourism is `losing` oneself in a beautiful natural forest or landscape-watching animals, birds and trees in forest.

SECTION:12.2.: ECO-TOURISM POLICY OF MAHARASHTRA GOVERNMENT

12.2.1. The Maharashtra Govt. has issued its Eco-tourism policies vide R & F. D. G.R. no. WLP 1002/pr.kr.53/F-1 dt.20/02/2008 In this policy also the main objective is to conserve the Protected Areas, like National Parks, Wildlife Sanctuaries and Tiger projects as they are the repositories of biodiversity is accepted. At the same time, it is important to improve the financial condition

of the people who are depending on these forest areas for their livelihood and who care for the conservation of these areas. These people can provide for the daily needs of such tourists and get benefited from it. Hence cardinal principle of conservation of local peoples culture without degrading the environment and promote Eco-tourism, to benefit both tourist and local has been adopted under this policy. Eco-tourism standard order given in **Appendix No. LVIX in Volume II.**

Ecotourism has been defined as, expression of local culture, study of fauna and flora in unpolluted natural areas, introduction of nature and moving in nature for enjoyment.

12.2.2 PRINCIPLES OF ECO-TOURISM: ---

1. "Small is beautiful". It should be small.
2. Appropriate from environmental, social and cultural as well as financially proper.
3. Already tested and worth adopting
4. Participation of locals.
5. It should not be degrading
6. As per tourist demand but with restriction

12.2.3 ROLE OF STAKE HOLDERS: -- Role of stake holders and forest Department has been identified in this policy. The Forest Deptt. has been entrusted with preparation of management plans without violation the provisions of, Indian Forest Act 1927, Wildlife Protection Act 1972, Forest Conservation Act 1980 and National Tiger Conservation authority (NTCA) guidelines. Every visiting tourist should go back as messenger of forest and wildlife conservation.

MAHARASHTRA ECO TOURISM PROMOTION BOARD: -- This has been solely created to promote eco tourism in the State. The board has to coordinate with all concerned Deptts and enter into MOU with Forest Deptt. The board should obtain necessary permissions and shall create necessary infrastructure outside Protected areas by itself or on BOT (build, operate, transfer) principles. The Board should coordinate with MTDC (Maharashtra Tourism Development Corporation), Private tour operators, State Govt. in creation of proper facilities for tourist in consultation with the needs of local population.

12.2.4 PROCEDURAL GUIDELINES FOR ECOTOURISM:

Detailed guidelines has been given in the policy regarding identification and development of tourist places, identification of various types of tourist, accommodation arrangement, capacity buildings of local people to get employment etc. In case of accommodation new concepts like Home stays with construction of western toilets or stay in tents has been suggested. Tribal Development Department has been entrusted with imparting Hospitality Management Training to tribal youth, to enable them in getting employment.

It is evident that the policy of state govt. is pro eco tourism and in favour of conservation of forest, wildlife, environment and local culture. However while using land for Eco-tourism relevant Hon. Supreme Court and High Court directives be taken into account.

12.2.5 The tract dealt with has potential for eco-tourism and at present an ideal environment having distinct vegetation cover, enchanting mountain ranges and bewitching river flows and above all unique tribal population and their distinct cultural and social life.

Central Chanda forests have distinct floral variation. The beautiful lofty trees, dense bamboo forests and unlimited herbs and shrubs, spiraling climbers embracing and curling the trees, chirping of jungle fowl, peacock and other birds with serene voices of animals which any body with passion to watch the nature will love to visit.

12.2.6. FOLK DANCE AND FOLK-LORE OF TRIBALS:

Tribals of this area have unique Madia dance; Banjara dance and folklore to present before the visiting guests.

SECTION-12.3: ECOTOURISM CENTERS:

Many places have been identified as eco-tourism centers in Central Chanda Division, they are as follows:

12.3.1 (1) BALLARSHA RANGE: Ballarshah Fort, Ballarshah Paper Mill.

Ballarpur/Balharshah is a city and a municipal council in Chandrapur district in the state of Maharashtra, India. Many people call this city as mini India due to large number of people from all over India. Reason behind these much diversity in people is BILT (Ballarpur Industries Ltd) which is a famous paper industry which created huge employment opportunity for people from all around in its early days. However now they have started to cut down their employee strength.

The king of Ballarpur was Balhar Sah. The town was named Balharshah after him. King Balharshah shifted his capital from Sirpur to Balharshah in middle ages. He built Balharshah fort. Afterwards he shifted his capital to Chandrapur. Even today the ruins of the old Balharshah fort can be seen on the banks of Wardha river.

Balharshah has 9 coal mines nearby owned by the public sector company WESTERN COALFIELDS LIMITED, A SUBSIDIARY OF COAL INDIA LIMITED, which gives a huge opportunity to fresh graduates for further jobs.

12.3.1 (2) BALLARSHA DEPOT: Teak logs which was The historical and famous two Teak Trees all over the World and India was exploited from Glory of Allapalli during the year 1951 and 1958 respectively. One teak tree length is 36.880 mtr. and girth is 3.408 mtrs. and second teak tree length is 38.099 mtr. and girth is 3.657 mtr. Through out world and India people are visited to see above teak trees.

There is Timber sale depot established in 1918 in the British Governed. This timber sale depot is big throughout Asai as well as throughout in India.

The purchasers from all over the India are coming for purchasing timber. This sale depot is under the administrative control with Conservator of Forest, Transport and Marketing, Ballarshah, District Chandrapur.

12.3.1 (3) RAJURA RANGE: Forest Park: In Rajura Range Comptt. No. 153 there is Forest Park developed by State Forest Department an area of 11.80 ha. is away 3 kms. from Rajura. Its around the villages i.e. Rajura, Somthana, Kapangaon, Arvi, Tulana, Chunala etc. From the above villagers around 40,000 people takes benefits of Forest Park like as Children's playing park, Van-Vihar, introducing the flora and fauna as well as forest protection and forest importance.

12.3.1 (4) RAJURA RANGE: Hanuman Mandir Jogapur,

Rajura is located at 19.78°N 79.37°E^[1] in Maharashtra, the second most populous and the third largest in area of India's 28 states. The city has an average elevation of 181 metres (593 feet). Rajura lies on the banks of the Wardha River and falls within the coal belt of Central India.

Jogapur is one of the famous place 10 km from Rajura. The famous Hanuman temple and many temples are situated nearby to the lake in Jogapur.

12.3.1 (5) WANSADI RANGE: Amalnala & Pakdigudam Dam.

(I) Pakdigudam Dam:- Pakadiguddam Dam was constructed as part of irrigation projects by Government of Maharashtra in the year 1993. Live storage capacity is 11.8 MCM. Now a days almost all the water bodies make for good picnic spots. Pakadiguddam Lake is also a popular Tourist attraction for its scenic beauty. Hilly terrain and forest adds to the natural beauty.

(II) Amal-Nalla Dam:- Amal-Nalla Dam was constructed as part of irrigation projects by Government of Maharashtra in the year 1985. It is built on and impounds Amal nallah River, Nearest city to dam is Rajura in Chandrapur District of Maharashtra. The Dam's catchment area is 8.417 Thousand Hectors. . Maximum / Gross storage capacity is 25.98 MCM. Live storage capacity is 24.48 MCM. Now a days almost all the water bodies make for good picnic spots. Amal-Nalla Lake is also a popular Tourist attraction for its scenic beauty. Hilly terrain and forest adds to the natural beauty.

(III) Vishnu Mandir.: Near to Manikgarh Fort a Old Hemadpanthi Temple of Vishnu Mandir were constructed by Gond Raja. Its distance from Chandrapur is around 60 kms. Its around the forest like; as Teak, Ain, Moha, Bija, Salai, Awala, Tendu etc. as well as various type of medicinal plants. There is habitate of wildlife. Near the temple one water Zara is alive and its called as Amar Zara.

12.3.1 (6) JIWATI RANGE : MANIKGARH FORT,

Manikgarh (also called Gadchandur) is an ancient fort in Chandrapur district, Maharashtra. It is a hill fort 507 metres above sea level built by the Naga kings in the 9th century. Currently the fort is in complete ruins and is

frequently by wild animals that live in the vicinity like panthers and bears. Several monuments of historical importance are also present in the area.

Manikgad was built by the last Mana Naga King - Gahilu. The Mana Nagas settled in this area around 9 AD century. Initially, the fort was named Manikagad after the patron deity of the Mana Nagas - Manikadevi - but later on this got shortened to Manikgad. Local legend holds that the fort was built by a Gond king named Mankyal (hence the name Manikgad). However, the lintel of the entrance gate has a Naga image carved in relic and not the Gond emblem of lion and an elephant. So this legend is not true.

The fort is built of large basalt stones and it would have been a formidable fort in its time. Rampart walls of the fort enclose a valley which has ruins of old buildings and store-houses. Outlines of some apartments are visible against the rampart walls. The southern bastion along with its supporting wall is collapsed. In the valley below lies a cannon which likely was mounted on that bastion. Unlike a cast iron cannon, this cannon made of several iron straps welded together. The gateway of the fort is still intact.

12.3.1 (7) DHABA: Kondayya Swami Mandir Dhaba,

Shri Swami Pramahansa Kondayya Maharaj temple is a beautiful shrine that was built over his Samadhi. Shri Swami Kondayya Maharaj Sansthan is a spiritual park, which is situated in a place called Dhaba, Dist. Chandrapur (Maharashtra). This place is 225 Km from Nagpur and can be reached here by Bus. For the devotees, it would be inspiring to learn about the life and deeds of 'Shri Swami Kondayya Maharaj'. Shri Swami Kondayya Maharaj born on "Magha Shuddha Trutiya, 1834" and Yog-Samadhi Nirvan on "Kartik Shuddha Trutiya, 14.11.1939".

Shri Swami Pramahansa Kondayya Maharaj is revered as one of the greatest saints ever seen in India, endowed with unprecedented powers, and is worshipped as a God incarnate. He transformed the lives of those who met him and continuously is doing so even after his Samadhi in 1939 for those whose hearts are touched by his love and who pray and call him at any emergency in life for his blessings.

Shri Kondayya Maharaj Sansthan, Dhaba, is the Administrative body of Shri Kondayya Swami Samadhi Temple and all other temples in this premises, and devoted towards development of Dhaba village. Shri Kondayya swami sansthan, Dhaba, is the authorised body to control and manage the day-to-day activities at the Shri Swami Temple.

Sansthan Trust also participates in the development of Dhaba Village. Shri Kondayya Maharaj Sansthan is established in 1939 with the divine blessing of Shree. The day & place of his Samadhi was declared by Shree well in advance with his celestial vision.

SECTION-12.4: ROLE OF FOREST DEPARTMENT:

Each Eco-center is proposed to have the following components as its integral part of the programme.

- (a) Nature interpretation and awareness centers which tell about the importance of the area, people and their culture.
- (b) Audio-visual Aids and equipments, including films and documentary related to the conservation of environment, forest, wildlife and local customs of people.
- (c) Eco-tourism camps to provide recreation, and education through organization of tracking programme, botanical tours to students of local schools and colleges.
- (d) Watch towers with binoculars, wireless handsets shall be provided.
- (e) Water sports facilities on eco-centers at water bodies

12.4.1. The villages adjoining to these centers are proposed to be taken up under eco-development program for their overall development.

12.4.2 It is also prescribed to improve the worship sites of the local people as a part of people's participation in the eco-development and allied activities.

12.4.3 Archeologically important sites identified by the Archaeological Survey of India or the State Department of Culture shall be delineated and marked on the divisional/range maps to serve as focal sites for eco-tourism.

12.4.4 Awareness generation campaign shall be taken up to involve local villagers and JFM committees in the wildlife conservation programme.

12.4.5 Eco-tourism centers should have good approach roads, transportation facilities, interpretation centers, signs, observation towers, adequate but unpretentious lodging and dinning facilities, garbage disposal facility and other utilities as per the requirement.

12.4.6. Teaching institutions viz. schools, colleges, nature and wildlife lovers shall be involved through nature interpretation camps, wildlife film shows, exhibitions, seminars competition etc.

12.4.7 The division will also provide information and interpretation services. It will be in the form of brochures, leaflets, specialized guides, and visitor information centers etc. The visitors are advised to abide by the guidelines prepared for them.

====00==

CHAPTER – XIII

BIODIVERSITY CONSERVATION

SECTION: 13.1 GENERAL CONSTITUTION OF THE WORKING CIRCLE.

13.1.1 Biodiversity encompasses variety of all life on earth. India is one of the 12 mega biodiversity countries of the world. With only 2.5 % of the land area, India already accounts for 7.8% of the recorded species of the world. India is equally rich in traditional and indigenous knowledge, both coded and informal. India is a Party to the Convention on Biological Diversity (1992).

SECTION: 13.2 THE MAIN OBJECTIVES OF THE CONVENTION ARE:

- I. Conservation of biological diversity;
- II. Sustainable use of its components;
- III. Fair and equitable sharing of benefits arising out of utilisation of genetic resources.

13.2.1 The Central Chanda Division falls under Deccan peninsula. The forests of Deccan peninsula are principally deciduous forests. This zone is relatively homogeneous and is under protection as is evident from the relatively low level of fragmentation in the forested areas. Due to the protection, the disturbance to the forested areas is relatively less. Since the forests are mainly dry deciduous dominated forests, the biological richness in the area is mostly moderate. Biodiversity conservation necessitates not only preservation of single or multiple species but also the habitat as a whole conservation of this national wealth is of paramount importance in face of increasing pressure on the plant diversity in form of land use and land cover change, invasive species, global warming, nutrient deposition and climate change.

Biodiversity is a multi-disciplinary subject involving diverse sectoral activities and actions. The stakeholders in biological diversity include the Central Government, State Governments, institutions of local self-government, scientific, and technical institutions, experts, non-governmental organizations, industry etc. One of the major challenges before India lies in adopting an instrument which helps realise the objectives of equitable sharing of benefits enshrined in the Convention on Biological Diversity.

SECTION: 13.3: THE MAIN OBJECTIVES OF BIODIVERSITY CONSERVATION ARE AS UNDER:-

- I. To regulate access to biological resources of the country with the purpose of securing equitable share in benefits arising out of the use of biological resources ; and associated knowledge relating to biological resources
- II. To conserve and sustainable use biological diversity;

- III. To respect and protect knowledge of local communities related to biodiversity ;
- IV. To secure sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating to the use of biological resources ;
- V. Conservation and development of areas important from the standpoint of biological diversity by declaring them as biological diversity heritage sites;
- VI. protection and rehabilitation of threatened species;
- VII. Involvement of institutions of self- government in the broad scheme of the implementation of the Act through constitution of committees.

SECTION: 13.4 BIODIVERSITY MANAGEMENT COMMITTEES:

13.4.1 So far, 44 Biodiversity Management Committees have been constituted in this Division. These Committees are being involved in various activities related to biodiversity conservation.

Proper documentation of biological diversity is essential for conservation planning and its sustainable use for using it sustainable for the benefit of human kind. The endangered and threatened plant species in the forests of this Division needs to be explored with the help of knowledge persons. In this regard, efforts are being made to seek the help of locally available lecturers of colleges and other learned persons in this field.

Awareness raising among people through activities like holding camps, trainings, dissemination of information through print media etc. are proposed to be undertaken during the Plan period.

====00====

CHAPTER - XIV

FOREST RIGHT ACT & COMMON FOREST RIGHT

SECTION:14.1: THE DRAFT SCHEDULED TRIBES AND OTHER TRADITIONAL FORESTS DWELLERS (RECOGNITION OF FOREST RIGHTS) RULES, 2007

14.1.1. The draft Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Rules, 2007 were published, as required by sub-section (1) of section 14 of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007) under the notification of the Government of India in the Ministry of Tribal Affairs number G.S.R.437(E), dated the 19th June, 2007 in the Gazette of India, Part II, Section 3, sub-section (i) of the same date, inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of forty-five days from the date on which the copies of the Gazette containing the said notification are made available to the public; AND WHEREAS copies of the said Gazette were made available to the public on 25.06.2007; AND WHEREAS the objections and suggestions received from the public in respect of the said draft rules have been duly considered by the Central Government. The said act is incorporated in **Appendix No. LVI** of Volume II.

14.1.2. In exercise of the powers conferred by sub-sections (1) and (2) of section 14 of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007), the Central Government hereby makes the following rules for recognizing and vesting the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers residing in such forests, namely:-

1. GRAM SABHA.- (1) The Gram Sabhas shall be convened by the Gram Panchayat and in its first meeting it shall elect from amongst its members, a committee of not less than ten but not exceeding fifteen persons as members of the Forest Rights Committee, wherein at least one-third members shall be the Scheduled Tribes: Provided that not less than one-third of such members shall be women: Provided further that where there are no Scheduled Tribes, at least one third of such members shall be women.

(2) The Forest Rights Committee shall decide on a chairperson and a secretary and intimate it to the Sub-Divisional Level Committee.

(3) When a member of the Forest Rights Committee is also a claimant of individual forest right, he shall inform the Committee and shall not participate in the verification proceedings when his claim is considered.

2. SUB-DIVISIONAL LEVEL COMMITTEE.- The State Government shall constitute Sub-Divisional Level Committee with the following members, namely:-

I. Sub-Divisional Officer or equivalent officer - Chairperson;

- II. Forest Officer in charge of a Sub-division or equivalent officer - member;
- III. three members of the Block or Tehsil level Panchayats to be nominated by the District Panchayat of whom at least two shall be the Scheduled Tribes preferably those who are forest dwellers, or who belong to the primitive tribal groups and where there are no Scheduled Tribes, two members who are preferably other traditional forest dwellers, and one shall be a woman member; or in areas covered under the Sixth Schedule to the Constitution, three members nominated by the Autonomous District Council or Regional Council or other appropriate zonal level, of whom at least one shall be a woman member; and
- IV. an officer of the Tribal Welfare Department in-charge of the Sub-division or where such officer is not available the officer in-charge of the tribal affairs.

3. DISTRICT LEVEL COMMITTEE.- The State Government shall constitute District Level Committee (DLC) with the following members, namely:-

- I. District Collector or Deputy Commissioner - Chairperson;
- II. concerned Divisional Forest Officer or concerned Deputy Conservator of Forest - member;
- III. three members of the district panchayat to be nominated by the district panchayat, of whom at least two shall be the Scheduled Tribes preferably those who are forest dwellers, or who belong to members of the primitive tribal groups, and where there are no Scheduled Tribes, two members who are preferably other traditional forest dwellers, and one shall be a woman member; or in areas covered under the Sixth Schedule to the Constitution, three members nominated by the Autonomous District Council or Regional Council of whom at least one shall be a woman member; and
- IV. an officer of the Tribal Welfare Department in-charge of the district or where such officer is not available, the officer in charge of the tribal affairs.

4. STATE LEVEL MONITORING COMMITTEE. - The State Government shall constitute a State Level Monitoring Committee with the following members, namely:-

- I. Chief Secretary - Chairperson;
- II. Secretary, Revenue Department - member;
- III. Secretary, Tribal or Social Welfare Department - member;
- IV. Secretary, Forest Department - member;
- V. Secretary, Panchayati Raj - member;
- VI. Principal Chief Conservator of Forests - member;
- VII. three Scheduled Tribes member of the Tribes Advisory Council, to be nominated by the Chairperson of the Tribes Advisory Council and where there is no Tribes Advisory Council, three Scheduled Tribes members to be nominated by the State Government;

- VIII. Commissioner, Tribal Welfare or equivalent who shall be the Member-Secretary.

SECTION 14.2. PROCEDURE FOR FILING, DETERMINATION AND VERIFICATION OF CLAIMS BY THE GRAM SABHAS

14.2.1 The Gram Sabhas shall -

- I. call for claims and authorize the Forest Rights Committee to accept the claims in the Form as provided in Annexure-I of these rules and such claims shall be made within a period of three months from the date of such calling of claims along with at least two of the evidences mentioned in rule 13, shall be made within a period of three months: Provided that the Gram Sabha may, if consider necessary, extend such period of three months after recording the reasons thereof in writing.
- II. fix a date for initiating the process of determination of its community forest resource and intimate the same to the adjoining Gram Sabhas where there are substantial overlaps, and the Sub-Divisional Level Committee.

14.2.2 The Forest Rights Committee shall assist the Gram Sabha in its functions to -

- I. receive, acknowledge and retain the claims in the specified form and evidence in support of such claims;
- II. prepare the record of claims and evidence including maps;
- III. prepare a list of claimants on forest rights;
- IV. verify claims as provided in these rules;
- V. present their findings on the nature and extent of the claim before the Gram Sabha for its consideration.

14.2.3 Every claim received shall be duly acknowledged in writing by the Forest Rights Committee.

14.2.4 The Forest Rights Committee shall also prepare the claims on behalf of Gram Sabha for community forest rights in Form B as provided in Annexure I of these Rules.

14.2.5 The Gram Sabha shall on receipt of the findings under clause (v) of sub-rule (2), meet with prior notice, to consider the findings of the Forest Rights Committee, pass appropriate resolutions, and shall forward the same to the Sub- Divisional Level Committee.

14.2.6 The Secretary of Gram Panchayat will also act as Secretary to the Gram Sabhas in discharge of its functions.

SECTION 14.3. PROCESS OF VERIFYING CLAIMS BY FOREST RIGHTS COMMITTEE.-

(1) The Forest Rights Committee shall, after due intimation to the concerned claimant and the Forest Department –

- I. visit the site and physically verify the nature and extent of the claim and evidence on the site.

- II. receive any further evidence or record from the claimant and witnesses;
- III. ensure that the claim from pastoralists and nomadic tribes for determination of their rights, which may either be through individual members, the community or traditional community institution, are verified at a time when such individuals, communities or their representatives are present;
- IV. ensure that the claim from member of a primitive tribal group or pre agricultural community for determination of their rights to habitat, which may either be through their community or traditional community institution, are verified when such communities or their representatives are present; and
- V. Prepare a map delineating the area of each claim indicating recognizable landmarks.

(2) The Forest Rights Committee shall then record its findings on the claim and present the same to the Gram Sabha for its consideration.

(3) If there are conflicting claims in respect of the traditional or customary boundaries of another village or if a forest area is used by more than one Gram Sabha, the Forest Rights Committees of the respective Gram Sabhas shall meet jointly to consider the nature of enjoyment of such claims and submit the findings to the respective Gram Sabhas in writing: Provided that if the Gram Sabhas are not able to resolve the conflicting claims, it shall be referred by the Gram Sabha to the Sub-Divisional Level Committee for its resolution.

(4) On a written request of the Gram Sabha or the Forest Rights Committee for information, records or documents, the concerned authorities shall provide an authenticated copy of the same to the Gram Sabha or Forest Rights Committee, as the case may be, and facilitate its clarification, if required, through an authorized officer .

SECTION 14.4. EVIDENCE FOR DETERMINATION OF FOREST RIGHTS.-

14.4.1. The evidence for recognition and vesting of forest rights shall, inter alia, include -

- I. public documents, Government records such as Gazetteers, Census, survey and settlement reports, maps, satellite imagery, working plans, management plans, micro-plans, forest enquiry reports, other forest records, record of rights by whatever name called, *pattas* or leases , reports of committees and commissions constituted by the Government, Government orders, notifications, circulars, resolutions;
- II. Government authorised documents such as voter identity card, ration card, passport, house tax receipts, domicile certificates;
- III. physical attributes such as house, huts and permanent improvements made to land including levelling, bunds, check dams and the like.

- IV. quasi-judicial and judicial records including court orders and judgments;
- V. research studies, documentation of customs and traditions that illustrate the enjoyment of any forest rights and having the force of customary law, by reputed institutions, such as Anthropological Survey of India;
- VI. any record including maps, record of rights, privileges, concessions, favours, from erstwhile princely States or provinces or other such intermediaries;
- VII. traditional structures establishing antiquity such as wells, burial grounds, sacred places;
- VIII. genealogy tracing ancestry to individuals mentioned in earlier land records or recognized as having been legitimate resident of the village at an earlier period of time;
- IX. statement of elders other than claimants, reduced in writing.

14.4.2. An evidence for Community Forest Rights shall, inter alia, include –

- I. community rights such as *nistar* by whatever name called;
- II. traditional grazing grounds; areas for collection of roots and tubers, fodder, wild edible fruits and other minor forest produce; fishing grounds; irrigation systems; sources of water for human or livestock use, medicinal plant collection territories of herbal practitioners;
- III. remnants of structures built by the local community, sacred trees, groves and ponds or riverine areas, burial or cremation grounds;

14.4.3. The Gram Sabha, the Sub-Divisional Level Committee and the District Level Committee shall consider more than one of the above-mentioned evidences in determining the forest rights.

SECTION 14.5. PETITIONS TO SUB-DIVISIONAL LEVEL COMMITTEE.-

(1) Any person aggrieved by the resolution of the Gram Sabha may within a period of sixty days from the date of the resolution file a petition to the Sub-Divisional Level Committee .

(2) The Sub-Divisional Level Committee shall fix a date for the hearing and intimate the petitioner and the concerned Gram Sabha in writing as well as through a notice at a convenient public place in the village of the petitioner at least fifteen days prior to the date fixed for the hearing.

(3) The Sub-Divisional Level Committee may either allow or reject or refer the petition to concerned Gram Sabha for its reconsideration.

(4) After receipt of such reference, the Gram Sabha shall meet within a period of thirty days, hear the petitioner, pass a resolution on that reference and forward the same to the Sub-Divisional Level Committee.

(5) The Sub-Divisional Level Committee shall consider the resolution of the Gram Sabha and pass appropriate orders, either accepting or rejecting the petition.

(6) Without prejudice to the pending petitions, Sub-Divisional Level Committee shall examine and collate the records of forest rights of the other

claimants and submit the same through the concerned Sub-Divisional Officer to the District Level Committee.

(7) In case of a dispute between two or more Gram Sabhas and on an application of any of the Gram Sabhas or the Sub-Divisional Level Committee on its own, shall call for a joint meeting of the concerned Gram Sabhas with a view to resolving the dispute and if no mutually agreed solution can be reached within a period of thirty days, the Sub-Divisional Level Committee shall decide the dispute after hearing the concerned Gram Sabhas and pass appropriate orders.

SECTION 14.6. PETITION TO DISTRICT LEVEL COMMITTEE.-

(1) Any person aggrieved by the decision of the Sub-Divisional Level Committee may within a period of sixty days from the date of the decision of the Sub-Divisional Level Committee file a petition to the District Level Committee.

(2) The District Level Committee shall fix a date for the hearing and intimate the petitioner and the concerned Sub-Divisional Level Committee in writing as well as through a notice at a convenient public place in the village of the petitioner at least fifteen days prior to the date fixed for the hearing.

(3) The District Level Committee may either allow or reject or refer the petition to concerned Sub-Divisional Level Committee for its reconsideration.

(4) After receipt of such reference, the Sub-Divisional Level Committee shall hear the petitioner and the Gram Sabha and take a decision on that reference and intimate the same to the District Level Committee.

(5) The District Level Committee shall then consider the petition and pass appropriate orders, either accepting or rejecting the petition.

(6) The District Level Committee shall send the record of forest rights of the claimant or claimants to the District Collector or District Commissioner for necessary correction in the records of the Government.

(7) In case there is a discrepancy between orders of two or more Sub-Divisional Level Committees, the District Level Committee on its own, shall call for a joint meeting of the concerned Sub-Divisional Level Committees with a view to reconcile the differences and if no mutually agreed solution can be reached, the District Level Committee shall adjudicate the dispute after hearing the concerned Sub-Divisional Level Committees and pass appropriate orders.

14.6.1 The District Level Committee (DLC) Chandrapur in August 2015 has finally approved 2948.703 ha. forest area for individual claims under section 3(1) of Forest Rights Act, 2006.

Trible		Non Trible		Total	
No. of cases	Area in Ha.	No. of cases	Area in Ha.	No. of cases	Area in Ha
1859	2948.703	-	-	1859	2948.703

14.6.2. Cases under “Forest Rights Act 2006” are under process for finalization. After completion of demarcation by TILR actual fixation of

boundary by erecting pillars has to be carried out and the area should be transferred on village and forest maps.

14.6.3. The cases of encroachment not regularized under “Right to Forest Act 2006” should summarily be removed.

14.6.4 THE SCHEDULED TRIBES AND OTHER TRADITIONAL FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS) ACT, 2006 SECTION 3(1) COMMUNITY FOREST RIGHT.

As per Nistar Rights the Gramsabha Panchgaon Ta. Gondpipari was submitted Community Forest Rights claim for collect & disposal of minor forest produce. on 1006.416 ha. Protected forest area of comptt.no. 534,535,536,& 537. The District level Committee meeting held on dt. 25.04.2012 and sanctioned the above community forest right

14.6.5 STATEMENT SHOWING THE FOREST AREA APPROVED BY DY.C.F. FOR DIRVERSION OF BASIC AMIENTITIES U/S 3 (2) OF F R A- 2006.

Sr. No.	Name of Project	Range	Village Name	Location Comptt.No	Area in ha.	Dy. C.F. Central Chanda Sanction Letter No. & Date
1	Construction of Drinking Water Supply & Water Pipeline at Vishnu Mandir	Jiwati	Nagralla	Comptt. No. 26, 33	0.1517	Letter No. Desk-12/Sur/ Land/3369 dt. 05.02.2010.
2	Construction of Drinking Water Well at Pataguda (Jankapur)	Jiwati	Pataguda (Jankapur)	Comptt. No. 57	0.0225	Letter No. Desk-12/Sur/ Land/3932 dt. 19.03.2010.
3	Construction of Cement Bandhara of Irrigation Purpose at Pombhurna	Kothari	pombhurna	Comptt. No. 94	0.900	Letter No. Desk-12/Sur/ Land/3997 dt. 25.03.2010.
4	Construction of Govt. Dispensary at Kalamana	Ballarshah	Kalmana	Sur. No. 55 Comptt. No. 571AC	1.00	Letter No. Desk-12/Sur/ Land/288 dt. 30.04.2010.
5	33 KV Trans. Line Korpana to Pardi	Wansadi	Korpana to Pardi	Comptt. No.189,182	0.760	Letter No. Desk-12/Sur/ Land/502 dt. 28.05.2010.
6	Construction of Ghatrai Devi Road.	Wansadi	..	Comptt. No. 8	0.750	Letter No. Desk-12/Sur/ Land/577 dt. 23.06.2010.
7	Construction of Community Centre at Jogapur	Rajura	Jogapur	Comptt. No. 176	0.280	Letter No. Desk-12/Sur/ Land/627 dt. 30.06.2010.
8	Construction of Community Centre at Ghatrai Devi	Wansadi	Hatloni	Comptt. No. 8	0.010	Letter No. Desk-12/Sur/ Land/3095 dt. 18.03.2011.
9	Construction of I.T.I Building at Jiwati	Jiwati	Jiwati	Comptt. No. 83	1.00	Letter No. Desk-12/Sur/ Land/1468 dt. 06.09.2011.
10	Construction of Minor Irrigation Canal for Manora Tank to Itoli	Ballarshah	Itoli	Comptt. No.451,521	0.968	Letter No. Desk-Sur/2231 dt. 05.12.2013.
11	Construction of Road at Manikgarh Fort.	Jiwati	Jiwati	Comptt. No. 26	0.240	Letter No. Desk-Sur/407 dt. 19.05.2014.
Total					6.0822	

===00===

CHAPTER XV

FOREST PROTECTION IN THE TRACT

SECTION: 15.1: NEED FOR FOREST PROTECTION:

15.1.1. GENERAL CONSTITUTION: Preparation of a working plan and all its' prescriptions will be proved to be a futile exercise, if the forest resources, like any other precious treasures, are not provided with an appropriate and effective protection from the factors injurious to them. Therefore, forests are to be protected from factors like fire, grazing, illicit cutting and encroachments etc. Considering the importance and gravity of this problem, the National Working Plan Code 2004, prescribes this ' the mandatory Working Circles ' for the Forest Protection Working Circle ' in all the Working Plans.

15.1.2. The forests are burdened with heavy biotic interferences; hence addressing these problems in a systematic manner necessitated the constitution of this Chapter. Illicit felling, Grazing, Fire, Encroachments and Poaching are the major causes for the damage of the forests.

SECTION: 15.2: SPECIAL OBJECTIVES OF MANAGEMENT:

15.2.1. THE SPECIAL OBJECTIVES OF MANAGEMENT ARE:

- i) To enforce the Indian Forest Act 1927, Wildlife (Protection) Act 1972 and Forest (Conservation) Act, 1980, for effective control of Illicit felling, grazing, encroachments, poaching, fires and diversion of any forest land for non-forestry purpose.
- ii) To develop a database to monitor various forest and wildlife offence cases in a systematic manner.
- iii) To motivate and sensitise the staff and to strengthen their hands and capabilities so that they face the challenges and threats from organized groups of offenders.
- iv) To equip and train the staff to meet the field challenges, including their own protection, while discharging their duties.

15.2.2. ILLICIT FELLING: Illicit fellings are done either by

- i) Commercial wood smugglers to feed the demand of urban market and
- ii) Local people to meet their house hold requirements of timber and firewood.
- iii) Supply of timber and fire wood to the nearby towns by the local people as Head loads.

15.2.3. Illicit felling in the forest area is growing at an alarming rate. To deal with the offenders of illicit felling with the help of better communication system, the forest department is going to installed wireless communication system in Central Chanda Dn. Various wireless stations have been established

in the Division for this purpose. Range wise details of existing wireless stations are given below:

TABLE :
RANGE WISE LOCATION OF WIRELESS STATIONS.

Name of Range	Location of Wireless Stations
Jioti	Jioti, Shengaon, Patan, Bhari, Wani
Wansadi	Pardi, Gadchandur, Parsoda Naka, Sawalhira, Pakadigudam
Wirur	Siddheshwar, Koshtala, Annur-Naka, Dewada, Antargaon (Bapunagar)
Kothari	Kothari, Pombhurna, Ghosari, Karanji
Dhaba	Gondpipri, Wamanpalli, Dongargaon,
Ballarshah	Ballarshah, Manora, Umari, Kalamgaon –Depot
Rajura	Girgaon, Khambala

15.2.4. To check the illicit felling in the forest it is necessary that the forest produce are not transported without transit permit, as the transit permit is the most powerful tool for controlling the illegal harvest and transport of any forest produce. To have a control on transport of the forest produce, check posts have also been established in the Division. They are **located at Bamni and Lakkatkat on Stateway.**

Regular patrolling in the sensitive areas, faster communication including Motor vehicles facilities, adequate self protection capabilities, frequent training and establishment of forest stations at strategic places are recommended to control illicit felling and transport of wood. Establishing intelligence network, with the help of Forest Protection Committees, for this purpose is strongly recommended.

15.2.5. In addition, to address supply-side management by augmenting wood production on forest and other community land, the demand-side management should be taken up like 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:

- i) Rapport establishment with the local villagers through JFM and other development schemes

- ii) The Forest Department shall try to meet the bonafide needs of wood of the local population from the regular coupe working, including thinning and cleaning.
- iii) Employment through forestry works shall be generated in the remote villages where there is no other job opportunity so that the economically weak population is not get involve in illicit felling for big smugglers.
- iv) An intelligence network will be very useful in preventing any offence
- v) The forest field staff shall stay at their respective headquarters.
- vi) Regular patrolling shall be done in the sensitive areas and a squad of 6 to 10 persons, as per requirement, can be made for this purpose.

Besides this, the following measures are also recommended:

- I. Review of beat wise offence cases, every month.
- II. Review the VARAS, BEVARAS offence cases monthly; efforts are made to find out the offenders in each bevaras case.
- III. Every VARAS case having more than Rs.10,000/- worth forest produce/loss to the forest invariably is submitted to the court within the prescribed time.
- IV. Complaints should be filed in the courts without any delay.
- V. IPC sections may be used for offences where the IFA is not applicable
- VI. To properly monitor the forest offences, a modern data compilation and analysis system, with suitable software, should be developed at Range, Division and Circle levels.
- VII. Wireless, phone or internet systems shall be used for fast communication.
- VIII. Use the provisions of rewards for gathering of information through intelligence.
- IX. The staff should be given regular exposure regarding all the legal aspects of handling the offence cases.
- X. Suitable staff should be posted at suitable places
- XI. History sheets of all the offenders along with their photo and bio-data are maintained at Round Level, Range and Division Level.
- XII. Prepare the list of offenders, showing the offence cases involved by him, against the each offender.
- XIII. The provisions of the G.R. dated 8/5/2003 & dated 13/8/2014 shall be implemented. If any difficulties are there be communicated to the Govt. with supporting data.
- XIV. Sufficient funds for protection related works should be made available in time.
- XV. Beat checking should be carried out as per the standing orders.

- XVI. 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 the number is 198/05, means 198 is tree no. and 05 is the year.
- XVII. Every year from January 1, onwards start the new series.
- XVIII. 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.
- XIX. Every Range and Division office shall maintain the Xerox copies of the judgments of all forest cases for the guidance and improvement purposes.
- XX. Inter state co-ordination meetings with the authorities of A.P. Govt. shall be made, to arrest and prosecute the offenders of A.P who are involved in the offences of Maharashtra state.
- XXI. The RFO shall collect the monthly beat khairiyat report from each forest guard and Round officer and shall submit Range khairiyat report to the DCF in the first week of every month
- XXII. All cases of violation of the Forest Conservation Act, 1980 shall be referred to the Nodal Officer for necessary legal and administrative actions

15.2.6. SPECIAL PROTECTION CAMPS: - As the tract does not have major threat for illicit felling, no special efforts are essential. Existing Mobile Squad will be strengthening to check any illegal activities in time.

15.2.7. SPECIAL CHECK POSTS/NAKAS. State Highway is passing through the tract joining two States namely Maharashtra and Andhra Pradesh. State Highway links the tract with other part of Maharashtra. To have proper check on transit of forest produces through the tract it hereby proposed to erect check posts at strategic places. These check post must be duly notified by the competent authorities and published for the benefit of public and other law enforcing authorities. The strategic points identified are:

Sr No.	Place	Range	Site
1	Bamni	Ballarshah	On State Highway
2	Lakkadkot	Wirur	On State Highway

These check posts should be manned by Forest Guards and Van Majoors in rotations to have effective control.

15.2.8. PROVISION OF MOBILE PHONE TO EACH TERRITORIAL STAFF:

Each Territorial staff including Forest guards, Foresters, Range Officers, Assistant Conservator of Forests, and Deputy Conservator of forest

should be provided with efficient mobile phone hand set and services to have effective communication in forest protection.

15.2.9. PROVISION OF MOBILITY FACILITIES TO EACH TERRITORIAL STAFF: Each forest guard should be at least provided with Motor Cycle to traverse his Beat. Similarly forester will be given Motor Cycle. Range Forest Officer and higher Officer should be given Jeep/Car to have effective control over protection, conservation and just utilization of forest resources.

15.2.10. Not only that the Government will provide above facilities, the forest personnel will have to work in tandem to existing laws, rules and statutory orders issued by the competent authorities from time to time.

SECTION: 15.3. STANDARD PROVIDED FOR PROTECTION OF FORESTS

15.3.1. The Government of Maharashtra vide its G.R. No TRS-06/2001/C.N. 209/F-6 Mantralaya, Mumbai, dated 8/5/2003 and G.R. No TRS-04/2014/C.N. 72/F-6 Mantralaya, Mumbai, dated 13/8/2014 has given detailed standards to deal with Forest Protection and dealing with Forest Offences. The said G.R. dated 13.8.2014 is incorporated in **Appendix No. LXI** of Volume II.

15.3.2. CLASSIFICATION OF BEATS: Beats will be classified as hypersensitive, sensitive or normal beats on the following basis by Dy. Conservator of forests (Territorial)/Chief Conservator of forests (Territorial) for three years. It may be review after that.

Sr No	Annual Standard	Normal Beat	Sensitive Beat	Hypersensitive Beat
1	Illicit tree felling: a. No of trees Teak Non Teak b. Value of trees c. No of offences.	Less than 25 trees Less than 100 trees Less than Rs 1 lakh Less than 15	25-50 100-200 Rs 1 – 2 lakh 15-25	More than 50 More than 200 More than Rs 2 lakh More than 25
2	Forest fire: Extent of area	Less than 25%	25% - 50%	More than 50%
3	Illegal grazing	Less than 3	3 – 5	More than 5
4	Illegal hunting	Beat in which illegal hunting occurs will be treated as hypersensitive.		

15.3.3. Beat Checking: The primary responsibility of forest protection revolves on the protective staffs, which generally detect and report the offences. Following norms have been fixed for Beat Checking.

15.3.4. Range Forest Officer: Range Forest Officer will inspect at least one Beat and send its report to his Deputy conservator of Forests.

15.3.5. Deputy Conservator of Forests: He will set the annual target and schedule of Beat Checking for his Subordinate staff.

15.3.6. Assistant Conservator of forests and Deputy Conservator of forests will do sample Beat checking to confirm the work of Beat Checking done by subordinate staff whether they have inspected Beats properly and taken note of cognizance of offences properly or not.

15.3.7. Saw Mill Inspection: standard for Saw Mill inspection is as follows

Sr No	Designation of post	Standard of Saw mill inspection
1	Range Forest Officer	Minimum 8 per month. If no of saw mill is less than 12, all saw mill will be inspected in each month.
2	Asstt. C.F.	Minimum 4 saw mill per month.
3	Dy. C.F.	Minimum 2 saw mill per month.
4	C.C.F. (T)	Subject to condition whenever required.

15.3.8. Tour of tract: standard for touring is as follows.

Sr No	Designation of post	Norms of tour
1	Range Forest Officer	Minimum 210 days per annum.
2	Asstt. C.F.	Minimum 180 days per annum.
3	Dy. C.F.	Minimum 150 days per annum.
4	D.F.O. Vigilance	Minimum 120 days per annum.
5	C.C.F. (Territorial)	Minimum 120 days per annum.

Out of total touring days, Officers are expected to stay in forests in nights for 75% days.

15.3.9. Beat Khairiat Report: Forest Guard of Beat will keep with him the Beat Khairiat register. He will keep the records of daily illicit felling or other offences in that register. He will submit Beat Khairiat Report to his RFO by each 5th day of month. RFO will submit the consolidated Beat Khairiat report of his Range to DCF by 10th day of month.

15.3.10. Investigation of offences: Officers/staff responsible for protection of forests are responsible to book the offences as well as to have measures to control such happening not to crop up in future. Also it is expected to report such offences to Government from time to time within stipulated time frame work. The following time schedule has been prescribed for inspection of illicit cutting area by the respective officers:

Sr No	In situ value of illicit cutting at a place	Designation of the Inspecting Officer	Period within which inspection should be completed
1	2	3	4
1	Upto Rs 50,000	RFO	3 days from detection/receipt of

			intimation of detection.
2	Above Rs 50,000 but not exceeding Rs 2,00,000	ACF/Sub-DFO	3 days from the receipt of information.
3	Above Rs 2,00,000 but not exceeding Rs 5,00,000	DY. CF/ DFO/Sub-DFO	3 days from the receipt of information.
4	Above Rs 5,00,000	CCF(Territorial)	7 days from the receipt of information.

(The value of illicit felling is for one fortnight for a Beat)

15.3.11. Registering of forest offences: Preliminary Offence Register book will have 4 copies each for an offence booked. First copy will be sent to D.C.F. directly. Second copy will be sent to R.F.O. directly. Third copy will be sent to Round Officer. Fourth copy will be retained by Beat Forest Guard as an office copy.

15.3.12. Office Inspection: To have effective control over smooth working of offices, reporting of offences, Beat checking, regular report compliances, regular inspection of offices by superior officers are essential. Standard set for office inspection is as follows.

Sr No	Name of office	Inspecting Officer and Norms
1	Round Office	A.C.F. will inspect once in 3 months.
2	Range Office	A.C.F. In charge will inspect once in a year. D.C.F. will inspect 3 RFO offices in a year. C.C.F. (Territorial) will inspect one RFO office of each division in a year.
3	Divisional Office	C.C.F. (Territorial) will inspect two Division offices of his circle in a year.

15.3.13. Offences to be reported to Judicial Court: Forest offence involving value of forest produce more than Rs 10,000 will be booked in Court of Law. The offence in which habitual offender and/or motor vehicle is involved will be invariably booked in Court of Law irrespective of value involved.

15.3.14. Offences to be handled by staff or officer:

Sr No	Designation	Norms of Investigation
1	Round Officer	Offence involving value of forest produces upto Rs. 10,000.
2	Range Forest Office	Offence involving value of forest produces to the tune of Rs. 10,000. – Rs. 25,000.
3	A.C.F.	Offence involving value of forest produce more than Rs. 25,000 and offences related to Saw Mill, Mechanized vehicles and Wildlife.

SECTION-15.4. TRANSIT RULES FOR FOREST PRODUCES

15.4.1. The transit of forest produce is regulated as per the Bombay Transit of Forest Produce Rules, 1960, which were published by the Agriculture and Forest Department under NoIFA-1057/22947-(VI)-J, dated April 23, 1960.

15.4.2. The Government of Maharashtra vide Notification No TRS/1083/91822 (ii) CR-87/F-6; dated May 13, 1985 has amended Section 61 of Indian Forest Act, 1927 making the law more stringent. It has authorized certain officers, Assistant Conservator of Forests and above, to be called as authorized officer for the purpose of this Act, who are competent to confiscate the vehicle, instruments, forest produces etc involved in forest offence related to the illicit removal of notified forest produces.

15.4.3: To facilitate the issuing of passes, the Government vide TRS/1089/PK-267/89/F-6, dated May 14, 1990 has stated that the decision regarding the issue of passes, to an applicant should be taken within 45 days of the submission.

SECTION: 15.5: FIRE PROTECTION:

15.5.1. The forests are valuable and need careful fire protection over the entire area. Due to fire a considerable damage is caused to the timber besides causing long range effects on the soil fertility, young crops and regeneration. The special and determined efforts are needed to enforce the proper fire discipline. For the purpose of fire protection the areas are classified as follows.

15.5..2. CLASS I. FORESTS COMPLETELY PROTECTED.

This class includes:

- I. All plantations.
- II. All forests of Protection Working Circle and all main felling and thinning coupes of Selection cum Improvement Working Circle, Teak Plantation Working Circle and Improvement Working Circle.
- III. All regenerated coupes of all working circles till; the young crop has attained an age of 10 years.
- IV. All Government Timber Depots.
- V. Any other areas of special importance ordered by the Conservator of Forests.

15.5.3. All areas in this class will be isolated by means of fire lines and cut guidelines. They will be patrolled by fire watchers. Any fire incidence in these areas will be a calamity. It must be reported to Deputy Conservator of Forests Central Chanda Dn. in writing giving the details of area burnt and the various types of losses occurred to the forest crop.

15.5.4. CLASS II: FORESTS GENERALLY PROTECTED. This class includes:

- I. The remaining areas of Improvement Working Circle and Selection-cum-Improvement Working Circle.
- II. Such other areas as the Chief Conservator of Forests, Chandrapur Forest Circle may for special reasons direct.

- III. All areas in this class will be isolated from the surrounding country by means of external fire lines and will be divided into convenient blocks of interior fire lines. No guidelines will be cut.
- IV. Fire watchers may be engaged for patrolling in this area if sanctioned by the Chief Conservator of Forests.

15.5.5. CLASS III: FORESTS PROTECTED BY LAW ONLY. All other forests not included in the above two classes, are included in this class. In forest of this class deliberate burning is prohibited but no special measures of protection will be undertaken.

15.5.6. The following lines will be maintained as fire lines and will be kept clear of all growth and kept clean of combustible material during the fire season:

- I. All external Reserve Forest boundary lines to a width of 12 meters.
 - II. 6 meter wide lines around all plantations up to 10 years from the year of planting.
 - III. 3 meter wide coupe lines which form the boundary between class I areas and areas of class II and III for period of 10 years from the year of main felling.
 - IV. Compartment boundaries, Inter State boundaries, Inter Division boundaries and Inter Range boundaries of standard widths.
 - V. 6 meter wide line on both sides of all roads and Cart tracks passing through the forests.
 - VI. 40 meter wide line on all sides of the timber, bamboo and fire wood depots.
- 15.5.7.** To reduce the possibility of forest fires following should be observed
- I. The cutting and cleaning of fire lines should be completed by the end of December and burning should be completed before the end of February.
 - II. Dry leaves and other dry material on fire lines must be collected from time to time and deposited along the edge of the fire lines and burnt before the fire season starts. But the burning of such material on the fire lines after the hot weather has commenced, is strictly prohibited.
 - III. Except with the express order of the Deputy Conservator of Forests Central Chandra Division, no fire lines shall be burnt after the end of February. If such permission is granted, the burning should be done in the presence of the RFO at his risk and cost.

15.5.8. LEGAL PROVISIONS AVAILABLE. Under the relevant sections of Indian Forest Act, 1927 and rules framed under it, forest fire can be controlled effectively.

STEPS TO BE TAKEN TO CONTROL FIRE

15.5.9. CUTTING AND BURNING OF FIRE LINES. The cutting of the lines will be completed by the end of December and burning will be completed before the end of February. Dry leaves and other dry material on fire lines will be collected from time to time and deposited along the edge of fire lines

and burnt before the fire season starts. Except with the express permission of the Deputy Conservator of Forests Central Chandra Division no fire lines will be burnt after the end of February. If such permission is granted, the burning should be done in the presence of the Range Forest Officer concerned. If possible, modern fire fighting tools will be used for extinguishing the fire.

15.5.10. FIRE WATCHERS

- I. The fire watchers will constantly patrol the fire lines in the areas assigned to them. They should keep them entirely free from the inflammable material and prevent the carrying and kindling of fire in the forest area. As soon as a forest fire occurs he should inform the concerned Beat Guard and assist him in procuring the manpower from the nearby areas and also help in extinguishing the fire. The fire watchers should not leave their areas. The watch towers will be constructed at such elevated points from where the fires even at distant places can be easily detected.
- II. The persons involved in lighting of fires are mostly local villagers only. Therefore, it is very much essential to have an open dialogue with villagers and they should be made aware of the disastrous effect of forest fire. Repeated dialogue and persuasion can be of great help in solving the problem. Solution will be asked from them only. After doing all these things, areas vulnerable to fire will be identified around each village and for that area a gang of fire watchers of that village will be employed under Joint Forest Management. Who will have the sole responsibility of the fire protection of that area? If the village is big then a list of fire watchers will be prepared after taking meeting of villagers and having dialogue with them and rotational employment of fire watchers will be thought of. The money meant for fire protection will be directly given to Joint Forest Management Committee and that amount will be paid to fire watcher employed by that Joint Forest Management Committee.
- III. Before the fire season starts, a scheme will be prepared in which the strategic locations will be marked on a map at which gang of fire watchers of 5 to 10 will be kept, who will supervise the area around that point and can reach the spot where fire is noticed. Daily reports from the fire watchers should be called for.
- IV. The staff associated with the fire protection work will monitor the working of fire watchers and will coordinate the working of different gangs located at different points.
- V. The available vehicles will be deployed at strategic locations which can be approached by any gang, in case of help required by them. These vehicles will help in transport of fire fighting Labourers, water and other equipment required for fire fighting.
- VI. The regeneration area of Selection cum Improvement Working Circle, Teak Plantation Working Circle, and Improvement Working Circles will require special efforts. For this, the area will be divided into section.

For each section, special efforts will be taken to protect the area from fire and grazing.

15.5.11. WHEN FOREST FIRE IS REPORTED.

15.5.11. As soon as the smoke is seen rising anywhere in or near the forest, by any Range Forest Officer or Forester or Forest Guard, he shall at once collect such aid as is immediately available and proceed in person to the spot to extinguish forest fire. If the fire is out-side his own Range, Round or Beat, he will continue there till the fire is extinguished and the concerned RFO or Forester or Forest Guard arrives on the spot. This rule will apply to all the three classes of the forests.

The utmost care should be taken to extinguish the fires and to quench the smoldering material absolutely. Filling earth over such material will be found every effective. No official shall leave the burnt locality till the senior forest officer present on the spot has ascertained and satisfied himself that no smoldering material remains. All men assisting in extinguishing fires in Government forest shall be paid according to the amount of assistance rendered.

15.5.12. USE OF WIRELESS : Though the area is infested with naxalism and use of wire less system is not going to be tolerated by the anti social element, a welfare state demand is that one should not be afraid of such element. A scheme will be prepared for establishing the wireless network in the whole division so that the communication becomes easier and faster. This will help not only in the fire protection works but will also be helpful in overall protection of the forest.

15.5.13. RESPONSIBILITY

1. The Range Forest Officer will be held personally responsible for the efficient fire protection in his range.
2. Where the forests of two ranges which are to be fire protected adjoin, the responsibility for efficient protection and clearing of common fire line will rest with one of the Range Forest Officer to be selected by the Deputy Conservator of Forests, Central Chanda Forests Division.
3. In cases of common boundary between two divisions of the same circle, the above responsibility will be fixed by the Chief Conservator of Forest on one of the Range Forest Officer. In cases of the common boundary between Chandrapur Forest Division which are of the same Chandrapur Forest Circle, Chief Conservator of Forests(T), Chandrapur will fix the responsibility on one of the Range Forest Officer concerned.
4. The Deputy Conservator of Forests Central Chanda Forests Division will be held personally responsible for carrying out efficiently all protective and prohibitive measures (as envisaged under various acts

and rules and regulations made there under) in the areas of his division.

5. Deputy Conservator of Forests Central Chanda Forests Division must satisfy himself that the exterior fire lines and other fire lines have been properly cleared and burnt thoroughly before the end of February. He must carry out inspections inquire about the implementation for the various prohibitory orders and ensure that sufficient protective staff is available to implement these orders. He must take frequent visits to the areas where the incidences of fire are common.
6. The Deputy Conservator of Forests Central Chanda Forests Division must, during his tour satisfy himself by constant enquiries and inspections that no fires in forest areas anywhere have gone unreported, and that the areas of reported fires have been accurately estimated. These checks require extensive and thorough personal inspection by him. A strict watch should be kept on the tendu leave contractors and their agents who engage the local people to put fire to the forest floor in order to get a good flush of tendu leaves. These fires are generally made between 1st of March and 15th of April each year.

15.5.14. FIRE REPORTS

1. The Range Forest Officer shall report the outbreak of a fire in his area to the Deputy Conservator of Forests Central Chanda Division at once. Special messenger should be used if the fire extends over a large area. The Range Forest Officer must maintain a proper communication and coordination between outbreak of fire by him and further transmitting it to the Deputy Conservator of Forests Central Chandra Forests Division. After the fire is extinguished a detailed final report covering the area burnt and other details along with a sketch map should be submitted by the Range Forest Officer to the Deputy Conservator of Forests, Central Chanda Forests Division within 15 days after thorough inspection of the burnt area by himself.
2. Deputy Conservator of Forests Central Chanda Forests Division will submit monthly return (in prescribed preformed Form No IX-74) to the Conservator of Forests showing therein the serial number of fire, date of occurrence, cause, area burnt, extent of damage and measures taken to extinguish fire. This report will cover:-
 - I. All fires in class I areas.
 - II. All fires that have occurred in class II areas after the date given for completion for the line burning works prescribed in the previous paragraphs.
 - III. All fires that have occurred in class II areas before the date fixed for completion of line burning works. All records of fires will be shown on maps of scale 1": 2 mile and the record of fire will be filled in the concerned compartment history and the map will be

attached to it. This work will be done both at the level of RFO and Deputy Conservator of Forests.

3. A fire record will be maintained in the Deputy Conservator of Forests Central Chanda Forests Division office showing name and the length of fire lines burnt with costs. All fire lines burnt and areas especially Protected shall be indicated on the map. Incidence of fires in class I, II and III areas in each range will be serially numbered in chronological order and the details of areas burnt will be shown on the map.
4. Areas deliberately burnt for silvicultural reasons e.g. to destroy felling debris or to stimulate reproduction, will be excluded from the schemes of fire protection. Such fires will not be reported unless they spread into a protected area. Deliberate burning is only permissible if prescribed in the working plan or sanctioned by the Chief Conservator of Forest. The steps to cut back the badly damaged young regeneration in the naturally and artificially regenerated areas due to fires, should be under taken by the Range Forest Officer in consultation with the Deputy Conservator of Forests Central Chanda Division.
5. Financial loss due to fire will be communicated to the Accountant General as per Control Form.

Standard Widths of Various Types of Fire Lines:

Sl. 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

SECTION: 15.6 GRAZING CONTROL

15.6.1. The entire forests are liable to damage from grazing including grazing by goats, except the interior areas, which are away from the villages. 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.

15.6.2. The grazing incidence figures are much heavier than estimated. Damage caused by uncontrolled grazing is heavy due to large cattle population. The grazing incidence, as prescribed in the grazing policy of 1968 of Govt. of Maharashtra, is not followed. The Cattle of the erstwhile forest

villages are also grazing in the immediate vicinity of the villages. The true grazing incidence in the areas adjoining the villages is therefore, very detrimental to the forest conservation. Moreover, the Protected Forests have Nistar rights for grazing and they have so far not been worked under any scientific forest management. Due to this the protected forests are more vulnerable to heavy grazing. Even large number of goats is also seen grazing in the forest. Continuous and heavy incidence of grazing, not only prevents regeneration of tree species, but also the plantations and young regeneration obtained during the period of closure is lost soon after the areas are open to grazing. In fact the closure of forest areas are only on paper, in reality grazing is carried out in all areas including the current coupes and plantations.

Areas with clayey soil, the trampling by cattle results in compaction, change in structure of the soil and reduction in soil aeration. In sandy soils heavy grazing results in accelerated erosion and denudation. Due to over grazing the wild animals also suffer due to scarcity of fodder in the forest.

Grazing by sheep and goat is highly damaging to the flora as well as for the soil. These animals not only browse the foliage of plants and grasses but also uproot and eat away the roots and rhizomes of the grasses as well as the bark of the young plants, leading to exposure of the soil and drying of saplings. Due to the structure of the hoof of sheep and goats, the pressure exerted on the soil due to their body weight is very high which leads to the compaction of the surface soil. Once the soil becomes compact, it becomes very difficult for the wild seeds to germinate during the rainy season.

15.6.3 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 November 3, 1973. However no grazing beyond carrying capacity shall be permitted.

15.6.4. Heavy cattle pressure adversely affects the forest regeneration and soil condition. The present political economy of domestic animals in the area throws up strong challenge, and implementation of the Grazing Regulations in its current form. Therefore special efforts need to be taken up to ensure that no grazing is allowed beyond carrying capacity.

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

15.6.6. Maximum admissible grazing incidence according to the current policy has been shown for various working circles in the following table.

Admissible Grazing Incidence in Various Working Circles:

Working Circle	Functional Classification	Maximum Grazing incidence (ha/Cattle unit)	Period

Special Areas(overlapping)			
Protection areas (A1 & A2) & Special habitat areas	Protection forest	Nil	Permanent
Flowered Bamboo area	Protection forest	Nil	Till seventh year
Annual coupes	Protection forest	Nil	Till six years
Plantations	Protection forest	Nil	Till fifth year
Other Area (under Working Circles)			
Selection-cum-Improvement	Tree forest	1.2	
Improvement	Minor forest	0.8	
Afforestation	Open forest	0.8	Except plantations
Fodder & Afforestation	Minor forest	0.8	Except plantations

❖ *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.*

15.6.7. 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.

15.6.8. 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.

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

15.6.10. 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.

15.6.11. 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.

15.6.12. All forest officers while visiting the forest areas should check the grazing pass if any cattle found grazing in the forest. Stringent action should be taken if any person found his cattle illegally grazing in the forest. The passes shall show the compartment numbers meant for the grazing by writing clearly.

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

15.6.14. 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.

15.6.15. Recently the Govt. of Maharashtra vide it's G.R No.MFP-2103/Case No.135/F-1. dated 29.10.2007 has granted permission for grazing of sheeps in the forest area including Central Chanda Division. The illegal grazing by goats and sheep is already in practice and if it goes uncontrolled it will lead to heavy degradation of forest leading to severe scarcity of fodder in the forests. The degradation of forest will not only limited to the flora and fauna but it will degrade the land itself, as the single biotic factor contributing to the desertification is the uncontrolled grazing in general and grazing by herds of sheep and goats in particular.

SECTION: 15.7. ROLE OF JFM

15.7.1. Joint Forest Management committees will be used as a tool in controlling in illicit felling of trees, encroachment, fire control measures and grazing control. With constant dialogue wit JFM committees for importance of protection of forest from illicit felling, encroachment, fire and unauthorized grazing, the committee member will be allocated forest lines and area for protection of those to be carried out. The committees will be given the amount ear marked for fire protection after successful protection of the same. In such way JFM will get employment as well good will of forest department and above all the purpose of protection of forests from fire is met out. Effective involvement of people will generate environment for protection of forest from illicit tree felling, encroachment, fire and grazing.

SECTION: 15.8. ENCROACHMENTS ON FOREST LAND:

- i. There have been large scale clearances of the forests in the past for encroachment with a purpose to get 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 the encroachments on forest lands done during the period from 01.04.1972 to 31.03.1978. This has increased 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 adjoining the cultivation and villages and there is no proper demarcation at most of the places.
- ii. The encroachment problem is more prevalent in the Wirur and Jioti Ranges and mostly made for agricultural purposes. The eviction operations led to animosity between the villagers and foresters.
- iii. The causes of forest encroachment shall be examined thoroughly and addressed in a comprehensive manner. A proper boundary management and standard administrative guidelines will help to control encroachment.

- iv. Renewed and concentrated efforts on the part of division staff is required to prevent new encroachment on forest land.
- v. 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.
- vi. The civil powers of eviction are entrusted with ACF and DCF vide Govt. Res. No. R and F.D/PWR/1196/296/CR.No.17/LII, dated 30-1-97. The procedures laid out in the Land Revenue Code shall be followed before the execution of eviction.
- vii. Habitual encroachers shall be prosecuted as per Indian Forest Act.1927.
- viii. All external boundaries shall be demarcated with concrete pillars.
- ix. All sensitive and important boundaries and wherever disputes are there, be surveyed with DILR and concrete pillars be laid immediately.
- x. 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.
- xi. A Detailed report of the encroachment cases after 13.12.2005 be prepared for each encroacher and be submitted to ACF to obtain summary eviction orders, in a time bound program.
- xii. 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.
- xiii. The concerned RFO shall execute the eviction order.
- xiv. If the encroachments in a village are more in number police protection be obtained for the operation.
- xv. Use of Cr. P. C. provisions like section 106 and 110 be used to obtain good character of offenders before *Tahsildar* and SDO respectively to smoothen the eviction operations as well as to prevent the tendency of future encroachments.
- xvi. For the encroachments on the un-classed forests (though 7/12 shows clear possession of the departments) FIR shall be lodged in the concerned police station for the prosecution.
- xvii. To prevent the tendency of encroachments, improved crop techniques be propagated in the problem villages to enhance the crop productivity with the help of Agricultural Department.
- xviii. Regarding encroachments before 13.12.05, action as given in the Schedule Tribes and Other Traditional Forest Dwellers(Recognition of Forest Rights) Act, 2006 and rules made there under be taken.
- xix. In the month of May, a drive for encroachment prevention be taken up in all the sensitive areas by taking meetings in the villages by *Dawandi* and distribution of leaflets and posters.

- xx. Keep a watch on all the sites meant for debris cleaning, ploughing etc., in the month of May, so that encroachments are removed even before the sowings.
- xxi. A total of 10530.390 ha. of encroachment was registered by the Central Chanda Division.
- xxii. The actual encroachment may be much more than recorded by the Department. Now, action is required to be taken as per the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and Rules made there under.

SECTION: 15.9: PROTECTION OF VALUABLE MINERALS IN FOREST LAND:

The forest lands of Central Chandra division are rich in valuable mineral deposits and they are highly vulnerable to theft. Most of the forest staff is not aware about this fact. The Dy.C.F. should sensitise the field staff about the importance and vulnerability of the forest areas where the deposits of valuable minerals are found. The name of minerals and locations where they are found should be mentioned in the beat, round and Range maps.

- i. These minerals should also be considered as a forest produce and should be given the same priority as timber or other forest produce.
- ii. In case of any theft, prompt legal action should be taken.
- iii. A proper watch should be kept on all trucks moving in the areas, rich in minerals.
- iv. The beat, round and range Khairyat Reports should include the report about these minerals.
- v. Any large scale illegal mining or quarrying should be immediately reported to the Nodal Officer.

SECTION: 15 .10. POACHING OF WILD ANIMALS: The issues related with poaching have been dealt in detail under Chapter on Wildlife (Overlapping) Working Circle.

====00====

CHAPTER-XVI

WORKING PLAN FOR OTHER IMPORTANT REGULATIONS

SECTION : 16.1: DEMARCATION OF COUPE AND PREPARATION OF TREATMENT MAP.

16.1.1 The coupe will be demarcated one year in advance of working as mentioned under different working circles and a treatment map will be prepared by the R.F.O., which will be verified by an A.C.F. After that a coupe demarcation certificate alongwith the treatment map will be furnished by the concerned R.F.O. in the following format:

I, _____, R.F.O.-----
----- certify that I have personally inspected
the demarcation of coupe No. -----in Compartment No.-----of ---
-----F.S. in -----
W.C. on dated
----- and have prepared the treatment map
as per the prescriptions of the working plan. The area of the coupe is-----
----- ha

(-----)
RANGE FOREST OFFICER, -----
Signature of the RFO with date.

Counter Signed by

(-----)
Assistant Conservator of Forests,

Counter signature of ACF with date

16.1.2. DEMARCATION OF COUPE:

(i) Annual coupe will be demarcated by cutting and clearing bushy undergrowth on 3 m wide line and by erecting pillars or posts in the middle of the line at suitable intervals, except where the coupe boundary runs along a big nala, a fire line or a road. Coupe number and felling series will be written on the pillars on the side away from the area of the coupe.

(ii) Selected trees at suitable intervals, standing on the periphery of the coupe, will be given two coaltar bands and a geru or red band in between. The lower coaltar band will be at B.H. and the other coaltar band will be 15 cm

above it. Just below the lower coaltar band serial number in Arabic will be given on the side away from the area of the coupe. The serial numbers of such trees will be maintained in the marking register in the following format:-

Serial Number.	Species	GBH(OB) in Centimetr	Remarks
1	2	3	4

(iii) No trees bearing coupe demarcation bands will be marked for felling.

(Guidelines for carrying out Demarcation,CBO and Cleaning works and Natural regeneration and Grids laying in coupes for accurate treatment map are issued vide PCCF (HOFF)M.S.Nagpur vide letter No. D-14/WP/721, dated 25.10.2013 and letter No.338, dated 2.7.2010 is given in Appendix No. XXVIII-A of Volume II.)

16.1.3. DEMARCATION OF SECTIONS:

(i) To control harvesting, each coupe marked for felling 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, e.g. nala.

(ii) Trees above 45 cm girth, selected at suitable intervals on the inner edge of the 1.5 m wide cleared section line will be given two coaltar bands 15 cm apart, the lower coaltar band being at breast height. Just below the lower coaltar band section number will be given on the side away from the area they would denote.

16.1.4. DEMARCATION OF PROTECTION AREAS: Selected trees, on the periphery of the protection areas will be given two geru bands 15 cm apart, lower band being at b.h. In addition, a cross in geru colour between the bands will also be given on the side away from the protection areas. All those trees will be serially numbered. The serial number will be given just below the lower geru band, on the side bearing the cross. All the protection areas will be numbered in Roman numerals and the trees standing on the periphery of each protection area will be numbered in Arabic, adopting separate series for each area, so that the trees on the periphery of protection area No.1 will bear the Sr.No. I/1 and the similar trees on the priority of protection area No.II will bear the No.II/1 etc. The serially numbered trees will be recorded in the following format:-

Serial Number.	Species	GBH(OB) in Centimetr	Remarks
1	2	3	4

16.1.5: DEMARCATION OF OTHER AREAS GIVEN IN THE TREATMENT MAP: The other categories of areas will be demarcated by giving one geru band and one coaltar band. The geru band will be at b.h. and the coaltar band above this and at a height of 5 cm above this.

16.1.6: METHOD/TECHNIQUE OF MARKING OF TREES:

- I. All trees to be marked for felling will be given a geru band at b.h. after removing the bark and will bear marking hammer marks at both b.h. and base on a clear blaze of size - (10 cm x 10 cm).

Following trees in addition will bear digit serial nos. at both b.h. and base:

- II. All trees of teak, bija, shisham, ain, tiwas, haldu, kalam, dhawada and shiwan of 45 cm and over in girth at b.h.(o.b.). Trees of all other species of and above 60 cm girth at b.h.
- III. All remaining trees marked will bear serial number, which will be given by coaltar. The digit and coaltar serial numbers will form separate series. Malformed trees alone will be recorded as fuel trees except that of teak. A tree will be classified as fuel tree only when it is incapable of yielding any useful sawn timber or pole.
- IV. All trees bearing serial number will be individually recorded in marking (recording) book giving following details:

Serial Number		Species	GBH(OB) in centimeter	Remarks
Digit	Coaltar			
1	2	3	4	5

- V. Abstract of trees marked for felling will be made in 15 cm girth classes. Timber, poles and firewood trees will be shown separately.
- VI. The number on the trees will be put in the vertical direction as shown below :

Tree No. 215 → 1. 2
1
6

SECTION: 16.2: HARVESTING AND DISPOSAL OF FOREST PRODUCE:

16.2.1. TIMBER AND FIREWOOD: All coupes of main felling will either be worked departmentally or allotted to Forest Labourer's Cooperative Societies. All timber and firewood will be extracted to the established Government depots for sale in open auction. The quantity of timber, poles and firewood, to be given on nistar at concessional rates, will be kept separately in these depots.

16.2.2. TENDU LEAVES: With the enactment of "Maharashtra Forest Produce (Regulation of Trade) Act, 1969", the trade in tendu leaves has been nationalized. The disposal of this produce will be done in accordance with the provisions of this Act. In all 26 tendu units have been formed.

16.2.3. BAMBOOS: Bamboo will be harvested in accordance with the prescriptions laid down in Bamboo Overlapping Working Circle. After harvesting, the bamboos will be brought to the various depots set up for distribution of bamboos to Burads and agriculturists at the rates fixed by the competent authority. The excess of unlifted bamboos will be sold in open auction.

16.2.4. GRASS: Disposal of grass from closed coupes will be done as per instructions contained in Government Resolution No.MFP 1169/118931 - (6)-F2, dated 29-10-1976 i.e grass from closed coupes will annually be offered on cutting terms to the Gram Panchayats or public bodies or F.L.C.S. in the neighbouring area at a reasonable price to be fixed by the Department, considering the availability of grass and current market trend. If the concerned Gram Panchayat or the other public bodies are not coming forward to take those areas, then grass may be disposed of either by public auction or by rated passes. In order to persuade the villagers to stall feeding, the grass may be allowed to be removed even free of cost without damaging the forest.

16.2.5. GUM, LAC AND SITAFAL FRUITS: To collect natural gum, sitafal fruits the areas may be sold by public auction. Unauthorised tapping or making injuries to trees to collect gum is not permitted. Gum shall be tapped as mentioned in Non-Timber F.P. Working Circle.

16.2.6. HONEY, WAX, BROOM GRASS, HIDES AND HORNS: There are not many quantities available of these items. Broom grass may be sold by public auction. Collection of hides and horns have been completely banned as per the amendment to Wild life Protection Act, 1972 Other may be allowed to be removed by local villagers either free or at nominal rates, decided by the Additional Principal Chief Conservator of Forests(Nationalization & Evaluation) M.S., Nagpur.

16.2.7. GENERAL: Sound and young growth of all important species yielding Non Timber Forest Produce such as moha, charoli, harra, aonla, tendu fruits etc. will be retained in areas earmarked for harvesting in such a manner that they are suitably dispersed and would also serve as a subsidiary crop to main species and constitute a source of availability of Non Timber Forest Produce to the local people.

SECTION: 16.3: IRREGULAR HARVESTING:

16.3.1. Irregular harvesting of timber, firewood and other Non Timber Forest Produce is prohibited, except in the following cases:

Removal of dead fallen firewood and trees uprooted by wind or storm all parts of the forest, except the coupes due for working, will be done in the following manner.

Every year in the month of October each beat guard will report compartmentwise the availability of dead fallen firewood and trees uprooted

by wind or storm to the concerned R.F.O. The R.F.O. will then prepare compartment wise estimates for such material. Then marking by compartment will be done if the number of such trees is more than 2 per ha as this much number will be required to be left in the forest to decay in order to benefit the wildlife in the forest. After the approval of estimates by the Deputy Conservator of Forests, harvesting will be done and the material will be taken out of the compartment and it will be brought to the sale depot and sold in open auction. The details in material obtained from each compartment, number of beneficiaries and revenue realised from it will be entered in the respective compartment history form.

Felling of trees on fire lines will be carried out as per orders of the Dy. Conservator of Forest, without reference to the Chief Conservator of Forests.

Felling of trees under electric and telephone lines existing prior to coming in force of Forest Conservation Act, 1980 may be carried out by the Dy. C.F. as they do not come under the purview of the Forest Conservation Act, 1980.

Felling of trees on forest land required by the other departments such as Irrigation, PWD. etc will be undertaken only after approval of proposals for the use of forest land for non forestry purposes by the Government of India under the provisions of Forest Conservation Act, 1980. The material obtained from such harvesting will be brought to the depots and will be disposed of along with regular coupe material. Teak plantation not included in old teak plantation working circle can be thinned according to its regime. It will not constitute a deviation.

The disposal of forest produce obtained from submergence areas of dams and tanks, from construction of roads etc will be carried out according to the orders, issued by the competent authority, in writing, in case of sanctioned projects. However any plantation taken in addition to sequence prescribed shall not constitute irregular in nature. The same will hold good for the soil and moisture conservation works.

No irregular harvesting for the purpose of undertaking plantations / afforestation work under schemes outside the scope of this working plan will be taken up in any of the areas under this working plan. The felling of bamboo outside the area falling in working circle for bamboo (overlapping) will not constitute a deviation and can be disposed by the D.C.F. (Territorial) as per rules. Similarly the disposal of high stumps will not constitute a deviation. However before felling, each high stump will be marked and some proportion of it duly verified by A.C.F. The felling of trees for the purpose of growth study, volume table or yield table to be carried out by the working plan division will need no permission, except giving the details of the plan of work to be concerned Dy. C.F. well in advance. Felling should be strictly as per the objectives of the work.

SECTION: 16.4 SCATTERED BAMBOO AREA MANAGEMENT:-

16.4.1. All areas having substantial bamboo has been included in Bamboo overlapping working circle. However there are still some areas, having few clumps, which could not be included in that working circle, due to falling short of criteria fixed for that. These remaining area of division, will be divided in (3) groups of A, B & C, compartment wise and an appendix will be prepared locally. The felling of bamboo will be then carried out on the silvicultural line, as per prescribed rules, for meeting nistar demand, and departmental use including sales.

SECTION: 15.5: MAINTENANCE OF BOUNDARIES :

16.5.1. With reference to legal status, the forest areas within the tract dealt which can be classified as Reserved Forests, Protected forests, and Unclassed Forests. The maintenance of boundaries of these three classes is described as follows:

16.5.2. RESERVED FORESTS: Reserved forests boundaries are being maintained by traditional boundary pillars known as cairn class I and cairn class II. Due to increasing population, the biotic pressure on forests has been increasing and it has crossed the threshold. This has resulted the encroachment mentality of the people. So far the number of cases of encroachments in R.F. of the tract is almost nil as per the record but pressure is tremendous. Therefore, looking into the future of the forest, it is essential to change the external boundary pillars from traditional to R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, Maharashtra.

16.5.3. PROTECTED FOREST: These areas are not demarcated by any type of boundary pillars. These are normally around the villages and therefore very vulnerable to encroachment. Therefore, survey and demarcation of the P.F. areas should be done on priority basis. R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, Maharashtra should be used as boundary pillars. This work should be started from the first year of the implementation of this plan. GPS reading should be recorded in electronic register.

16.5.4. UNCLASSIFIED FORESTS: New areas are being taken over from Revenue Department as land bank against compensatory afforestation. These were not demarcated. Its survey and demarcation should be done forthwith before taking any other action. The proposal for declaration as Reserved or Protected Forests should be mooted. So long as it is not declared either R.F. or Protected Forests, it should be demarcated by R.C.C. Pillars of convenient shape and size to avoid chance of encroachment. After notification of the same under section 20 or 29 of IFA, 1927, the same should be demarcated by R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, (HOF) Maharashtra State at Nagpur for reserved/protected forests.

16.5.5. For sake of uniformity through out the state, the shape, size and estimate in terms of mandays of the R.C.C. boundary pillars for both R.F. and P.F. have been approved by the Hon'ble PCCF (HOFF) M.S. Nagpur. Details of RCC boundary pillar and Model estimate is given in given in **Appendix No. XLII-A** of Volume II.

16.5.6. The internal boundary marks/pillars/cairns/ will be traditional and maintained as per the 1/5 th boundary demarcation and verification scheme, which is given in **Appendix no XLII** of Volume II. Where natural features form the boundary, demarcation need not be done either by R.C.C. or traditional boundary pillars.

16.5.7. BOUNDARY LINES: The width of the cleared line of outer boundary of the forest will be 13 metres (40 feet). Nothing will be cut growing outside the true forest boundary line. The clearing will consists of cutting down only all the undergrowth that impedes the view, preventing one forest boundary mark being seen from its neighboring one. Trees on the boundary lines will not be cut down so long as they do not obscure the view of the boundary marks one from the other.

16.5.8: APPLICATION OF GPS: The Dy.CF. shall pay initiative in training the field staff of the division in handling GPS instruments. All field staff should develop the skill in handling and using a GPS instruments in the field for Demarcation and fixing the location of Boundary pillars. The method of using a garmin in 72 GPS instruments is shown in **Appendix No.XLII-B** of Volume II.

SECTION: 16.6. BOUNDARY MARKS/PILLARS SPECIFICATION:

16.6.1. The specifications of RCC pillars boundary marks/pillars and the method for demarcation shall be as per the direction given by Office of Principal Chief Conservator of Forests, Maharashtra State.

16.6.2. SHAPE: A truncated cone.

16.6.3. DESCRIPTION: The cairns will be built of loose stones upon an excavated foundation so that the lowest tier of stones will be held in position and not pushed out by the weight of the superstructure, especially when the ground becomes wet and slippery. The interspaces between the large stones composing the cairn will be filled in with small stones and the outer stones will be wedged with stone chips. A stab stone or a central stake of teak or khair projecting 50 cm will be fixed firmly on the top of the cairn in the centre.

16.6.4. FOUNDATION: It will be 30 cm dug out in the soil.

16.6.5. DIMENSIONS: A cairn will have a base of 1.8 metre Diameter, 1.2 metre high and the top diameter will be 1.2 metre (vide para 64, vol.I of CENTRAL PROVINCE and Berar Forest Manual, Fifth edition).

16.6.6. INDICATOR: A slab stone of size 0.2m x 0.2m x 0.9 m or a stake of teak or khair projecting 50 cm above the cairn will be embedded firmly in the centre and a serial number will be put on it.

16.6.7. COLOUR WASH: The slab stone will be colour washed red in case of closed forest and white in case of open forest and lines of the same colour will be applied on the top of the cairns radiating from the centre slab stone to show the direction of the boundary lines.

16.6.8. POSITION: The boundary marks (cairns) will be placed at visible distance one from the other, so that from any mark it's neighbouring one on both sides can be seen clearly. Where there is no change in direction over a large distance, the boundary marks will be erected at intervals not greater than 250 metres. Each cairn will bear a serial number; a separate number will be given for each adjoining village.

In addition to the boundary marks, tin plates will be fixed on the boundary trees at a height of 3 m above ground, preferably at the boundary of two compartments. These plates will indicate the compartment numbers with arrows and below them will be pillar numbers on either side of the plates. The metal plates will be size of 45 cm x 45 cm. They will be painted white and compartment number and boundary pillar number will be written in red.

16.6.9. While carrying out annual maintenance, the following points need special attention

That the pillars are correctly located as per map and demarcation register that the forest boundary is cut to the required width, that the repairs to the cairn are done. that the boundary post bear the correct number and the same is engraved and written coaltar or paint, that there are no encroachments.

If there are any encroachments or are suspected, the matter should be pursued and all legal measures should be taken to remove the encroachments.

16.6.10. Rules for inspection and maintenance of forest boundary marks:

(i) The forest guard of the beat will be responsible for the maintenance and protection of all the boundary marks in the forests of his beat. He himself will colour wash them annually after rains and will make a special report of having performed this work. Each forest boundary mark in his beat will be specially inspected by him at least once every year, and a record of his inspection will be entered in his diary.

(ii) The Round Officer will be responsible for the maintenance and protection of all the boundary marks in the forests of his round and he will see that they are maintained properly, repaired and colour washed by the concerned beat

guard, as directed. The Round Officer will check all the boundary marks in a year which come up for maintenance and repair as per the 1/5th boundary demarcation scheme. A mention of this will be made by him in his diary. The Round Office will annually submit to the Range Forest Officer a certificate in the following format:

“I, ... Certify that the annual length of boundary lines in my jurisdiction as prescribed under the scheme given in Appendix no XLVII of the working plan for the Central Chanda Forest Division has been verified by myself personally on dated and that boundary lines and marks and pillars are found to be correct as per the demarcation registers and maps. I, further certify that next cairns on either side of a cairn are visible and they are in proper condition and bear correct serial number. There are no encroachments or are encroachments as detailed below:

(iii) The Range Forest Officer will check at least 25% of the annual boundary line as per the 5 year programme and 5% verification will be carried out by the ACF.

SECTION: 16.7. MAINTENANCE OF COMPARTMENT BOUNDARIES:

16.7.1. The compartment boundaries will be cleared to a width of 3 metres, except where the same runs along big nala or road. Rectangular tin plates of size 30 cm x 30 cm will be fixed with nails on the trees at 3 metre height standing on the boundary of the compartment at regular intervals of 250 metres and also at all the corners. After painting the tin plates white, the compartment numbers will be written on them with red paint.

16.7.2. Legal provisions available for protection of the boundary marks. Under section 26 (c) of the IFA, 1927 altering, moving, destroying or defacing any boundary marks of any forests to which the provisions of this Act apply, is punishable with imprisonment for a term which may extend to two years, or with fine, or with both. This offense is non-compoundable under section 68 of the above Act. This legal provision should be made use at all levels by the field staff. Strict watch will be kept on the persons who do so and they should be booked under the above provisions contained in IFA, 1927.

SECTION: 16.8: FOREST FIRE AND PROTECTION MEASURES:

16.8.1. We can have eternal forest only when regeneration and its establishment is normal. One of the important reasons for poor regeneration and its non establishment is fire. Thus fire is directly responsible for degradation of the forest. The operations prescribed in this plan will have beneficial effects only if rigid fire control is observed in the whole forest, in general and the worked areas in particular.

16.8.2. To find out solution of the problem, it is essential to analyse it and to know the probable root causes of the problem. Without knowing the root cause, trying to find out the solution is nothing but beating about the bush.

The merriutal to fire protection works cannot be of any help. Therefore, before coming to the solution we look into the probable reasons of forest fire.

16.8. 3. The following are probable reasons of forest fires:

(a) TENDU COLLECTION: Every year permission for pruning is given to the tendu contractor. It is observed that either during the course of pruning or just after formal completion of pruning, invariably forest fire is seen in the forest. There are two reasons of this - firstly, pruning is not carried out in whole unit and so forest fire is used as the substitute of pruning. Secondly, it is a popular belief that fire injured stumps and shoots send out heavy and healthy flush of leaves. On this pretext expected expenditure on pruning is saved and whole forest is burnt. This is one of the most important reasons of forest fire.

(b) COLLECTION OF MOHA FLOWER AND FRUITS: This is also one of the important reasons of forest fire. Falling of moha flower starts normally at the end of February which is the beginning of summer. Moha flower is used in many ways by the people and so the local people collect moha flower. To make the collection easy, the leaf litter beneath the crown of Moha tree is burnt but fire is not controlled to confine around the moha trees only. Therefore, fire spreads in the forest and extends till it gets medium of propagation. Usually during this season medium of propagation of fire remains available for miles together and so fire extends for beyond the moha tree. This is very popular reason of forest fire but its extent is not comparable to that of fire caused by tendu contractor. Forest fire due to moha flower is seen only where there are no moha trees. Where as tendu contractor willfully burns each and every part of the forest having tendu.

(c) GUM COLLECTION: The local villagers set fire to facilitate movements in the forests for collection of Gums and other Non Timber Forest Produce.

(d) GRASS REGENERATION: In some areas, having good crop of grass is burnt by local villagers to have good future crop of grass.

(e) GRAZIERS: Sometimes, fire spread through burning bidi stubs, thrown by the people passing through the forest. Due to excess grazing pressure each and every part of the forest is grazed and consequently graziers too roam the forest with their cattle. Most of the graziers are smoker who smoke bidi. They do not have so much sense of protection of forest and so indifferently and carelessly throw burning bidi stub which causes forest fire. This is also very important reason of forest fire.

(f) ENCROACHMENT: During the process of encroachment, material felled is usually burnt as they all can not be consumed by them. This burning is not controlled and so becomes one of the reasons of forest fire.

(g) SHIFTING CULTIVATION AND RAB BURNING: This is also one of the reasons but this problem does not exist within this tract.

16.8.3. Though there are a number of reasons as mentioned above yet the persons who set fire are local villagers only. This is most important facts to be considered for searching the solution to the problem.

16.8.4. MEASURES: Measures to solve this problem can be classified as follows:

- i) Preventive measures. ii) Control measures.iii) Punishment measures:
a) Punitive b) Deterrent

16.8.5. PREVENTIVE MEASURES: Preservation is better than cure. This implies that the reasons of the problem are to be removed. If by some means people abide by not bringing any agent of fire in the forest, occurrence of fire will not take place. This can be achieved by social or legal or both means. The methodology may be as follows:

Since villagers are setting fire for different reasons and objectives, they are required to be taken into confidence. This can be achieved by teaching and motivating them. The ill effects of fire should be known to villagers clearly. The respected persons of the village like teachers, sarpanch, police patil etc. should be taken into confidence and convinced first.

Once they are convinced with the philosophy of protection, they will easily convince other villagers through their own means. Thus the cooperation of the local villagers is of prime importance to ensure protection of the forest from fire. Repeated dialogue of forest officers with villagers will have to be made to keep such drive alive. This is, indeed, a permanent measure. To make this measure intensive, some people of the village should be involved in protection works and responsibility and benefit should be given to them by way of deploying them as fire watchers.

SECTION 16.9. CONTROL MEASURES: TO HAVE EFFECTIVE FIRE CONTROL FOLLOWING MEASURES WILL BE TAKEN :

16.9.1. CUTTING AND BURNING OF FIRE LINES: Following rules should be followed :

- i. Cutting of fire lines will be completed by the end of December and burning will be completed before the end of February.
- ii. Dry leaves and other dry material on fire lines will be collected from time to time and deposited along the edge of fire lines and burnt before the fire season starts.
- iii. Except with the express permission of the Deputy Conservator of Forests, no fire lines will be burnt after the end of February. If such permission is granted, the burning should be done in presence of the R.F.O.
- iv. Modern fire lighting tools will be used for extinguishing the fire.

16.9.2. DEPLOYMENT OF FIRE WATCHERS AND STAFF:

- i) There are a number of reasons, intentional or accidental forest fire but the persons involved in lighting up are the local villagers only. Therefore, it is very much essential to have an open dialogue with villagers and they should be made aware of the disastrous effect of forest fire. Repeated dialogue and persuasion can be of great help in solving the problem. Solution should be asked from them only. After doing all these things, area vulnerable to fire should be identified around each village and for that area a gang of fire watchers of that village should be employed, who will have the sole responsibility of fire protection of that area. If the village is big then a list of fire watchers should be prepared with taking meeting of villagers and having dialogue with them, rotational employment of fire watchers should be thought of.
- ii) Before the fire season starts, a scheme will be prepared in which the strategic locations will be marked on a map at which gang of fire watchers of 5 to 10 will be kept, who will supervise the area around that point and can reach the spot where fire is noticed. Daily reports from the fire watchers should be called for.
- iii) The staff associated with the fire protection work will monitor the working of fire watchers and will coordinate the working of different gangs located at different points.
- iv) The available vehicles will be deployed at strategic locations which can be approached by any gang, in case of help required by them. These vehicles will also help in transport of fire fighting labourers, water and other equipments required for extinguishing fire.
- v) The regeneration areas of SCI Working Circle will be given special treatments. For this, the area will be divided into 5 to 10 ha patches. For each patch one labourer will be kept, whose main job will be to protect the patch from the fire and grazing. In addition, he will do the work of cleaning, weeding and singling of seedlings.

16.9.3. Tendu collection being the most important reason for forest fire, introduction of protective measures in the policy of tendu leaves are required to be made so that the contractor could not be tempted to have more leaves from the unit purchased. This can be done if the present system is changed and instead of selling units, tender should be called for collection of leaves. The collected leaves from all units should be brought at central places where it should be sold. This will be beneficial in many ways, such as the contractor will not have temptation of collecting more leaves from the unit as it is not certain that the same could be purchased by him so he will not indulge himself in forest fire. Second solution of the problem is that pruning provision should be freezed for 10 years and tender should be

finalised between 15th March to 5th April. After that pruning should be permitted alternate year instead of annually.

16.9.4. Usually Moha collection is done from trees within a radius of 2 km. from the village site. Therefore, it is not difficult to locate such trees. All such trees should be enumerated and given serial number and compartment, beat, round and range wise information should be recorded. Since collection cannot be stopped therefore, we will have to allow them to clean the ground beneath crown of the tree to make easy collection. But thing is that this has to be done in controlled way so that it could not become the reason of fire to spread in the forest. For this, a list of showing the distribution of trees by numbers to different families should be prepared and then the concerned beat guard should got done the cleaning operation through concerned families before the start of falling of flowers. In this, if possible, the assistance of our permanent Chaukidar working in that beat should be made available to villagers. Besides, if budget permits a circular trench of size 30 cm x 30 cm with tree as centre and crown as diameter should be dug and dug up soil should be kept inside also of possible burning and reburning should be done by forests watchers and permanent chowkidars. This will act as preventive measures and obstruct spreadal of fire caused by moha collection.

16.9.5. No grazier should be allowed to keep with them match box and bidi while they go into the forest. They should be educated and motivated in this regard. The masters of graziers should also be talked to ensure strict implementation of the measures. Strict action against violation should be taken. Similar steps should be avoid chances of fire from gum collection.

16.9.6. Areas which are potential for grass production for local people should be recorded by compartment and control burning in those areas in presence of Beat Guard should be done.

16.9.7. To the maximum possible extent firewood should be taken out from forest on which fire survives and develops and the same should be given to the local people on nistar. LPG should be distributed among the villagers having ¼ there share.

16.9.8. LEGAL MEASURES: All legal provision for prevention of fire should be followed scrupulously and they should be known to the extent possible to the villagers also.

16.9.9. PUNITIVE MEASURES : Under different sections of IFA, 1927; Wildlife Protection Amendment Act, 1991, Maharashtra Forests (Protection of forest from fire) Rules, 1982 , Maharashtra Non Wood Forest Produce (Regulation of Trade) Act, 1969; Maharashtra felling of trees (Regulation) Act, 1964 and under provisions of Maharashtra Forest Manual Volume I & II of 2011 and 2013 respectively, the quantum of punishment and the proceedings are given. Punishments enshrined in above Acts are punitive only but as the per the gravity of the case, the H'ble court should be convinced for the maximum

punishment prescribed. Besides, if the involvement of our staff is seen, they should be thrown out of the service as a deterrent punishment so that no other could dare to repeat the same.

SECTION 16.10. CLASSIFICATION OF FORESTS AS PER LEGAL PROVISIONS:

16.10.1. Fire is the dominant factor for non-establishment of natural regeneration and degradation of forest. The operations prescribed in this plan can have beneficial effects only if fire control measures are rigidly observed in the whole forest, in general, and the worked areas in particular. The mere ritual of fire protection works can not be any help. For the purpose of fire protection the areas are classified as follows:

16.10.2. CLASS I: FOREST COMPLETELY PROTECTED: This class will include:

- i. All main felling and thinning coupes of Modified SCI and old plantation Working Circles. The above coupes are to be rigidly fire protected from fire for five years.
- ii. All roads passing through the forest.
- iii. All Government depots.
- iv. Any other areas of special importance ordered by the Conservator of Forests.

16.10.3. All areas in this class will be isolated by means of fire lines and will be patrolled by the fire watchers.

16.10.4. Any fire occurring in them will be a calamity and must be reported to the Deputy Conservator of Forests immediately, in writing, giving details of the area burnt and the various types of losses occurred.

16.10.5. CLASS II: FOREST GENERALLY PROTECTED : This class will include :

- i. The areas of Afforestation Working Circle.
- ii. Broom grass areas.
- iii. Such other areas the Conservator of Forests may, for special reasons, direct.

16.10.6. All areas in this class will be isolated from the surrounding country by means of external fire lines and will be divided into convenient blocks of internal fire lines. No guidelines will be cut. Fire watchers will be engaged for patrolling in these areas.

16.10.7. CLASS III: FORESTS PROTECTED BY LAW ONLY: All other forests, not included in the above two classes, are included in this class. In the forests of this class deliberate burning is prohibited, but no special measures for protection will be undertaken. The following lines will be maintained as fire lines and will be kept clear of all growth and kept clean of combustible material during the fire season.

- i. All external boundary lines of Reserved and Protected Forests to a width of 13 or 40 feet.
- ii. 6 metre wide lines around all regeneration areas, natural and artificial, upto 5 years from the year of planting or tending of natural regeneration.
- iii. 3 metre wide coupe lines, in which regeneration operations have not been done and which form the boundary between class I areas and areas of class II and III for a period of 5 years from the year of main felling.
- iv. 6 metre wide lines on both sides of all roads and cart tracks passing through the forest.
- v. 40 metre wide line on all sides of the timber, bamboo and firewood depots.

16.10.8.LEGAL PROVISIONS IN THE IFA, 1927 : The various legal provisions to protect the forests from fire are contained in the following sections of the Indian Forest Act, 1927. The following acts are prohibited under these sections in the Reserved Forests area or in areas notified under section 4 of the IFA, 1927.

- (i) Section 26(i) b - to set fire to a Reserved Forests.
- (ii) Section 26(i)(c) - Kindling , keeping and carrying any fire except at such seasons as the forest officer may notify in this behalf.
- (iii) Section 26(i) (f) - Burning of any trees.
- (iv) Section 26(i)(g) - Burning of limestones or charcoal.
- (v) Section 26(3) - The State Government may suspend the exercise of all rights of pasture or to forest produce in the Reserved / Protected Forests or a portion there of whenever the fire is caused willfully or by gross negligence for such period as it thinks fit.

16.10.9. IN CASE OF VILLAGE FORESTS PROVISION IS AS FOLLOWS :

- (vi) Section 28(3) – All the above provisions apply in case of Village Forests too.

16.10.10. IN CASE OF PROTECTED FORESTS: In protected forests provisions are as follows:

- (vii) Any person who commits any of the following offenses under section 33(i) (a), (b), (d) and (e) namely, burns any tree reserved under section 30, burns any lime or charcoal contrary to prohibition under section 30, sets fires to such forests or kindles a fire without taking all reasonable precautions to prevent its spreading on any tree reserved under section 30 and leaves burning any fire kindled by him in the vicinity of any such tree or closed portion under section 30, shall be punishable with fine which may extend to two thousand rupees.

16.10.11. PROVISIONS CONTAINED IN THE MAHARASHTRA FORESTS

(PROTECTION OF FORESTS FROM FIRE) RULES, 1982: The government of Maharashtra, vide Notification No.1074/252 359/F-6, dated 14/10/1982 under section 32(6) and 76(i) (d) of the I.F.A., 1927 made the rules for the protection of protected forests from fire called "The Maharashtra Forest (Protection of forests from fire) Rules, 1982". The various provisions made under rules 3 to 7 are given as under :

Rule 3: A ban is placed on kindling fire within a distance of one km from the boundary of the forests.

Rule 4 : Under this rule any person desirous of clearing by fire any standing forests or grass land beyond a distance of one Km from the boundary of the forest shall observe the following rules :

- i. He shall clear a fire belt at least 10 meter wide on the side of the area, which he proposes to burn which is nearest to the boundary of the forest in such a manner that no fire can spread across such belt.
- ii. He should keep a fire watcher to see that the fire does not spread in the forest area.

Rule 5 : Under this rule any person desirous of burning "Rab" or clearing land by burning the growth on it near the forest boundary, should inform the nearest forest officer at least one week in advance of his intention to do so. A clean belt of at least 10 m width should be left in between the boundary of the forest and the place where the rab is to be burnt so that the fire does not spread in the forest and while burning the rab he should make such arrangements so that the fire does not spread in the forest area.

Rule 6: Under this rule any person collecting inflammable forest produce such as grass, firewood, leaves, bamboos on the land adjoining the forest land, and holder of a permit to collect such produce from the forest area, shall stack it in an open space at such reasonable distance from the forest as the Dy. Conservator of Forests may by general or special orders prescribe, and shall isolate the stacks in such a manner that if they catch fire, the fire will not be able to spread to the surrounding forest areas.

Rule 7: Under this rule all camping places along the boundary of an within the limits of the forest area will be cleared and will be set apart by the Dy. Conservator of Forests for the use of visitors. A list of all such camping places will be published annually and except on such camping ground no fire shall be lighted within or along the boundary of the forest. All persons using these camping grounds shall light any light for cooking or other purposes in such a way so as not to endanger the forest or any buildings, sheds or other property on the camping grounds and before leaving they shall collect in the centre of the camping ground all inflammable material which is to be left behind and shall carefully extinguish all fires.

Rule 8: Rules 3 to 7 will be relaxed during the rainy season from 15th of June to 31st of October.

16.10.12. PROVISIONS CONTAINED IN THE MAHARASHTRA FOREST MANUAL VOL-II, PART-IV.

- I. Rule 152 : As per this rule the forest fire cases should not be compounded.
- II. Rule 153 : It deals with the duties of the Magistrates, dealing with forest fire offence cases.
- III. Rule 157 : It provides for the continuous protection of the valuable forests from fires.
- IV. Rule 158 : Under the provisions contained in this rule, if the forest fire is serious and due to repeated neglect by the villagers, then as an exception a communal punishment can be given with the sanction of the Government.
- V. Rule 159 : It deals with the duties of the villagers.
- VI. Rule 160: It deals with the powers of the forest officers to sanction rewards in cases of effective fire protection.
- VII. Rule 162 : It deals with the powers of the Commissioner to sanction rewards to the villagers for effective fire protection.

16.10.13. PROVISIONS CONTAINED IN THE WILDLIFE (PROTECTION) ACT, 1972 :

- i. Section 17(i)(e) : Under this section setting fire to any vegetation for hunting purposes is prohibited.
- ii. Section 27(2)(d) & (e) : Every persons so long as he resides within the sanctuary is bound to extinguish any fire in such sanctuary of which he has knowledge or information and also he will help the forest officer in extinguishing the fire.
- iii. Section 30 : Setting fire to a sanctuary, or kindling any fire or to leave any fire burning, in a sanctuary by any person so as to endanger such sanctuary , is prohibited.
- iv. Section 32 : Use of explosive in a sanctuary by any person so as to cause injury or endanger any wildlife in such sanctuary is banned.

16.10.14. PROVISION CONTAINED IN THE MAHARASHTRA FOREST PRODUCE (REGULATION OF TRADE) ACT, 1969 (LVII of 1969: As per condition No.XII (**KINDLING OF FIRE IN FOREST AREA PROHIBITED**) of terms and condition of contract for tendu for 2014, the Licensee, his representative and munshis and labourers employed by him for collecting tendu leaves shall be bound to assist in putting out any forest fire and to give information of any forest fire in their knowledge or vision to the nearest forest or police officer. The Licensee will be held responsible for any fires deliberate or accidental

occurring in his Unit/Group of Units or in its close proximity during the above period for which he will be liable for penal action.

16.10.15. PROVISIONS CONTAINED IN THE MAHARASHTRA FELLING OF TREES (REGULATION) ACT, 1964: As per section 2(e) of the above Act, burning trees on private lands is included in the definition of "Felling of Trees", and such act on the part of any person without obtaining felling permission from the competent authority under section 3, is punishable under section 4 of the above Act. The punishment to be given by the competent Revenue Officer may extend upto Rs. 1000 /-. Besides, the tree so felled is also liable to be forfeited to the Government. As per the amendment to this Act, in 1989 the word Revenue Officer has been replaced by "Tree Officer", who is a forest officer not below the rank of the R.F.O. The Dy. C.F. should get translated the provisions / rules in Marathi or vernacular language and printed copy be supplied to Gram Panchayat annually, well before fire season, and request should be made for assistance to control forest fire.

16.10.16. MEASURES TO ENSURE PROMPT CONTROL : After recurrence of the fire, the action left with us is to extinguish it as soon as possible to lesson the national loss and effect of fire. For this following steps and equipments are required to be used:

16.10.17.. OCCURRENCE OF FIRE: As soon as the smoke is seen rising anywhere in or near the forest by the fire watcher's gang located in that area, they will immediately rush to the spot of fire and extinguish it. At the same time, they will send a message to the staff associated with the fire protection work. This staff will inform the R.F.O. concerned and will arrange the help to fire fighting gang, by way of calling additional gangs adjoining to the area of fire and requisitioning the vehicles kept for this purpose. If the fire is noticed by the fire watchers or staff, outside their area, then they will take immediate step to inform the concerned staff and will proceed to the spot of fire. They will carry out the fire extinguishing work and will remain there till the concerned staff comes.

16.10.18. Utmost care will be taken to extinguish the fire and to quench the smoldering material absolutely. Filling earth over such material is found very effective. No official will leave the burnt locality till the senior most forest officer present on the spot directs them to leave after ascertaining and satisfying himself that no smoldering material remains.

16.10.19. USE OF WIRELESS : A scheme should be prepared for establishing the wireless network in the whole division so that the communication becomes easier and faster.

This will help not only in fire protection works but will also be helpful in overall protected of the forest.

16.10.20. The financial loss due to fire will be communicated to the Accountant General as per Appendix - 19 of Rule 148 of Bombay Financial Rules, 1959 and Maharashtra Forest Manual Volume I & II

16.10.21. RESPONSIBILITY : The Range Forest Officer will be personally responsible for the efficiency of fire protection in his range. The responsibility will be fixed on the merit of each case and after due enquiry by the Deputy Conservator of Forest. Where the forests of two ranges which are to be fire protected adjoin, the responsibility for efficient protection and cleaning of common fire line will rest with one of the R.F.O's to be selected by the Deputy Conservator of Forests. In case of common boundary between two divisions of the same circle, the above responsibility will be fixed by the Chief Conservator of Forests on one of the R.F.O's and in case of the common boundary between two divisions of the two different circles, the concerned Conservators of Forests after mutual consultation, will fix the responsibility on one of the R.F.O's. The Deputy Conservator of Forests will be personally responsible for carrying out efficiently all protective (as envisaged under various Acts and Rules and regulations made thereunder) measures in the area of his division. The Deputy Conservator of Forests must satisfy himself that the exterior fire lines and other fire lines as mentioned supra have been properly cleared and burnt thoroughly before the end of February. He must be continual inspections enquire about the implementation of the various prohibitory orders and assure that sufficient protective staff is available to implement these orders. He must make frequent visits to the areas, where the incidence of fire are common. He must, during his tour satisfy himself, by constant enquiries and inspections, that no fires in forest areas anywhere have gone unreported, and that the areas of reported fires have been accurately estimated. These checks required extensive and through personal inspection by him. A strict watch should be kept on the tendu leave contractors and their agents who engage the local people to set fire to the forest floor in order to get good flush of tendu leaves and as a substitute of pruning. These fires are generally made between 20th Feb to 20th of March each year.

SECTION 16.11. EVALUATION : For evaluation of the fire, following steps should be followed:

16.11.1. FIRE REPORTS : The Range Forest Officer will report the outbreak of fire in his area to the Dy. C.F. at once. Special messenger will be used if the fire extends over large area. The R.F.O. must maintain a proper communication and coordination between himself and his field staff so that no delay occurs in receiving a report on outbreak of fire by him and in further transmitting it to the Deputy Conservator of Forests.

16.11.2. After the fire is extinguished, a detailed final report covering the area burnt and other details along with a sketch map will be submitted by the

R.F.O. to the Dy. C.F. within 15 days after through inspection of the burnt area by himself.

16.11.3. The Deputy Conservator of Forests will submit monthly return (in prescribed proforma, Form No.IX-74) to the Chief Conservator of Forests showing therein the serial number of fire, date of occurrence, cause, area-burnt, extent of damage and measures taken to extinguish it. This report will cover. All fires in class I areas, all fires that have occurred in class II areas before and after the date fixed for completion of the line burning works prescribed in the previous paragraphs.

16.11.4. All records of fire will be shown on maps of scale 1" = 2 miles and the record of fire will be filled in the concerned compartment history and the map will be attached to it. This work will be done both at the levels of the R.F.O. and the Deputy Conservator of Forests.

16.11.5. A fire record will be maintained in the office of the Deputy Conservator of Forests showing name and the length of fire lines burnt and areas specially protected will be indicated on the map. Incidence of fire in class I, II and III areas in each range will be serially numbered in chronological order and the details of areas burnt will be shown on the map.

16.11.6. Area deliberately burnt for silvicultural reasons e.g. to destroy felling debris or to stimulate reproduction, will be executed from the scheme of fire protection. Such fires will not be reported unless they spread into a protected area. Deliberate burning is only permissible if prescribed in the working plan or sanctioned by the Conservator of Forests. The steps to cut back the badly damaged young regeneration in the naturally and artificially regenerated areas due to fires, will be undertaken by the R.F.O. in consultation with the Deputy Conservator of Forests.

16.11.7. Principal Chief Conservation of Forests (HOFF), M.S., Nagpur office had given comptt. There to Forest Survey of India, Dehradun giving extent of area burnt with GPS reading periodically. Dy. C.F. / D.F.O., have to inspect the 10% burnt area. Forest Guard/Foresters have to report by 100% inspection.

SECTION: 16.12: NATURAL REGENERATION:

16.12.1. Natural regeneration is profuse in the area which is protected from grazing and fire. When grazing intensity and local demand is moderate, the forest is usually denser and when these two are heavy, the forest is usually open or tending to become open.

16.12.2. The natural regeneration process starts under the protection of an old tree. An old tree surrounded by a mass of regeneration in descending size from the centre outwards is often a very noticeable feature. The regeneration of some species, the seeds of which do not germinate without treatment of some kinds, is rarely seen around the old or mother trees. It is

very unfortunate for us to not having much knowledge about seed treatment of many miscellaneous species. But the beauty of the nature is that there are seed treaters in the forests with the service of which treatment of seed and propagation of miscellaneous species are going on. Such agents of seed treatment though not known but are existing in the balanced natural forests of miscellaneous species. Most of them are birds and animals. They love certain plants and plant community to survive. Monoculture can never provide such conducive environment for them.

16.12.3. The principal factors influencing natural reproduction, its survival and development are as follows :

- i) Seed supply,
- ii) Soil conditions and
- iii) Light conditions

16.12.4. Here the seed supply implies the supply of seeds suitable for germination. As discussed above all seeds do not germinate without treatment. But presently by and large this is beyond our control. Very less research work has been carried out in this regard. And therefore, we have to depend upon nature for this requirement for which we should try to have a balanced state of forest.

16.12.5. Some species, such as khair, tiwas, shisham, sissoo, tendu & salai can be propagated through root suckers. This is very good technique of propagation of these species. If such seedlings are saved from fire and grazing their survival is assured. For this circular trench of size 20 cm x 20 cm with tree as centre and crown as diameter will be dug up to damage the root suckers. This operation should be done just before the growing season starts i.e. between 15th Feb to 15 March.

16.12.6. The soil condition is very important for germination of the seed and providing food for establishment and development. The over grazed soil can not help to germinate and support the germinated seedlings for their further development. If the soil is compact due to heavy grazing the natural regeneration in such areas can be promoted only by ripping the soil and controlling the grazing. Again the ripping is technical, we can not apply the same method of ripping every where. For this all the soil and moisture conservation principles should be applied. In a ripped area, continuous trenches, to the extent that rainfall is completely absorbed, should be taken along contour, so that the added probability of soil erosion due to ripping of soil could be reduced to minimum. The deficiency of soil generally does not occur in the forest areas which are having balanced forest cover. If area is degraded soil testing and appropriate measures to boost up natural regeneration should also be thought of. Since ripping in entire area is not practicable and therefore, mother trees @ 30 per ha uniformly spread over whole area should be selected. Around selected trees circular trenches of size 30 cm x 20 cm with tree as centre and crown as diameter should be dug

and dug up soil should be kept inside. After doing so within circular area closed by continuous trench will be ripped. Ripping will be done in the angular area closed by between circular trench and circular area with radius 3m from the selected tree. This will be most successful in case of bija, dhora, teak etc. species. This operation should be done before rains.

16.12.7.Light condition is equally important right from germination to establishment and development. All natural processes are dependent on light (sunlight), the most important source of energy. Therefore, the floor of the forest needs light for germination of seed and after germination for establishment the required quantity of light should be provided by removing its competitor for light. This implies the removal of weed growth. For the favoured seedlings all other growth of species should be treated as weed and they should be removed. In the tract dealt with is having thick bamboo regeneration which is acting as weed for other species.

16.12.8. All above mentioned efforts are shattered by the repeated fire. Fire burns seedlings and deteriorates soil condition. Though sometimes controlled fire helps in regeneration but never uncontrolled fire. Due to uncontrolled fire, seeds of most of species are burnt and therefore, regeneration of grasses and weeds come up. Therefore, the uncontrolled fire is the enemy of the forest in all respect.

16.12.9. Thus factors affecting adversely to natural regeneration are grazing, fire and weed, which are within our control. Controlling these factors, measures have been suggested under respective sections. Effective implementation of measures suggested and observing the facts as mentioned above, natural regeneration can be promoted without any difficulty.

16.12.10. In each to at least 5 ha. Area should be find out where there is adequate regeneration. This area will be demarcated, treatment map should be prepared mark the selected regeneration by red paint which is to be retain. Soil working & Fire protection, Fencing should be done to protect natural regeneration.

16.12.11. Every year 5 ha area should be taken to protect natural regeneration by each Joint Forest Management Committee & should be carried out by Shramdan.

SECTION: 16.13 : ARTIFICIAL REGENERATION :

16.13. PLANTING OF TEAK AND MISCELLANEOUS SPECIES :

16.13.1. In the areas suitable for planting teak and miscellaneous species, planting will be done in the year following the year of main felling. Teak will be planted through stumps and miscellaneous species will be planted through polythene bag plants. Root trainer seedlings of teak can also be tried. The details of various works will be as follows :

16.13.2. PREMONSOON WORKS : They will be carried out in the year of main felling alongwith the felling. They will include following works :

16.13.3. FENCING: The whole coupe if 70% area is to be planted otherwise compartment will be taken for fencing by T.C.M. (Trench Cum Mound) of standard cross section of 1.90m x 0.60m x 1.0m will be dug where the boundary runs along the contour. No.T.C.M. will be dug when the boundary of the coupe runs across the contour or inside the compartment. In that case, live-hedge fencing will be taken. Live hedge fencing will consist of two outer rows of agave 50 cm apart and 3 inner rows, 50 cm apart, on which sowing of seeds of fast growing thorny trees like *Acacia senegal*, babul etc. and planting of cutting of shrubs like vitex, *dodonea* etc will be done after monsoon.

16.13.4. PIT DIGGING: For planting of miscellaneous species pits of size 30 cm x 30 cm will be dug. The dug up soil will be kept on the lower side of the slope. The pit digging will be completed upto 31st March and the soil will be allowed to weather during summer. Pit filling will be done at the end of May. The number of plants of teak and miscellaneous species will be 2500 / ha

16.13.5. NURSERY: TEAK: Teak stumps will be prepared from one year old seedlings raised in the beds as per standard nursery technique. Stumps should not be below thumb thickness. Besides, root trainer seedlings of teak (from seed) can also be tried.

16.13.6. MISCELLANEOUS PLANTS : Miscellaneous plants will be raised either in the polythene bags or poly tubes or root trainer. The standard size of the polybag plants suitable for planting will be when the collar of the plant is approximately thumb thick and woody in appearance. The height of the plants will vary from species to species. To achieve the optimum sized polybag plants, the nursery work will be started latest by December in the previous year of planting. In case of root trainer, seed sowing should be done in last week of February. The polythene bags, after sowing of seeds of desired species will be properly watered. Shifting of bags will be done every 15 days, once the height of plants reaches ten cm Care will be taken that each bag contains only one seedling. During the shifting, the bags will be arranged in descending order of plant heights. Suitable insecticides/fungicides, fertilizer and manure will be given to the plants at regular intervals. Before planting, the planting stock will be examined by an ACF and he will certify the suitability of the planting stock.

16.13.7. FIRST YEAR OPERATIONS: As soon as the monsoon starts, seed sowing in 3 rows for live hedge fencing, described earlier, will be done by raking the soil along the line 10 cm deep. Planting of agave on the outer two rows of live hedge fencing at a spacing of 50 cm and planting of shrub cutting on the inner 3 rows, will be done. Teak stump by crow bar method after 1st shower of monsoon and after on set of monsoon and polybag/ poly tube / root

trainer seedlings will be planted. The polythene bags will be planted in such a manner that their collars are at the ground level and it will be covered with soil upto a height of 5 cm above collar. All these operations will be completed in not more than 15 days after the break of monsoon.

16.13.8. SUBSEQUENT OPERATIONS: Immediately after the completion of planting, first weeding will be started. Casualty replacement will be done alongwith the first weeding. Second and third weeding will be done in the month of September and November respectively. The last weeding will include soil working and mulching to reduce the evaporation losses. One more soil working may be done in the month of January, if there are winter rains, subject to the availability of funds. Weeding and soil working to the seedlings on live hedge will also be done in order to enhance their growth and survival.

16.13.9. In the second year of plantation, casualty replacement will be completed soon after the start of monsoon. Two weedings will be carried out in the month of August and November respectively. Soil mulching will be carried out at the time of second weeding. Debudding of teak plants, will be done in the month of April/May.

16.13.10. In the third year one weeding with soil mulching will be carried out in the month of September. Debudding will be done as in second year.

16.13.11 . BAMBOO PLANTING: Bamboo will be planted, at a spacing of 6m x 6m, in the fourth year from the year of planting in afforestation or other working circles. Besides, bamboo planting in other suitable areas can also be thought of. The details of various works will be as follows:

16.13.12. PREMONSOON WORKS: They will be taken in the third year from the year of planting or main felling in suitable coupes of afforestation or other working circles. Pits of size 45 cm x 45 cm x 45 cm will be dug before March. The dug up soil will be kept on the lower side of the slope. Pits will be filled in the following year before the onset of monsoon.

16.13.13. NURSERY: Two years old bamboo seedlings with well developed rhizomes will be used for planting. The best method for preparing the good seedlings will be by establishing rhizomes bank at suitable sites in each range. Bamboo seeds will be sown in beds of size 12m x 1.2m x 0.3m. Two years in advance of planting. In the month of February and March of the year of planting, seedlings from the beds will be transplanted into polythene bags after cutting their branches above 3 to 4 nodes. They will sprout within 15 to 20 days. After sprouting, suitable fertilizers will be given to get the vigorous growth.

16.13.14. FIRST YEAR OPERATIONS: At the onset of the monsoon, the polypot seedling will be transported to the planting site and will be planted in pits. At the time of planting, suitable fertilizers and insecticides will be given

to each plant in the pits. Casualty replacement will be done at the end of July or in the first week of August. Three weedings and soil working will be done.

16.13.15. SUBSEQUENT YEARS OPERATIONS: Casualty replacement and two weedings with soil working will be done in the second year. One weeding and soil working will be done in the third year. Insecticides will be used if there is insect attack

16.13.16.:GRASS PLANTATON: 2 ha. Grass Plantation should be taken in blank area of each coupe. Separate estimate will be prepared after finalizing by ACF which help to mitigate Man-Animal conflict.

SECTION: 16.14 : SOIL AND MOISTURE CONSERVATION :

16.14.1. With the increase in biotic interference in the forest areas, the forests are becoming degraded. The annual fires are enhancing this process. As a result of this, the forest floor is becoming compact and is being exposed to sun and rain, thus becoming vulnerable to erosion. The areas adjoining to human habitation, especially the protected forests have become devoid of vegetation by way of illicit cutting, heavy grazing and repeated fire. The soil erosion has increased in these areas. In the worked coupes also soil conservation works are, generally, not taken. This also makes them vulnerable to erosion. The intensity of rainfall varies. The greater intensity of rainfall increases to run off from the forest floor. Rain water washes off alongwith it the exposed top layer of the soil. The compaction of soil reduces percolation and water holding capacity of the soil. This decreases the sub-soil water level. Extensive silvicultural works have been prescribed in this working plan among which soil and moisture conservation works are of primary importance to ensure improvement of the forest. Unless they are taken, the quality of the forest can not be improved in long run. They will include two main operations namely, contour trenching and nala bunding/check dams.

16.14.2. CONTOUR TRENCHING: Continuous contour trenching will be taken all over the coupe, due for working, where the density is below 0.4. In areas above 25 degree slope, trenches will be dug in accessible area only. The cross section of the trenches will be 60 cm x 30 cm. The soil from the trenches will be heaped on the lower side of the trenches. The boulders from the trenches will also be neatly stacked on the lower side. Grass tussocks planting, sowing of seeds of grasses and local tree and shrub species and planting of cuttings of vitex, dodonea, ipomea and bulbils of agave will be done on the heaps of the soil for its stabilisation. The contour interval between the consecutive trenches will be 1.5 cm depending upon the slope, the distance between the two consecutive trenches will vary. In order to determine the distance between consecutive trenches on flat areas, calculations are done:

If a = Average annual rainfall in mm in a year.

b = **15.33.** Rainy days in a year,

$c = a/b$, the average rainfall per rainy day in mm.

Then $d = 10c$, is the rain fall in cubic metre/rainy day/hectare.

For the trench of size $= 0.6 \times 0.3 = 0.180$ sq.mt., the length of trench in metre per hectare required to completely absorb water, trench in metre per hectare can be calculated as follows:

$L = d/0.18$ in mt. and accordingly the distance between two consecutive lines can be determined. Taking an example of one hectare the distance between two consecutive trenches comes to $10,000 / L$ in metre. The trenches near the nalas will be discontinued and will be curved upwards, on both sides of the nala, at an angle of 45 degree. This will prevent the run off of water, stored in the trenches, into the nala. The curved portion will be of 5m length on either side of the nala. The alignment of contour may be done by a simple water level.

16.14.3. NALA BUNDING/CHECK DAMS: The basic aim of nala bunds or check dams is to reduce the run off of water and to arrest the silt. Nala bunding will start from the top of nala downwards. Nala bunds/check dams will be prepared from the loose boulders found in or around the nala bed. No digging or blasting will be done. Where sufficient boulders are not available brushwood can also be used. Nala bunds will be prepared on nalas upto 8 m bed width. Beyond that these structures will not be useful and permanent engineering structures will be required. These structures are not being prescribed here. For the design of nala bunds, the nalas have been divided into three categories, namely:

- (i) upto 4 m bed width,
- (ii) Between 4m to 6m bed width and
- (iii) Between 6m to 8m bed width.

The important points to be kept in mind are as follows :

- (i) Nala bunds should be started from one side of the bed.
- (ii) Semi circular boulder pitching should be done on the top of the bunds, so that the stones are compact and are not washed away by water.
- (iii) The batter on upstream and downstream should be 2/1 and 1/1 respectively.

The distance between the successive bunds will be such that standing on the site of lower bund the base of upper bund should be in line of eye sight of the person, standing on the nala.

SECTION: 16.15: GRAZING CONTROL:

16.15.1. This is one of the most important factors, responsible of poor regeneration and degradation of forests in the tract dealt with. The tract is heavily burdened with grazing. The rate of increase of population of cattle is tremendously high. For grazing forest is the only shelter. Besides with cattle religious sentiment is also attached. At such a difficult situation, finding out solution is not so simple. Rotational system or any other system of open

grazing is not going to help much and this cannot be permanent solution to the problem. The population explosion has made us puzzled.

16.15.2. The steps of solution require strong determination, full confidence of getting success and immense patience. Though it appears funny but no other solution is seen, except proposing the following.

16.15.3. COMMUNITY CATTLE SHED: People rear cattle not for milk but mainly for cow dung as source of compost and calf as a source of bullock. In tribal area, tribal people do not even take out milk and taking out milk is taken as against "Dharma". The number of cattle is regarded as status symbol as well. Now a days under different developmental schemes subsidised gobar gas plant is being pushed in the villages, which requires cattle to function. The cattle shed will comprised of ashed for cattle to keep them; small campus around which there will be a gallery in which all cattle will walk 10 rounds daily both in the morning and evening; feeding tubs of R.C.C. with concrete platform, a chauer for every five such cattle sheds; one tractor to bring fodder for every 5 cattle sheds; silage unit in each cattle shed, fodder storage hall in each cattle shed, gobar gas plant in each cattle shed, a small complex of two rooms, a hall, a office, latrine and bath room and water supply system. Activities to be taken are to nurse cattle with all regards as per the Hindu belief and faith; to take all measures of family planning of all those cattle who have already given 3 calves; to improve the breed by cross insimination by bulls of improved breed, keeping them in the cattle shed; preparation of gobar gas for campus utilization and supply of FYM in proportionate basis to villagers whose cattle will be taken; provide adequate medical care and do research on breed with the help of Z.P. doctors for this purpose. For management each cattle shed will have one forester and two-three guards depending upon the size of shed. For all cattle sheds in the range, there will a R.F.O. For every 20 cattle (grown up) 1 labour will be provided. For fodder supply the whole responsibility will be of forest department. Grasses in Pasture and plantation areas will be kept reserved for this purpose. To enhance its productivity appropriate measures will be taken. The produce of the cattle shed will provide part of the finance. The price of the produce will be fixed by the Committee consisting of Dy. C. F. as Chairman, R.F.O. as member secretary, Sarpanch and one or two respected persons of the village as member. First right to purchase will be of villagers and they will be supplied relatively at less price. FYM will be given free of cost to them. From the selected village, all unwanted and non-milching cattle will be brought to the community cattle shed and record by shed of cattle will be maintained. With above proposition, the entire area will be covered with stall feeding practices which are so far confined to the pages of text books. The silege prepared at cattle shed can also be supplied to the local villagers. With the success of this the free or open grazing will be completely stopped which will be a golden time for the forestry.

16.15.4. As per existing procedure open grazing is allowed based on functional classification of forests. Grazing settlement was conducted and grazing zones and units have been formed. A functional classification of the forest is given in section 2 of Chapter I, Part II as enunciated in the grazing policy formulated by the Government of Maharashtra vide its resolution No.MFP-1385/132211-Y, dated 8-12-1968. Grazing will be controlled till the complete success of stall feeding as per the prescribed grazing incidence for each class of forest in the interest of forests and pasture to minimize the damage from it. As per the provisions contained in A-259 of B.F.M. Vol II, Part VI, coupes can be closed to grazing for a period upto 10 years or more where it is difficult to get successful regeneration in a shorter period. Keeping in view the above provisions the grazing in various working circles of this plan will be regulated as follows:

(i) SCI FORESTS (ALL AGED MISCELLANEOUS AND ALL AGED TEAK) WORKING CIRCLE AND OLD PLANTATION W.C. : As per functional classification, these working circles comprise of tree forests and the maximum incidence of grazing prescribed for it is 1.2 ha per cattle unit. All main felling coupes will remain closed to grazing for a period of 5 years from the year of main felling. Thus with a felling cycle of 15 years, 5/15th or 1/3rd will remain closed to grazing at any time after 5 years from the commencement of this plan.

(ii) AFFORESTATION CIRCLE: This working circle comprises of minor and degraded forest and the maximum incidence of grazing prescribed for it is 0.8 ha per cattle unit. As main felling coupes will remain closed to grazing for 5 years from the year of main felling. Thus with a felling cycle of 10 years, 5/10th or 1/2nd will remain closed to grazing at any time after 5 years from the commencement of this plan.

16.15.5. Thus as per the prescriptions of the working plan, number of cattle units can graze in the forest area at any time will be calculated. The remaining cattle can be accommodated by taking fodder development works in the community lands in these villages which can be done by the Social Forestry Department, Village Panchayat, Forest Protection Committee or voluntary agencies. Villagers should be motivated for this. At the same time the villagers will be persuaded to stall feed their cattle, the grass for which will be allowed to be removed from the closed coupes. They will be made aware of the ill effects of excessive grazing on the forest growth. Besides, the staff should have dialogue with the local villagers to discuss the issue. The Dy. Conservator of Forests should think for rotational grazing in areas which are not due for working. The experiment on silage preparation should be conducted and through this, stall feeding should be advocated. The preparation of silage will solve the problem completely. People should be motivated for rearing cattle in less number of better breed to have better return and less problem.

SECTION : 16.16 : REQUIREMENT OF THE PEOPLE FOR VARIOUS FOREST PRODUCE :

16.16.1. No attempt has been made to estimate or quantify the requirement of the people for small timber, firewood, poles and bamboos. The Deputy Conservator of Forests should, on priority, do this exercise. For estimation point of view a few villages should be chosen randomly as a sample and should be studied thoroughly. On the basis of the data so obtained the requirement of different forest produce should be obtained statistically. For the management point of view and to decide the priority over distribution, the data collection and estimation should be made separately for tribal families, families having land upto 5 hectare, and families having land more than 5 hectare. This classification is necessary as the consumption of forest produce depends upon economic status of the people.

16.16.2. FIREWOOD: The large scale illicit cutting due to firewood is going on in this tract. The problem is becoming grave day by day. Fortunately the North Chandrapur Circle has potential for firewood in large quantity. If the problem is thought on circle level for all divisions, the solution will become easy. Supply of firewood for commercial purpose to prepare charcoal should be stopped. After meeting the local requirement if some thing is left, only that could be made available to contractors. The mode of supply and rate should be decided by the Conservator of Forests. Pumping, of firewood to different villages through department involving sarpanch will be beneficial in many ways. The market available to illicit cutter will be closed, service to society will be done; confidence, good will and support of villagers through sarpanch becomes available. These activities are also in consonance with the new forest policy of India.

16.16.3. BAMBOO: For Bamboo too similar arrangement should be made. Only after meeting the requirement of the local population, bamboo should be made available to any industry. The supply of bamboo to a given place and given duration be made through the industry working in this area and distribution of the same to the people should be done through department only. Supply should be on regular basis during the operation of extraction of bamboo by the industry. Burads and artisan should be protected by giving special attention to them. This will close the door of illicit cutting due to non-availability of market to them for the same. This will avoid large scale destruction which is going on in the forest.

16.16.4. There always exists a gap between the demand and supply and therefore, the forests are under pressure. To minimise the pressure, the gap between the supply and demand can be bridged by raising plantations in village community lands and wastelands with the help of Social Forestry Department, by involving the local people. At the same time people can be persuaded to minimise their consumption of forest produce.

SECTION: 16.17: ILLICIT CUTTING:

16.17.1. There is a problem of organised illicit cutting by gangs of criminals in the forest of Wirur/Wansadi/Jioti Ranges and illicit cutting by villagers in forest areas adjoining to villages in all ranges. Besides, the large consumption of forest produce by the local people, as described in section 10 above, has put tremendous pressure on these forests. This has resulted in deterioration of forests adjoining to the villages in general and forests in Ballarshah in particular. For effective control on illicit cutting one mobile unit, consisting of one ACF, 4 foresters, 4 forest guards some vanmajoor and unit should have vehicle. This unit will continuously patrol the forest areas vulnerable to illicit cutting.

16.17.2. The Government vide letter No. TRS 1087/102380/F-2, R & F.D., dated, 18th June, 1981 and G.R. No. TRS-04/2014/CR 72/F-6, dated 13.8.2014 has stated that all illicit cutting valuing Rs. 25,000 /- and above at a place should be reported to the Government, the Chief Conservator of Forests and the Conservator of Forests by the Deputy Conservator of Forests within three days of the receipt of the report of the R.F.O. The following time schedule has been prescribed for inspection of illicit cutting area by the respective officers:

Sr.No .	In situ value of illicit cutting at a place	Designation of the inspecting officer	Period within which inspection should be completed
1.	Upto Rs. 25,000	R.F.O.	3 days from detection/ receipt of intimation of detection
2.	Above Rs. 25,000 but not exceeding Rs.1,00,000.	A.C.F.	3 days from receipt of information
3.	Above Rs. 1,00,000 but not exceeding Rs.5,00,000	Dy.C.F	3 days from receipt of intimation of information
4.	Above Rs. 5,00,000.	C.C.F. (T)	7 days from receipt of information.

Vide letter No. TRS-1082/36/F-6, dated 8th September, 1982 the Government has stated that the offence above Rs. 2000 /- should be necessarily brought to the court for prosecution, unless the prosecution is difficult to succeed.

SECTION: 16.18: DEVIATIONS:

16.18.1. The following works will not be constituted as deviation from the plan.

- i) Removal of dead and fallen firewood.
- ii) Petty fellings carried out as mentioned in irregular harvesting.
- iii) Works to be carried out as per sanctioned J.F.M. plan.

16.18.2. The following works will constitute a deviation from the Working Plan:

i) The felling and disposal of forest produce from submergence areas of dams, tanks, canal sites, road sides and other cases coming under the purview of the Forest Conservation Act, 1980. The sanction to it will be obtained.

ii) All other deviations can be classified into following two categories as per draft amendment to article 191 and 192 of Working Plan Code vide Agriculture and Forest Department Government Resolution No. FWP 1062/5625(ii)-J, dated 25.5.1962.& Working Plan Code -2004.

A) DEVIATIONS: - Which would seek to alter the schedule of working given in the Working Plan, the examples of which are -

i) Both non-working a coupe in the prescribed year or working the coupe in the year not prescribed by the plan.

ii) Changes in the areas of coupe on account of disforestation or undertaking areas for execution of any special scheme under plan-programme; and

(B) DEVIATIONS: Which would involve alteration in the silvicultural treatment, for example?

i) Stopping or curtailing fellings or planting because of shortage of labour, funds, material for plantation work, or unsuitability of terrain and soil for undertaking plantations to the extent prescribed by the Working Plan.

ii) Extensive fellings of dry trees killed by fire, fungus, insect attack or other natural calamities.

iii) Fellings of unusual size and extent for special departmental works.

iv) Special fellings to meet a sudden new demand of a particular industry.

v) Fellings involving modifications in the prescribed marking rules.

The proforma for submission for deviation proposal is given in **Appendix No. LXIX** of Volume II.

16.18.3. PROCEDURE FOR OBTAINING SANCTION FOR DEVIATIONS:

All types of deviations are to be got approved from Central Government as per the instructions contained in Government of India Ministry of Agriculture No 6 – 14/84/FRY/(WP).dated23.08.1984. Hence in case of the deviation of any type, the (Territorial) Deputy Conservator of Forests of Central Chanda Forest Division will submit, in eight copies, the proposals of deviations to the Chief Conservator of Forests (Territorial) Chandrapur Circle through the Conservator of Forests, Working Plan, Chandrapur who on scrutinising the proposals will forward them to the Territorial C.C.F. with his opinions and report as to the manner, the departure decided upon should be recorded. The C.C.F. territorial will pass on the proposals to the P.C.C.F.(MS)Nagpur through A.P.C.C.F. WP (East)Nagpur with his remarks. Then P.C.C.F. will

forward the proposals to the Central Government through the Government of Maharashtra with his remark for final approval. The standard proforma for submission of deviation proposals will be used.

16.18.4. The sanction to all deviations will be obtained. Application for sanction to such deviation will be submitted sufficiently in advance, so that sanction may be received as far as possible before the deviation occurs and without fail before the annual list of deviation is submitted alongwith the control forms.

SECTION 16.19: ROADS, CART TRACTS & CULVERTS:

16.19.1. The entire area is served by a network of roads. No new forest roads are proposed. Most of the roads are transferred to B & C. (PWD) department for maintenance. In some roads cross drains are being properly provided to make them all Weather roads.

SECTION 16.20 : BUILDINGS :

16.20.1. RESIDENTIAL: Adequate residential accommodation exists for the Range Forest Officers, Round foresters and few of the Beat Guards. Special duty Foresters and Beat Guards need to be provided with suitable accommodation.

16.20.2. NON-RESIDENTIAL: The range offices are housed in the pucca buildings. The existing accommodation needs to be supplemented by construction of additional room to each one of the range officers. On account of nationalization of tendu leaves, suitable additions and alterations may be carried out to accommodate the tendu clerk and the record. Adequate number of forest rest houses and inspection huts suitably located, exist in this tract. Additional rest house or inspection huts are not necessary.

SECTION 16.21: WATER SUPPLY:

16.21.1. The existing wells and tanks should be maintained in proper state of repair, cleaned and disinfected periodically. The list of water wells will be given in **Appendix No XV.** of Volume II.

SECTION 16.22: PRIVILEGES AND CONCESSIONS FOR FOREST PRODUCE:

16.22.1. As per the National Forest Policy of 1988, the first charge on the forest produce is that of villagers living in and around the forest. Accordingly, the forest produce obtained from the forest will first be supplied to the local people at the rate fixed by the Conservator of Forests. The arrangement for supply of material will be made in such a way that the people should get the material within a radius of 2 km from their inhabitation. Only the surplus forest produce or the forest produce which is not required by the local people will be sold in open auction.

16.22.2. BAMBOOS: In Chandrapur District lot of Burads are there who prepare bamboo mats and other articles to earn their livelihood. Bamboos are required by agriculturists also. Their requirements are fulfilled through supply of bamboos from other divisions of the circle obtained from departmental or nistar coupes.

16.22.3. SMALL TIMBER, POLES AND FIREWOOD : Small timber and poles for agricultural purposes and repairs to houses and firewood for domestic use will be supplied from the depots and concessional rates, depending upon the availability of these produce. Depots will be opened at suitable places, throughout the division, so that people have to go to minimum possible distance to procure these produce. Range, round and beat headquarters should be chosen for this purpose, so that supervision and maintenance of these depots becomes convenient.

16.22.4. REMOVAL OF EDIBLE FLOWERS, FRUITS, SEEDS, OTHER MFPS: Collection of moha flowers and seeds, charoli, tendu, fruits, bor and other Non Timber Forest Produce may be allowed free to tribals and local villagers for their consumption. However, no forest produce will be allowed to be removed free for commercial purpose. During collection of any produce, no felling or hacking of trees will be allowed. In Schedule areas ownership over minor forest produce lies in gram panchayat as per Panchayati Raj Act. Hence collection and disposal of the minor forest produces will be through panchayat through its gram sabha resolution and forest department will maintain the hygiene of forests by enforcing silvicultural discipline while collecting minor forest produces by panchayat members.

SECTION: 16.23: SURVEY AND MAPS:

16.23.1. Forests of Central Chanda Forest Division except in Manickgarh Block have been surveyed on 4"=1 mile scale. All these forests have been stock mapped on 1 : 50,000 toposheets. For Manickgarh Forest Block many attempts had been taken in past to survey the areas but for the reasons mentioned in Part I of this document, the same could not be completed yet. It will need a special drive to complete the surveying and demarcation and preparation of realistic maps. As per the instructions contained in standing order No. 55 of the Conservator of Forests, Working Plan, the following sets of maps will be prepared:

16.23.2. DIVISIONAL MAPS: These are to be prepared on 4"=1 mile or 1:15,000 sheets. In all 9 sets will be prepared out of which two sets will be cut and mounted and 7 sets will be uncut and mounted, the details of which are as under –

(A) FOR C.F. WORKING PLAN: Two uncut and mounted sets called "Master sets" will be prepared having following details:

(i) One fair set indicating stocking details

(ii) One management map showing compartments, coupes, felling series, working circles, range boundaries and other management details.

(B) FOR Dy.C.F., CENTRAL CHANDA: One uncut and mounted and two cut and mounted sets showing the management details will be supplied to the Deputy Conservator of Forests. One copy of the cut and mounted set will be for the use of Deputy Conservator of Forests and the Divisional Surveyor and the second cut and mounted set will be given to the concerned R.F.O.

16.23.3. MANAGEMENT MAPS FOR THE TERRITORIAL DIVISION, CHIEF CONSERVATOR OF FORESTS (T) AND THE ADDL. CHIEF CONSERVATOR OF FORESTS, WORKING PLANS: Two sets of maps on 1: 15,000 will be prepared, one copy of each for the territorial Chief Conservator and the APCCF, Working Plans, Nagpur. These maps will show all the management details viz comppts, working circles, felling series, range boundaries and other administrative details.

16.23.4. REFERENCE MAP: A small reference map on 1 : 2,50,000 scale showing range boundaries, compartments, working circles, felling series, roads etc. will be prepared and attached to each copy of the working plan.

16.23.5. GRAZING MAPS: On 1:2,50,000 scale showing Grazing Series will be prepared. One set will be kept in the Conservator of Forests Working Plan Office and the other set will be supplied to the Dy. C. F. Central Chanda.

SECTION 16.24: ENCROACHMENTS:

16.24.1. The problem of encroachments around the villages is prominent. The proper and correct demarcation and maintenance of the boundaries between Revenue Land and Forest Land is one of the main reasons of encroachments. As discussed earlier encroachment in Manickgarh Block in particular and Wansadi, Jioti Ranges in general is on large scale and same is to be reflected on Revenue and Forest Records. A special scheme is required to be launched to demarcate Protected and Reserved Forests properly. The maintenance of the boundary will be emphasized. The beat guards will be provided beat maps along with the instructions in vernacular language. Records of encroachments will be made compartment wise in the compartment history forms and will be shown on the map also.

16.24.2. The encroachment on forest land between 1972 to 78 are to be regularised by the Government vide two resolutions R & F D, LEN-1078 / 3483-F-G-1, dated 24th December, 1978 and R&FD-FLD-1079/1366-F3 dated 12th September, 1979. The present Government policy is very clear vide two resolutions R & F.D.No.FLD-1078/144074-F-3, dated 5th March, 1980 by which any illegal construction of hut on the forest land should be removed immediately and FLD-1087/PK-397/F-3, dated 14th July, 1987 stating that encroachment not likely to be regularised and taken place after 31st March, 1978, should summarily be removed. There is a need for stringent measures against the encroachers.

16.24.3 According to the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006, tribes having their possession on the land. They are dependent on this land, the rights are recognize to them. The details are discussed in **Chapter XIV**.

SECTION 16.25: BEAT CHECKING:

16.25.1. To ensure strict protection of forest, it is imperative that the protective staff vigilantly patrol the forest entrusted to their care and the officers concerned exercise effective supervision and control at all levels. It is of the essence that every forest offence is reported with the utmost promptitude whether the offender there in is apprehended or otherwise and whether the forest produce involved therein is recovered or not. As per the standing order 37, Chapter IX, instructions issued for guidance and strict compliance with a view to tighten up the measures in regard effectual protection of forests are as follows:

16.25.2. The primary responsibility of forest protection devolves on the protective staff, which generally detects and reports the offence. The duties and responsibilities in regard to each category of the staff are broadly specified as below:

16.25.3. BEAT GUARD: Every guard will prepare a Protection Plan for each beat and must patrol his beat regularly. He will thoroughly inspect the entire forest within his charge every fortnight and issue P.O.R. for all the damage detected in each beat within the first instance.

16.25.4. ROUND OFFICER: Each Round Officer will inspect each beat once in three months. He should verify and enumerate the damage not reported by the beat guard. He will submit punctually the report of each area inspected by the Deputy Conservator of Forests through his Range Forest Officer.

16.25.5. RANGE FOREST OFFICER: It is the prime responsibility of the R.F.O. to ensure that round officers and guards carry proper patrolling of the forests. He should endeavour to inspect a specific portion of the beats covering at least the 1/4th area of the beat once in six month and report should be punctually submitted to the Deputy Conservator of Forests In case of extensive illicit felling he will take prompt measures to inspect the beats thoroughly.

16.25.6. GAZETTED OFFICERS: Gazetted Officers, during their tours, must inspect specific areas vulnerable to illicit felling. At least one day in a fortnight should be devoted to check the illicit fellings, apart from normal inspection.

SECTION: 16. 26 : CHARCOAL KILNS :

16.26.1. No permission to manufacture charcoal to the private persons will be given in the Reserved or Protected Forests or in private areas upto 1 km from the boundaries of the forests.

SECTION: 16. 27: PRESERVATION OF WILDLIFE:

16.27.1. The distribution of wild animals and birds has been given in Chapter VIII of Part I. The protective staff will take adequate measures to protect the wildlife also. The following prescriptions will be followed for the conservation of the wildlife.

- a. While preparing the treatment map of a coupe for felling in any of the working circles, potential habitat for the wildlife and existing waterholes will also be identified and will be shown on the treatment map.
- b. The details of riparian habitats along various nalas will be prepared along with the treatment map.

Marking of dead, wind fallen and malformed trees in any felling coupes will be done only if their number is more than 2 tree/ha. These two trees will act as snags and den trees for nesting and resting of the wildlife. Trees of commercially low utility may be used for this purpose.

- c. During harvesting, some unsound and hollow logs, of commercially low utility, not exceeding 3 per ha will be left in the forest to serve as shelter for the wild animals.
- d. In the plantations few trees of fruit species like gular and other ficus species will also be planted to provide food to the wild animals.
- e. The waterholes which are visited most frequently by wild animals will be prohibited from grazing by making a special mention of such areas in the grazing permit licence.
- f. Suitable locations will be identified where forest tanks can be constructed to provide water to the wild animals.
- g. Efforts will be made to inoculate the cattle grazing around the waterholes.
- h. A vigilant watch will be kept on poachers also at the checking gates erected to check/prevent the illicit transport of forest produce.
- i. The labour camps and transit depots will be established away from the high wildlife density areas.
- j. Hoardings on the importance of wildlife and its protection will be exhibited at strategic locations.

- k. The provisions contained in the Wildlife (Protection) Amendment Act, 1991 will be enforced rigidly.
- l. With the tree enumeration programme, the presence of wild animals, their kind and location etc should also be recorded so that the status and location of a particular species of wild animals could easily be identified and accordingly appropriate prescription could be given.
- m. Annual census of the wild animals should be conducted and recorded.

SECTION 16. 28: MEDICAL FACILITIES:

16.28.1. Medical facilities in the tract dealt with is adequate. However, most of the forestry works are in the interior and therefore, at all working sites there must be a first aid box with common medicines. The list of medicines and suitable instructions for administration of medicines shall be obtained from the Civil Surgeon of the District.

SECTION 16. 29: TRANSIT RULES FOR FOREST PRODUCE:

16.29.1. The transit of forest produce is regulated as per the Bombay Transit of Forest Produce Rules, 1960, which are published by the Agriculture and Forest Department under No. IFA-1057/22947-(VI)-J, dated 23rd April, 1960.

16.29.2. The Government of Maharashtra vide Notification No. TRS/1083/91822 (ii) CR-87-F-6, dated 13th May, 1985 has amended Section 61 of Indian Forest Act, 1927 making the law more stringent. It has authorised certain officers to be called as authorised officers for the purpose of this Act, who will be competent to confiscate the vehicle involved in offence related to the illicit cutting, removal of timber and firewood and other notified forest produce.

16.29.3. To facilitate the issuing of passes, the Government vide TRS/ 1089/PK/ 267 / 89/ F-6 , dated 14th May, 1990 has stated that the decision regarding the issue of passes, to an applicant should be taken within 45 days of the submission.

16.29.4. Govt. vide notification No. TRS 09/2013/CR-193/F-6 dated 25 Feb 2014 modify Transit Rules and some powers delegate to ACF also.

SECTION: 16.30: RAIN GAUGE AND TEMPERATURE RECORDING CENTERS:

16.30.1. The temperature recording at range level is essential and rainfall recording at round level is necessary. Therefore, it is proposed that rain guage should be established at each round head quarters and temperature recording instrument should be established at each Range Headquarter. Automatic/self recording rain guage has been devised by Empire Industries, Roorkee from which it can be procured.

SECTION: 16. 31: SAW MILLS:

16.31.1. The following are the rules regarding Saw mill given in Bombay Forest Rules, 1942 revised from time to time.

16.31.2. PROHIBITING CONVERSION OF TIMBER WITHIN CERTAIN DISTANCE OF FOREST:

(i) Within the limits of any Reserved or Protected Forests (whether in charge of the Forest or Revenue Department) or of any land in respect of which a notification under section 4 of I.F.A. 1927 declaring that it has been decided to constitute such land as Reserved Forest has been issued, and within one mile of such limits, no person shall establish a saw pit for cutting or converting of timber or manufacture charcoal without the previous sanction, in writing, of the Range Forest Officer.

(ii) Within the limits of any Reserved or Protected Forests, or of any land referred to in clause and within 80 km of such limits, no person shall erect or operate any machinery or saw mill for cutting or converting of timber, without obtaining a licence in that behalf. Any person desiring to establish a saw-pit or to manufacture charcoal under clause (i), or to erect or operate any machinery or sawmill under clause (ii), of sub-rule (1) shall make an application in that behalf to the Range Forest Officer and the Divisional Forest Officer, respectively. Provided that where within a period of one month from the date of application the applicant fails to receive the sanction under clause (i) of sub-rule(1), the applicant may proceed to establish the saw-pit or to manufacture charcoal, but not so as to contravene any of the provisions of the Act or any Rules made thereunder.

On the receipt of an application under sub-rule(2), the Range Forest Officer, or as the case may be, the Divisional Forest Officer shall make such enquiry as he deems fit and after satisfying himself on the question whether or not there would be any objection to granting the sanction or licence applied for, having regard to safeguarding the timber in any Reserved or Protected Forests or in any land referred to in sub-rule(i), may grant the sanction or licence in the form of Schedule-E subject to the conditions set out therein, or refuse to grant the sanction licence.

Every licence granted or renewed under this rule shall, subject to the provision contained in this rule regarding cancellation, be effective for a period not beyond the 31st day of December from next following the date of its issue or renewal.

The divisional Forest Officer may, on application made to him, renew the licences issued under sub-rule (3) with effect from the date of its expiry.

An application for renewal of a licence shall be made before the expiry of the period of the licence and failure to renew will render the licensee liable to punishment for operating the saw mill without a licence.

Notwithstanding anything contained in the foregoing sub-rules, the Divisional Forest Officer may, where he has reason to believe a licensee is operating the saw mill in contravention of the provisions of these rules and conditions of the licence or the licensee is indulging in activities prejudicial to the interests of the forest conservancy, at any time, revoke the licence granted under this rule.

Where the Divisional Forest Officer refuses to issue, or renew, or revokes, a licence granted under this rule, he shall do so by an order communicated to the applicant or holder, as the case may be, giving reason in writing for such refusal or revocation. Any person aggrieved by an order made under sub-rule(8), may, within thirty days of the service on him of the orders, appeal to the Chief Conservator of Forests who shall decide the appeal after giving such person and the Divisional Forest Officer making the orders, an opportunity of being heard, and the decision of the Chief Conservator of Forests shall be final.

Nothing contained in this rule shall apply to the ordinary operations of domestic carpentry or to other similar work on a small scale. Subsequently, the Government issued amendments from time to time. Vide Notification No.SWM 1081/106836-F-6, dated 15th July, 1981, the State Government put a ban on issue of new licence. However, if the applicant has already spent the money and completed the formalities, the licences can be issued vide SWM 1081/106836(A)/F-6, dated 18th August, 1981. The licence of saw mill can be suspended for three months. Saw mills are required to maintain three registers by the Government Orders No. SWM-1082/CR-20/F-6, R & F.D., dated 22nd February, 1984 in F.No., I-Nintake, F.No.2 - out-turn, F.No.3-disposal. Vide SWM 1082/2590/CR195 /F-6, dated 17th December, 1986, now saw mill can operate after sunrise to sunset without the written prior permission of the Divisional Forest Officer. The Government vide letter No.TRS 1081/102380/F-2, R & F.D., dated 18th July, 1981 has laid down the inspection norms of saw mills by the officers of various ranks. The Range Forest Officer is to inspect - 12, the Asstt. Conservator of Forests-6, the Deputy Conservator Forest -3 and the Chief Conservator of Forests -1 saw mill in a month. The details of saw mills will be given in **Appendix No.XII** of Volume II.

Section 129 Bombay Forest Rules, 1942 states that who so ever contravenes the provision of Rule 88, shall be punishable with imprisonment for a term which may extend to six months or with fine which may extend to five hundred rupees or both.

SECTION: 16. 32: CAMPING SITES:

16.32.1. No camping site for the harvesting purpose or for any other purpose should be permitted within half a kilometer radius of the existing waterholes. The exhaustive list of such waterholes shall be prepared and maintained at divisional level and the copy of the same shall be provided to the Conservator of Forests, Working Plans Chandrapur for record.

SECTION: 16. 33: SOCIO - ECONOMIC DEVELOPMENT:

16.33.1. To ensure a proper environmental and ecological balance, it is essential that the cultural survival and socio-economic well being of the local people is well taken care off. Unless it is done all attempts aiming at protection and management of forests shall be futile. Thus to ensure this, it is essential that the social and economic stability of the local people through forest based industries/programme, safeguarding their genuine domestic needs for forest produce like bamboo, firewood and constructional timber, is under taken by the forest department. All activities of Non Timber Forest Produce enshrined in Non-Timber Forest Produce Working Circle will be set up for local people through forest department. Besides, the local people can also be encouraged for collecting other Non Timber Forest Produce which have not been covered under (NTFP) Working Circle. However, all developmental activities are being shattered by the population explosion. Therefore, the success of these activities depends on the control of population. Besides, all basic needs of the people directly or indirectly depend on natural resources, most important of them is forest. Therefore, the prerequisite for development is to have forest in healthy condition. There should not be any activity in the name of development which is directly or indirectly tending to destroy or degrade the forest. As an example, a few activities which are detrimental to the forests are given as below:

- i) Providing subsidised Gobar gas plant is encouraging people to rear more number of cattle to make available cow dung as raw material for running to Gobar gas. Since people do not follow stall feeding and send their cattle in the forest, the grazing pressure is increasing day by day and this excess grazing pressure is destroying forests, which is undisputed fact.
- ii) Upgrading roads passing through the forest is helping and will be helping offenders in doing illicit felling and facilitating transportation of illicitly cut material fastly. Since protection staff, being in very small number and without any fast moving vehicles and weapons, is unable to combat with this problem.
- iii) Development of agriculture: The area on hills is undulating. People are small farmer and therefore, area is in small pieces. Productivity is low. Area is very prone to soil erosion and therefore, intensive soil working leads to heavy soil erosion. Besides, almost all plain villages are having malguzari tanks, locally known as "Bodi". These are perennial source of water and very potential for irrigation and drinking water. Developing this problem of water supply to villages can be solved. Instead of developing these tanks, constructing large and medium irrigation projects by engulfing very large forest area is not justified. Construction of such dams gives rise temptation in the people to have more land holding, around dams and for quenching it the chance of encroachment increases sharply.

16.33.2. In hilly areas, the local people usually take coarse grains from their agricultural field that too, very few number of grains. The required quantity is also not much, which can not be supplied from outside and so doing agriculture is not indispensable proposition. Since production of agriculture crop is not essential to feed these people and therefore, giving thrust to develop agriculture by destroying forest in hilly areas and becoming permanent threat to the destruction of forest is not wise step. To get food all should cultivate is not necessary. The important thing is that the people should have purchasing power. If the purchasing power of the people residing on hills is enhanced, all will live happily provided population is controlled and stabilized.

SECTION: 16.34: SUGGESTIONS FOR IMPROVEMENT IN DEVELOPMENT:

16.34.1. Following are indispensable components / factors of development:

i) FAMILY PLANNING: This is prerequisite for any development. People should be educated and motivated through repeat talks and other knowledge imparting means. In most of the cases, birth of the first child, gap between children and the number of children are not controlled. Usually people commits mistake in this regard and that too due to lack of complete knowledge of the subject. Therefore, people should be equipped with complete knowledge of the subject. Therefore, people should be equipped with complete knowledge of family planning and then they should be motivated for adopting it by convincing them its merits as against demerits. In this regard following decision should be taken in each village by the people on discussing the issue:

1. First child only after 3 years of marriage. Prevention of child birth should be done preferably through non chemical means. All such means should be taught to both male female separately by male and female doctors.
2. First child in a family only when the youngest member of the family is more than 5 years old.
3. Birth of a child in a given village should be thought against death of some one in one village.

If this is adhered to, the village will be happiest village and all developmental activities will bear golden fruit. In this the forest department will be of great help as officers of this department usually make frequent visit even of the interior most villages.

ii) BASIC NEEDS AND THEIR FULFILMENT: This basic needs of the people, in general, are “Roti, Kapra Aur Makan”. Local people residing in interior forest know Bhakhari and coarse Rice as main food, moha tori as edible oil. Moha flowers as sweet dish. Analyzing the ingredients of their

food we thank nature who made them so resistant. In edible oil they consume excess amount of acid which is health hazardous. In many areas people do not wear much cloth due to non availability which has become their tradition and culture. This is the poor state of living despite many efforts of the Government. All development agencies should work under single department which has rural base. The forest department will be the most suited for this purpose. All activities of development should be for development of natural resource i.e. forest and through which their purchasing power should be increased. For this, some light has been thrown in NTFP working circle. On increasing purchasing power, sustained supply of good quality food materials from outside should be ensured. Besides, efforts for refinement in their traditional food should also be made so that it could become free from health hazardous ingredients. Essential cloth should be given on ration card. So far as building are concerned, it is undisputed fact that building with attached roof provided the effect of air condition. Therefore, well planned buildings of grass, bamboo and poles should be thought of good thatching lasts more than 5 years without repair. Providing tile over thatching will add another 10 years life to the building. All efforts should be made to make drinking (pure) water available. For health care "Vaidus" should be made more educated so that by way of health care practices medicinal plants which are hidden natural wealth could be saved.

iii) EDUCATION: This is most important factor of development. Due to uncontrolled population, what we are doing is that "Ashram Shala" is being provided for their education. This again isolates tribal people. They could not get chance to come in the main stream. They remained shy and their all round development could not take place. The constitution of India enshrines reservation for these SC & ST people to bring them in main stream. But unfortunately the real poor are still not enjoying fully this facility due to low educational level. Higher services are beyond their reach. Only counted families are enjoying these reservation facilities. To make it available to the poor persons, the economic criterion among themselves should be applied. Besides, the educational pattern should also be changed to enhance their mental status. Instead of Ashram Shala, there should be centralised education at District level providing residential facilities to rural people. In education there should not be compartmentalization. If the population is controlled every thought could be translated to reality.

iv) LIGHT: Light should be provided to villages. The maintenance of power supply is very poor and therefore, some modified system of power supply such as underground cable or solar light should be thought of. Underground supply will solve the problem of forest destruction as well; the maintenance problem will also be less.

v) ROADS: Each village should be connected by roads but roads passing through forest which is vulnerable to illicit cutting should not be upgraded. All weather road will also solve the problem. In villages, the main transporting

vehicle is bullock cart for which tar road is not essential. Road construction should be avoided if it is detrimental to the forests.

16.34.2. CHANGE IN LEGAL PROVISIONS:

a) Efforts should be made to make amendment in IFA, 1927 with regard to section 61, in which the word “notified forest produce” should be replaced by “Forest Produce” or by issuing notification all forest produce should be brought under the preview of section 61.

b) Efforts should be made to establish forest court, chaired by IFS officers for quick disposal of forest case and to give judicious decision. Presently some courts are taking forests offence seriously but move very lightly. Forest officer can judge correctly the gravity of the case.

16.34.3. RESEARCH: There are so many Non Timber Forest Produce in the forest which are undefined and untapped. Efforts of the department should be to explore them and manage them scientifically. The identification of medicinal plants is the field to be taken for study immediately. This has wide scope in future. Dr. M.N. Padhye of Nagpur and his team have been conducting survey of medicinal plants in the forests of Chandrapur and Gadchiroli Districts. Over 150 such plants have been identified so far. The list of plants will be given in Part I. It is open to add more names of such plants. Besides, quantification and localization of the same are the fields for future study. Innovation and research works should always be carried out and the same be recorded and reported properly so that those could be of use to those who come next.

16.34.4. Nursery technique for miscellaneous forest species should be developed. Presently we are very poor in it. Besides, experiments should be carried out for establishing natural regeneration of different species. The effect on natural regeneration by controlling grazing, fire and weeds should be experimented. The roles of micro organism, wild animals, herbs, shrubs in development of forest are required to be known and documented so that people could give the importance to them along with tree species. Due to lack of knowledge, the forest officers are not understanding well this relationship and therefore, we tend to commit mistake by raising the voice for separating wild animals from forestry. In fact there are a number of organisms and plants in this eco-system and they all have some relation among themselves. Therefore, existence of all is required for balanced eco-system.

SECTION : 16.35: REMOVAL OF KUKUDRANJI

16.35.1: The Division has old teak plantations some of which have been affected by Kukudranji (*Calycopteris floribundia*). Even some patches of natural forests have also been badly affected by excessive growth of this species. It grows upto the tip of trees and overtops them. It has very adverse effect on growth and form of valuable trees. Hence, it should be removed

repeatedly to improve the hygiene of the crop. A special programme needs to be undertaken for eradication of this obnoxious weed.

16.35.2: Kukudranji in coups should be removed at the time of CBO, 3rd & 6th year cleaning. For removal of Kukudranji in Teak Plantation rangewise special program should be prepared after inspection of ACF.

16.35.3.: Site specific estimate should be prepared & got technical sanctioned by DY. CF and administrative approved by CCF (T).

SECTION : 16.36: SURVEY DEMARCATION

16.36.1: Cases under "Forest Rights Act 2006" are under process for finalization. After completion of demarcation by TILR actual fixation of boundary by erecting pillars has to be carried out and the area should be transferred on village and forest maps.

16.36.2: The cases of encroachment not regularized under "Right to Forest Act 2006" should summarily be removed.

SECTION : 16.37 INFRASTRUCTURE FACILITY

Following Infrastructure facilities should be made available to control forest/wildlife crime.

16.37.1 RAPID RESPONSE TEAM

- A) A field van/mini-truck with built in rails for accommodating a trap cage, with space for equipments, attendants and staff.
- B) A tranquilization kit with drugs for chemical immobilization.
- C) Mobile phones for continuous communication with the authorities.
- D) 4 wireless handsets.
- E) GPS set.
- F) 1 long range night vision binocular for seeing objects in the dark.
- G) A digital camera.
- H) 4 trap cages (2 for tiger and 2 for leopard)
- I) 1 mini-tractor for transporting the cage in rugged terrain.
- J) 2 search lights.
- K) 2 radio collars with receiver and antenna.
- L) 2 portable tents.
- M) 2 folding chairs with table.
- N) Hand audio system.
- O) Rope and net.
- P) Services of Govt. veterinary doctor on deputation should be made available.
- Q) Vehicles should be provided to Range Forest Officers.
- R) Creation of Forest custody with adequate man power.
- S) Separate staff should be provided for armory.
- T) Secret funds should be made available for intelligence gathering.

- U) Creation of Task force with 1 Forester, 3 Guards and 3 Laborers with vehicle at range level to meet any emergency.

**SECTION 16:38.:AREA SANCTIONED BY GOI/GOM UNDER FOREST
CON- SERVATION ACT, 1980:**

16.38.1. The list of proposal sanctioned by GOvt. of India under Forest Conservation Act, 1980 is incorporated in **Appendix No. XLIX** of Volume II.

**SECTION 16:39: AREA RECEIVED FOR COMPENSATORY
AFFORESTION:**

16.39.1 Central Chanda Forest Division has received 527.94 Ha. of area from various agencies towards compensatory afforestation scheme to be carried out under Forest Conservation Act, 1980. The details of is in **Appendix No. L** of Volume II.

====00====

CHAPTER – XVII

ESTABLISHMENT AND LABOUR

SECTION: 17.1: STAFF:

17.1.1 The details of staff have been given in Chapter IV of Part I of this plan. The existing ranges, round and beats have been given in **Appendix NO III** of Volume II.

17.1.2. The existing staff and set up is adequate for the management of the forests. However, being the protection, pressure, deployment of additional staff to protection works requires to be done. For mobility, the staff is poorly equipped. At least mobile squad R.F.O. should be given independent jeep for better mobility. Checking naka from Junona site at proper place is required to be erected. Near Ballarshah some criminal gangs are operating. To deal with them police assistance of permanent nature is required.

SECTION: 17.2: LABOUR SUPPLY:

17.2.1. Normally there is no problem so far as labour is concerned. Labourers are easily available. There was problem with EGS works as wage rate was less. But this problem has been lessened by enhancing EGS wage rate too. To lessen the labour pressure and to get good quality of works modern mechanical methods should be adopted. Efforts have also been made to scatter the works uniformly over the whole tract to overcome the chance of labour problem.

====00====

CHAPTER – XVIII

CONTROL AND RECORDS

SECTION: 18. 1: CONTROL AND RECORDS :

18.1.1. The following will be maintained in the division office :

- i) Control Form
- ii) Compartment History
- iii) Plantation and Regeneration Registers.
- iv) Seed and Nursery Register
- v) Boundary Registers.

18.1.2. CONTROL FORM:

The record of all harvesting, subsidiary cultural operations, regeneration works and soil and moisture conservation works carried out as per the Working Plan prescriptions, will be maintained in the control forms. The prescribed proforma of the following control forms will be given in **Appendix No. LXIV** of Volume II.

18.1.3. Two sets of control forms will be prepared. One set will be kept in the divisional office and the other set will be the flying set for the use of the D.C.F. Working Plan. The flying set will be sent annually by the D.C.F. Central Chandra division, to the D.C.F. Working Plan not later than October 1 every year taking the necessary entries. All entries showing the deviations from the prescriptions will be underlined in red. The C.F. Working Plan Chandrapur will scrutinise it and will send it to the territorial C.C.F. along with his remarks to the Addl. Principal Chief Conservator of Forests Working Plan-East, Nagpur not later than February 1 of the following year. The Conservator of Forests, Working Plan in turn will forward them to the Add. Principal Chief Conservator of Forest for perusal and orders where required.

18.1.4. Chief Conservator of Forests Territorial will ensure that the required Control Form is being maintained as stipulated above by Office Inspection of DCF.

18.1.5. COMPARTMENT HISTORIES:

Compartment histories i.e. the record of various forestry activities and observations made in the past year, will be maintained in form nos. 1 to V as shall be given in the **Appendix No. LXV** of Volume II.

Form I : Description of the Compartment.

Form II : Records of plantation and changes in the growing stock.

Form III : Records of operations and out-turns.

Form IV : Records of observations.

Form V : Records of injuries.

18.1.6. Each compartment must have a separate file for its records. Compartment histories must be maintained by the division since they keep the record of past management practices and their effects on the growing stock.

18.1.7. Every year, in July, the Range Forest Officer should fill in the necessary information and will send it to the Dy. Conservator of Forest, Central Chanda Division for scrutinising, editing through the concerned Asstt. Conservator of Forests, who after doing so, will get them typed and sign them. One copy of the forms will be filled in the divisional compartment history file while one copy each will be sent to the Range Forest Officer and the Conservator of Forest, Working Plan Division in the month of August.

18.1.8. DCF Territorial will ensure that the required Control Form is being maintained as stipulated above by Office Inspection of RFO.

18.1.9. PLANTATION AND NURSERY REGISTERS :

Plantation registers will be maintained for all the areas regenerated artificially in the Form Nos. 1 to 9 as shall be given in the **Appendix No. LXVII** of Volume II and Nursery registers will be maintained in Form Nos. 1 to 10. These forms shall be given in the **Appendix No. LXVI** of Volume II.

18.1.10. DIVISIONAL NOTE BOOK:

The matters of divisional importance will be recorded under standard headings for records and ready reference in the divisional note-book. A brief note of the plantations will also be recorded by the Dy. Conservator of Forest Central Chanda division under the appropriate heads. The form of Divisional note book shall be given in the **Appendix No. LXVIII** of Volume II.

====00====

CHAPTER – XIX

FINANCIAL FORECAST

SECTION: 19.1 : WHY FINANCIAL FORECAST ?

19.1.1: Working plan for the Central Chanda Forest Division Chandrapur has been prepared with specific objectives in respective working circles. Various prescriptions have been given to achieve these objectives. Execution of works needs proper planning and adequate financial provision for that. Execution of works will render services to society, environment and generate revenue to exchequer. That is why we need financial forecast for the plan.

SECTION: 19.2 : EXPENDITURE

19.2.1: Expenditure on establishment :

To run the proper administration, an efficient administrative set up is required. It is recurring expenditure on the set up of organization i.e. on salary and other benefits to officials and staff, maintenance of offices, vehicles, roads, buildings, machines, communications.

19.2.2: Expenditure on harvesting forest produces and other activities:

During the implementation of prescriptions of the draft report, some forest produce are going to be harvested. In SCI, WC, IWC, AWC, FWC, BOWC, OTPL and NWFP WC, forest produce in the form of timber, firewood or other produce like tendu leaves, gums etc will be harvested, it will need expenditure to be incurred on various activities.

19.2.3: Expenditure Details :

Since the expenditure on various items are linked with minimum wage rate for wages and the prevailing salaries of staff and officers, it is not possible to work out expenditure on specific item at this point of time. We can have the glimpses of it based on certain assumptions. First of all we assume that wage rate and salaries and other commodities consumption are going to be static. The quantum of works to be carried out is also going to be constant and furthermore the areas to be tackled yearly are also not going to vary. Based on these assumptions, the calculations are made. These are symbolic and not final.

(A) Timber: Cost of exploitation per cubic meter timber = Rs. 3350/-
Cost of exploitation per beat firewood = Rs. 540/-

Details of Yield and Expenditure

Working Circle	Area in ha.	Average Area per year in ha.	Yield per year			Expenditure per year- rupees in lakhs
			Timber	Poles	Fire wood	Total
SCI	7738.266	384	1669	310	184	56.92
IWC	53852.411	2700	840	-	40	28.14
AWC	36465.962	1818	-	-	-	-
OTPWC	8429.840	410	730	410	-	24.45
FWC	5421.484	900	-	-	-	-
Total	111908.057	-	3239	720	224	109.51

(B) Regeneration

(i) Natural Regeneration:

Natural regeneration will be carried out in Selection cum Improvement WC, Improvement WC, Afforestation WC, and Fodder Improvement WC. The expenditure will be incurred as per the rate sanctioned by PCCF, M.S.

Projection of Expenditure in Various WC

Sr. No.	Working Circles	Area in ha.	Workable Area per year in ha.	Expenditure (rupees in lakhs (Rate @ Rs.9680/ha., daily wage Rate Rs.285.46/MD)	No. of man-days to be generated
1	2	3	4	5	6
1	SCI	7738.266	150	14.52	5086
2	IWC	53852.411	700	67.76	23737
3	AWC	36465.962	400	38.72	13564
4	OTPWC	8429.840	-	-	-
5	FWC	5421.484	100	9.68	3391
	Total	111908.057	1350	130.68	45778

(ii) Artificial Regeneration:

Artificial regeneration works are required in under stocked and suitable blank areas. The expenditure will be incurred as per the rate sanctioned by PCCF (HoFF), MS.

Plantation Under A.R. in SCI

(No.of seedlings 1600/ha.)

Plantation work	Total area in ha. during this Plan period	Area available per year in ha.	Operation	Expenditure in rupees lakhs (daily wage rate 285.46/MD)	No. of man-days to be generated
1	2	3	4	5	6
Mix species plantation and others	7738.266	100	PPO/PYO	83.39	29200
			FYO	48.42	16962
			SYO	25.38	8890
			TYO	17.84	6250
			4 th YO	10.98	3850
			5 th YO	10.98	3850
			Total	196.96	69002

(C) Soil and moisture conservation and other items:

Exhaustive plan will be prepared and expenditure will be incurred from Mahatma Gandhi Rojgar Hami Yojna, State Plan, District Plan, Employment Guarantee Schemes, Rural Development Schemes, and Water Conservation Schemes of Central and State Government. Hence no quantification has been attempted.

Year wise details of expenditure: Expenditure to be incurred during Plan period is summarized in following table.

Artificial Regeneration expenditure in SCI

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs. (lakhs)	No. of man-days to be generated
	P P O	F Y O	S Y O	T Y O	4 th Y O	5 th Y O		
1	2	3	4	5	6	7	8	9
2015-16	84		--	--	--	--	84	29400
2016-17	84	48	--	--	--	--	132	46162
2017-18	84	48	25	--	--	--	158	55052
2018-19	84	48	25	18	--	--	176	61302
2019-20	84	48	25	18	12	--	188	65152
2020-21	84	48	25	18	12	11	198	69002
2021-22	84	48	25	18	12	11	198	69002
2022-23	84	48	25	18	12	11	198	69002
2023-24	84	48	25	18	12	11	198	69002
2024-25	84	48	25	18	12	11	198	69002

Plantation Under A.R. in IWC

(No. of seedlings 625/ha.)					
Plantation work	Total area in ha. during this Plan period	Area available per year in ha.	Operation	Expenditure in rupees lakhs (daily wage rate 285.46/MD)	No. of man-days to be generated
1	2	3	4	5	6
Mix species plantation and others	53852.411	500	PPO/PYO	297.20	104114
			FYO	156.00	54630
			SYO	46.06	16140
			TYO	79.56	27876
			4 th YO	54.94	19250
			5 th YO	54.94	19250
			Total		241260

Year wise details of expenditure: Expenditure to be incurred during Plan period is summarized in following table.

Artificial Regeneration expenditure in IWC

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs. (lakhs)	No. of man-days to be generated
	PPO	FYO	SYO	TYO	4 th YO	5 th YO		
1	2	3	4	5	6	7	8	9
2015-16	298	--	--	--	--	--	298	104114
2016-17	298	156	--	--	--	--	454	158744
2017-18	298	156	46	--	--	--	500	174884
2018-19	298	156	46	80	--	--	580	220760
2019-20	298	156	46	80	56	--	636	222010
2020-21	298	156	46	80	56	54	690	241260
2021-22	298	156	46	80	56	54	690	241260
2022-23	298	156	46	80	56	54	690	241260
2023-24	298	156	46	80	56	54	690	241260
2024-25	298	156	46	80	56	54	690	241260

SMC Works with artificial regeneration expenditure (SCI & IWC)

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs (lakhs)	No. of man-days to be generated
	P P O	F Y O	S Y O	T Y O	4 th Y O	5 th Y O		
1	2	3	4	5	6	7	8	9
2015-16	382	--	--	--	--	--	382	133819
2016-17	382	204	--	--	--	--	586	205282
2017-18	382	204	71	--	--	--	657	230154
2018-19	382	204	71	98	--	--	755	264485
2019-20	382	204	71	98	68	--	823	288306
2020-21	382	204	71	98	68	65	888	311076
2021-22	382	204	71	98	68	65	888	311076
2022-23	382	204	71	98	68	65	888	311076
2023-24	382	204	71	98	68	65	888	311076
2024-25	382	204	71	98	68	65	888	311076

Plantation Under A.R. in AWC

Plantation work	Total area in ha. during this Plan period	Area available per year in ha.	Operation	(No. of seedlings 1111/ha.)	
				Expenditure in rupees lakhs (daily wage rate 285.46/MD)	No. of man-days to be generated
1	2	3	4	5	6
Mix species plantation and others	36465.962	300	PPO/PYO	365.70	128106
			FYO	131.25	45984
			SYO	62.49	21891
			TYO	46.50	16551
			4 th YO	33.00	11550
			5 th YO	33.00	11550
			Total	671.94	235631

Year wise details of expenditure: Expenditure to be incurred during Plan period is summarized in following table.

Artificial Regeneration expenditure in AWC

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs (lakhs)	No. of man-days to be generated
	P P O	F Y O	S Y O	T Y O	4 th Y O	5 th Y O		
1	2	3	4	5	6	7	8	9
2015-16	366	--	--	--	--	--	366	128214
2016-17	366	132	--	--	--	--	498	174455
2017-18	366	132	63	--	--	--	561	196524
2018-19	366	132	63	48	--	--	609	213339

2019-20	366	132	63	48	33	--	642	224900
2020-21	366	132	63	48	33	33	675	236460
2021-22	366	132	63	48	33	33	675	236460
2022-23	366	132	63	48	33	33	675	236460
2023-24	366	132	63	48	33	33	675	236460
2024-25	366	132	63	48	33	33	675	236460

SMC Works with A.R. Expenditure in Rs. Lakhs in FWC

¼oSj.k lk/ku laiRrhpk fodkl dj.ks½

Plantation work	Total area in ha. during this Plan period	Area available per year in ha.	Operation	Expenditure in rupees lakhs. (daily wage rate 285.46)	No. of man-days to be generated.
1	2	3	4	5	6
Fodder & Misc. Plantation	5421.484	100	PPO/PYO	22.17	7765
			FYO	4.22	1479
			SYO	5.05	1769
			TYO	4.53	1589
			4 TH YO	4.32	1514
			5 TH YO	4.32	1514
			Total	44.61	15630

Year wise details of expenditure: Expenditure to be incurred during Plan period is summarized in following table.

Artificial Regeneration expenditure in FWC

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs lakhs	No. of man-days to be generated
	P P O	F Y O	S Y O	T Y O	4 th Y O	5 th Y O		
1	2	3	4	5	6	7	8	9
2015-16	22	--	--	--	--	--	22	7765
2016-17	22	4	--	--	--	--	26	9244
2017-18	22	4	5	--	--	--	31	11013
2018-19	22	4	5	5	--	--	36	12602
2019-20	22	4	5	5	4	--	40	14116
2020-21	22	4	5	5	4	5	45	15630
2021-22	22	4	5	5	4	5	45	15630
2022-23	22	4	5	5	4	5	45	15630
2023-24	22	4	5	5	4	5	45	15630
2024-25	22	4	5	5	4	5	45	15630

SMC Works with artificial regeneration expenditure (AWC & FWC)

Year	Artificial Regeneration expenditure in Rs. lakhs						Total expdr. in Rs. (lakhs)	No. of man-days to be generated
	PPO	FYO	SYO	TYO	4 th YO	5 th YO		
1	2	3	4	5	6	7	8	9
2015-16	388	--	--	--	--	--	338	128214
2016-17	388	136	--	--	--	--	474	166047
2017-18	388	136	68	--	--	--	542	189868
2018-19	388	136	68	53	--	--	595	208436
2019-20	388	136	68	53	37	--	632	221397
2020-21	388	136	68	53	37	38	670	234708
2021-22	388	136	68	53	37	38	720	252224
2022-23	388	136	68	53	37	38	720	252224
2023-24	388	136	68	53	37	38	720	252224
2024-25	388	136	68	53	37	38	720	252224

Total Expenditure in Rs lakhs

Year	Establishment	Boundary, demarcation fire protection	Timber	S & m work	N.R.	Artificial regeneration expenditure In Rs. (lakhs)	Total expdr. in Rs. (lakhs)	No. of man-days to be generated
1	2	3	4	5	6	7	8	9
2015-16	26	12	110	22	130	670	970	339802
2016-17	26	12	110	22	130	670	970	339802
2017-18	26	12	110	22	130	670	970	339802
2018-19	28	14	115	23	134	680	994	348209
2019-20	28	14	115	23	134	680	994	348209
2020-21	28	14	115	23	134	680	994	348209
2021-22	30	16	122	25	136	690	1019	356967
2022-23	30	16	122	25	136	690	1019	356967
2023-24	30	16	122	25	136	690	1019	356967
2024-25	30	16	122	25	136	690	1019	356967

SECTION: 19.3: ANNUAL REVENUE EXPECTED FROM ALL SOURCES:

Exploitation of forest produce not only leads to incurring expenditure but also generates revenue in the form of services and goods. Revenue would be received from exploitation of timber, firewood, bamboo, services of grazing, eco-tourism, NWFP etc.

Revenue from all sources:

Sr. No.	Item	Quantity	Rate	Revenue in Rs. (lakhs)
1	2	3	4	5
1	Timber (Selection)	3239	11300	366.007
2	Timber (Improvement)	840	11300	94.92
3	(OTPWC)	730	20500	182.50
4	Fuel Beats	224	2312	5.18
5	Teak poles	720	225	1.62
6	Tendu	20350 Std. bags	Rs. 746	151.811
7	Miscellaneous	--	Lump-sum	8.00
	Total			810.038

SECTION 19.4: STATEMENT OF REVENUE AND EXPENDITURE FOR THE ENTIRE PLAN PERIOD:

(in rupees lakhs.)

Sr. No.	Year	Timber	Fuel Beat	Pole	Tendu	Other	Total Revenue	Total Expenditure	No. of man-days to be generated
1	2	3	4	5	6	7	8	9	10
1	2015-16	643	5	2	151	8	809	970	339802
2	2016-17	655	5	2	165	8	835	970	339802
3	2017-18	670	5	2	180	8	865	970	339802
4	2018-19	685	7	2	195	10	899	994	348209
5	2019-20	690	7	3	210	10	920	994	348209
6	2020-21	710	7	3	215	10	945	994	348209
7	2021-22	720	7	3	230	12	972	1019	356967
8	2022-23	730	9	4	245	12	1000	1019	356967
9	2023-24	735	9	4	260	12	1020	1019	356967
10	2024-25	750	9	4	275	12	1050	1019	356967

SECTION: 19.5 : EXPENDITURE ON PLAN PREPARATION:

Expenditure on Plan of Central Chanda Forest Division cannot be separately worked out. Working Plan Division has been given the responsibility of preparing plan of various forest divisions. Revision of working plan for Central Chanda Forest Division was taken up in 2014. Enumeration work has been completed by SOFR Scheme Gadchiroli. Hence actual expenditure on preparation of this Plan cannot be segregated. Proportionate expenditure has been worked out as given below.

Proportionate Expenditure	-	Rs. 5848750/-
Working Plan Area.	-	ha. 111908.057
Per Unit Area Cost.	-	Rs. 52.30/ha.



OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS,
(HoFF) MAHARASHTRA STATE, NAGPUR
Van Bhawan, Ramgiri Road, Civil Lines, Nagpur-440 001

Speed Post/E-mail

No.Desk-14/WP/SCC Meeting/ 582 /2015-16
 Nagpur, dated 6 /8/2015

To,

1. The Chief Conservator of Forests (T)
 Gadchiroli/Thane/ Chandrapur/ Dhule
2. The Conservator of Forests,
 Working Plan, Chandrapur/Dhule/Dahanu/Gadchiroli

Sub :- Minutes of the Standing Consultative Committee meeting held on 10th June, 2015 for approval of First & Second PWPRs.

The minutes of the Standing Consultative Committee meeting for approval of PWPR of Sironcha Forest Division & DWPRs of Dhule, Alibag, and Central Chanda Forest Division, held on 10th June, 2015 at Vansabhagraha, Nagpur, is enclosed for information and necessary action. Revised DWPRs of Divisions mentioned in the minutes should be submitted by the concerned WPO & CCF(T) by 31/8/15 after incorporating the suggestions/modifications suggested by the Committee for further necessary action.

Encl :- As above

O/C approved by PCCF(HoFF) M.S. Nagpur

For Principal Chief Conservator of Forests
 (HoFF) M.S. Nagpur

Copy forwarded along with enclosure to the :-

1. Principal Chief Conservator of Forests (Wildlife) M.S., Nagpur
2. Principal Chief Conservator of Forests (P & M) M.S., Nagpur
3. Additional Principal Chief Conservator of Forests (BPD), M.S., Nagpur
4. Additional Principal Chief Conservator of Forests (Personal), M.S., Nagpur
5. Additional Principal Chief Conservator of Forests (Campa), M.S., Nagpur
6. Additional Principal Chief Conservator of Forests (Protection), M.S., Nagpur
7. Additional Principal Chief Conservator of Forests (Conservation), M.S., Nagpur
8. Additional Principal Chief Conservator of Forests (Regional) MoEF, Nagpur
9. Additional Principal Chief Conservator of Forests (IT&P) M.S., Nagpur
10. Additional Principal Chief Conservator of Forests (WP-West) Pune

01-6/8/15
 6/8

**MINUTES OF THE MEETING OF THE STANDING CONSULTATIVE
COMMITTEE FOR THE STATE OF MAHARASHTRA
HELD ON 10th JUNE 2015 FOR APPROVAL OF PWPR & DWPR**

Government of Maharashtra vide G.R. NO. FDM -2015/CR-95/F-2 Dated 29/4/2015 has constituted a Standing Consultative Committee for approval of Secondary Preliminary Working Plan Reports and Preliminary Working Plan Reports of various Forest Divisions of Forest Department in Maharashtra before its submission to Government of India for approval. The meeting of the said committee was held at "Van Sabhagruh", Nagpur on 10/6/2015 under the Chairmanship of Shri. A.K.Saxena, Principal Chief Conservator of Forests (HoFF), M.S, Nagpur. During the meeting Shri A.S.K. Sinha, (Production & Management), M.S, Nagpur, and other concerned officers as members of the committee were also present. Shri.Kanwaljit Singh, APCCF (Central) Regional Office, Nagpur was present in the meeting as representative of GOI. The list of participants in the meeting is given in annexure-A.

2.00 Shri M.Karunakaran, APCCF(WP-East) Nagpur welcomed all the dignitaries and officials attending the meeting and briefly introduced the agenda of the meeting. He informed that **One PWPR of Sironcha Forest Division, and Three DWPRs namely Central Chanda, Alibag, Dhule Forest Division** will be placed before the committee for discussion and approval. Thereafter, he requested Shri A.K.Saxena, PCCF(HoFF), Nagpur to start the proceedings of the meeting.

3.00 Shri A.K.Saxena, PCCF (HoFF), M.S., Nagpur and Chairman of the Committee told that working plan was a technical document and explained the changing scenario in forestry sector and emphasized that latest guidelines for management of forest & wildlife and Working Plan should be kept in mind before finalising working plans and need to fine tune the DWPR & PWPR in the light of National Working plan code 2004 & new National working Plan Code 2014, which has become operational as soon as it was published. Thereafter, Shri A.K.Saxena PCCF(HoFF),M.S, Nagpur requested the C.F W.P. Chandrapur to make presentation of the DWPR of Central Chanda Forest Division. Shri A.K.Saxena, PCCF (HoFF), M.S., Nagpur informed

that, some working plan preparation are way behind their schedule time. He instructed all power point presenters to complete power point presentation within specified time and also requested Standing Consultative Committee members to see that the previous meeting suggestions are duly complied.

CENTRAL CHANDA FOREST DIVISION (DWPR)

4.00 Shri Dhabhekar, C.F W.P. Chandrapur made power point presentation on DWPR of Central Chanda Forest Division before the committee. He narrated different components of PWPR-I, and suggestions and modifications made by the State Level Committee in its meetings on 1st & 2nd March 2013, appropriate action taken in the modified DWPR and presented the same before the committee. He explained the basic details like geographic area, soil type, flora and fauna, result of past management and future management etc. of the Forest in Central Chanda Forest Division. During deliberations, following points were discussed and suggestions were made by the committee members.

1.00 Dr.V.K.Sinha A.P.C.C.F.(Conservation) Nagpur suggested to include the old Working Plan and Current Working Plan area of S.C.I.W.C. and display the same in the table. Those areas under the Building, Encroachment shall be excluded from this S.C.I. W.C.

2.00 The enumeration data of only one enumeration plot has been shown in this working plan. Hence requested that the WPO, under the guidance of APCCF (WP-E), Nagpur should examine all other sample plots and show the number of trees and basal area for this WC.

3.00 He also suggested to maintain the compartment history and control form of this current working plan so that it can be of help in future revision of the working plan.

4.00 He discussed about Shri Bommewar case which involves about 33000 ha and litigation is going on in the court. These areas should be verified and deleted from current Working Plan.

5.00 Those areas which are disputed and signed by Collector such type of disputed area should be attached as Appendix. He also directed to check the enumeration data, yield and the basal area.

6.00 Shri A.K. Saxena.P.C.C.F.(HOFF)M.S. Nagpur suggested that the area under encroachment under Jiwati range should not be taken under AWC and suggested the WPO to allot the such areas in Miscellaneous Regulations.

7.00 Shri A.S.K Sinha P.C.C.F.(P&M)M.S. Nagpur suggested to prescribe 50% retention from Silviculturally available stems in SCI WC.

8.00. Dr.V.K. Sinha APCCF (Conservation) suggested that, the WPO should write in detail about the chronology of events that led to large scale encroachments in Jiwathi Range by compiling the details from various records available in the Division including past Working Plans.

9.00. Dr.V.K. Sinha APCCF (Conservation)suggested that in Chapter on Forest Rights Act, specific mention about the forest area finally accepted by DLC for vesting of rights and finally rejected should be clearly mentioned. For claims which are finally rejected, WPO should prescribe for eviction of such encroachments as per law.

10.00. For Bamboo (Overlapping) Working Circle, following suggestions were given by SCC members:

- a) Details of past flowering should be included in the Plan.
- b) Management prescriptions for flowered areas should be included in the Plan as there is likelihood of flowering during the Plan period.
- c) Regarding retention of culms in Clumps, SCC advised the WPO to follow the standard norm by referring to earlier plans.

11.00 During discussion on Wild Life (Overlapping) Working Circle, Shri Sarjan Bhagat P.C.C.F.(Wildlife)M.S. Nagpur suggested identifying sensitive areas for Man-Animal conflict and prescribing mitigation measures for the same.

12.00 Shri A.S.K Sinha P.C.C.F.(P&M)M.S. Nagpur and Shri Sarjan Bhagat P.C.C.F.(Wildlife)M.S. Nagpur suggested not to prescribe the Kulu gum tapping due to lesser number of trees



13.00 Dr. S.H. Patil, APCCF(Campa) suggested to prescribe the standard gum extraction technique for Dhawada, Salai etc, and also suggested to classify wildlife census data of Wildlife based on technique adopted such as 1. Line-transect method 2. Water hole census, 3. Camera trap.

14.00 Shri Kanwaljeet Singh, APCCF(Central) Regional Office, Nagpur, suggested to write in details about deviations observed during implementation of past working plan.

15.00 Dr. Mohan Jha APCCF(IT&P) and Dr.V.K.Sinha, APCCF(Conservation), suggested to incorporate Tiger corridor identified in the Tiger Conservation Plan of TATR.

16.00 Shri Sarjan Bhagat, PCCF(Wild life) MS, Dr.S.H. Patil, APCCF(CAMPA) and Dr. V.K. Sinha APCCF(Conservation), suggested to give preference to local grass species in fodder management working circle.

17.00 Dr. V.K. Sinha APCCF(Conservation), pointed out while checking the yield calculations from page no.179 onwards that there is anomaly of facts in yield like removing of 2 trees/ 4 trees per ha, 3/5 trees and somewhere 9/10 trees/ha and suggested to recheck and correct all these anomalies duly checked by APCCF WP.

18.00 While discussing Wildlife (OL) WC, Dr. V.K. Sinha APCCF(Conservation), pointed out that on page no.262 Cheetal species should be added and word **blasting** should be deleted. Hume pipe model for water hole should be modified with 1mt ht x1.5 mt width with proper diagram and saucer shape water hole model should be removed as it is injurious to wild animal. Solar Pumps should be proposed as aquafier(Water sources) in remote areas as source for water supply.

19.00 The members suggested the WPO to check spellings and grammar before submission of final DWPR.

After detail deliberations, SCC approved the DWPR of Central Chanda Forest Division subject to incorporation of suggestions of SCC Members and submit the revised DWPR within one month to PCCF (P&M) after the minutes are approved.

SIRONCHA FOREST DIVISION (PWPR)

5.00 Shri T.S.K REDDY, CCF(T) Gadchiroli made power point presentation on PWPR of Sironcha Forest Division before the committee. He narrated different components of PWPR and explained the basic details like geographic area, soil type, flora and fauna, result of past management and future management etc. of the Forest in Sironcha Forest Division. During deliberations, following points were discussed and suggestions were made by the committee members.

1.00 Current R.S. Yadav's Working Plan was reviewed. This plan has 4 Main Working Circles of SCI, IWC, TPWC and PWC having area of 62%, 26%, 5% and 7% of total 277785.20ha and also having 6 Overlapping Working Circles as Bamboo (OL) WC, Wild life (OL)WC, JFM(OL)WC, FP(OL)WC, E(OL)WC and NWFP(OL) WC.

2.00 Each Working Circle of Current working plan was reviewed about its performance for past years and the committee found the results were satisfactory.

3.00 While the performance of coupes under SCI WC was discussed, members expressed doubt about actual yield and wanted explanation as how actual average yield obtained came down to 3 m³/ ha in coupes when prescribed yield was 4 m³/ha.

4.00 Past performance of coupes and its result under Selection-cum Improvement working Circle was discussed. On the average 25 coupes out of 61 coupes/year were worked. Remaining coupes were not worked due to Naxalite influence.

5.00 Likewise past performance of coupes under IWC WC, Teak Plantation Working Circle, Protection(OL)WC, Bamboo (OL) WC, Wildlife (OL)WC, Ecotourism (OL) WC, JFM(OL) WC, NWFP(OL)WC was discussed and the result was satisfactory. As the result was satisfactory, CCF (T) proposed the same Working Circles for future management also.

6.00 Proposals for new Working Plan for Sironcha Forest Division:



Annexure-A

The meeting of SCC Committee to approve PWPR and DWPR was held at "Van Sabagruha" Nagpur 10th June, 2015 under the Chairmanship of Shri A.K. Saxena, PCCF (HOFF) M.S. Nagpur.. In the said meeting following officers were present .

1. Shri A.K. Saxena, PCCF (HOFF) M.S. Nagpur -	Chairman
2. Shri A.S.K. Sinha, PCCF (P & M) M.S. Nagpur -	Member
3. Shri Sarjan Bhagat, PCCF(Wildlife) M.S. Nagpur-	Member
4. Shri Dr. V.K. Sinha, APCCF (Conservation) M.S. Nagpur-	Member
5. Shri Sri Bhagwan, APCCF (B.P& D) M.S. Nagpur -	Member
6. Shri M. Karunakaran, APCCF (WP-E) Nagpur -	Member Secretary
7. Shri A.K. Mishra, APCCF (Personnel) M.S. Nagpur -	Member
8. Dr.Mohan Jha, APCCF (I.T &P) M.S. Nagpur -	Member
9. Dr. S.H. Patil, APCCF(Campa) M.S. Nagpur-	Member
10.Shri B.S.K. Reddy, APCCF(Protection) M.S. Nagpur-	Member
11. Shri Kanwal jeet Singh, APCCF(Regional) MoEF, Nagpur	Member
12 .Dr. V.D. Chafekar, APCCF (WP-West) Pune -	Member
13. Shri K.P. Singh, CCF(T) Thane-	Member
14. Shri SP. Thakre, CCF(T) Chandrapur	Member
15. Shri T.S.K. Reddy, CCF(T) Gadchiroli	Member
16. Smt. Suneeta Sing CCF(T) Dhule	Member
17. Shri R.M. Dayal, CF(WP) Dhule	Member
18. Shri P. Kalyankumar, CF(WP) Nagpur	Member
19. Shri P.G. Rahurkar, CF(WP) Dahanu	Member
20. Shri R.T. Dhabekar CF(WP) Chandrapur	Member
21. Smt. Shree laxmi CF(WP) Gadchiroli	Member

**OFFICE OF THE CONSERVATOR OF FORESTS,
WORKING PLAN, CHANDRAPUR.**

Director, Chandrapur Forest Administration, Development & Management
Academy, premises Mul Road, Chandrapur-442401 (M.S.),
Ph.No.(07172)256214, email: cfworkingpl@gmail.com

Subject :- Compliance of the
Changes and suggestion of the
State Level Standing Consultative
Committee on the Draft Working
Plan of Central Chanda Forest
Division, Chandrapur Meeting held
on Dt. 10/6/2015 & Resubmission of
revise DWPR

No :- CF/WP/RS/ 132 /2015-16
Chandrapur - 442401 Dt.7/10/2015

To,
**The Addl. Principal Chief Conservator of Forests,
Working Plan, East
Nagpur .**

Ref: Principal Chief Conservator of Forests (HOFF) M.S. Nagpur
letter No Desk-14/WO/SCC/Meeting/582/2015-16/ Dt.
6/8/2015

In the State Level Standing Consultative Committee (SCC) Meeting held at Vansabhagruh Nagpur on 10-06-2015, as per reference above the State Level Standing Consultative Committee (SCC) unanimously approved the Draft Working Plan of Central Chanda Forest Division, Chandrapur, subject to incorporation of the changes and suggestion made by the member of the Committee in the final DWPR.

Therefore the compliance of the changes and suggestions of the members in SCC is made accordingly as below and final DWPR is submitted in favour of information and necessary action.

Compliance Report

Sr. No.	Comments/Recommendations	Compliance done
1	Shri Dr. V.K. Sinha, APCCF (Conservation)Nagpur, suggested to include the old Working Plan and Current Working plan area of SCIWC and display the same in the table. Those area under the building, encroachment should be excluded from this SCIWC	All the data have been included as per discussions and suggestion. (Chapter II, Page 175) The area stated under SCIWC in current working plan does not include area under building and encroachment.

2	The enumeration data of only one enumeration plot has been shown in this working plan. Hence requested that the WPO under the guidance of APCCF (WP-East) Nagpur should examine all other sample plots and show the number of trees and basal area for this WC..	Suggestion incorporated. The statement at para 2.5.2 in Chapter- II for SCIWC, shown the average no of trees/ha, basal area/ha. & volume / ha. for 138 enumeration plots laid in 34 compartments.
3.	It was also suggested to maintain the compartment history and control from of this current working plan so that can be of help in future revision of the Working Plan.	Dy. CF Central Chanda Forest Division, Chandrapur had submitted compartment history, coupe control forms for the period of 2004-05 to 2013-14 to Conservator of Forest, Working Plan, Gadchiroli vide their ltr no.Survey/1345 dt24.8.2015 And also is informed him vide letter no CFWP/RS/128 dt. 20/09/2015 to submit duly filled forms of compartment history, coupe control forms every year as per working plan code 2014 through CCF Chandrapur (Territorial).
4.	APCCF (Conservation) Nagpur discussed about Shri. Bommewar case which involves about 33000 ha and litigation is going on in the court These area should be verified and deleted from current Working Plan.	Suggestion is incorporated in Volume -I Part II (Chapter XI, Page 301.) The Bommewar case report involves 33000 ha. forest area involves (for Chandrapur District), however according to stock map of Central Chanda Division area under encroachment is 26158.207 ha., which is now deleted from IWC & AWC, and after deletion the same is included in Misc. W.C.
5.	Those areas which are disputed and signed by Collector such type of disputed area should be attached as Appendix. He also directed to check the enumeration data, yield and the basal area..	Suggestion is incorporated. Letter from Dy. Secretary Govt of Maharashtra, Revenue & Forest Department Mantralay, Mumbai, Showing disputed area is attached in Appendix No LXX of Volume II. Page no.480-484. The statement showing trees per ha, basal area volume per ha. is given in Chapter- XI Of MWC under para 11.2 Page no.302

6.	Shri. A.S.K. Sinha PCCF (P&M)M.S. Nagpur suggested that the area under encroachment under Jiwati range should not be taken under AWC and suggested to the WPO to allot the such areas in Miscellaneous Regulations.	Suggestion incorporated in part II of volume -I. (Chapter XI, Page 301.) Area under encroachment now deleted from AWC & IWC and same is included in Miscellaneous W.C.
7.	Shri A.S.K.Sinha PCCF (P&M)M.S Nagpur suggested to prescribe 50% retention from silviculturally available stems in SCIWC.	Suggestion incorporated in Chapter II Of SCIWC page No 201 para no 2.14.6
8.	Dr. V.K. Sinha APCCF (Conservation) suggested that, the WPO should write in detail about the chronology of events that led to large scale encroachment in Jiwati range by compiling the details from various records available in the division including past Working Plan.	Suggestion incorporated. (Chapter I of part I in Volume-I. Page 14 to 20) paragraph from 1.8.11 to 1.8.34
9.	Dr. V.K. Sinha APCCF (Conservation) suggested that, in Chapter on forest right act, specific mention about the forest area finally accepted by DLC for vesting of rights and finally rejected should be clearly mentioned. For claims which are finally rejected, WPO should prescribe for eviction of such encroachments as per law.	Suggestion incorporated in part II of volume -I. (Chapter XIV, Page 321.) The claims under Forest Right Act 2006 are not settled finally, The process is on-going, as per provision laid down in FRA-2006. Hence the exact no. of claims finally settled can not be shown. After rejection of the claims finally as per provisions in FRA-2006, then forest area involved in such finally rejected claims, will be evicted as per legal provisions under relevant Acts. (Chapter XIV of Volume - I - Page 321.)
10.	For Bamboo (Overlapping) Working Circle, following suggestions were given by SCC members A) Details of past flowering should be included in the Plan period. B) Management prescription for flowered areas should be included in the Plan as there is likelihood of flowering during the Plan period.	Suggestion incorporated. A) Chapter VI Page 233. para no. 6.14 B) Chapter VI Page 233. para no. 6.14

	C) Regarding retention of culms in Clumps SCC advised the WPO to follow the standard norm by referring to earlier Plans.	C) Chapter VI Page 232 6.13.2
11.	During discussion on Wild Life (Overlapping) Working Circle, Shri. Sarjan Bhagat, PCCF (Wild Life) M.S. Nagpur suggested identifying sensitive areas for Man-Animal conflict and prescribing mitigation measures for the same.	Necessary suggestion is complied & incorporated in Chapter VIII, para No. 8.15.1 & 8.15.2, Page 277-279
12.	Shri A.S.K.Sinha PCCF (P&M) M.S. Nagpur & Shri. Sarjan Bhagat, P.C.C.C.F. (Wild Life) M.S. Nagpur suggested not to be prescribe the Kulu Gum tapping due to lesser no. of trees.	Suggestions complied. Kulu gum tapping is deleted from para 7.4.21, Page 241, Chapter VII
13.	<u>Dr.</u> S.H. Patil APCCF (Campa) suggested to prescribe the standard Gum extraction technique for Dhawada, Salai etc, and also suggested to clarify Wild Life census data of Wild life based on technique adopted such as 1. Line Transect method, 2. Water hole census, 3. Camera Trap.	Suggestions incorporated in Chapter VIII, Page no. 242 para no. 7.4.23 Wild life Census data is incorporated in Chapter VIII of Wild life Overlapping Working Circle on page no 251 vide para no 8.2
14	Shri. Kanwarjit Sing, A.P.C.C.F. (Central) Regional Office, (Western Central Zone), Nagpur suggested to write in details about deviations observed during implementation of previous working plan.	Suggestions incorporated The minor deviation observed during implementation of past working plan is given in assessment of each Working Circle which is incorporated in Chapter V - Past System of Management.- Page No 117, 119, 120, 122
15	Dr. Mohan Jha A.P.C.C.F. (IT & P) & Dr. V.K. Sinha, APCCF (Conservation) suggested to incorporate Tiger, corridor identified in the Tiger conservation Plan of TATR	All Suggestions incorporated in Chapter VIII of Wild life Overlapping Working Circle on Page No. 261-270 vide para no. 8.9
16	Shri, Sarjan Bhagat, P.C.C.F.(Wild Life) & Dr. S.H, Patil, APCCF(Campa) & Dr. V.K. Sinha APCCF (Conservation) suggested to give preference to local grass species in Fodder Management Working Circle.	Suggestions incorporated in Chapter -IX, Page 284-285 vide para no. 9.6.7.



17	Dr. V.K. Sinha APCCF (Conservation) pointed out while checking the yield calculation from Page No 179 onwards that there is anomaly of fact in yield like removing of 2 trees/ 4 trees per ha., 3/5 trees & somewhere 9/10 trees / ha. and suggested to recheck and correct all these anomalies duly checked by APCCF WP	Suggestions incorporated in Chapter II of Part II page no 201 para no. 2.14.6
18	While discussing Wild Life (OL) WC Dr. V.K. Sinha APCCF (Conservation) pointed out that on page no 262 Cheetal species should be added and word blasting should be deleted. Hume pipe model for water hole should be modified with 1 mt. ht x 1.5 mt width with proper diagram and saucer shape water hole model should be removed as it is injurious to wild animal, Solar Pumps should be proposed as aquafier (Water sources) in remote areas as source for water supply.	Suggestions incorporated. 1) Cheetal species added on page no 251. 2) Word 'blasting' is removed from page no 272, para no 8.11.2 3) Hume pipe model with 1mtr height x 1.5 mtr width size is incorporated on page no. 272, para no. 8.11.4 4) saucer shape water hole model removed from para no. 8.11.4 5) use of Solar pump added on para no 8.11.1
19	The member suggested the WPO to check spelling and grammar before submission of final DWPR	Suggestions incorporated. All spelling and grammer checked

Encl :- As above (Revised 4 copy of DWPR)
(Volume I & II of DWPR)

Ashwale
(A.D.Bhosale)
Conservator of Forests
Working Plan, Chandrapur

Copy submitted with compliment to the Principal Chief Conservator of Forests,(P&M) M.S Nagpur for information.

Copy with Volume I & II of DWPR submitted to the Chief Conservator of Forests,(T) Chandrapur for information.

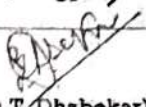
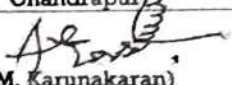
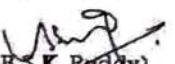
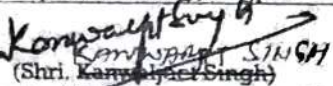
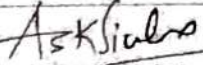
Copy with Volume I & II of DWPR forwarded to the Deputy Conservator of Forests, Central Chanda Division, Chandrapur for information.

Ashwale
(A.D.Bhosale)
Conservator of Forests
Working Plan, Chandrapur

STANDING CONSULTATIVE COMMITTEE MEETING HELD ON 10 JUNE, 2015

- Ref : 1) G.R. Revenue & Forest Department No. MSC 2004/CR-102/F-2, dated 25.6.2004.
 2) G.R. Revenue & Forest Department No. FDM-2015/CR-96/F-2, dated 29.4.2015.
 3) PCCFM.S.Nagpur's letter No.Desk-14/WP/ECCMeeting/168,dated 25.5.2015.

Draft Working Plan (DWPR-II) of Central Chanda Forest Division was discussed and approved by the Standing Consultative Committee under the Chairmanship of Principal Chief Conservator of Forests (HoFF), Maharashtra State, Nagpur in the meeting held on 10th June 2015 at Van Sabhagruh, Nagpur, *with certain recommendations/suggestions as per the Minutes of the meeting.*

 (Raju.T.Dhabekar) Conservator of Forests, Working Plan, Chandrapur	
 (Gajendra Hire) Dy. Conservator of Forest, Central Chanda Forest Division, Chandrapur	(Dr. Deepak Mhaisekar) Collector, Chandrapur
 (Sanjay P. Thakre) Chief Conservator of Forests, Chandrapur Circle, Chandrapur	 (M. Karunakaran) Add. Principal Chief Conservator of Forests, Working Plans (East) Nagpur
(Dr. Mohan Jha) Add. Principal Chief Conservator of Forest (IT & P) Maharashtra State, Nagpur	(Shri. Dr. V.K. Sinha) Add. Principal Chief Conservator of Forest (Conservation) Maharashtra State, Nagpur
 (Shri. B.S.K. Reddy) Add. Principal Chief Conservator of Forest (In-charge of Chandrapur Circle) Maharashtra State, Nagpur	(Dr. V. D. Chafekar) Add. Principal Chief Conservator of Forest (Working Plan-West) Pune
 (Shri. Dilip Singh) Add. Principal Chief Conservator of Forest Maharashtra State, Bio-diversity Unit, Nagpur	(Shri. V.N.Ambade) Regional Manager, Forest Survey of India, (Central Zone), Nagpur
(Shri. Shri. Bhagwan) Add. Principal Chief Conservator of Forest (BP&D) Maharashtra State, Nagpur	 (Shri. Kanwar Singh) Add. Principal Chief Conservator of Forest (Regional) MoEF, Nagpur
 (Shri. A.S.K. Sinha) Principal Chief Conservator of Forest (P&M) Maharashtra State, Nagpur	(Shri. Sarjan Bhagat) Principal Chief Conservator of Forest (Wildlife) Maharashtra State, Nagpur
(Shri. A. K. Saxena) Principal Chief Conservator of Forests (HoFF) Maharashtra State, Nagpur	

**OFFICE OF THE CONSERVATOR OF FORESTS,
WORKING PLAN, CHANDRAPUR.**

Director, Chandrapur Forest Administration, Development & Management
Academy, premises Mul Road, Chandrapur-442401 (M.S.),
Ph.No.(07172)256214, email: cfworkingpl@gmail.com

Subject:-Working Plan of Central Chanda
Forest Division, Chandrapur
written by Raju T.Dhabekar C.F.
(Working Plan), Chandrapur for the
period of 2015-16 to 2024-25

No :- CF/WP/RS/ 198 /2015-16
Chandrapur - 442401 Dt.6/01/2016

To,

**The Addl. Principal Chief Conservator of Forests,
Working Plan, East
Nagpur .**

- Ref:** 1.Your office letter No.Desk14/WP/ Central Chanda /1174 / 2015-16
Nagpur Dt.18/12/2015 received on 01.01.2016
2. Conservator of Forests (Central) Ministry of Environment, Forests &
Climate Change Regional office(WCZ) Nagpur File No.WP-10/ RON/
2015/518 Dt. 11/12/2015

With reference to letter under reference, the compliance report
is as follows :-

Compliance Report

Sr. No.	Comments	Compliance done
1	Total Working Plan area as per previous Working Plan is 114309.400 & as per proposed Working Plan is 111908.06 ha. The change in area may be explain. (Ref 11&17 of summary)	The Difference in area is as follows. Area in previous WP- 1,14,309.399 ha. FDCM- 28,785.395 ha. 1,43,094.714 ha. Area Cover in this WP-1,11,908.069 ha. FDCM- 31,360.641 ha. 1,43,268.710 ha. Diffrence- 174.00 ha.(Protected Forest Area) Which was not included in previous Working Plan.Now added in

		this Working Plan. Hence The differences are due to change in FDCM area, which was handed over to FDCM and some area which was not cover in previous working plan.
2	Compliance report of point/ suggestions raised by State Level Standing Consultative Committee in the DWPR of of Central Chanda Forest Division has been enclosed along with covering letter. But not fully complied. (SR No.1,4 etc.)	Suggestion raised by State level Committee in DWPR of Centra Chanda Forest Division had complied by this office letter No. CF/WP/RS/132 /2015-16 Dt.7/10/2015 Sr No.1:- The suggestions raised by Shri. Dr. V.K. Sinha APCCF (Conservation) Nagpur about area included in old Working Plan and current Working Plan of SCIWC displayed in table – on page no. 175. Area which included in SCIWC does not include area under building or encroachment. Sr. No.4:- The are under litigation regarding Central Chanda Forest Division included in Miscellaneous WC. As per Hon'ble High Court Mumbai Bench at Nagpur decision regarding Writ Petition No.3669/2009 on dt 12.08.2015 that the dispute land 33486 ha. should be treated as <u>Forest Area</u>. Hence it is not deleted from this Working Plan.
3.	Numbering of Page 1 to 38 are repeated in Vol-I	Suggestions noted. While Final printing after GOI sanction, the same will be taken in account.

4.	Area of Bamboo (Overlapping) Working Circle shown on page No.17 of Summary & Page No. 228,230 & 173 are different.	The area shown as Page.No. 17 / 26648.737 ha. Page.No. 173/ 26942.638 ha Page.No. 228/ 26942.638 ha. Page.No. 230/26942.638 ha. Area under Bamboo(Overlapping) Working Circle, shows on Page no. 173,228, 230 is 26942.638 ha. The area shown on page no. 17 is print mistake and will be corrected while final printing after GOI sanction.
5.	Yield regulation not prescribed in Chapter-IV (Old Teak plantation Working circle) and Chapter VI (Bamboo Overlapping Working Circle)	Old Teak Plantation WC and Bamboo (Overlapping) Working Circle are regeneration activity, hence Yield regulation are not prescribed.

It is requested to kindly consider the above compliance and necessary action.

-Sd/-

(S.G.Chopde)
Conservator of Forests
Working Plan, Chandrapur

Copy submitted with compliment to the Principal Chief Conservator of Forests, (P&M) M.S Nagpur for information.

Copy submitted to the Chief Conservator of Forests, (T) Chandrapur for information.

Copy forwarded to the Deputy Conservator of Forests, Central Chanda Division, Chandrapur for information.

257
(S.G.Chopde)

Conservator of Forests
Working Plan, Chandrapur

**OFFICE OF THE CONSERVATOR OF FORESTS,
WORKING PLAN, CHANDRAPUR.**

Director, Chandrapur Forest Administration, Development & Management
Academy, premises Mul Road, Chandrapur-442401 (M.S.),
Ph.No.(07172)256214, email: cfworkingpl@gmail.com

Subject:-Working Plan of Central Chanda
Forest Division, Chandrapur
written by Raju T.Dhabekar C.F.
(Working Plan), Chandrapur for the
period of 2015-16 to 2024-25

No :- CF/WP/RS/ 211 /2015-16
Chandrapur - 442401 Dt.18-19 /01/2016

To,

**The Addl. Principal Chief Conservator of Forests,
Working Plan, East
Nagpur .**

- Ref:** 1.Your office letter No.Desk14/WP/ Central Chanda /1273 / 2015-16
Nagpur Dt.14/1/2016
2. This office letter No. CF/WP/RS/ 198 /2015-16 Dt.06 /01/2016

Working Plan of Central Chanda Forest Division, Chandrapur, period 2015-16 to 2024-25 written by Raju T.Dhabekar was submitted to Government of India for final sanction and compliances report for the query raised by GOI was also submitted vide this office letter no under reference no. 2

But some clarification was asked vide your letter reference no 1 hence those clarification are submitted as follows

1.The Differance in area is as follows.

- **Old Work Plan Period - 2004-05 to 2013-14** One Year Extension

Total Area - 114309.399 ha.

Area transferred to FDCM ha. - 28785.315 ha.- (2401.338 ha.)

Total Area of Central Chanda ha. - **143094.714** ha.

- **New Working Plan Period - 2015-16 to 2024-25**

Total Area - 111908.062 ha.

Area transferred to FDCM ha - 31360.648 ha (+ 2575.333 ha)

- Total Area of Central Chanda ha - **143268.210** ha

Old Work Plan Area - 114309.399 ha.

New Working Plan Area - 111908.062 ha.

Difference + 2401.338 ha. Area transfer to FDCM

+173.995 ha, Area excluded from Old WP

Total 2575.333 ha.

The new area 173.995 ha. of Mouza Ballarpur, Mouza Kalmana, (Protected Forest) Mouza Chanakha, Mouza Nokhari (Reserved Forest area) is included in new working plan which was not included in previous plan.

Hence this area is reconciled

Point 2 - Regarding SCI working circle.

- As per point raised by Dr. V. K. Sinha, IFS, APCCF (Conservation) Nagpur in the State Level Standing Consultative Committee (SCC) meeting dated 10/06/2015, it is clarified that the comparative statement of rangewise distribution is SCIWC as per old WP and new WP is shown on page no 175, chapter 2. in volume no. 1 as follows.

Range	Range area in ha.	Area as per Old W.P. in SCIWC.	Area as per Current W.P. in SCIWC.	% area with respect to range area.	% Area of W.C. with respect to total area of W.C. in division.
Ballarshah	15,829.315	9256.716	2106.230	13.30	27.22
Kothari	11,599.490	214.983	1107.666	9.54	14.31
Dhaba	5,341.204	5461.257	1308.110	24.49	16.91
Rajura	10,376.132	5615.819	679.710	6.55	8.79
Wirur	19,961.269	10248.759	2536.550	12.70	32.77
Wansadi	20,592.362	15242.613	0.000	0.00	0.00
Jioti	28,208.285		0.000	0.00	0.00
	111,908.062	46040.147	7738.266	66.58	100%

- Dr. V. K. Sinha, IFS APCCF (Conservation) Nagpur also suggested that the area under encroachment and building should not be included in SCI WC, hence it is clarified that such area was already not included in new Working Plan.

Regarding Writ Petition No.3669/2009

Dr. V. K. Sinha, IFS APCCF (Conservation) Nagpur has also suggested to omit the above area of 33000 ha. involved in Bommewar case Writ Petition No.3669/2009 as the matter was sub-judicious.

Regarding this issue it is being clarified that Writ Petition No.3669/2009, submitted in Hon'ble High Court Mumbai Bench at Nagpur. The Hon'ble High Court has passed the final order dated 12/8/2015 and gave direction to treat 33446 ha. of disputed land to be a "forest area". Xerox copy of said order is already included in vol - 2 Appendix no. LXX on page no 480.

Copy of which is enclosed herewith for ready reference.

- And therefore the said area is not excluded from New Working Plan.

- The Chairman of State Level Standing Consultative Committee (SCC) Mr. A.K. Saksena, PCCF(HoFF)M.S.) Nagpur has suggested to include encroachment area in Miscellaneous Working Circle and not in any other Working Circle. Hence these instruction are complied and all such area is included in Miscellaneous Working Circle which is shown on page no 301 of volume - 1 chapter - XI

Hence you are requested to submit this clarification to Government of India and persue the matter to Government of India for sanction of Working Plan of Central Chanda Forest Division, Chandrapur, as early as possible.

Encl :- As above

 (S.G. Chopade)
Conservator of Forests
Working Plan, Chandrapur

Copy submitted to the Principal Chief Conservator of Forests,(P&M) M.S Nagpur for information.

Copy submitted to the Chief Conservator of Forests, (T) Chandrapur for information.

Copy forwarded to the Deputy Conservator of Forests, Central Chanda Division, Chandrapur for information.

 (S.G. Chopade)
Conservator of Forests
Working Plan, Chandrapur