GOVERNMENT OF MAHARASHTRA

WORKING PLAN

FOR

THE FORESTS OF BRAMHAPURI FOREST DIVISION

NORTH CHANDRAPUR CIRCLE

FOR THE YEAR

2004 - 2005 TO 2013 - 2014

VOLUME - I

TEXT (Part I & II)

T. K. CHOUBEY, I.F.S.
DEPUTY CONSERVATOR OF FORESTS,
WORKING PLAN DIVISION No.1,
CHANDRAPUR.

भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण एवं वन मंत्रालय
MINISTRY OF ENVIRONMENT & FORESTS

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आवक क्रमांक 96925
कक्ष क्रमांक 9

No. : 12-3/2004 (FOR)/ 1879 Dt- 15-9-2005,

To,

(कार्य आयोजना) 27 SEP
आवक क्र. 2286
कक्ष 14

The Principal Secretary,
Revenue and Forest Department,
Government of Maharashtra,
Mantralaya,
MUMBAI.

Sub : Approval of Working Plan of Bramhapuri Forest Division, for the period from 2005-06 to 2014-15.

Ref : Government of Maharashtra letter No. Msc.2004/CR-137/F-2 dated 13.8.04.

Sir,

With reference to the above mentioned subject, I have been directed to inform you that after careful examination of the Working Plan of the Bramhapuri Forest Division, the Central Government hereby conveys its approval to the said working plan in accordance with the powers vested under Forest (Conservation) Act, 1980 subject to following conditions:-

(1) Currency of the Working Plan shall be for 10 years i.e. from 2005-06 to 2014-15.

(2) The orders of Hon'ble Supreme Court passed in W.P. (Civil) No. 202 of 1995 in the matter of Godaverman Therumalkpad Vs Union of India and orders passed in in related Inter Locutory applications shall be strictly adhered to. Any prescription or operation at variance with the Hon'ble Supreme Court's order shall be kept in abeyance till the order is in force or otherwise modified.

(3) Further, orders of Hon'ble Supreme Court's dated 22.09.2000 in Interlocutory applicaton No. 424 shall be complied with by ensuring that regeneration of forests is commensurate with fellings carried out under this working plan. To achieve this it must be ensured that no felling be carried out without allocating necessary funds to regenerate the felled area. In the event of failure in regeneration or any shortfall in carrying out regeneration operation, no further felling shall be undertaken until the failure/shortfall is made up.

Following the directions of the Hon'ble Apex Court in their order dated 22.09.2000, in IA No. 424, the instruction/ directions of the Core Group constituted to decide the extent of felling or any direction of Central Government shall be strictly complied with and felling is to be done by State Government only after obtaining permission from Core Group constituted by the MoEF, New Delhi.

(5) No forests bearing naturally grown trees shall be clear felled for any purpose whatsoever.

(6) Compartment wise area under encroachment shall be incorporated in the working plan.

(7) All unauthorized encroachments from forest land shall be removed in a time bound manner and the areas thus evicted shall be rehabilitated. Progress in this regard shall be sent to this office every year by the State Government.

(8) In para 9.6.3 it h as been stated that 1/5th boundary demarcation and verification scheme is given in Appendix LVIII. From the Vol.II (Appendices) it is seen that Appendix LVIII is list of old teal plantations. The scheme of boundary demarcation and verification shall be appended in Vol. II of the working plan

(9) Proposed expenditure as fire tracing and boundary demarcation works shall be incorporated in Table III of Chapter XII.

(10) Adequate funds for implementation of prescriptions under the working plan including expenditure on fire tracing and boundary demarcation as worked out in Table III of Chapter XII shall be made available by the State Government to the Forest Department.

(11) Prescriptions of microplans for JFM should conform with the broad framework/guidelines of the Working Plan and shall be in accordance with Forest (Conservation) Act, 1980 and various orders of Hon'ble Supreme Court.

(12) 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 fellin_ in the forest division shall be restricted proportionately in the current/following years to compensate this removal.

(13) All kinds of fellings including that of dead, dying and diseased trees and for granting of rights and concessions as well as all illicit fellings should be compiled alongwith the estimation of their stand volumes as per the same volume table used for assessment of growing stock. This report shall be prepared annually Working Circlewise and Compartment wise by the territorial DFO and shall be submitted to the C.F., Working Plan within two months of the end of control year in a proforma, to be designed by the C.F., Working Plan for this purpose. Such removal shall be accounted for against the prescribed felling yield of the relevant year.

(14) No deviations shall be made from the prescriptions of working plan read with the conditions stipulated herein without prior approval by the Central Government under Forest (Conservation) Act, 1980. Deviation for excess yield in any Working Circle by more than 10% of the approved yield/fellings of that year will also be submitted to this office for approval. However, deviations of positive nature i.e. out of turn plantations carried out outside the worked area under any project, schemes and compensatory afforestation may be approved by the competent authority of the State Government.

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

Yours faithfully

(Santosh Kumar)
Dy Conservator of Forest (C)

Copy to

1 The Additional Director General of Forests (FC), Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi - 110 003.

2 The Principal Chief Conservator of Forests, Govt of Maharashtra, Seminary Hills, Nagpur

3 The Divisional Forest Officer, Bramhapuri Forest Division, District Chandrapur, Maharashtra.

14/9/15

(Santosh Kumar)
Dy Conservator of Forest (C)

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PART – II

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

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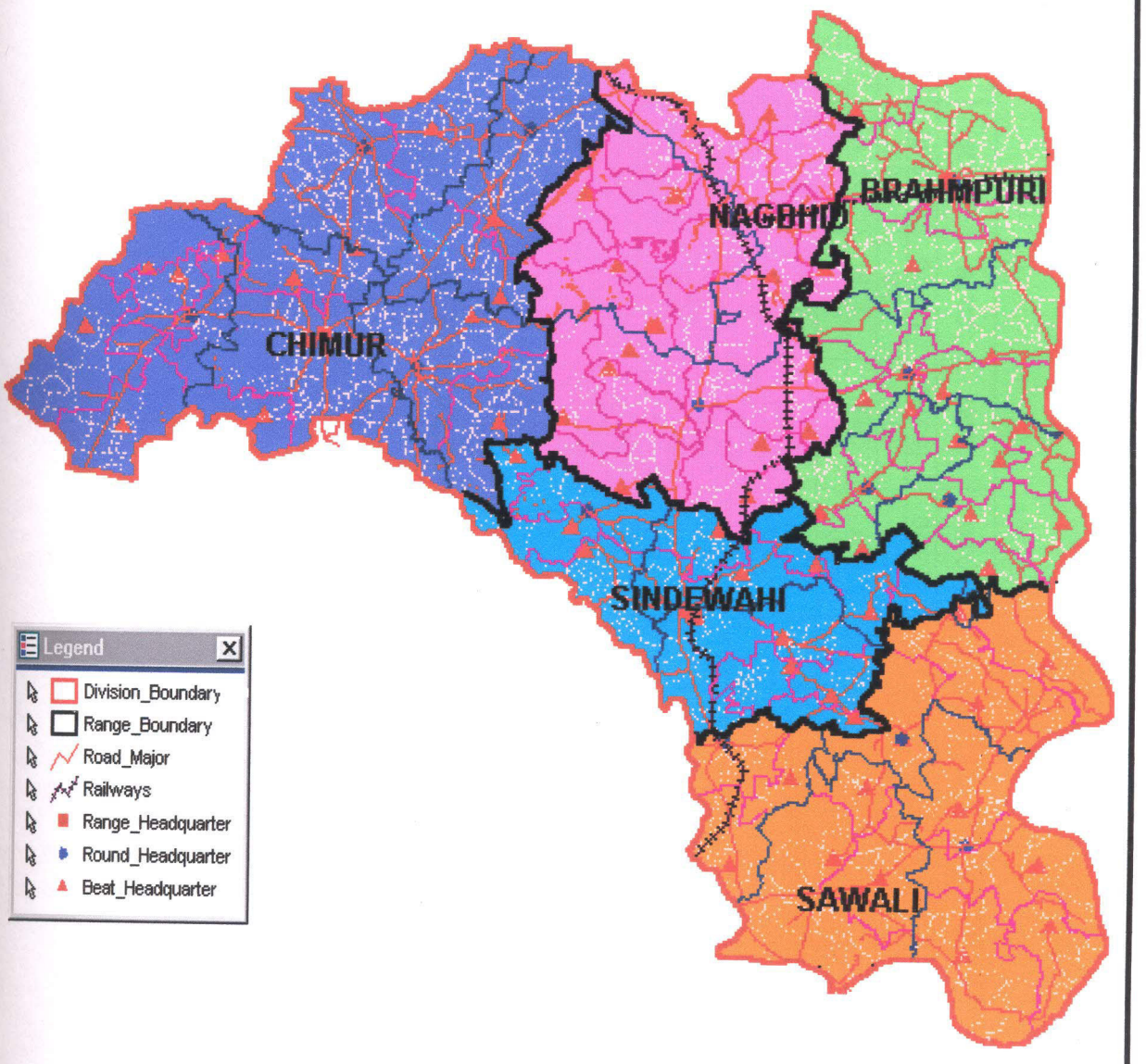
MAP OF BRAMAHAPURI FOREST DIVISION



Prepared By.
P.Y.MAHITKAR F/S

Conservator Of Forest
Working Plan Division – 1
Chandrapur.

INTRODUCTION

This working plan covers the entire Reserved, and Protected Forest areas of Bramhapuri Forest Division, which was the part of the erstwhile East Chanda Forest Division & West Chanda Forest Division till 28th August, 1983.This replaces the Working Plan of Shri Kartar Singh for Reserved Forests of tract dealt with. Also this Working Plan includes about 56948.99 ha of such forest land which have not been covered under any previous plan. Total area covered under this plan is 117173.83 ha. This is the first independent and consolidated working plan for Bramhapuri Forest Division.

- The period of Kartar Singh's plan was 1977-78 to 1991-92. For revision of this plan and to write up the plan for new areas , the field work was started during the year 1996-97 and part work could be completed. The part of the tree enumeration works could be completed during the year 1996-97 & enumeration of trres in remaining forest areas of about 77000 ha could be started in the month of January 2002 and it was completed in the month of June 2002 under the supervision of Sri T.K. Choubey, IFS Dy. Conservator of Forests, Working Plan Division No.1, Chandrapur. Subsequently remaining field works, collection and compilation of information for appendices & writing of the draft working plan were carried out under the supervision of Sri T.K.Choubey, IFS Dy. Conservator of Forests, Working Plan Division No.1, Chandrapur.

- The preliminary Working Plan Report was prepared by Sri B.S.Thengdi IFS Dy. Conservator of Forests, Working Plan Division Amrawati. The same was scrutinised by the Conservator of Forests, Working Plan Circle, Nagpur and was submitted to the Chairman and member of the Committee. Meeting of the above committee was held on 19th April,1995 in the Chamber of the Chief Conservator of Forests (Production), M.S. Nagpur and the preliminary Working Plan Report was discussed in detail. Suggestions were given for necessary corrections.

- The preparation of this plan was entrusted to me on January 2002 after completing the draft plan of Wadsa Forest Division. The Working Plan for Bramhapuri Forest Division encompasses the ideas of National Forest Policy guidelines of 1988 and therefore lays more emphasis on conservation, preservation and Protection of Forest, Wildlife and Environment. In this draft plan, suggestions given during the discussion on preliminary working plan report have been incorporated. Besides, new entries have also been made under the guidance of the honorable Additional Principal Chief Chief Conservator of Forests (Production & Management) M.S., Nagpur and the Conservator of Forests, Working Plan Circle, Nagpur. To solve the problem of forest fire to the greatest extent, the special thrust have been prescribed.

- This Working Plan has prescribed for the formation of Old Teak Plantation Working Circle for to improve the stock of teak recognizing the fact that teak is a light demander species and comes up very well after canopy removal & planting teak. The other working circles proposed are Selection - Cum - Improvement Working Circle, Afforestation Working Circle, Improvement Working Circle, Pasture Working Circle, Kuran Working Circle, Non Timber Forest Produce (Overlapping) Working Circle and Wildlife (Overlapping) Working Circle which have been prescribed for the better scientific management of the forest areas in order to meet the ever growing demand for large size timber and the small size timber for construction of houses, Agricultural implements, Firewood and Grasses & Fodder requirements. Canopy removal in patches in SCI and Improvement Working Circle have been prescribed followed by planting of superior quality of teak to improve the growing stock. In addition to this, the present working plan also offers greater employment opportunities to the local people in forestry operations.

- This working plan has for the first time has suggested prescriptions for identification, multiplication and marketing of medicinal plants in the forest areas in order to increase the potential of growth and harvesting of medicinal herbs in the forest areas as well as to provide employment to the local people in the field of marketing of natural herbs and medicines.

- This working plan has also suggested for establishment of Eco-tourism in the forest areas on the lines of National Policy on Eco-tourism of Govt. of India in order to educate the people and to create awareness among the citizens visiting forest areas about the conservation, preservation and protection of natural resources including wildlife.

- The management maps and stock maps have been prepared using GIS technology through Geo-media Software in the office of the Conservator of Forests, Working Plan Circle, Nagpur and the same will be supplied with this working plan by him.

- I am highly grateful to Shri M.K.Sharma, IFS, then Director General of Forest, and *ex-officio* Secretary to the Govt. of India, Ministry of Environment, Forest and Wildlife, New Delhi whose encouragement inspired me to think and incorporate innovative ideas in the preparation of this working plan. I am also thankful to Shri S.K.Mitra, IFS, the Principal Chief Conservator of Forests, Maharashtra State, Nagpur for his kind inspiration and valuable guidance in the preparation of this working plan.

- I am also thankful to Shri B.K.Singh, IFS, the Principal Chief Conservator of Forests, Maharashtra State, Nagpur for giving me an opportunity to write this draft plan & also his kind inspiration and valuable guidance in the preparation of this working plan.

- I am extremely thankful to Shri Jwala Prasad, IFS, Additional Principal Chief Conservator of (Production & Management), M.S., Nagpur for his keen interest and valuable guidance provided in the preparation and revision of this working plan especially for the formation of all the proposed working circles. He has taken very keen interest & guided extremely in writing up different chapters of this draft working plan.

- I am extremely thankful to Shri J.N.Saxena, IFS, MD, Forest Development Corporation of Maharashtra, M.S., Nagpur & then Additional Principal Chief Conservator of Forests (Production & Management), M.S., Nagpur for his keen interest and valuable guidance provided in the preparation and revision of this working plan. I am also thankful to him for providing the logistic support i.e. Computer, its peripherals, vehicle and manpower without which it would have been very difficult to accomplish this task. I am also grateful to Shri K. Subramaniam, IFS, Additional Principal Chief Conservator of Forests (Administration & Human Resource Development) M.S., Nagpur for his kind inspiration and valuable guidance for the revision of this plan.

- I am also highly grateful to Shri J.S.Grewal, IFS, Chief Conservator of Forests (Conservation), M.S., Nagpur, Shri Shailendra Bahadur, IFS, Conservator of Forests, Working Plan Circle, Nagpur whose keen interest, valuable guidance and suggestions have helped me to complete this working plan in time. I am also thankful to Shri S.D.Sontakke, IFS, then Conservator of Forests, North Chandrapur Circle, Chandrapur, Sri Bhagwan, IFS, Conservator of Forests, North Chandrapur Circle, Chandrapur, Shri K.R.Khadse IFS, then Deputy Conservator of Forests, Bramhapuri Forest Division, Bramhapuri, Sri N.R. Zurmure, IFS, Deputy Conservator of Forests, Bramhapuri Forest Division, Bramhapuri, and Sri S.B. Kewete, Assistant Conservator of Forests, Bramhapuri Forest Division, Bramhapuri and all other officers & staff of Bramhapuri Forest Division for extending cooperation in providing important information needed to complete this plan specially when they have extended sincere co-operation for the tree enumeration works in Bramhapuri Forest Division.

- I am also thankful to Dr.S.S.Srivastava, IFS, Deputy Conservator of Forests, Working Plan Division No.2, Chandrapur for extending his kind co-operation and valuable suggestion in the preparation and revision of this working plan.

- I am personally thankful to the staff of this Division who have made it possible to complete this working plan and they have put in their best endeavour in the preparation and revision of this working plan. I am extremely thankful to Sri S.K.Thapliyal, Range Forest Officer Working Plan Division No.1,Sri R.T.Khanke, Range Forest Officer Working Plan Division No.1, Sri N.T.Ramteke, Ranger Surveyor, Working Plan Division No.1 and Sri S.V. Deshmukh Forest Surveyor Working Plan Division No.1 who have done outstanding works in completing this preliminary working plan in stipulated time and all of them deserve special

appreciation for cooperation they extended to achieve this target. I am also thankful to Sri S.K.Thapliyal, Range Forest Officer Working Plan Division No.1, Chandrapur who has done outstanding works of GIS related to maps of Bramhapuri Forest Division.

- The staff of Working Plan Division No.1,Chandrapur were deeply associated with preparation of this working plan and they deserve appreciation for cooperation they extended. Shri S.K.Thapliyal, Shri. R.T.Khanke R.F.Os, Shri N.T.Ramteke, Ranger Surveyor, Sri S.V. Deshmukh, Sri P.Y. Mahitakar Forest Surveyors, Sri G.N.Mandhre, Chief account (Retd.), Sri R.V. Thakre, Chief Account, Sri.B.F. Ambekar, Steno Typist, Sri S.K.Rathe, Accountant, Sri A.G.Badghare & Sri V.R.Watekar Clerk, Md.Yousaf, Forest Guard, Sri G.R.Pendam, Driver, Sri S.V.Choudhary Office Peon who have done hard work and contributed a lot by assisting in compiling this plan, deserve highly appreciation.

- I am extremely thankful to the administrative staff of this Division who have taken keen interest and extra pains to prepare this working plan and therefore the staff of this Working Plan Division associated with the preparation of this working plan deserve appreciation for their sincere and dedicated efforts.

Place :- Chandrapur
Date :- 22/03/2004

(T.K.Choubey)
Dy.Conservator of Forests
Working Plan Division No.1,
Chandrapur

SUMMARY OF THE WORKING PLAN FOR THE BRAMAHPURI FOREST DIVISION FOR THE PERIOD FROM 2004 -2005 TO 2013 -2014

PART – I

SITUATION :- This Working Plan covers Reserve and Protected Forest areas admeasuring 117173.83 ha. in charge of the Forest Department located in the Eastern part of the Chandrapur District and within the civil territories of Bramhapuri, Nagbhid, Sindewahi,Sawali,Chimur,Mul(P) and Warora(P) Tahsils. The above area is inclusive of Zupdi and big tree forests admeasuring 1266.24 ha which is in possessation of Forest Department. The forest areas are more or less in compact blocks.

CONFIGURATION :- The area is undulating and hilly, the hills being low in height. The forests area situated on the triangle of high lands forming a table land, which runs the entire length of the western portion of the tract. Numerous hills rise on this table land mainly on the north-eastern, eastern and south-eastern sides. The main Ranges of group of hills in the tract viz. Satnala in the north east, Khobramendha and Tipagarh in the south east. Wainganga is the main river & it is situated on the western boundary of the division and it is the recipient of the tributaries viz. Sati, Khobragadi, Garvi, Kathani. Among these Khobragadi is the main tributary and other rivers and tributaries join with Khobragadi river.

GEOLOGY :- The geological formation throughout the division belongs to Archaean series.

CLIMATE :- The weather remains hot and dry for the major part of the year. The mean maximum temperature is 29.4ºc.and the mean minimum temp. is about 13.7ºc. during winter. The highest and lowest temperature recorded are 47.8ºc. and 5ºc. respectively. The average rainfall over the area is 1524 mm.

WATER SUPPLY :- During summer from April to June, water shortage is felt.

BOUNDARIES :- The state of maintenance of the boundary lines and pillars is very poor. In case of 'B' class and Protected Forests, the boundaries do not exist at most of the places. This led to encroachment. Village boundaries of surveyed villages are not maintained. Unsurveyed villages are still without proper boundary demarcation.

RIGHT AND CONCESSIONS :- Reserve Forests are not burdened with rights. However, some concessions have been granted to agriculturists. In the Protected Forests areas, nistar rights are recorded in the "Nistar Patrakas" of the concerned village.

DESCRIPTION OF THE FORESTS : The forests of this tract belong to the group "Tropical Dry Deciduous Forests" and sub-group "5A/C3- Southern Tropical Dry Deciduous Forests."

The local sub-types found are as follows :

A. TEAK FORESTS WITH DENSE BAMBOOS :-

(i) Plain sub-type

(ii) Hill sub-type

B. TEAK FORESTS WITH SCANTY OR NO BAMBOOS :-

(i) Plain sub-type

(ii) Hill sub-type

C. MIXED FORESTS WITH SCANTY OR NO BAMBOOS :-

Teak forests account for only 1.14 % of the total area of the Division. The percentage of teak in teak bearing areas varies from 20 to 50. The edaphic and biotic factors are responsible for low extent of teak in the division. In mixed miscellaneous forests commonly found important species are ain, bija, harra, beheda, semal, haldu, dhaora, bhirra, tendu,

salai, mowai, lendia, khair etc. Bamboo is found in some patches in Chimur and Sindewahi Ranges. The main species of bamboo is Dendrocalamus strictus.

INJURIES TO WHICH THE CROP IS LIABLE :- Frequent fire is one of the important causes of injuries to the crop. This causes considerable damage to the young crop. The fire affected saplings and poles develop hollowness. Fire prevents formation of humus by burning the grass and leaf litter. Illicit cutting is common, especially in the vicinity of human habitation. However, organised illicit cutting is not common. Encroachments are noticed in the protected forests, specially near the cultivated areas, and where the boundaries are not properly demarcated. Grazing by cattle is beyond the capacity of the tract. No frost occurs in this tract. Strong wind causes damage to the weaker members of the plant communities. Drought is not common.

AGRICULTURAL CUSTOMS AND WANTS OF THEPOPULATION :- The total population of the Chandrapur District as per 2001 census is 20.78 lakh. Average population density is 194 per sq.km. The rate of increase in population is 17.26%. As per the cattle census of 1997, the total cattle in the district is 11.22 lakh. The density of the cattle is 104.96 per sq. km. Agriculturists dominate in the population but they are mostly small or marginal farmers. Malgujari tanks are main and potential source of irrigation. People depend upon forests for timber, firewood, bamboo, grass and other MFP's.

MARKET :- These forests are worked commercially for timber, fire-wood, and certain MFP's. Timber, poles and firewood are brought to the sale depots, where they are sold in open auction. Fuel beats are sometimes sold at the jungle depots itself. Tendu leaves are sold by tender. Other MFP's are collected by T.D.C. through local tribals. Bramhapuri is well connected by roads.

METHODS OF HARVESTING AND TRANSPORT :- Annual coupes are worked either by the FLCS or depart-mentally. Felling and logging is mostly done by saw. Timber is transported to sale depot by departmental trucks and tractors. Fuel beats are either stacked in coupe depots or transported to sale depot.

STAFF AND LABOUR :- The supervision of works is done by the Dy. Conservator of Forests through A.C.F's. There are 3 A.C.Fs, 12 R.F.Os, 45 Foresters, 153 Forest Guards, 4 Drivers, 1 Surveyor, 1 Head Clerk, 8 Accountant, 1 Junior Assistant Statistician, 19 Clerks, 1 Daftari, 1 Choukidar, 1 Naik, 2 Peons, 1 Sweeper, 1 Dakrunner, and 1 Khalashi. To implement the prescriptions of the plan, the present staff is not sufficient. The labour potential of the division is poor. Need of importing labourers is felt to supplement the local labour potential.

PAST HISTORY

A. RESERVED FORESTS :- The forest areas forming old reserves account for 51.49 % of the total forest area of division. These areas were reserved in 1897 under IFA, 1878. In the past plan these areas covered 60376.59 ha. belonging to 'A' class. About 11302.41 ha. areas was newly reserved during 1992. During the preparation of this plan the whole RF area is divided into 318 compartments. These are distributed in Chimur, Naghbhid, Bramahpuri, Sindewahi and Sawali Ranges of Bramahapuri Forest Division after reorganisation in 1983. Before reorganisation Bramhapuri, Nagbhid and Chimur Ranges were independent parts of the East Chanda Division and Sawali & Sindewahi Ranges were independent part of the West Chanda Division.

- Prior to reservation of this forest in 1879, the tract was in very under developed state. There was no regulation or control over the fellings in this forests. After reservation of this forests, some protection measures were taken. Period of regular working under different plans started from 1899.

- The first working Plan for these areas have been prepared for the period between 1900-1926 by Ranges. Mr.C.M.Hanson's Working Plans for Bramhapuri & Gunjewahi Ranges and Mr. Poona Swami's Working Plan for Warora Range were the first working plan for the Reserve Forest of the present tract dealt with. These two Working Plans described that no good forests existed in

these Ranges. These working plans originally prescribed improvement fellings and coupes were opened for felling by Petty Purchasers who could remove any tree not marked for Reservation. The main objects of this plan were to obtain a small timber & fuelwood for Agricultural classes. The plan was quite simple in prescription and prescribed improvement felling all over the area. This was subsequently changed into coppice with standard in some felling series.

- This plan was replaced by Mr. Vahid (1927 – 1935). Mr. Vahid's plan prescribed five Working Circles. (1) High Forest Working Circle, (2) Coppice with a Standard Working Circle, (3) Low Forest Working Circle , (4) Low Forest Under Worked Working Circle and (5) Bamboo Working Circle. Best Forest areas were placed under High Forest Working Circle under this plan were uniform system of management was prescribed with rotation period of 60 to 80 years. Medium quality forest were worked under Coppice with Standard Working Circle with rotation of thirty years with Teak and Bija being prescribed as the most suitable standard. Teak and Mixed Forest considered unfit for producing large size timber were allotted to Low Forest Working Circle with rotation of 30 to 40 years. Remaining areas were allotted to the Low Forest Unworked Working Circle with no regular working prescribed. No area of the present tract dealt with was under Bamboo Working Circle. The Silvicultrual System prescribed was clear felling. Main felling was carried out fairly completely. Thinning were not carried out partly because of insufficient demand.

- This Plan was replaced by Mr. Hewtson (1936-1946). Mr. Hewtson's plan described four Working Circles. (1) High Forest Working Circle (2) Coppice with Standard Working Circle (3) Misc. Working Circle (4) Bamboo Working Circle. Only small areas of the same Working Circle in Mr. Vahid plan for growing large valuable timber and all highest site quality areas of Coppice with Standard Working Circle in Mr. Vahid's Plan were allotted to High Forest Working Circle in this Plan. The areas of the tract dealt with in the present plan were not covered by this Working Circle. The characteristics of the high forest were the deficiency of the lower girth classes, the general absence of advanced growth and the presence of dense bamboo under growth rather than overwood. The Coppice with the Standard Working Circle was allotted to all areas taken out of High Forest Working Circle of the previous Plan as well as other areas situated fairly close to Markets and in which the Forest growth was sufficiently dense. The rotation was fixed at 40 years and the rotation for standards was not fixed due to lack of growth statistics of the species concerned. Areas having inferior and open forest & those areas too remote from the markets were placed under Misc. Working Circle. Irregular working removal of dead & dying trees & improvement or selection felling was prescribed under the orders of Conservator of Forests. Bamboo Working Circle (Overlapping) of Mr. Hewtson's Plan does not include the present tract dealt with. Under this Working Circle the felling cycle was of 4 years. The felling rules were relaxed in case of advanced clear felling in coupes of High Forest & Coppice with Standard Working Circle. It was for the first time when retention of minimum 8 culms over one year was prescribed each clump.

- This Plan was replaced by Mr. Singh & Mr. Majumdar's plan (1949-64). This was a more systematic plan which was prepared after intensive study of forest. Under this plan forest areas were divided into teak & Misc. forest depending upon the presence of teak in the crop. The forest having 15% & more teak were classified as Teak Forest. The area of present plan belongs to the then Bramhapuri, Sindewahi & part of Warora Ranges of erstwhile North Chanda Forest Division. The main object of Mr. Singh & Mr.Majumdar's Plan was to obtain maximum sustained yield of all kinds of produce & to satisfy the local demands for small timber firewood & other minor forest produce.

- This plan was replaced by Mr. Kartar Singh's Plan (1979-1992). Sri Kartar Singh set objectives according to the National Forest Policy guidelines & methods of treatment were adopted on the basis of functional classification of Forest. This plan prescribed five Working Circles – (1) Conversion Working Circle (2) C.W.R. Working Circle (3) Improvement Working Circle (4) Kuran Working Circle (5) Misc. Working Circle. The areas under conversion Working Circle allotted to were the better quality forest of site quality mostly from III to IVa. All these areas were considered to be suitable for clear felling & raising teak plantation. The coppice with Reserve Working Circle included well stock of Forest of inferior quality capable

- of producing small to medium size timber, poles & firewood. Mostly the forest under this Working Circle were of site quality varying from IV a to IV b with a few small patches of quality III also. The improvement Working Circle of Kartar Singh's Plan comprised marginal areas which failed to regenerate due to adverse biotic factors. These areas were degraded and were liable to erosion.

B. PROTECTED FORESTS :- Before the abolition of proprietary rights, the Jamindars and malgujars held the proprietary rights over Protected Forests. The people depended on the whims of individual proprietor for their requirement of forest produce or for grazing their cattle unless these rights were recorded in the Wazib-ul-arz.

- After abolition of the proprietary rights these forests vested in the State Government. The first working scheme for these forests were prepared by V.K.Prabhu which was brought under implementation since 1965-66. Prior to that, these forests were not managed under any systematic or on silvicultural basis. The present plan does not include any areas which were included in V.K.Prabhu's working scheme and are being managed scientifically under any working plan for the first time.

RESULTS OF PAST WORKING :-

(1) Tree forests were divided into S.C.I. and C.W.R. Working Circles on the basis of presence or absence of commercial value of tree species.

(2) The compartments formed included forest as well as non-forest areas. This gave rise to serious protection problems. Protected forests in the vicinity of villages had heavy pressure of cattle and human population which resulted into large scale encroachments.

(3) In C.W.R. Working Circle, a number of spps. have diminished. These include bija, ain, moha, beheda, harra, bhirra, khair, semal as well as host of other species which are poor to no coppicers or which coppice only upto a certain age.

(4) Analysis of maps prepared at that time, reveals large scale pentagraphic errors.

(5) No soil conservation measures were carried out though prescribed during the plan period, soil erosion has accelerated.

(6) No light was thrown on the scientific management and improvement of M.F.P's.

(7) Age old tussar cultivation practice was ignored.

(8) Normalcy of forests could not be achieved.

STATISTICS OF GROWTH :- Growth study was made by Kartar Singh during preparation of Working Plan for East Chanda Forest Division. As per stump analysis, teak can attain girth of 150 cm in 108 years, bija, ain, bhirra, dhaora and tendu can attain girth of 135 cm in 112 years, 120 cm in 122 years, 135 cm in 108 years, 135 cm in 123 years and 135 cm in 120 years respectively. As per the enumeration data, the no. of stems per ha in SCI Working Circle of V.K.Prabhu's scheme is 303.

WILDLIFE PRESERVATION :- Wildlife was being managed under various rules and regulations, framed from time to time till enactment of the wildlife (Protection) Act, 1972 as well as the latest amendment to this Acts from time to time. This Act came into effect in Maharashtra with effect from 1st June, 1973. Subsequently, various rules were framed under this Act. No shooting blocks exist in Bramhapuri Forest Division. Compensation is paid to the owner of cattle, which is killed by tiger, panther and other wild animals as prescribed by the Government from time to time inside or outside the forest areas. Also compensation is also paid in case of death or injury to human life by wild animals prescribed by the Government from time to time.

PART – II

BASIS OF PROPOSALS

NATIONAL FOREST POLICY 1988 :- The National Forest policy of 1988, lays much emphasis on maintenance of environment stability, conserving national heritage, checking soil erosion in catchments area of rivers, increasing the tree cover through massive afforestation, meeting the requirement of firewood , fodder, small timber and minor forest produce of rural and tribal people, efficient utilization of forest produce and people's involvement to achieve these objects.

The general objects of management are as under :

i) To preserve forest cover on steep hill slopes, along the nalla banks and water courses to prevent soil erosion and for preserving site and environment.

ii) To enrich the growing stock in natural forests and to restock the under stocked and degraded forests, to achieve normalcy of growing stock in the shortest possible time.

iii) To meet the requirement of small timber, firewood, 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 optimum extent on sustained basis.

v) Consistent with the above objective to ensure maximum sustained yield.

CONSTITUTION OF WORKING CIRCLES :-

The following working circles have been constituted :

i) Selection Cum Improvement Working Circle.

ii) Afforestation Working Circle

iii) Improvement Working Circle

iv) Fodder Management Working Circle.

(a) Pasture Working Circle.

(b) Kuran Working Circle.

v) Non-Timber Forest Produce (Overlapping) Working Circle

vi) Old Teak Plantation Working Circle

vii) Wildlife (Overlapping) Working Circle

I. Selection Cum Improvement Working Circle:-

Total Area :- 9748.68 ha

Felling cycle :- 20 years

Felling series :- 5

Selection girth :- 1) Teak, ain, bija, shisham and haldu :- 120 cm.

2) Garari, lendia :- 45 cm.

3) Other timber species :- 90 cm.

Regulation of yield :- Yield will be regulated by area.

Demarcation :- Main felling coupes will be demarcated one year in advance of felling.

Treatment map :- Treatment map will be prepared by the Range Forest Officer. Treatment map will show the following areas.

Type A :- Protection areas

Type B :- Under stocked areas

Type C :- Group of young poles.

Type D1 :- Well stocked areas suitable for canopy removal.

Type D2 :- Remaining Well Stocked areas suitable for selection felling.

MARKING TECHNIQUE :-

A. In protection areas no felling will be done.

B. In under stocked areas all dead trees after retaining two per ha will be marked for felling.

C. Thinning marking in type C areas will be done to bring the average spacement equal to 1/3 rd of the average height of the crop. In plantations thinning will be done as per the quality classes and age.

Type D1 Areas :- The area will be canopy removed subjected to the following condition and will be planted with teak at a spacing of 2 m. x 2 m. The selection of ideal sites for the teak plantation has been left for the field staff. Following conditions will be adhered to.

a) All young to middle aged fruit bearing trees up to 20 trees/ha should be retained.

b) Young to middle aged trees of Semal, Khair, Rosewood and other superior miscellaneous species up to 20 trees/ha uniformly spread over the area should be retained.

c) No felling will be done on either side of Nallah, Stream and River beds up to 30 m.

d) The section size at a place will not exceed 20 ha.

e) A 20 m strip of natural forests will be retained on all sides of the section.

f) The plantation will be fire protected.

g) Superior planting stock will be planted.

Type D2 Areas :- All edible fruit and flower yielding trees of moha, char, tendu, aonla, chinch, sitafal, harra, bel and trees of kulu will be reserved from felling. All trees above selection girth and approach class will be enumerated, before marking, in 15 cms girth classes. The following trees will be marked for felling:-

(i) The percentage of selection trees to be marked for felling for various species groups has been worked out in regulation of yield. Fifty percent of the trees above

exploitable girth will be marked for felling. Marking will start from the highest girth class trees and trees of less importance as described earlier.

(ii) All dead and malformed trees, after retaining 2 trees/ha will be marked for felling. A tree will be treated as malformed if it does not have a clean bole upto at least 2 m above the breast height.

(iii) All live high stumps will be marked for felling.

(iv) All but one vigorously growing coppice shoots per stool where the density is less will be retained.

(v) No sound tree will be removed unless it is sillviculturally available.

(vi) 50 % trees above selection girth shall be retained and uniformly spread over the whole area of the coupe. It will start from highest girth class and trees of less importance. Besides these principles the marking shall be done only when the trees are available silviculturally.

Marking Rules :- Marking will be done under the close supervision of the Range Forest Officer and will be verified by an Officer not below the rank of Assistant Conservator of Forests.

Cutting back operations :- These operations will be carried out departmentally in the year following the year of main felling.

Cleaning :- A cleaning operation will be carried out in the 6th year of main felling.

Thinning :- Thinning in plantation areas will be carried out at 10^{th} year, 15^{th} year and thereafter on a 10 years cycle. The first thinning will be mechanical. During first mechanical thinning trees in alternate diagonal lines will be removed. The subsequent thinnings will be silvicultural aiming at the spacing in congested crop equivalent to 1/3 of the average height of the stems.

II. AFFORESTATION WORKING CIRCLE :-

Total Area	:-	18344.17 ha
Felling series	:-	8
Choice of species	:-	Teak, Bija, Shisham, Ain, Semal,neem,bamboo and fodder grasses.
Planting Cycle	:-	20 years.
Rotation	:-	Not fixed.
Demarcation	:-	Main Afforestation coupes will be demarcated one year in advance of plantation.
Treatment map	:-	Treatment map will be prepared by the RFO.

Method of Treatment :- The primary object of management of these areas is to restore the soil fertility and increase the productivity of land. The species to be planted will depend upon the soil type, its depth and local requirement. The number of plants per/ha will be 1100 or less depending upon site and nature of species selected. No regular silvicultural system will be applied. The existing growth will be tended by suitable operations. The rooted stock present in the area which have been constantly hacked for firewood will be redressed properly to achieve the vigorous growth.

III. IMPROVEMENT WORKING CIRCLE :-

Total Area : 69082.04 ha

Felling Cycle : 20 years

Felling series : 30

Method of Treatment : The basic aim to constitute this working circle is to improve the quality and quantity of the growing stock.

I. Removal of dead, dying and diseased trees.

II. Thinning in congested patches.

III. Raising of plantation of teak and other economically important species at suitable patches upto 10 ha per coupe after removal of overwood.

IV. Planting of teak and other suitable economic important species in the understocked areas upto 10 ha per coupe.

IV. FODDER MANAGEMENT WORKING CIRCLE :-

A. PASTURE WORKING CIRCLE :-

Total Area : 9477.83 ha

Working series : 4

Choice of species : Seed broadcasting and tussock planting of superior fodder grasses like paunya (Isccoemum sulcatum), marvel(Andropogan annulatus), sheda (Isccoemum laxmum) etc. shall be taken up.

Working Cycle : 20 years.

Rotation : Not fixed.

Treatment map : Treatment map will be prepared by the RFO.

Method of Treatment : The main object of management of forest areas in this working circle will be provide grazing to maximum possible extent, consistent with preservation and improvement of pasture. Limitation of incidence of grazing and grazing closure to enable seeding and establishment of grasses is of paramount importance for the maintenance and improvement of the grazing grounds.

B. KURAN WORKING CIRCLE

Total Area :- 9301.30 ha

Working series :- 4

Choice of species :- Seeds/Tussocks of Sheda, Paonia, Mushan or Marvel

Working Cycle :- 20 years.

Rotation :- Not fixed.

Treatment map :- Treatment map will be prepared by the RFO

Method of Treatment : There will be four working series and each working series is divided into twenty coupes. Every coupe will be taken up for a special improvement operation every year. The coupe will be demarcated. There after the coupe will be thoroughly inspected by Range Forest Officer and a treatment map will be prepared.

V. NON TIMBER FOREST PRODUCE (OVERLAPPING) WORKINGCIRCLE

Total area :- 117173.83 ha.

Method of treatment :- The treatment to be given will be different for different types of minor forest produce.

Regulation of yield :- Yield will be regulated by area.

Tapping of Gum :- The kulu, dhawara and salai trees produce gum.

TAPPING RULES :-

Following are the main tapping rules :

i) The tapping period will be from November to May each year.

ii) Tapping will be confined to main bole of trees of gbh more than 90 cm only.

iii) Each tree will be tapped continuously for 3 years and will be given rest for next three years.

iv) No fresh blaze will be made on the partially healed up surface or old wounds.

v) The lowest row of blaze shall be at 1 m above ground level.

vi) Each blaze will be in a shape of parabola with 2.5 cm wide base.

vii) At the end, the height of the blaze shall not be greater than 12.50 cm.

REGENERATION :- Natural regeneration will be tended and supplemented by artificial regeneration 15 to 20 cm deep circular trench around tendu, salai and kulu will be made in current coupes so as to damage the root to get shoots from root suckers.

VI. OLD TEAK PLANTATION WORKING CIRCLE :-

Total Area : 1219.83 ha.

Felling Series :- 1

Method of Treatment :- The main objective of teak plantation 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 previous working plan after taking plantations. But this could not be observed meticulously mainly due to paucity of funds, which resulted in poor growth than expected. The proportion of miscellaneous species has increased beyond limit. Therefore, to achieve the goal of the plantations to the greatest extent, the objectives of management are as follows.

I. To carry out thinning as per the yield table on the basis of age and site quality.

II. To improve the crop by carrying out required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.

III. To cover thinning in all overdue plantations in the shortest possible time and to ensure thinning & other silvicultural operation in other plantations when they are due.

IV. To convert the existing uneven aged crop containing large percentage of inferior species into an even aged teak forest.

V. To obtain maximum sustained yield of teak timber of commercial value.

VI. Consistent with the above to utilize the maximum production capacity of forest.

Cutting back operations :- These operations will be carried out departmentally in the year following the year of first mechanical thinning. The operations consists of the following:-

I. Climber cutting over whole area of the coupe except the endangered & threatened species.
II. Felling all badly damaged or broken trees.
III. Cutting back of malformed advance growth of teak.
IV. Cutting back of valuable growth damaged during the felling.
V. Freeing young growth of teak and other valuable species from interference of bamboos and other inferior species.
VI. All stools will be cleared of felling debris.
VII. In eroded areas and areas liable to erosion, gullies and small nallas will be plugged with nearby debris or stones to check washing away of the soil and deepening and widening of the gullies and nallas.

Cleaning :- A cleaning operation will be carried out in the 5^{th} year commencing from the year of first mechanical thinning.

I. All climbers will be cut over the whole are of the coupe, if necessary except endangered & threatened species .
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 2.50 meter depending on the height growth.
VI. In plantations of teak, weed growth may be cleared within a radius of 1 m from each surviving plant and intensive soil mulching carried out immediately after the rainy season is over.

Thinning :- Thinning in plantation areas will be carried out at 10^{h} year, 15^{th} year and thereafter on a 10 years cycle. The first thinning will be mechanical. During first mechanical thinning trees in alternate diagonal lines will be removed. The subsequent thinnings will be silvicultural aiming at the spacing in congested crop equivalent to 1/3 of the average height of the stems.

VII. WILDLIFE (OVERLAPPING) WORKING CIRCLE :-

Total area : 117173.83 ha.

Provisions for conservation of wildlife have been prescribed.

MISCELLANEOUS REGULATIONS :-

DEMARCATION OF COUPES :-

i) Annual coupes will be demarcated by clearing 3 m wide lines and by erecting pillars or posts on the lines.

ii) Selected trees on the periphery will be given two coaltar bands and a serial number.

iii) Unworkable areas will be demarcated by giving two geru bands with a cross in geru colour between bands and a serial number on selected trees on the periphery.

MARKING TECHNIQUE :-

i) All trees to be felled will be given a geru band and will bear distinct hammer marks at both breast height and base.

ii) All valuable trees of gbh 45 cm and over and other species of girth over 60 cm at breast height will bear digit serial number both or breast height and base.

iii) Remaining trees will be given different series of serial numbers with coaltar.

DISPOSAL OF FOREST PRODUCE :-

It will be done as per the prescription embodied in the working plan.

IRREGULAR HARVESTING :- Removal of dead fallen firewood will be done. Felling of trees on fire lines will be carried out. Felling of trees for the purpose of growth study will be done.

MAINTENANCE OF BOUNDARIES :- The construction of RCC cairns of approved size and design will be started on the external boundary of the division. The works of $1/5^{th}$ demarcation scheme will be followed for other boundaries.

FIRE PROTECTION :- Fire protection measures for different areas have been prescribed.

GRAZING :- Worked coupes in all working circles will remain closed for grazing for 5 years from the main felling.

SOIL AND MOISTURE CONSERVATION WORKS :- Continuous contour trenches, check dams and nala bunding in each working circle have been suggested.

ESTABLISHMENT :- Additional staff is required for the proper execution of the prescriptions of the plan.

LABOUR :- The present labour supply is inadequate.

CONTROL AND RECORDS :- Separate control forms have been prescribed for each working circle. **APPENDIX NO. XVIII**

COMPARTMENT HISTORIES :- Compartment history from Nos 1 to 5 will be maintained in the division and range offices in the given format. **APPENDIX NO. XVII**

PLANTATION AND NURSERY REGISTERS :- These will be maintained in the standard format given in volume-II. **(APPENDIX NO. XIX & XX.)**

DIVISIONAL NOTE BOOK :- It will be maintained in the standard format given in volume-II. (**APPENDIX NO. XXI.)**

FINANCIAL FORECAST AND COST OF THE PLAN.

FUTURE REVENUE :- The estimated revenue to be received in various years have been worked out and given in the chapter – XI of Part II

FUTURE EXPENDITURE :- The expenditure on the various works as per prescriptions of the plan have been worked out and given in the chapter - XI of part of this plan.

COST OF THE PLAN :- The total expenditure incurred on the preparation of this plan is difficult to account for because the part tree enumeration and writing of P.W.P.R. for Bramhapuri Forest Division was carried out by Deputy Conservator of Forests, Working Plan Division, Amravati and the preparation of the final Draft plan has been completed by Deputy Conservator of Forests, Working Plan Division No.1, Chandrapur who is also preparing P.W.P.R. for Gadchiroli Forest Division therefore expenditure incurred can not be worked out separately for this plan.

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I. ABBREVIATIONS USED IN THE PLAN

a.m.s.l.	Above mean sea level
A.C.F.	Assistant Conservator of Forests
b.h.	Breast height
C.A.I.	Current Annual Increament
Cft.	Cubic feet
CM.	Centimeter
Cm3	Cubic centimeter
Comptt.	Compartment
d.b.h.o.b.	diameter at breast height over bark
d.b.h.u.b.	diameter at breast height under bark
Dy.C.F.	Deputy Conservator of Forests
Dn.	Division.
F.D.C.M.Ltd.	Forest Development Corporation of Maharashtra Limited.
F.L.C.S.	Forest Labour Co-Operative Society
F.R.H.	Forest Rest House
F.S.	Felling Series
F.S.O.	Forest Settlement Officer
F.V.	Forest Village
F.Y.M.	Farm Yard Manure
F.Y.O.	First Year Operations
g.b.h.	girth at breast height
g.b.h.o.b.	girth at breast height over bark
g.b.h.u.b.	girth at breast height under bark
ha/Ha	hectare
IGF	Inspector General of Forests
IFA	Indian Forest Act.
Km	Kilometre
Kg	Kilogram
m.	Metre
Mm	Millimetre
M3/m3	Cubic-metre
M.A.I.	Mean Annual Increment
M.F.P.	Minor Forest Produce
M.V.S.S.	Maharashtra Van Sanshodhan Sanstha
P.B.	Periodic Block
P.F.	Protected Forests
P.P.O.	Pre Planting Operations
P.Y.O.	Preliminary Year Operations
P.W.D.	Public Works Department
R.F.	Reserved Forests
R.F.O.	Range Forest Officer
Rs	Rupees
S.C.I.	Selection-Cum-Improvement
Sq.	Square
Sq.km.	Square Kilometre
Spp.	Species
S.R.P.	State Reserved Police
S.Y.O.	Second Year Operations
Sr.No.	Serial Number
T.Y.O.	Third Year Operations
W.C.	Working Circle
IVth Y.O.	Forth Year Operations
Vth Y.O.	Fifth Year Operations

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II. GLOSSARY OF LOCAL TERMS

Adjat species	Miscellaneous species
Bhatti	Local distillery for liquor production
Bidi	Hand made cigarette wrapped in tendu leaf
Bir	An area reserved to grow grass
Burad	A caste whose main occupation is to make Articles from bamboo
Doh	A deep pond in a river or stream
Geru	Red ochre or red earth
Ghani	Local crusher for oil extraction
Ghat	A road with a steep gradient
Gully	Water channel
Jigir	An estate conferred by the state in return for service
Jagirdar	The holder of jagir
Jimindari	An estate belonging to a zamindar
Jhiras	Temporary small wells dug in nalas during summer
Juar	A cultivated millet(Sorghum vulgares)
Kacha(roads)	Temporary(roads)
Kankar	Lime nodules
Karka	Whippy bamboo
Katha	Catechu
Kharif	Monsoon crop
Khasara No.	Serial number given to any portion of land entered in land records.
Khories	Valleys in between two hills or hillocks
Malguzari	Land tenure system which existed in Vidarbha.
Malki Land	Lands belonging to private individuals.
Mouza	A village area
Murum	A reddish hard soil
Myrabolons	Aonla,harra and beheda
Naka(Forest)	Barrier on road for checking forest produce in transit.
Nala	A water course
Nistar	Forest produce required for bonafide agricultural or domestic Purposes.
Nistar Patrak	Record of rights on Government Land.
Occupational-Nistar	The nistar granted to village craftsman i.e.Nistar mahars,blacksmiths,chamars etc.at concessional rate For their craft purposes.
Paidawar	Wild edible flowers, fruits or roots
Patwari	Village Officer(Sub-ordinate of Revenue Department)
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.
Regur	Block cotton soil.
Rith	A deserted village site
Satkatha	Miscellaneous tree species
Seri-culture	Rearing silk/tussar worms.

LOCAL AND BOTANICAL NAMES OF PLANTS OCCURING IN BRAMHAPURI FOREST DIVISION

A . TREES

LOCAL NAME	BOTANICAL NAME	FAMILY
Achar	Buchanania lanzan	Anacardiaceae
Amaltas/Bahava	Cassia fistula,Linn	Caesalpiniaceae
Amta	Bauhinia malabarica,Roxb	do
Anjan	Hardwickia binata,Roxb	do
Apta	Bauhinia racemosa,Lamk	do
Aonla	Phyllanthus emblica	Euphorbianceae
Arjun	Terminalia arjuna	Combretaceae
Babul	Acacia nilotica Linn	Mimosaceae
Bud/Wad	Ficus bengalensis,Linn	Moraceae
Beheda	Terminalia bellirica,Gaertn	Combretaceae
Bel	Aegle marmelos(L)	Rutaceae
Bhirra	Chloroxylon swietenia	do
Biba/Bhilwa	Semecarpus anacardium,Linn	Anacardiaceae
Bija	Pterocarpus marsupium,Roxb	Fabaceae
Bistendu	Diospyros montana, Roxb	Ebenaceae
Bor/Ber	Zizyphus maurltiana,Lamk	Rhamnaceae
Chichwa	Albizia odoratissima,Roxb	Fabaceae
Dhaman	Grewia tiliifolia(vahl)	Tiliaceae
Dhaora	Anogeissus latifolia(R.Br.exDC)	Combretaceae
Dhoban/Satpuda	Dalbergia peniculata, Roxb	Fabaceae
Dikamali	Gardenia resinifera, Roth	Rubiaceae
Garari	Cleistanathus collinus,Roxb	Euphorbiaceae
Ghogar/papda	Gardenia latifolia Ait	Rubiaceae
Ghoti/Ghot	Zizyphus glaberrima (Sedgw)	Rhamnceae
Gongal	Cochlospermum religiosum	Cachlospermaceae
Haldu	Haldina cordifolia Roxb	Rubiaceae
Hingan	Balanites aegyptica (L)Del	Balanitaceae
Hiwar	Acacia leucophloea Roxb Willd	Mimosaceae
Hirda/Harra	Terminalia chebula Getz	Combretaceae
Imli/Chinch	Tamarindus indica	Caesalpinanceae
Jambhul/Jamaun	Syzigium cumini Linn	Myrtaceae
Kakad	Garuga pinnata Roxb	Burseraceae
Kala-umber	Ficus hispida	Moraceae
Kakai	Flacourtia indica (Burm.f)	Flacoutiaceae
Kamala	Mallotus philippensis	Euphorbiaceae
Karai	Miliusa velutina H.F.& Thoms	Anonaceae
Kalam	Mitragyna parviflora Roxb	Rubiaceae
Karanj	Pongamia pinnata(L)pierre	Fabaceae
Kateyen/Kasai	Bridelia retusa spreng	Euphorbiaceae
Kawith	Limonia acidissima Lorr	Rutaceae
Khair	Acacia catechu willd	Mimosaceae
Khirni	Manilcora hexandra Roxb	Sapotaceae
Kullu	Sterculia urens Roxb	Sterculiaceae
Kumbhi	Careya arborea Roxb	Lecythidiaceae
Kusum	Schleichera oleosa Lour Merr	Sapotaceae
Lasora/Bhokar	Cordia dichotoma Forst.f.	Boraginaceae
Lendia/sehna	Lagerstroemia parviflora Roxb	Lythraceau
Lokhandi	Ixora arborea Roxb	Rubiaceae

Maida-Lakri	Litsea glutinosa	Lauraceae
Medshing	Dolichandrone falcata Seem	Bignoniaceae
Moha/Mahuwa	Madhuca longifolia Koen	Sapotaceae
Mokha	Schrebera swietenoides	Aristolochiaceae
Moyen/mowai	Lannea coromandelica Hoult	Anacardiaceae
Neem	Azadirachta indica A.Juss	Meliaceae
Padar	Stereospermum suaveolens DC	Bignoniaceae
Pair	Ficus rumphii	Moraceae
Palas	Butea monosperma Lamk Tau	Fabaceae
Pangara	Erythrina variegata Linn	do
Papra	Holoptelea integrifolia	do
Rankela	Dillenia pentagyna	Magnoliaceae
Rohan	Soymida febrifuga(A.Juss)	Meliaceae
Sagwan	Tectona grandis Linn	Verbenceae
Saja/ain	Terminalia alata Heyne	Combretaceae
Salai	Boswellia serrata Roxb	Burseraceae
Semal	Bombax ceiba L	Bombaceae
Shisham	Dalbergia latifolia Roxb	Fabaceae
Shivan	Gmelina arborea Linn	Verbenaceae
Siras-black	Albizia lebbek L.willd	Mimosaceae
Siras-white	Albizia procera Roxb	do
Sitaphal	Annona squamosa L.	Annonaceae
Suriya	Xylia sylocarpa Roxb	do
Tendu	Diospyros melanoxylon Roxb	Ebenaceae
Tiwas/Tinsa	Ougenia oojeinensis Roxb	Fbaceae
Umbar/Gular	Ficus recemosa Linn	Moreaceae
Warang/Baranga	Kydia calycina Roxb	Malvaceae

B. SHRUBS AND HERBS

LOCAL NAME	BOTANICAL NAME	FAMILY
Aal	Moringa citrifolia(Lin)	Celeastraceae
Aghada	Achyranthus aspera(Linn)	Amartaceae
Akola	Alangium salvifolium(Thwaites)	Cornaceae
Ban rahar	Flemingia semialata(Roxb)	Fabaceae
Baibirang	Embelia ribes	Myrsinaceae
Bankapas/Rankapas	Thespesia lamps	Malvaceae
Bharati	Maytenus emarginata(Benth)	Celastraceae
Chind/Sindhi	Phoenix sylvestris Roxb	Palmae
Chipti	Desmodium pulchellum Benth	Fabaceae
Dhawai/Jilbili	Woodfordia fruticosa Kurz	Lythraceae
Dikamali	Gardenia resinifera Roth	Rubiaceae
Gurmukhi/Gursukri/ Gaturli	Grewia hirsuta	Tiliaceae
Gokhru	Trubulus terrestris,Linn	Zygoiphyllaceae
Harsingar/Kharsui	Nyctanthus arbortristis	Oleaceae
Jine	Leea crispa	Leeaceae
Ranbhendi	Dodonea viscosa	Spindaceae
Koril	Petalidium barlerioides nees	Acanthaceae
Kasterua	Hygrophila auriculata k.Schum	Acanthaceae
Kharoti	Grewia hirsuta vahl.	Tilianaceae
Kudursi	Bridelia hamiltoniana wall	Euphorbiaceae
Kudmudi	Gardenia gummifera Linn	Rubiaceae
Kuda	Holarrhena pubescens(Buch,Ham)	Apocynaceae
Kala kuda	Wrightia tinctoria	do
Kuchala	Strychnos nuxvomica	Strychnaceae
Lokhandi	Ixora arborea Roxb	Rubiaceae
Morarphal	Helicteres isora Linn	Steculiaceae
Maruadona	Carvia callosa Ness	Acanthaceae
Nirmali	Strychnos potatorum	strychnaceae
Neel	Indigofera tinctoria	Papilionaceae
Phetra-safed	Gardenia turgida Roxb	Rubiaceas
Phetra-kala	Tamilnadia uliginosa(Retz)	do
Tarwad	Cassia auriculata	Caesalipiniaceae
Tarota	Cassia tora Linn	do

Thuar	Euphorbia tirucalli Linn	Euphorbiaceae
Warangal	Celastrus paniculata Willd	Celastraceae

C. GRASSES AND BAMBOOS

LOCAL NAME	BOTANICAL NAME	FAMILY
Ghonad	Themeda triandra	
Bamboo-karka	Dendrocalamus strictus(Roxb)	Gramineae
Bamboo-katang	Bambusa arundinacea(willd)	do
Bhurbhusi	Eragrostis tenella(Roem & Schulf)	do
Godhel	Eragrostis interapta	do
Katanbahari	Aristida funiculata(Trin. et.Rupa)	do
Kunda/sum	Eulaliopsis binata(Retz.)(Mark)	do
Kusal/Speargrass/ Diwartan	Heteropogon contortus(Linn)Beau	do
Marvel-small	Dicanthium annulatum(Forsek) Staff	do
Marvel-big	Dicanthium aristatum(poir)	do
Mushan	Iseilema laxum (Hack)	do
Paonya	Sehima sulcatum (Hack)Acamus	do
Sheda	Sehima nervosum (Staff)	do
Tikhadi	Cymbopogon martinii(Roxb)Watson	do
Ukari	Iseilema prostratum Anderss	do
Chir	Imperata Officinalis	do

D. CLIMBERS

LOCAL NAME	BOTANICAL NAME	FAMILY
Bandke	Dendropthoe falcata(Linn)	Loranthaceae
Chilar	Caesalpinia decapetala(Roxb)	Caesalpiniaceae
Chilati	Mimosa hamata(Willd)	Mimosaceae
Chilati badi	Acacia torta(W & A)	do
Dhimarval	Celastrus paniculata(Willd)	Celastraceae
Dudhi/Nagvel	Cryptolepis buchanani(Roem)	Periplaceae
Eroni	Zizyphus oenoplia(Linn)	Rhamnaceae
Gunj	Arbus precatorius(Linn)	Fabaceae
Gulvel	Tinospora cordifolia(Willd)	Menispermaceae
Gurar,Nasvel	Millotia extensa(Baker)	Papilionaceae
Kajkuri	Mucuna pruriens(L)	Fabaceae
Khadyanag	Gloriosa superba	Liliaceae
Khobarvel	Hemidesmus indicus(Linn)	Periplieonaceae
Kukuranji	Calycoipteris floribunda	Combretaceae
Mahulvel	Bauhinia vahlii(Wand A)	Caesalpiniaceae
Musalikand	Dioscorea pentaphylla(Linn)	Dioscoraceae
Papri,Lalvel	Ventilage denticulata(Willd)	Rhamnaceae
Palasvel	Butea superba(Roxb)	Fabaceae
Piwarvel	Combretum ovalifolium(Roxb)	Combretaceae
Ramdaton	Smilax macrophylla(Roxb)	Liliaceae
Shataori	Asparagus recemosus	

E . PARASITES

Amaraval	Cuscuta reflerxa(Roxb)	Cuscutaceae

F . EPIPHYTES

Vanda	Vanda cesellata(Roxb)	Orchidaceae

G . ENDEMIC/THREATENED PLANT SPECIES

Alichettu	Eonymus godaverensis	Celastraceae

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COMMON AND ZOOLOGICAL NAMES OF THE ANIMALS AND BIRDS COMMONLY FOUND IN BRAMHAPURI FOREST DIVISION.

A . ANIMALS

COMMON NAME	SCIENTIFIC NAME
Tiger	Panthera tigris
Panther	Panthera pardus
Hyaena	Hyaena hyaena
Wild dog	Cuon allpinus
Wolf	Canis lupus
Jackal	Canis aureus
Fox	Vulpes bengalens
Jungle cat	Felis chaus
Bison	Bos gaurus
Sambhar	Cervus unicolor
Cheetal	Axis axis
Nilgai	Boselaphus tragocamelus
Wild boar	Sus cristatus
Sloth bear	Melursus ursinus
Barking deer	Muntiacus muntjak
Common Langur	Presbytis entellus
Flying squirrel	Petaurista petaurista
Porcupine	Hystrix indica
Hare	Lepus ruficaudatus

B . BIRDS

COMMON NAME	SCIENTIFIC NAME
Painted sandgrouse	Pterocles indicus
Common sandgrouse	Pterocles exustus
Pea fowl	Pavo cristatus
Grey jungle fowl	Gallus sonneratii
Painted Partridge	Francolinus pictus
Grey partridge	Francolinus pondicerianus
Blackbreasted quail	Couturnix coromandelicus
Red spour fowl	Galloperdix spadicea
Crane	Grus antigone
Spotted bill duck	Anas poecillorhyncha
Pigeon	Treron phoenicoptera
Dove	Streptopelia spp.
Cotton teal	Nettapus coromandelienus
Whistling teal	Dendrocygna javanica

C . ENDANGERED WILDLIFE

ANIMALS

Bison
Wolf
Panther
Sloth bear
Tiger

BIRDS

Pea fowl

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PART I

SUMMARY OF FACTS ON WHICH THE PROPOSALS ARE BASED

CHAPTER - I

THE TRACT DEALT WITH

SECTION - 1 :- NAME AND SITUATION

1.1.1. The forest areas of the tract dealt with lie between parallels of latitude 20.43 degrees and 19.30 degrees north and the meridians of longitudes 78.56 degrees and 80.21 degrees east. The forests areas are more or less in compact block and situated in the eastern part of Chandrapur District. These areas are situated within the civil (administrative) territories of Bramhapuri, Nagbhid, Chimur, Sindewahi, Saoli, Mul(P), and Warora(P) Tahsils of Chandrapur District.

1.1.2. This working plan deals with the entire forests areas of Bramhapuri Forest Division which was the part of erstwhile East Chanda & West Chanda Forest Division. On reorganization of the Forest Department, the Brahmapuri Forest Division was carved out from erstwhile East Chanda & West Chanda Division in 1983 vide Government of Maharashtra Resolution No. FDM/1880-F2, dated 29th August, 1983. This is the first independent consolidated working plan of Brahmapuri Forest Division. This working plan replaces the working plan of Shri Kartar Singh. The boundary of the division in the north is bounded by the Bhandara District and east by the Gadchiroli District and the west by Nagpur District and Wardha District and in the south by the Mul River.

1.1.3. The forest area of the Bramhapuri Forest Division occurs both in compact blocks and scattered patches within the above territories of the Chandrapur District. The geographical area of the District is 10695 Sq.km. Total forest area included in this working plan is 1171.7383 Sq. km. which comes to 10.96 % of the total geographical area of the District. Out of the total forests areas, 603.7659 Sq.km. is A-class Reserved Forests, 2.9825 Sq.km. is B-class Reserved Forests, 439.3034 Sq.km.is Protected Forest, 8.0532 Sq.Km is Zupdi Jungle and 4.6092 Sq.Km. is big tree forest. The forests areas covered by this plan include Reserve Forest of Kartar Singh's Plan and Protected Forest of 444 village areas and 113.0241 Sq.km. is newly created Reserved Forest area.

SECTION - 2 :- CONFIGURATION OF THE GROUND

The hills of the topography can be included as: -

1.2.1. Chimur hills:- Chimur hills are extending from 5 Km west of Chimur.These hills runs in north – south direction & strikes in the eastern part of Warora tahsil at a distance of about 32 Km with an average width of 8 to 10 Km.

The ridge is flat topped with a gentle slope to the east and generally rises about 100 to 150 m. The Irai River flows to the west and Andhari river flows to the east of these hills. It is made up of gently eastward dipping sandstone formation of the Vindhyan age.The ridge has been breached in a number of places by streams and gullies that drain to the east and the west resulting in a number of natural depression which on being bonded at their lower ends have become perennial and semi perennial tanks.

1.2.2. Parasgarh-Nagbhir hills :– East of the Chimur hills, running parallel to it along the Warora Brahmapuri Tahsil boundary, are the Parasgarh-Nagbhir hills. The Nagpur-Nagbhir-Mul-Chandrapur railway runs skirting the hills to their east between Tempa and Talodha Railway Stations. Running with a north-east, south-west strike for a distance of about 20 km., with an average width of about 10 to 12 km, this almost single ridge is also of a cuesta type with an excellent cliff section facing west and in parts to the south; the dip slope faces eastwards and the ridge is flat-topped. Like the Chimur hills, this ridge also the made up of almost horizontally bedded Vindhyan sand stones and are underlain by limestones of the same age. At the lower end of these hills too, there are large natural tanks & depressions. In comparison to the Chimur hills, this ridge raises too much higher elevations; the Pendhri peak (474 m.) Sat Bahini (459 m.) overlooking and presenting a romantic view of the Ghorajhari tank to its east, Siwap Hurki (383 m.), Mugdabhai pahar (411 m.) and the Waghahi pahar (431 m.) are the greater heights reached in this ridge.

1.2.3. Rajoli -Nawargaon hills :- South of the Parasgarh-Nagbhir hills, on either side of the Nagbhir-Chandrapur Railway, but more to the west lies a triangle of hill country with mostly isolated residual hill masses in an archean gneissic terrain consisting of unclassified crystalline and metamorphic formations. The landscape in this region stands a sharp contrast to the sandstone topography to its north and the west. The rounded smooth-lined residual hills rising barely a hundred metres above the peneplaned surface of the archaean basement floor run here with a general north-west to south-east or north-south strike and a steep dip; they are mostly ‘Dharwarian’ outcrops of the ‘Iron-ore series’ in the form of banded hematite quartzite. These ‘Dharwar’ inliners occurring in trough of deep synclinal floods in the archaean basement carry in them valuable high grade hematite variety of iron ore that outcrop in a number of places like the Lohara hills, 5 km. North-east of Allewahi Railway Station, Asola, about 10 km. east-south-east of Sindewahi Railway Station and Ratnapur near Nawargaon Bujrukh. Further east of Lohara, on either side of the confluence of the Khobragarahi river with the Wainganga on the left bank of the letter, lies a group of elonykted ‘Dharwar’ outcrops near the village Deulgaon on the Gadchiroli road; these hillocks are spreading with a length of about 2 km. north to south and width rarely exceeding half a kilometer.

SECTION - 3 :- GEOLOGY, ROCK AND SOIL

1.3.1. GEOLOGY AND ROCKS: - The tract dealt with, is on the western side of the Wainganga river and the geological formation belongs to the Archaean series. The most predominant rock formations are granite and granite-gneisses. These rocks are uniform in texture and composition. They are composed of quartz, feldspar and hornblende with varying proportions of

biotite. The granite becomes fine grained towards north. The proportion of feldspar in these rocks varies from place to place and influences the colour of the rock. Potash feldspar predominates over soda feldspar and opaque ore and apatite occur as accessories. These rocks give rise to arenaceous loamy soil. Most of the area under soil cover has granite or gneiss as bedrock.

1.3.2. Basic dykes cut the granite at several places and general trend is northwest to southeast. In the field the dykes occur as long narrow wall like ridges. The rocks exhibit a fine to medium grained typical dolerite textures and consist essentially of dull white plagioclase and dark pyroxene with magnetite and pyrite as accessory minerals. Complete or partial utilisation of pyroxene and saturation of plagioclase giving rise to zoisite, opidote etc. are also observed in some thin sections.

1.3.3. **SOIL: -** The soil resulting from the disintegration of dolerite dykes as well as the traps is heavy black cotton soil called as "regur". Laterite which covers most of the rock units, displays vesicular and tubular structure, the inner surface of which are stained by a dull brown limonite coating. When fresh, the rock is soft and bright but turns hard and dull brown on exposure to atmosphere. Its thickness varies generally from 1 to 2 meters and rarely from 3 to 5 meters. The laterite gives rise to reddish brown soil. The soil mantle covering all the rock units varies in thickness from 2 to 6 metres except in some areas, where there is greater thickness of soil mantle.

SECTION – 4 :- CLIMATE

1.4.1. Climate of this area remains hot and dry for major period of the year. It is characterized by a hot summer, almost well distributed rainfall during the southwest monsoon season and general dryness except in the rainy season.

1.4.2. **SEASONS :-** Broadly, there are four seasons as given below: -

1.4.3. **(i) HOT SEASON :-** Summer starts from mid of February and continues up to onset of monsoon in mid of June. With the beginning of summer there is definite rise in the day and night temperatures. The temperature remains very high till the break of monsoon. During April and May the heat of the day is intense and unbearable. Hot winds start blowing from early April and remains continuous till the onset of monsoon. In general, May is the hottest month of summer. Occasionally the day temperature rises up to 47 degree centigrade or 48 degree centigrade. Occasionally cyclonic rains are received during March and April months.

1.4.4. **(ii) MONSOON SEASON** :- The monsoon season is from mid of June to the end of September and some times early October. With the onset of South-West monsoon the temperature decreases appreciably and the weather becomes pleasant. The monsoon months are sultry. The normal course of the rainfall is of increasing in intensity during July, some what abating in August, continuing to slacken through September and disappearing about early of October. The intensity of rainfall is in the month of July. However, cyclonic rains are received during remaining part of the year.

1.4.5. (iii) POST MONSOON SEASON :- October and November contribute the post monsoon season. Early in October, when the South-West monsoon withdraws from the tract, the day temperature increases a little and a secondary maximum is reached in October. The climate remains humid and hot. Later, both day and night temperature decreases progressively and winter sets in.

1.4.6. (iv) COLD SEASON :-The winter season is of very short duration. It starts from November and continues up to mid-February. The winter is moderately cool and pleasant.

1.4.7. TEMPERATURE :- The statistics of temperature are given in **Appendix No. II.** The diurnal range of temperature is highest during March. In August, these changes are minimum. In April, the maximum temperature goes up to 39.53 C.g., while in May it goes up to 42.45 C.g. During the summer, the mean maximum temperature is about 42.45 C.g. and the mean minimum temperature is about 27.19 C.g. During the winter, the mean maximum temperature is about 28.08 C.g. and the mean minimum temperature is about 11.11 C.g. High temperature in summer adversely affects the vegetation owing to the exposure in flat and bare country. It also adversely affects the daily activities. However, tendu season makes it lively as all related to this actively remains mobile and active right from very early morning till late evening.

1.4.8. RAINFALL :- The average annual rainfall over the area is 275.82 mm. The total annual rainfall varies from 213.88 mm. to 312.48 mm. The average for this tract indicates that the major portion of the total annual rainfall is received during June to September each year, which generally amounts to 85 % of the annual rainfall. July and August are the months when maximum downpour is experienced. About 71.14 % rainfall is received in pre and post monsoon season. The annual rainfall is showing large variations. The rainfall distribution in a year is also irregular. In the recent past there has been erratic rain during the monsoon almost every alternative year.Erratic rains affect the natural regeneration and plantations.

1.4.9. The statement showing average distribution of rainfall at different stations is given in **Appendix No. III.**

1.4.10. FLOOD: - Though the occurrence of flood is not common, in 1994 monsoon season there was severe flood which affected both natural regeneration and plantations very badly.

1.4.11. HUMIDITY: - The air is generally dry except during south-west monsoon season when the humidity exceeds 70%. The summer month are the driest when the relative humidity in the afternoon is between 20 to 25 %. The average monthly relative humidity % data is given in **Appendix No. IV**. The data indicates that the relative humidity is maximum in the month of August and September and then it gradually decreases till April, while it again increases in June.

1.4.12. CLOUDINESS :- The skies are heavily clouded to overcast during the south-west monsoon seasons. In the rest of the year the skies are lightly clouded or mostly clear.

1.4.13. FROST :- Frost is almost unknown in this tract.

1.4.14. STORMS AND WINDS :- Winds are generally light to moderate with some increase in wind force during the latter part of the summer and monsoon months. During the monsoon season the winds blow mostly from directions between south-west and north-west. In the period from October to February, the winds are mainly northerly to north-easterly in the mornings and north-easterly to easterly in the afternoons. By March, winds begin to blow from directions between south-west and north-west and with the advance of the season they become predominant. Occasional storms during the pre-monsoon or during the monsoon periods are also experienced which result in uprooting of isolated trees.

1.4.15. DROUGHTS :- Though the rainfall figures don't show marked difference in the annual precipitation, the erratic rainfall is being observed almost every alternate year in the recent past. This creates occasional drought and leaves its adverse effect on the vegetation. Unestablished seedlings of natural regeneration as well as plantations suffer a lot due to such drought effect and particularly in summer cases of die back and mortality are noticed on large scale in young regeneration.

1.4.16. HEALTH :- The weather is usually oppressive in the summers and very sultry and humid during monsoon. However, during winter it is pleasant. There is improvement in health services with new tahsil headquarters, even then existing medical facilities are quite inadequate. The epidemics are rare. People often suffer from gastroenteritis and malaria in remote villages during monsoon and post monsoon seasons. Incidents of malaria are increasing every year. Respiratory and skin diseases are also not uncommon. Use of contaminated water on scarcity of drinking water in summer and rainy season, malnutrition and climatic conditions are primarily responsible for poor health of the people in this tract. The health conditions are worse in interior areas.

SECTION - 5 :- WATER SUPPLY

1.5.1. A number of tanks and wells form the major source of water supply. Wainganga and Mul River are the only perennial river which flows along the eastern and southern boundary respectively of the tract dealt with.Rain water drains off quickly. Most of inland nalas go dry from December on wards and water is confined to pools only.

1.5.2. In the interior areas there are a few springs and number of perennial streams, which form the natural source of water. The nalas on the high sides on getting down in the plain contain scattered pools of permanent water, which form the most important sources of water supply for grazing cattle during the hot season.

1.5.3. During summer, water table recedes, wells and tanks dry up and there is acute scarcity of water. During this period the people obtain their drinking water either from the perennial wells or by digging few feet water hole known as Jhira in the nala or river beds. The perennial wells also hold insufficient water during summer. In the interior areas the people mostly depend on Jhira in summer.

Deepening of existing wells, digging of new wells, tube wells, borewells, hand pumps etc. on large scale during recent past has improved the condition to some extent. Especially in the years of low rainfall acute shortage of drinking water is felt in many villages and water is supplied by tankers and bullock carts to scarcity areas.

1.5.4. In summer wildlife also suffers and it has to depend on very few limited sources like natural springs, small stagnated pools in some nalas and Jhiras. The number of these sources decrease in the later part of summer. Large number of small, temporary Jhiras are dug by tendu labourers for drinking water during tendu season. Due to frequent, exhaustive use of almost all water sources in the interior areas for drinking purposes by tendu labourers, the wildlife is affected adversely during this period and in the post tendu season till onset of monsoon. There hardly remains any water source undisturbed or unused during tendu season.

1.5.6. Irrigation :- Irrigation in this area is through wells and there are only two irrigation projects out of which one is major and the other is minor project.

SECTION - 6 : DISTRIBUTION OF AREAS

1.6.1 Total forest area of the division included in this plan is 117173.83 ha and it is distributed over five ranges of this division. The distribution of forest area is as follows.

TABLE - I

RANGE WISE DISTRIBUTION OF FOREST AREAS

SN	Name of the Range	Reserve Forests (in ha)			Protected Forests (in ha)	Zudpi Jungle (in ha)	Big Tree Forests (in ha)	Grand Total (in ha)
		A-Class Reserve Forests	B-Class Reserve Forests	New Reserve Forests				
1	Bramhapuri	16136.17	217.31	4256.36	11302.15	170.09	6.90	32088.98
2	Nagbhid	16715.56	----	3240.25	11176.22	286.48	198.81	31617.32
3	Sindewahi	10203.88	80.94	1729.67	5005.40	102.49	255.21	17377.59
4	Sawali	7603.65	----	994.03	10209.28	196.44	----	19003.40
5	Chimur	9717.33	----	1082.10	6237.29	49.82	----	17086.54
	Total	60376.59	298.25	11302.41	43930.34	805.32	460.92	117173.83

SECTION - 7 : STATE OF BOUNDARIES

1.7.1. RESERVED FORESTS : The Reserved Forest account for 71977.25 ha. or 61.43 % area of the forest tract covered under this working plan. The detail distribution of forest areas in different categories is given in the **Appendix No. IX**.

1.7.2. Artificial boundaries consists of a cleared 12 m wide 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. The height of the stake is about two metres, of which about one metre

projects above the cairn. They are numbered serially anti clock wise, each village boundary having separate series of numbers. The state of maintenance of the boundary lines is very poor. At most of the places pillars are no more in existence. In case of B-class Reserved Forests, the boundaries do not exist at most of the places making it difficult to locate them on the ground thus leaving the land more vulnerable to encroachments.

SECTION - 8 :- LEGAL POSITION

1.8.1. (i) RESERVED FORESTS :- The forests dealt with under the plan were notified as Reserved forests under Indian Forest Act (VII of 1878) under the Central Provinces' Gazette Notification No. 917(i), dt. the 24th February, 1879, and No. 3918, dt. 5th September, 1895, and Govt. of Maharashtra, Revenue and Forest Department Notification No. FLD/3685/9316/C-R-42/F-3, dated 5/5/1992.

1.8.2. (ii) PROTECTED FORESTS :- Under the provisions of Madhya Pradesh Abolition of Proprietary Rights (Estate, Mahals, Alienated govt. on 31st. March, 1951 and were taken over by the Revenue Department. These forests were transferred from time to time to the Forest Department as per the instructions contained in Madhya Pradesh Govt. Revenue department No. 2249/286-XII, dated 6th April, 1951 and No.7177/CR-617-12 of 4th December 1951 with an object of managing the forests on scientific lines. Subsequently these forests were declared as Protected forests under sec. 29 of I.F.A., 1927, Notified vide M. P. Gazette Notification No.3056-1216-XI, dated 4th June, 1955 and Bombay Gazette Notification No.FLD/1056-12623-F, dated 8th August, 1957 published on 3rd October 1957. Further the Govt. of Bombay declared their intention to constitute these forests as reserved forests under sec. 4 of I.F.A. 1927 vide Bombay Govt. Gazette Notification No.FLD/1258/II-3314-E,dt. 30th May, 1959 which was published 20th August, 1959.

1.8.3. For the purpose of completion of enquiries into the rights over these forests, the Forest Settlement Officer was appointed in Chandrapur Districts on 12th February 1960. The F.S.O. completed his enquiries about the settlement and submitted his final report with recommendations to the Commissioner, Nagpur vide his letter No. WS.FRSO/1340/75, dated 13th September,1975. The Government of Maharashtra has approved the recommendations of the F.S.O. and the forests have been declared as Reserve forests under Section 20 of the I.F.A. 1927, vide Govt. of Maharashtra, Revenue and Forest Department Notification No.FLD-3685/9316/CR-42/F-3, dt. 5th May, 1992. Vide this Notification the Government has declared 11302.41 ha forest area as the Reserved Forest in the tract dealt with.These forests are commonly called as New Reserved Forests.

SECTION - 9 :- RIGHTS AND CONCESSIONS

1.9.1. (i) RESERVE FORESTS :- The Reserved Forest areas coming under Bramhapuri Forest Division are not burdened with any rights & Concessions, however, are given to the agriculturists of certain villages to graze their cattle in accordance with grazing rules issued vide Government

Resolution No. MFP-1371/237035-Z, dated 3rd November, 1973. Agriculturists are also allowed at concessional rates for certain items of forest produce.

1.9.2. (ii) PROTECTED FORESTS :- Prior to abolition of proprietary rights in 1951, all the lands belongs to the proprietors. The rights and concessions, available to the local inhabitants, were governed as per the entries made in the Wajib-ul-arz prepared for the villages at the time of settlement. As a consequence of the Madhya Pradesh Abolition of Proprietary Rights (Estates, Mahals, Alienated Lands) Act, 1951, coming into force, all the community and other waste land became the property of the Government while the occupied lands continued to be private. In order to distinguish between the rights existing on the new Government waste lands and on other lands, a provision was made in the new Madhya Pradesh Land Revenue Code, 1957 prescribing the preparation of a Nistar Patrak and Wajib-ul-arz for every village.The Nistar Patrak deals exclusively with the management and use of Government Land while the Wajib-ul-arz deals with community rights and customs of user over private lands.

1.9.3. The nistar enquiry was conducted in old Bramhapuri tahsil during the period 1953-55 and almost all the villages were covered under it. The nistar officer formed grazing and nistar zones by clubbing together surplus villages with deficit villages while self sufficient villages were treated as individual zones. Villages assigned to particular zone can exercise their nistar.

1.9.4. The classification of villages into surplus, deficit or self sufficient for exercise of nistar rights were made on the following basis.

(i) A village having tree clad area equal to half the occupied area was considered to be self sufficient.

(ii) A village having tree clad area more than half the occupied area was considered to be surplus village.

(iii) A village having tree clad area less than half the occupied area was considered to be a deficit village.

1.9.5. The nistar enquiry reports were however found wanting in certain aspects, some of them being as under.

1.9.6. In the nistar patraks in several cases almost all the forest areas of the concerned villages were included in the nistar zone. Considering the standard laid down by the Madhya Pradesh Govt. the areas included in the nistar zone in several cases were far in excess of the stipulated area.

1.9.7. Details regarding the quantum of nistar, period during which it is to be allowed, payment if any to be made etc. were not given in the nistar patraks in general.

1.9.8. GRAZING :- The basis for forming grazing zones was that each head of cattle in cotton and jawar tract should have 1/2 acre area of grazing ground and that in other tracts it should have 1 acre.

1.9.9. The rules for grazing of agricultural cattle are as below.

1.9.10. Agricultural cattle can either graze free of cost in the protected forest land indicated by Khasra numbers or after the payment of commutation dues in case of villages, where this system exists. Agricultural cattle have been defined by the Nistar Officer as cattle required for any of the following purposes :-

i) For agricultural operations like ploughing etc.

ii) Cattle for milk, curds, ghee etc.(for domestic consumption).

iii) Cattle used for bullock carts and transport. (For cultivators own use and not for hire etc.)

iv) Cattle maintained to provide calves, etc.(For cultivators own use).

1.9.11. As per the directives of the Government contained in Land Reforms Department, Ex-Madhya Pradesh Memorandum No.1290-1227-XXVIII, dated 4th September 1953, sheep and goats are not allowed to graze in forests meant for production of big timber or in the forest areas where villagers generally exercise their nistar rights. These animals are not normally allowed to graze in a village forest if they do not belong to that village. Special areas are to be assigned for sheep grazing , which is to be identified by Dy. Conservator of Forest of Forest section 116 of BFM Volume III.

1.9.12. OCCUPATIONAL NISTER :- In nistar patraks, occupational rights of the Kumbhars, Chamars, Madias, Gonds, Mahars, Pradhan, Zariva and Lohar communities have been recorded and recognized in several villages and entries are found in the Wazib-ul-arz of each village.

1.9.13. The nistar is required by the villagers for bonafide domestic and agricultural purposes. Forest nistar generally includes timber of certain species and sizes for agricultural implements, house and cattle sheds, fire wood, bamboos, thatching and fodder grasses, fencing material, bark, fibre, minor minerals and minor forest produce i.e. edible fruits, flowers and roots, honey, wax etc.The rights and concessions are governed as per the provisions made in the nistar patrak for each village, according to which, agriculturists and agricultural labourers are entitled to the forest produce for their nistar either free of charge or at concessional rates fixed by the Collector, from their nistar zones only.The distribution of nistar was intrusted to Zilla Parishad vide GR No. TRN - 1162/2014, Sachiwalay dated 22/06/1964.

1.9.14. The then Government of Madhya Pradesh under whose control these forests vested, issued detailed instructions regarding administration of nistar supply of timber etc. to villages (new system) vide the Government No. 2396/2389-XXVII, dated 16th October, 1956. These instructions which listed details about areas from where nistar was to be made available, extent of nistar to different categories, management of nistar and other forests,extraction and distribution of nistar material by the Gram Panchayats, Gram Sabhas or Nistar Panchayats, envisaged that the forests would be managed on scientific basis by the Forests Department and communicated to the Village bodies which would then regulate the supply of nistar as per rules. The quantum of nistar was to be regulated as per the Government

order No. 1336/1606-XXVIII, dated 19th June, 1953, which listed the following categories of forest produce and the nistar over the same.

A. GRAZING :

(a) CULTIVATORS :- Two Plough cattle per plough plus four other including one she buffalo.

(**b) AGRICULTURISTS :-** Four cattle and four sheep or goats/ household, artisans, labourers etc.

B. TIMBER :-

ARICULTURAL IMPLEMENTS :- Eight poles up to 18"(45 cm.) girth and timber actually needed for implements.

MACHAN :- Four poles up to 45 cm girth at every third year.

REPAIRS TO HOUSES :- Up to ten poles of satkatha(Misc.tree spps.) up to 60 cm girth, if needed

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

C. BAMBOO :

AGRICULTURISTS (for repairs) :- 50 bamboo.

NON AGRICULTURISTS :- 25 bamboo. (subject to availability)

D.GRASS FOR THATCHING:

a) AGRICULTURISTS :- Four cartloads

b) NON AGRICULTURISTS :- Two cartloads

E. MISCLLANEOUS :-

(i) FUEL :- Hundred headloads or five cartloads.

(ii) THORNS AND BRUSH WOOD :

a) AGRICULTURISTS :- Five cartloads

b) NON AGRICULTURISTS : Two cartloads

(iii) LEAVES (excluding tendu) :- No limit

(iv) BAKKAL :- Four cartloads

(v) ROOTS

EDIBLE :- No limit
PALAS :- One headload

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

(vii) KARAI AND KARKA BAMBOO :-

(**a) AGRICULTUTISTS** **:-** Two cartloads

(**b) NON AGRICULTURISTS** **:-** One cartload

1.9.15. In nistar patrak of each village khasara, numbers are set aside for nistar are recorded. However, the details regarding quantum of nistar during which it is to be allowed, payment if any, to be made etc. are not given in the nistar patraks in general.Nistars are also regulated by Protected Forest Rules 1958 & laid down in various sections regarding restrain in removal of nistar material.

1.9.16. Nistar forest areas were dealt very badly in the past and therefore, the crop condition is very bad especially near the human habitation. These forests suffered considerably due to over harvesting in the past, excess grazing and repeated fires. If the appropriate measures for improvement of the crop is not taken, these forests will no longer be able to meet the nistar requirements of the people.

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CHAPTER - II

THE FORESTS

SECTION - 1 :- COMPOSITION AND CONDITION OF THE CROP

2.1.1. The forests of the tract dealt with belong to the Sub-group 5A Southern Tropical Dry Deciduous Forests, as per the revised classification of forest types of India by Sir Harry Champion and Shri S.K. Seth. Within the main type of sub group 5A, considerable local variations occur and most of the forests of the tract dealt with belong to the type 5A/C3- Southern Dry Mixed Deciduous Forests. Local variations in the composition and condition of the crop depend mainly upon locality factors such as, edaphic, topography, geology and biotic factors and also past treatment. These factors of locality play an important role in determining the distribution, composition and stocking of the vegetation. These are so variable that even in the limited limits of compartment, particularly in the plain regions it is not uncommon to find abrupt changes in the crop.

2.1.2. The climatic conditions are almost identical and uniform throughout the tract dealt with. As variations in altitude are not very significant, it does not influence the distribution of various species. The biotic factors have played the major role in influencing the composition and condition of the crop. The forests have been degraded because of excessive grazing unregulated felling and frequent fires. The felling is often concentrated on the species valued for various purposes. Seedling stages are particularly exposed to extermination due to excessive grazing and fires. The species surviving during degradation are resistant ones that can stand grazing and limited species are of low utility. In the vicinity of villages forests have been subjected to severe exploitation and mass encroachments, which have resulted in either heavily, eroded scrub vegetation or blanks. Sheet erosion is in advanced stage and the underlying areas are cut up by nalas. The major rock formations throughout the tract are granite and granite-gneiss, but the soil varies. The composition and quality of the crop varies appreciably depending upon the soil type, its depth and drainage. Well-drained deep loamy and alluvial soils bear better quality forests. The quality deteriorates where the soil is shallow or water logged.

2.1.3. The forests dealt with under this plan are primarily mixed forests having a great variety of species. The most characteristic tree of the type is teak and its most typical associates are dhaora and ain. Distribution of teak is in small patches in varying proportions depending upon the soil, drainage and topography. It is however, completely absent in the major portion of the tract dealt with. The upper canopy is uneven and not very dense one, formed by mixture of trees practically all of which are deciduous during dry season, usually for several months, though some for short period only. The lower canopy is likewise almost deciduous as, although evergreens and sub-evergreens are present, they are inconspicuous and mainly confined to the moist and more sheltered spots. The undergrowth of shrubs is usually present but enough light gets in to permit the growth of grass. Canes and palms are

absent. The chief bamboo is Dendrocalamus strictus. Epiphytes and ferns are quite inconspicuous.

2.1.4. Considering all the factors mentioned above and the composition and condition of the crop, for the purpose of description, these forests can be distinguished in to the following types as per revised survey of the Forest Types of India by Champion and Seth.

TABLE - 1

S.N.	Group of Forest	Champion and Seth's classification
1	Group 5 Sub-group 5A	Tropical Dry Deciduous Forests, Southern Tropical Dry Deciduous Forest
2	I. Climax Types. (1) 5 A/C1 (2) 5A/C3	 (1) Dry Teak Bearing Forests (2) Southern Dry Mixed Deciduous Forests
3	II. Degradation Stages. (1) 5/DS1	 (1) Dry Deciduous Scrub
4	III. General Seral Types. (1) 5/1S1	 (1) Dry Tropical Riverain Forests

SECTION – 2 :- GENERAL DESCRIPTION

2.2.1. DRY TEAK FORESTS OR DRY TEAK BEARING FORESTS :-

2.2.2. This category has been identified mainly because of the presence of teak in the crop. In this type proportion of teak varies from 10 to 25 percent, but nowhere it forms a pure crop. Tectona grandis, Anogeissus latifolia and Diospyrous melahoxylon spp. are the particular characteristic of the type. In comparison to the forests of 5A/C3 type, there is no much difference in the composition of other species in these forests. The distribution of this sub type is in small scattered patches in Chimur and Nagbhid Ranges of Bramhapuri Division. The teak plantation would also fall in this category. The presence of teak can be ascribed to the alluvial soil along the prominent nalas.

2.2.3. The quality of teak forests varies from III to IVb. The density of forests varies from 0.5 to 0.7. The crop represents mostly young to middle aged trees with scattered matured and over matured trees. The young trees are somewhat well grown and sound, but the older trees are branchy and malformed, exhibiting ill effects of incessant fire and adverse effect of past maltreatment. The natural regeneration of teak is sporadic and not satisfactory and at most of the places the degradation is compounded by a virtual absence of the regeneration of this valuable species. The natural regeneration of other miscellaneous species like ain, bija, dhaora is satisfactory.

2.2.4. FLORISTICS :

2.2.5. I. TOP CANOPY :- Teak (Tectona grandis), Ain (Terminalia alata), Dhaora (Anogeissus latifolia), Bija(Pterocarpus marsupium), Tendu (Diospyros melanoxylon), Kusum (Scheleichera oleosa), Kalam (Mitragyna parvifolia), Haldu (Adina cordifolia),Salai (Boswellia serrata), Shivan (Gmelina arborea), Moha(Madhuca longifolia), Behada (Terminalia bellirica), Mokha (Schrebera swietenoides), lendia (Lagerstroemia parviflora), Dhoban (Dalbergia paniculata), Hirda (Terminalia chebula), Jamun (Sygigium cumini), Padar (Stereospermum suaveolens).

2.2.6. II. SECOND STOREY :- Garari (Cleistanthus collinus), Achar (Buchanania lanzan), Aonla (Phyllanthus emblica), Kakai (Flacourtia indica), Ghoti (Zizyphus glaberrima), Amta (Bauhinia malabarica), Palas (Butea monosperma), Ghogar (Gardinia latifolia), Bhirra (Chloroxylon swietenia), Biba (Semecarpus anacacardium), Amaltas (Cassia fistula),

2.2.7. IIa. BAMBOOS : Bamboo (Dendrocalamus strictus)

2.2.8. III. SHRUBS : Morarphal (Helicteres isora), Chhindhi (Phoenix sylvestris), Bharati (Maytenus emarginata), Gursukri (Grewia hirsuta), Kudursi (Bridelia hamiltonii), Kudmudi (Gardenia gummifera), Jilbili (Woodfordia fruticosa), Dikamali (Gardenia resinifera).

2.2.9. IVa. HERBS : Tarota (Cassia tora), Divali (Tephrosia hemiltonii).

2.2.10. IVb. GRASSES :- Mushan (Iseilema laxum), Kusal (Heteropogon contortus)

2.2.11. V. CLIMBERS : Palasbel (Butea superba), Mahulbel (Bauhinia vahli), Ramdaton (Smilax macrophylla), Chilati (Mimosa hamata), Kukutranji (Calycopteris floribunda).

2.2.12. SOUTHERN DRY MIXED DECIDUOUS FORESTS :-

2.2.13. Most of the forests of Bramhapuri Forest Division belong to this category. This type occurs in major portions of all the five Ranges in the Division. These are rarely semi evergreen and are leafless in hot season. These forests are characterized by great diversity in vegetational composition. The composition and condition of the crop is relatively better and the forests are dense in interior hilly portions because of inaccessibility, while in plains, near human habitations the areas have been subjected to heavy biotic pressure and the density is either very low or the areas are blank. Thorny plants occur and tend to increase in proportion with heavy grazing. Bamboos are present in Chimur and Sindewahi Ranges. Planted bamboos have come up at many places. Grass is conspicuous till it is grazed down or burnt. Climbers are generally few but may be heavy locally.

2.2.14. Terminalia alata, Anogeissus latifolia and Cleistan thuscollinus spp. are the particularly characteristic of the type. In general, the quality of the crop is IVa to IVb. Patches of quality III are intermixed with the crop in pockets with deep, moist, fertile and well drained soils in valleys and along big nalas.

In eroded and calcarious soil, quality IVb is found. Mostly the poor quality classes predominate. The density varies from blank to 0.7. The trees on the whole are young to middle aged with scattered matured and over matured trees. Teak can be found scattered with quite low percentage. The natural regeneration of almost all the species is found. It occurs in patches in case of ain, bija, tendu, dhaora, garari etc. while it is sporadic and not satisfactory in case of teak and other valuable spp. The establishment of regeneration differs from place to place depending upon the incidence of grazing and fire. The forests adjoining to cultivated tract and human habitations have been subjected to the severe exploitation and mass encroachments, with result, the forests in these areas are now severely degenerated and the areas are heavily eroded. Lack of scientific management, absence of post harvesting care, lack of boundary demarcation and boundary maintenance resulting in to large scale encroachment, heavy biotic pressure etc. all have contributed in severe degeneration. The condition of B-Class forests is worst as these forests have not been managed scientifically and have been ignored.

2.2.15. FLORISTICS :-

2.2.16. I. TOP CANOPY : Ain (Terminalia alata), Bija (Pterocarpus marsupium),Dhaora (Anogeissus latifolia), Lendia (Lagerstroemia parviflora), Tendu (Diospyros melanoxylon), Suriya (Xylia xylocarpa), Salai (Boswellia serrata), Bhirra (Chloroxylon swietenia), Moha (Madhuca longifolia), Mowai (Lannea coromandelica), Behada (Terminalia belerica), Kusum (Schelichera oleosa),Haldu(Haldina cordifolia),Chinchwa (Albizzia odortissima), Karam (Mitragyna parviflora), Semal (Bombax ceiba), Kullu (Sterculia urens), Rohan(Soymida febrifuga).

2.2.17. II. SECOND STOREY : Garari (Cleistanthes collinus),Achar (Buchanania lanzan), Palas (Butea monosperma), Dhaman (Grewria tilaefolia), Khair (Acacia catechu), Ganer (Cochlospermum religiosum), Amaltas (Cassia fistula), Apta (Bauhinia racemosa), Tundri (Casearia tomentosa), Ghogar (Gardenia latifolia), Lokhandi (Ixora arborea), Warang (Kydia calycina).

2.2.18. IIa. BAMBOOS :- Bamboo (Dendrocalamus strictus).

2.2.19. III. SHRUBS :- Kuda (Holarrhena pubescens), Kharassi(Nyctanthes arbortristis), Bharati (Maytenus emarginata),Dikamali(Gardenia resinifera), Jilbili (Woodfordia fruticosa), Kala Kuda (Wrightia tinctoria), Morar Phal (Helicteres isora), Neel (Indigofera tinctoria), Safed Fetra (Gardenia turgida), Kharata (Dodonea viscosa), Nirgudi (Vitex negudo).

2.2.20. IVa. HERBS :- Tarota (Cassia tora), Diwali (Tephrosia hamiltonii).

2.2.21. IVb. GRASSES :- Kusal (Heteropogon contortus), Ghonad (Themeda quadrivalvis), Mushan (Iseilema laxum), Bhurbhusi (Eragrostic tenella), Dab (Imperata cylindrica), Sheda (Sehima nervosum), Phulkia (Apluda mutica).

2.2.22. V. CLIMBERS :- Adhanipari (Olax scandens), Chilati (Mimosa hamata), Yeroni (Zizyphus oenoplia), Kukutranji (Calycopteris floribunda), Mahulbel (Bauhinia vahli), Palasbel (Butea superba), Dudhi (Cryptolepis buchanani), Gunj (Abrus precatorius).

2.2.23. DRY DECIDUOUS SCRUB :-

2.2.24. These forests found on low broken soil cover and are characterised by the stunted growth of tree species. A thin grass growth is present during the short moist season, otherwise the soil is mostly bare. Many of the shrubs are distasteful to cattle or are thorny. These forests are found mostly in isolated patches of Protected Forests surrounded by cultivation and the patches of Reserved Forest close to human habitation where biotic interference is heavy. These forests have been subjected to severe exploitation and mass encroachments, resulting in to severe degeneration and heavy erosion. Such forests are the result of long continued maltreatment, grazing, fuel or pole felling, frequent fire etc. Woodfordia fructicosa, Maytenus emarginata and Gardenia resinifera spp. are the particularl characteristic of the type.

2.2.25. FLORISTICS :-

2.2.26. I/II. TOP CANOPY/SECOND STOREY :- Hiwar (Acacia leucophloea), Ain (Terminalia alata),Khair (Acacia catechu), Mowai (Lannea coromandelica), Achar (Buchananaia lanzan), Rohan (Soymida febrifuga), Palas (Butea monosperma), bhirra (Chloroxylon swietenia), Ziziphus Spp., Gardenia Spp.

2.2.27. III. SHRUBS :- Kuda (Holarrhena pubscens), Kharasani (Nyctanthes arbortristis), Kharata (Dodonea viscosa), Kudmudi (Gardenia gummifera), Jilbili (Woodfordia fruticosa), Bharati (Maytenus emarginata), Dikamali (Gardenia resinifera).

2.2.28. IVa. HERBS :- Tarota (Cassia tora), Divali (Tephrosia hamiltonii)

2.2.29. IVb. GRASSES :- Kusal (Heteropogon contortus), Bhurbhusi (Eragrostic tenella), Phulkia (Apluda mutica).

2.2.30. V. CLIMBERS :- Chilati (Mimosa hamata), Yeroni (Zizyphus oenoplia).

2.2.31. DRY TROPICAL RIVERAIN FOREST :-

2.2.32. This type consists of an irregular over wood of greater height than the climax dry deciduous forest, and the trees often being of larger size and forming patches and strips with varying amount of smaller trees and shrubby undergrowth. They are confined to narrow strips along the hilly sections of the larger streams which have moisture during the major portion of the year.

2.2.33. FLORISTCS :-

2.2.34. I. TOP CANOPY :- Arjun (Terminalia arjuna), Ain (Terminalia alata), Kalam (Mitragyna parviflora), Jambhul (Sygigium cumini), Umar (Ficus glomerata).

2.2.35. II. SECOND STOREY :- Karanj (Pongamia pinnata), Tendu (Diospyros melanoxylon), Palas (Butea monosperma), Amta (Bauhinia malabarica).

2.2.36. III. SHRUBS :- Mararphal (Helicteres isora), Katumber (Ficus hispida), Nirgudi (Vitex negundo)

2.2.37. IVa. HERBS :- Very little herbs .

2.2.38. IVb. GRASSES :- Very little grass.

2.2.39. V. CLIMBERS :- Very little climbers.

2.2.40 TEAK AND ROCK :- Teak Is the predominant timber species found in this region and is associated with many species of varied importance and is usually associated with metamorphic (calcareous, crystalline, phyllite, schists and granite gneiss) rocks deccan trap (sills, dykes, flows, inter trappen beds) it is associated with a rocks of volcanomic origin, as these are rich in calcium. Teak is absent from sedimentary rock, due to leaching of calcium. More important for the teak to grow is usually absent from sandstone belt and trap-Gondwana boundary line is a perfect match between teak and non teak demarcation – Teak is present is such alluvium deposit which are rich in lime. The trap is this region contain 46.4% felspar. It is found growing best in the ph between 6.5 to 7.5 while subsoil acidity is not a dominating factor for the presence of teak. Teak is a calcium accumulating plant. Teak is found doing well in soils with high SO2/R203 ratui a high dispersion coefficient, and soil with high moisture retention. In the swampy condition, teak is found replaced by Lagestromia paniflora, and a lateretic soil by xylia xylocorpa.

2.2.41 Other Rock Association :-

1. Alluvium and Latentic :- Alluvium is found only in a small patches and thus for the purpose of vegetation has no Lateretic occurs in a difficult strata in the patches around Bramhapuri but more often it constitutes the overlying soil-a lateretic murram frequently as a capping to the hill. The patches of pure cleistanthees collinus (Garadi) are the remarkable feature of this well disintegrated lateretic

2. Trap formation – The type of vegetation supported here is pure teak, but since soil lack in great depth, this plentiful teak is of poor quality. The absence of pterocorpus marsupium is remarkable.

3. Black cotton soil is usually associated with trap and is usually found in Savli range (adjacent to Warora Range). This black cotton soil has been derived from the disintegration of homblende schists, which consists chiefly of sitica, alakaline, lime and oxide of iron. The throny forests persists here like predominance of Acacia leucophelea, Acacia catechu, Butea frondosa,

Zyzyphus xylopyra, Anogeissis latipholia, Gardinia turgida. The common grasses are lseilema species, Andheteropagon contortic. Owing to maltreatment, the forest is often reduced to a miserable growth of Diospyros chloroxyn Gymnosporie Montana. Ixora parniflora, catycopteris floribunda.

4. Kamthe formation : The rocks here are usually grits sandstone, coarse, sandstone argillacrous and ferruginous. The forests found here on this soil is of mixed teak and mixed type. The species predominant are Pterocorpus marsupim, Terminalia tomentosa, Terminalia bellarica, Terminalia chebula Terminalia arjuna (along the stream) Anogeissis latifolia, cleistanthus Collins, The climbers are numerous.

5. Vindhyan formation : The basic rock here is sandstone and semiquatzite, shales and lime stone. The forests on there soils is usually of mixed teak type, mixed salai, Bhirra goggal and Roshan.

6. The mixed teak type consists of teak Pterocorpus massupium. Dalbergia paniculata, Bombex cuba, Terminalia tomentosa, Diospyrous Melenzylon, Amoguisses latifolia, Lagestromea parsiflora, Aegle marmemelos, clustianthis collinus and Buitia monosperma.

7. The mixed forests is usually found in places which are not suitable for teak possibly due to absence of loam. The crop contain here are Gardenia lucida, Gardaina gummifera, Gardina turgida.

8. The salai and bhirra gongal types are the local representative xerophytic forest formation. On ridges salai is prominent and also scattered. In Bherra gongal forest formation. The crop is open with chloroxylon sweitenia, cochlospermum gossypium, and sterculia urenu. Rohan is predominant is time attected water-logged condition.

9. The metarmorphic rocks mostly consists of granite and gneiss as along with quartz. The later produces infertile soil, and the forest is reduced to thorns.

SECTION – 3 :- INJURIES TO WHICH THE CROP IS LIABLE

2.3.1. The principal causes of injury to which the crop is liable are as under :--

2.3.2. A. HUMAN AGENCIES :-

2.3.3. FIRES :- There is a long and extremely hot dry season from February to June during which the forests are vulnerable to fires. Fires taking place at the end of winter and beginning of summer are not so severe, but fires in the hot, dry season cause large scale damage. They prevent the formation of humus by destroying micro flora and fauna and also organic matters. Destruction of the organic matter which maintains or increases the humus content of the soil, causes deterioration. Not only are the organic compounds of the dry leaves and wood lost, but the nitrogen in them is almost entirely lost as free nitrogen, and the only apparent gain is a supply of immediately available potash. Fire of course have other effects of significance such as direct physical effects from the heat generated and an

often pronounced influence on the relative proportions of the different types of soil organisms and hence on the results of their activities. The heat produces in all soils a soluble organic substance inhibitory to germination, which should react on weed growth.

2.3.4. The fire affected saplings and poles develop hollows thereby reducing the timber value. Fires cause unsoundness in large trees. These hollow and unsound conditions and low vitality render the trees liable to attack by fungi and insects.

2.3.5. Considerable damage is caused by the fire to the young crops and the regeneration. Several species in the young regenerated crops are often killed or have to undergo process of dying back for years together before they establish.

2.3.6. The occurrence of fires can be attributed to the negligence of way farers, graziers and fruit and flower collectors. Most damaging is the tendu season, when in many cases willful fire is caused by the tendu leaf contractors with a popular belief that it results into profuse flush of tendu coppice shoots and leaves. The Moha flower collectors also set fire round about the mahuwa trees so that the floor can remain clear and flowers can be collected easily. This fire spreads into the adjoining forests and cause extensive damage. Fire is sometimes caused by encroachers on the forest lands. In general, the area is so badly affected by the fire that by the end of summer hardly any parts left intact without having suffered from fire.

2.3.7. The standard of fire discipline needs to be raised and sufficient funds need to be provided for fire protection and publicity to make the public fire conscious.

2.3.8. The accurate and up to date data is not available. Though the above data is not available, it is a general observation that fires are frequent in hot and dry season. Damage caused by fire in the past are given in **Appendix No. XLVIII.**

2.3.9. **ILLICIT CUTTINGS :-** The pressure of illicit cuttings in interior hilly areas is comparatively less than that of plains, especially the areas in the vicinity of human settlements. In the interior areas illicit cutting is mostly for the purpose of construction of houses, agricultural implements, firewood, clearing the land for encroachments and extending cultivation. Forests especially in the vicinity of human settlements suffer considerable damage as whatever growth coppices put on is exploited mostly by the head loaders. The problem is severe in near by areas to taluka head quarters and relatively big villages where there is high demand of small timber and firewood. Multifold increasing trend in population dynamics and further increase in per capita consumption put high pressure on near by forest areas. Due to high prices of timber and firewood, the incidence of illicit felling is high and increasing day by day and vast patches of denuded scrub lands have been developed in the vicinity of villages. Though there are provisions of nistar supply, but generally this facility is availed by only those who can not access the forests easily. Most of timbers and firewood is illicitly taken away by the villagers. Increase in population and unemployment has taken its toll and illicit cutting

in forest areas has become source of income and lucrative business. Removal of green bamboo by illicit cutting is a common feature by locals and burads. Damages caused due to illicit cutting are given in **Appendix No. XLVIII.**

2.3.10. These damages are only detected cases as per record available. There may be many more which remained undetected. With the explosion in population and with the increased pressure on the forests, protection of forests from illicit cutting is becoming difficult day by day. This vicious cycle needs to be checked by adopting various measures like check on increasing population, reorienting the locals towards their participation in forestry management and convincing them about importance of forest protection in their own interest, supplying biogas plants to the villagers, raising energy plantations in and around the villages through Social Forestry, regulating the nistar supplies, training of forest staff on proper lines and equipping the staff with required facilities. This is high time to think on these lines to accept the challenge of changing to adverse circumstances.

2.3.11. ENCROACHMENTS :- There have been large scale encroachments, particularly in the Protected Forests in the vicinity of villages. In the absence of demarcation of forest lands on the ground and in the absence of accurate maps, its detection has become difficult. Absence of boundaries led to very large scale encroachments and large tracts exists on which there are chances of dispute regarding ownership and control between Revenue and Forest Departments. Because of lack of coordination between Revenue and Forest Department and further in the absence of proper records and correct maps with the forest department, the ignorant staff at the lower level has been seriously infringing the provisions of Indian Forest Act and misinterpreting the powers of "Mutation of records" to suit the convenience of ambitious and massive program of distribution of land and regularization of agriculture in notified Protected Forest areas.

2.3.12. The forest areas other than already listed by the forest department as the encroachments prior to 1978 and details furnished to Revenue Department have been regularized in notified Protected Forest areas. Regularization of 1972-1978 encroachments on forest lands still remains unresolved and confusion has further aggravated the situation which led to further large scale encroachments on forest lands. In this regard the latest instructions from Government of India as well as from Government of Maharashtra to evict the encroachments in forest lands should be strictly followed.

2.3.13. (B) ATMOSPHERIC AGENCIES :-

2.3.14. WINDS :- The prevailing winds are from the west and are generally of moderate velocity, except when the severe storms occur during the hot weather and strong winds blow in February and during the monsoon. The damage is sporadic and mostly shallow rooted species like teak etc. are uprooted.

2.3.15. DROUGHT :- Damage due to drought is restricted to young plants of growing stock, which keep on dying back for a few years before establishing. The damage due to drought is not a serious factor.

2.3.16. FROST :- Frost is unknown in this tract.

2.3.17. (C) OTHER AGENCIES :-

2.3.18. GRAZING :- There is steep rise in the population of animal livestock. Further more, due to mass encroachment and disforestation of the forest areas, forests have deteriorated and thus the grazing pressure has been increased in multi folds.

2.3.19. The incidence of grazing is quite high in the plains, particularly surrounding the habitations which are thickly populated. In hilly areas also damage caused by grazing is heavy in the forest, which are surrounded by thickly populated villages. In the interior tribal belt, the tribals, however, believe in having large number of cattles such as bullocks, cows, calves, he buffaloes but strangely the tribals do not believe in milking them. The tribal's idea of wealth is the possession of cattle, from which they do not derive any considerable commercial profit, except production of bullocks or buffaloes for agriculture. These cattles require large grazing area in the forests and depend only on forest areas for grazing. The state forest have the capacity of sustaining only about 6 % of livestock population of the state. The same situations more or less prevail in the plains in the tract being dealt with. Though the situation is different in the hilly portion of the tract, yet the grazing pressure is beyond the capacity of the tract. Localized heavy grazing results in the deterioration of forests to a considerable extent. During the monsoon, pressure of grazing is heavy in plains and even in hill forests. In areas with clayey soils, the soil cover becomes hardened and soil aeration is reduced due to continuous beating by hooves of domestic animals while in sandy soils, due to heavy grazing, the soil is loosened and erosion is accelerated with result the regeneration diminishes. The regeneration is badly affected through trampling and eating away of young growth. Grazing details are given in **Appendix No. XLVIII.**

2.3.20. INSECTS AND FUNGI :- The insect damage is negligible in this area although the teak skeletonizers (Hepalia Machaeralis) and teak defoliators (Hyblea puera) cause damage to the teak areas sporadically. In teak plantations this problem is more severe. Damage by fungi is not uncommon in this area.

2.3.21 The fallen logs of Terminalia tomentosa is attacked by insects called Acolesthes holoserica, usually in the month of June and July. Tkhe attack is from the bark and hence the logs of these species should be debarked and be kept in the open. The felled logs of Adina cordiflora (Haldu) is attacked by Xylotreches Smei. Jamun is attacked by very less number of pest species. Terminallia bellenca and Terminalia tomentosa is also is attacked by insects, Sinoxylon anale and sinoxylon crassam of family Bostrychide (called powder pest beatle that converts starchy sap wood into the powder leta substance), Acolesthes holosesica of family cerambycide (insect that make a large tunnel inside the sap wood and hert wood of the timber) and Sphenaptere Kombicernious of family Buprestidan (insects that converts sap wood in to the powder) and platypoles solidus of family platypodide. The insect damage the timber in the form of black strained

pinholes. The beatles do not attack dry logs) Salai logs are attacked by Lymexylonid borer, Atractocorpus reverses. These insects make a long sinuous tunnel inside the logs. Bija logs are attacked by Xylotreches smei and chrysobothrus and logs are not attacked if debarked. Meharook logs are attacked by xylotrechus smei and sipalus hypocritea. The phenomena of dying back of leading and lateral shoot of Tectona grandis is noted mainly due to insect called Aedcides ludificator. Zanzora coffeae attacks the yound leaves of teak. Termites attack the collar of a small seedlings. Termites also attack the seedlings of Dhaora and Aonla. Dhaora is also attacked by bark eating catapillors, called Indarbela quadrinotales. Leaves of Garuga pinnata and Ficus Glomerata are attacked by Gall insect.

2.3.22 Fungus attack is also very common. The fungus usually enters through the damaged branches or through roots and usually destroy, heart wood, but not soft wood. Tree doe not die but is uprooted in the wind pressure. Polyporous gilvus attack the sap wood of Dalbergia sissoo, Dalbergia latifolia, Acacia arabica, katha, bija, sirus (A. Procera), causing white rot. Heart wood is affected in a limited way. Ganoderma lucidium attacks Dalbergia sissoo, neem and Acrocarpus fraxinifolous, through the roots, as it is a root parasite. The roots become brittle and leaves yellow. Gamoderma applaneturn attacks usually the dead logs and few living species like Dalbergia sissoo, babul, bamboo and jack fruit. It renders the wood spongy to be thrown away by wind. Formes rimosus attacks Baheda, ain, dhawda and lendia and is a facultative parasite and enters through the injury. Only the heart wood is affected and the tree is thrown away by wind.

2.3.23 The mixed teak type consists of teak, pterocorpus marsumpium. Bombex cuba, Terminalia tomentosa, Legestromia parviflora, Aegle marmelos, clastanthis collinus, and Butia monosperma.

2.3.24 Teak has two major defolator – Hapalia inachaeralis and Hyblaea purea. The short lite cycle of these defoliator and a large size of teak area, are the deterent for the extensive use of chemicals. Biological control is advised. The following tree species harbour parasites, which host on these two pests.

1) Amogeisses latifolia (2) Careya arborea (3) Cassia fistula (4) Garuga pinnata (5) Grenia telia folie (6) Helicteres isora, (7) Lagestroemia parviflora (8) Xylia Xylocarpus and Terminalia tomentosa and should be retain in considerable number in the teak forests. Vitex negundo is also the alternate host of above two pests.

2.3.25 In very dry locality, teak develop hollowness at base which may go even upto 2-4 Meter in height in heart wood and is caused due to delay action by Fungus Formes Lividus and Polyporous Zonates. The dying back of teak seedling pole is also due to fungus formes spp. In nursery teak seedling are attacked by grub called holotrechea serreta.

2.3.26 Hyblaca puera is a teak defoliator and attacks in this region during the period of July and August, when the rain fall is maximum. The attack is more severe in pure teak plantation. In many cases, the defoliated teak tree, soon redevelop the leaves, and these leaves survive on teak tree

even up to November i.e. more than the casual period of their existence. Longitivity of leaves make up some part of the damage due to defoliator and the net loss is insignificant. Hapalia machaerates, the teak skeletonisor, usually attack the tree during the end of growing season may be around September, with the result the incremental loss in very minimal.

2.3.27 Diseases of animals :- The hoofed wild animals oftenly suffers from foot and mouth disease. The most affected animals are Bison, antilops and deers and oftenly even elephant. The animals are also affected adversely by Round worms, flukes, tape worms and protozoa. Among infectious disease, the wild animals are affected by Brutellosis (Animals don't die but suffer physically) Anthrax, (leading to death) flaemorrha geic septicemia (leading to death) and Tuberculosis. The affecting diseases are Rinderpest, FMD, Rabies.

2.3.28. PLANT PARASITES :- Panda (Dendrophthoe falcata) occurs occasionally on mahua (Madhuca latifolia), achar (Buchanania lazan), and ain (Termnalia alata). However, the damage done by these parasites, is not of very serious nature.

2.3.29. CLIMBERS AND WEEDS :- Climbers of different species are found in these forests. The common destructive climbers are kukutranji (Calycopteris floribunda), palasbel (Butea superba), Yeroni (Ziziphus oenoplia), chilati (Mimosa hemata), ramdaton (Smilax macrophylla) and mahulbel (Bauhinia vahlii). They are found in thick sizes in the rich moist soils. They usually damage the young saplings and poles. In areas heavily infested with climbres, regeneration fails to establish.The seasonal herbaceous annual climbers do some damage to the young seedlings. The weed growth is scanty.

2.3.30. SOIL EROSION :- Decrease in soil fertility, lowering of the sub-soil water level, water holding capacity , change of soil structure are all closely related to erosion caused by run off. The run off is greatly influenced by plant cover. As a result of ruthless felling, fires and excessive grazing the soil is deprived of its protective cover and consequently in the rainy season, the raindrops beat upon this naked soil like millions of little hammers. In areas with clay soils this reduces the absorbing capacity as the soil gets compacted. The suspended soil particles seal the pore spaces of the soil, while the muddy suspension percolates in to the earth to such a degree, that the soil absorbs but little. In sandy soil this accelerates the erosion. The excess water while running off removes the top soil in which are stored the organic matter, humus, chemical and other nutrients on which plants feed. The process of soil erosion is at alarming pace in all marginal areas of the division. The forest crop is degenerated into under stocked and scrub type in these areas. Gully erosion is noticed in undulating portion of the forests especially adjoining to well populated tracts. Ravines formation have taken places where some xerophytic shrubs and inferior grasses are found in undulating forests. Gully erosion is prominent in the areas where the areas subjected to repeated burning for cultivation, excessive grazing and illicit felling. Soil profile of north-eastern region is typical, deep sand loams, with underlying bed of quick sand gravels. These areas are very susceptible to erosion and signs of

degradation and denudation are visible through out the area. Ravine formations in few pockets in Chimur range indicate the alarming situation in future. The severe erosion in the form of ramification of ravines, 2 to 10 m deep is also not uncommon in these areas and unless immediately attended to and treated fast, the detrimental effects and further degradation of such areas in to value less blanks would be only a matter of time.

2.3.31. The area needs to be treated by engineering and biological measures through soil conservation, ravine reclamation, water course stabilization, nala bunding, gully plugging and improvement and afforestation of the degraded forests.

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CHAPTER - III

UTILIZATION OF FOREST PRODUCE

SECTION 1 :- AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION

3.1.1 The tract dealt with is spread over civil territories of Bramhapuri, Nagbhid, Chimur, Sindewahi, Mul(Part) and Warora (Part) tahsils. The tract dealt with comprises forest areas presently coming under the administrative control of Bramhapuri Forest Division. The Headquarter of this Division which was created in 1983, is situated at Bramhapuri which is the Sub Division Headquarters also.

3.1.2. Old Chandrapur District was bifurcated into Chandrapur and Gadchiroli District and came in existence on 26th August, 1982. Before division of the old Chandrapur District, the area of this Division was distributed in Bramhapuri and Warora Tahsils with Revenue Sub Division at Bramhapuri. After the division, the new Chandrapur district was divided into 12 talukas; viz. Chandrapur, Warora, Chimur, Brahmapuri, Nagbhid, Sindewahi, Sawali, Mul, Gondpipri, Rajura, Bhadrawati and Korpana.

3.1.3. POPULATION :- Total population of Chandrapur District as per 2001 census is 20,77,909 out of which 10,59,875 are males and 10,18,034 are females. The total geographical area of the district is 10695.00 Sq.km. Average density of population is 194 per sq.km. as compared to 256 per Sq.km. for the Maharashtra state. As per 2001 census the district has 14 towns and 1791 villages, out of which 1474 villages are inhabited while remaining 317 are abandoned. The number of urban and rural population is 6.73 lakhs and 14.05 lakhs respectively, while the number of female population per thousand male is 960 as compared to 922 of the state. The figures have been incorporated in this plan as per the report received from the District Statistical Officer.

3.1.4. Taluka wise break up of population of Chandrapur District as per 2001 census has been tabulated in Table no. I given below. The other figures related to population,cattle population,agricultural produce & other socio economic statistical figures reproduced in this chapter is as per the informations received from District Statistical Officer.

TABLE – I

S. N.	Taluka	Area in Sq.m.	Populati-on per sq.m.	No. of Villages		Town	Figures in thousands		Population in thousands		
				Inhibited	Deserted		No. of houses	No. of families	M	F	T
1	2	3	4	5	6	7	8	9	10	12	13
1	Chandrapur	941	477	80	10	5	96	102	227	222	449
2	Bhadrawati	1121	140	124	31	2	28	29	81	76	157
3	Warora	1184	140	153	35	1	32	35	86	80	166
4	Chimur	1015	156	178	75	-	30	31	81	77	158

5	Nagbhir	656	190	114	24	-	24	26	63	62	125
6	Brahmapuri	943	162	111	25	1	29	31	77	76	153
7	Sindewahi	620	171	92	22	-	20	21	53	53	106
8	Mul	495	222	78	27	1	19	20	56	54	110
9	Sawali	633	165	97	14	-	20	20	52	52	104
10	Gondpipri	1076	69	89	09	-	23	24	38	37	75
11	Rajura	1242	140	127	14	3	27	29	90	84	174
12	Korpana	768	157	143	12	-	19	20	62	58	120
13	Ballarpur	---		30	06	-	-	-	69	65	134
14	Pobhurna	---		58	13	-	-	-	24	23	47
Total -		10695	194	1474	319	13	367	388	1059	1019	2078

- Because of making round figure, totals will not tally in some case

3.1.5. The major area of the District is under forest. The percentage of forest area in this Division is 10.96 % of the total area of the District.

3.1.6. As per 1991 census, the population break up of the district on the basis of religion is as under (Figures for the year 2001 census were not available at the time of compiling these informations) :-

TABLE - II

S.N.	Religion	Population in hundred	% of the total poulation
1	Buddhist	239737	13.53
2	Christian	7799	0.44
3	Hindu	1451183	81.89
4	Jain	2841	0.16
5	Muslim	58773	3.32
6	Sikh	3815	0.21
7	Others	1777	010

3.1.7. As per 1991 census, the population of Schedule Castes and Scheduled Tribes in Chandrapur District and in talukas covering the tract dealt with is as under.

* Because of making round figures, totals will not tally in some cases.

TABLE - III

S.N.	Taluka	Population ¼in thousands½								
		S.C. ¼including Neo Buddhist½			S.T.			Total*		
		M	F	T*	M	F	T*	M	F	T*
1	Chandrapur	53	48	101	29	27	56	82	75	157
2	Bhadrawati	12	10	22	15	13	28	27	23	50
3	Warora	9	8	17	17	16	33	26	24	50

4	Chimur	13	13	26	24	24	48	37	37	74
5	Nagbhir	9	9	18	12	12	24	21	21	42
6	Brahmapuri	12	12	24	6	7	13	18	19	37
7	Sindwahi	7	7	14	14	15	29	21	22	43
8	Mul	6	6	12	10	9	19	16	15	31
9	Sawali	6	7	13	8	8	16	14	15	29
10	Gondpipri	9	9	18	13	13	26	22	22	44
11	Rajura	11	10	21	16	15	31	27	25	52
12	Korpana	7	7	14	13	13	26	20	20	40

3.1.8. As per 1991 census, the percentages of population of S.C. & S.T. in the district are 16.90 % and 19.70 % respectively. Percentages of population of S.C. and S.T. in talukas covering the tract dealt with are as under as per 1991 census :-

TABLE - IV

S.N.	Name of the Taluka	Total	Population percentage.	
			S.C.	S.T.
1	Chandrapur	101	2.70	8.86
2	Bhadrawati	22	1.25	2.82
3	Warora	17	0.96	2.82
4	Chimur	26	1.47	4.17
5	Nagbhir	18	1.01	2.37
6	Brahampuri	24	1.36	2.08
7	Sindewahi	14	0.80	2.42
8	Mul	12	0.67	1.75
9	Sawali	13	0.73	1.64
10	Gondpipri	18	1.01	2.49
11	Rajura	14	0.79	2.26
12	Korpana	21	1.18	2.94

3.1.9. LIVE STYLE PATTERN :- The distribution of the workers as per livelihood pattern in the tract dealt with, based on 1991 census is given below.:-

**** TABLE - V**

Taluka	Agricul-turist	Agricul-tural Labou-rers	Livestock, Fisheries, Forestry etc.	Other Services	Marginal Workers	Non Workers	Const-ruction workers
1	2	3	4	5	6	7	8
Chandrapur	155	166	52	185	26	230	112
Bhadrawari	145	195	9	50	10	24	13
Warora	204	248	13	11	9	35	19
Chimur	249	338	14	3	12	12	5
Nagbhir	207	250	11	-	10	6	5
Brahmapuri	291	255	10	3	8	14	6
Sindewahi	153	218	12	5	11	8	4
Mul	178	196	15	1	11	11	5

Sawali	209	230	10	-	7	5	2
Gondpipri	222	185	19	1	12	5	4
Rajura	195	203	8	24	11	12	11
Korpana	217	164	9	7	6	12	5
Total	2425	2648	182	290	133	411	191

** The figures in the above table are available on the basis of 1991 census.

3.1.10. On the basis of above, livelihood pattern, the population percentages of different livelihood classes are as under :-

TABLE-VI

S.N.	Livelihood Class	% w.r.t. total population	% w.r.t. working class population
1	Agriculturists	13.68 %	29.65 %
2	Agricultural Labourers	14.95 %	32.39 %
3	Livestock, fisheries, forestry etc.	1.03 %	2.23 %
4	Other services	12.39 %	26.86 %
5	Marginal Workers	4.09 %	8.87 %
6	Non Workers	53.86 %	--
	Total	100 %	100 %

3.1.11. As per 1991 census, in the District out of total population, 7,45,116 are main workers, 72,500 are marginal workers and remaining 9,54,200 are non-workers. This amounts to 42.05 %, 4.09 % and 53.86 % respectively of the total population of the District. In the district, out of main workers, agriculturists and agricultural labourers are 13.68 % and 14.95 % respectively and 30.43 % population are engaged other activities.

3.1.12. CROP :- Rice is the main agricultural crop of the district and the tract dealt with. Other crops are wheat, jawari, bajari, maize, pulses, other cereals etc. Oilseeds, fruits and vegetables are grown on very small scale. During the year 1999-2000,out of total area under cultivation of 490737 ha, 331868 ha was under food grains which is about 67.63 % of area under cultivation. Out of the area under food grains, the largest area (27.44 %) is under rice cultivation, 14.89 % is under Jawari, 16.25 % area under pulses and 14.60 % under cotton. There are Agriculture Produce Marketing Committees where the agriculturists bring their excess material for sale. Some private traders also purchase the excess material directly from the agriculturists.

3.1.13. IRRIGATION :- The irrigation facilities in the tract dealt with are not very good. Irrigation is done through wells, minor, medium and major irrigation projects, lift irrigation and the pumps fixed on the nalas and river banks. Ghodajhari & Asola Mendha are the major irrigation project and are the main source of irrigation water in Sawali, Sindewahi, Brahmapuri Talukas**.** Chargaon Dam supplies water to the areas of Chimur Tahsil and the Itiya Doh Dam from Bhandara District supplies water to the parts of Brahmapuri and Nagbhir Tahsils. The area is irrigated through

canals and people take double crop because of availability of this water. Besides, the tract dealt with has lot of Malguzari Tanks popularly known as 'Bodi'. Malguzari tanks are potential irrigation facilities and almost all big villages have such tanks. The tanks are scattered all over the area and if maintained and used properly, they can meet the irrigation demands. Looking in to the forest cover of the area and the demand of the time to save these forests, such tanks are better suited to this tract.

3.1.14. CATTLE :- As per the cattle census of 1997, the total cattle in the district were 11,22,584. Out of these, 58.98 % were cows and bullocks, 10.22 % were he and she buffaloes, 25.79 % were sheep and goats and 5.01 % were other cattle. The density of the cattle is 105 per sq.km. as per 1997 census. Since most of the agriculturists are either small or marginal farmers, they do not have any grazing lands of their own to graze their cattle. Most of the cattle in the villages around the forest area graze in the forest only. People are keeping cattle not for milk but for calf and FYM.

3.1.15. Set in rural environments, the populations of the villages inhibiting this tract is predominantly tribals, consisting chiefly of Kunbis, Mahars, Halbas, Gonds, Madias, Marars, Lohars,Sonars etc. who are mainly agriculturists and agricultural labourers. In general, the cultivation practices are of inferior quality. Kunbis predominate and the word Kunbi has become synonymous with cultivator's. Most of the agriculturists are small and marginal farmers.The forests play an important role in the daily lives of local population. Majority of the population depends upon the forest for their requirements of timber and poles for construction or repair of their houses, agricultural implements, cattle shed, fire wood, thorns, fodder and grasses, herbs, roots, flowers and fruits and grazing of cattle. The local population meets almost the entire needs for grazing and fire wood from forests in a most unregulated and unscientific manner with the administration watching helplessly as more and more forest areas fall victim to the ignorant masses.

3.1.16. The tribal residing in this tract are the main source of labour. When free from agricultural operations, they offer themselves for forestry activities. But with increasing other developmental works, labourer is becoming a scarce commodity particularly in the plains, the better developed areas. The usual edible flowers and forests such as mahuwa (Madhuca latifolia), Tendu (Diospyros melanoxylon) and achar (Buchnania lanzan) play an important role in the rural nutrition of this tract. Large number of labourers are engaged in tendu leave collection during summers and the money earned by them during the pinch period goes a long way towards buttressing the other wise fragile tribal economy of the tract.

3.1.17. The Principal requirements for which the people depend on the forests of this tract are as under :-

3.1.18. TIMBER :- Teak is the most valuable timber which is consumed for building purposes, agricultural implements and house hold furniture. But the yield of teak timber is not much from these forests and as such bija, saja, dhaoda, bhirra, garari,lendia and khair are used for timber

purposes. These species have gained importance gradually over the years. Mainly, teak is used for cart's body and spokes, garari poles are used for rafters, khair for stakes, dhaoda for axels, bhirra for hubs,tendu for shafts of carts and dhaman for handles. Besides tendu ,tiwas, ain, dhaman, lendia, dhaora etc. are also used for shafts. Tiwas for naves, siwan for yokes are used. Even mowai,and salai also are used for yokes if siwan is not available.Tiwas, siwan, khair and babul are preferred in order for plough.

3.1.19. Because of high prices and further shortage of valuable species timber, people has to resort to multiple use of a species available for making different parts of agricultural implements and also making huts, houses etc. The demands of local people for small size timber is very heavy because of easy accessibility; mostly people resort to illicit cutting of this small size timber from the adjoining forests.

3.1.20. FIRE WOOD :- Dikamali, dhaora, khair, garari birra etc. are commonly used fire wood species. Dikamali, garari and dhaoda are considered to be the best fuelwood species but in scarcity wood pieces of any species and sizes are used as fuel wood.

3.1.21. The demand for firewood has increased considerably due to the increase in population and there is keen demand for firewood all over the tract except the most interior hilly portion. It is used for domestic consumption as well as in small dhabas and hotels also. It is the only source of cooking energy in the area. Almost for 100 percent fire wood requirement, villagers depend on forests only. As a result, the demand for firewood is extremely heavy and major portion of forests, particularly in plains are not able to meet this demand. Due to high demand, easy accessibility to forests and lack of purchasing power, almost complete demand is met by way of illicit cuttings in the forests. Although the demand for fire wood is supposed to be fully met with from the designated nistar zones existing in the Protected Forest areas, increase in populations and unscientific exploitation coupled with large scale encroachments, in the areas covered in the zones has increased pressure on the remaining forest areas. Conversion of fuel wood to charcoal and its export to other districts/states has further served to worsen the situation by creating energy famine. There is, therefore, a need to review the present policy of commercial sales of firewood. That the forest areas of this tract should primarily cater to local needs, should take foremost precedence even if short-term gains of revenue are to be sacrified.

3.1.22. GRASS :- The demand of grass is local. Thatching grass is of considerable importance locally and continues to be extensively used by the villagers and the supply falls short of demand in the comparatively thickly populated western plains of the district. Coarse grasses of Ghonad and Kusal are used for thatching. Since there is no stall feeding of the cattle, the fodder grasses are not cut.

3.1.23. GRAZING :- The local cattle have easy access to the forests for grazing and they graze in these forests throughout the year. The local villagers totally depend on govt. forests for grazing their cattle. Stall feeding of cattle still remains largely unknown practice in this tract.

Grasses used for grazing are paonia, sheda, marvel, mushan, ghonad, phulkia and kusal. With the increase in cattle population coupled with an alarming rate of encroachment and loss of productivity in the forest areas, the pressures on the remaining forests have increased multifold leading to degradation of the forests to a great extent. This is high time to take immediate measures for legal and effective protection of these natural forests from such ruthless and unscientific usage. Rotational grazing and closure of forest areas for management purposes are the concepts which have been in existence since long back, but not implemented properly due to unmotivated ignorant public and casual administration, need to be applied now in their true spirit.

3.1.24. BAMBOOS :- Bamboo (Dendrocalamus strictus) is available in small patches of the division specially in parts of Chimur, Naghbhid & Sindewahi Ranges. It is mainly found in interior and hilly tract of these Ranges.Popularly known as poor man's timber, bamboos are used locally for making mats, baskets, construction of huts, agricultural implements and various parts of carts, cattle sheds, fencing of campus and variety of other house hold articles. Small bamboos locally known as Karkas are used for fencing. The major portion of available bamboo is used for local cunsumption given on nistar. Every year required quantity of Bamboo are brought from the adjoining Divisions and made available to Nistaries. Though there is provision of nistar, the local people, particularly in the interior hilly areas nobody avails this facility as they can easily remove the bamboo illicitly from the adjoining forests. However, in plains the facility of nistar supply is availed by few locals and again in this part also the major portion of bamboo consumption is brought by illicit means only. Bamboo is supplied on concessional rates to local Burads who mainly depend on bamboo for their lively hood. They make mats, baskets, dholis and variety of other house hold articles from it and sale them locally or out side. They need bamboo, particularly green bamboo through out the year. Though small market is there in Sindewahi, it is the main market within the tract. Gadchiroli is one of the main markets out side the tract.

3.1.25. TENDU LEAVES :- The local consumption is negligible. The collection of tendu leaves is nationalized since 1970 -71. Since 1991 tendu season, tendu units are being sold to the purchasers, called as 'licencees' by lumpsum method through tenders. Tendu leaves collection is highly labour intensive activity during the pinch summer season. However, this activity also has a fall out in the form of forest fires which occur at the begining of the season, caused by human agency with the intension of getting succulent flush of leaves.These fires which rage the tract incessantly year after year have contributed their might to the loss of regeneration capacity of forests as well as the health of the existing tree cover. Large number of labourers, not only local but outsiders also, called as 'Kafla labourers' get employments by tendu leaves plucking, bulk of which is exported out of the district for manufacture of bidis.

3.1.26. OTHER FOREST PRODUCE :- There are numerous minor forest produce available in this tract and are found in almost all Ranges with varying extent. The forest produce which the villagers take from

the forests are edible flowers and fruits, fibres from bark and roots, gum, honey, wax, lac, herbs, thorns and leaves. The main species of edible flowers and fruits are mahuwa and that of fruits are charoli, tendu, achar, kawat, bel, khirni, aonla, jamun, karonda, bor, harra, baheda etc. Leaves of bel, palas, mahul and gum of dhaoda, khair, palas, dikamali are used locally. Fibres are extracted from palas, palasbel etc. Thorns of bharati, hiwar, yeroni, chilhati, ghots, bor and babul are used for fencing. Cordage and lashings are made out from the bark of kuda, apta and roots of palas and some times piwarbel. Lac is collected from palas. Locals, particularly the tribals use these forest produce for their own use and also sell some of them locally to supplement their meagre income. The collection of Mahua flowers, gum, hirda in notified areas is done by T.D.C. in order to avoid exploitation of tribals by contractors.

3.1.27 MEDICINAL PLANTS :- The tract is rich in variety of medicinal plants which are used for curing various ailments by the local people and therefore medicinal plants occupy an important position in the socio-cultural, spiritual and medicinal arena of local villagers/tribes. Their sustainable management and harvesting can conserve bio-diversity, sustain human and environmental health, generate employment and earn foreign exchange by promoting exports. The detail prescriptions have been given in the part two of this plan.

SECTION 2 :- MARKET AND MARKETABLE PRODUCE

3.2.1. MARKET :- Sindewahi, Nagbhid and Chimur are the important centres of marketing of forest produce in small scale since long back. Historically Desaiganj has been an important market of timber, charcoal, tendu patta and others forest produce very near from this tract but outside the Division. Old meter-guage Railway line and large number of old godowns witness the extensive marketing of these produce in the past.

3.2.2. Now a days also the forests of Bramhapuri Division yields timber, poles, fuelwood, bamboo, tendu leaves, and many other minor forest produce. Though, the part of these produce is locally consumed, the bulk of it is exported out of district and even out of state in some cases. Timber and poles after extraction from the coupe are brought to the sale depot for auction sale and nistar supply. The major timber and poles sale depot is at Sindewahi and purchasers are mostly from out side. They are from Nagpur, Yeotmal, Chandrapur, Wardha, Bhandara Districts of Maharashtra and near by districts of Andhra Pradesh attend these sales for timber and poles. W.C.L., Chandrapur and S.C.Co. Ltd., Bellampalli (A.P.) also attend the sale and purchase poles in large quantity. Ballarshah in Chandrapur district on the Central Railway line is an all India market for teak and miscellaneous timber.

3.2.3. Fuel beats are either brought to the sale depot for auction sale. The major part of fuelwood is exported out side after its conversion to charcoal. Bramhapuri on Chandrapur Gondia Railway Line on the Eastern Railways served earlies with narrow guage, now converted in to broad guage, is the main centre of export. Charcoal is exported to various consuming centres like Nagpur, Pune,

Hyderabad, Bombay etc. Chandrapur has developed in to an important centre for storage and exporting charcoal to these cities. In the past there has been practice of sanctioning charcoal depots by the forest department near the established timber and fuel wood depots or near the jungle depots, where the contractors used to make charcoal from the fire wood. Looking in to the extensive damage it causes to the nearby forests and to the environment and further, as total conversion of fire wood to charcoal and its total export to big cities purely on commercial lines widens gap between demand and supply to local for their use and also, as the working with regard to exploitation of fire wood now a days is not intensified as it was earlier, the issue of giving permission to make charcoal in the coupe has been reviewed and presently such permission of making charcoal either in coupe depot or in established depot is not granted.

3.2.4. In the absence of Working Plan, there is no intensive harvesting and only wind fallen or offence case timber, poles and fire wood material is brought to Sindewahi and Khadsangi Depot and sold in open auction. Firewood is supplied to locals on concessional rate at Sindewahi and Khadsangi Depot. Bullock carts and tractors are used for local transport while trucks and trains are used for long distance transport.

3.2.5. Tendu leaves of the Division are sold in auction by tender along with the other divisions of the state. The successful tenderers, called as 'licencees' collect the leaves unit wise in the Division.The units in the division are purchased by traders and manufacturers of state as well outsiders. Leaves are exported to major bidi manufacturing districts of the state like Nagpur, Bhandara and to Andhra Pradesh and even in Karnatka.

3.2.6. Other minor forest produce like Moha flowers, Moha fruits, Charoli, gum Hirda etc. are sold in the weekly market places in different villages or sold to the local shop keepers, traders etc. Collection of M.F.P. like moha flowers, gum, hirda in notified area is done by T.D.C. through its collection centres, but the bulk of it is collected illicitly by local traders and exported out of district. In comparison to T.D.C. collection centres, the locals are attracted by better services like quick purchase, immediate payment etc. of private contractors and major part of these produce go out of hands of T.D.C.

3.2.7. MARKETABLE PRODUCE :-

3.2.8. (A) MAJOR FOREST PRODUCE :-

3.2.9. TIMBER AND POLES :- There is a great demand for teak timber and poles above 15 cm. girth. Production of teak in Brahmapuri division is very less. Teak pieces as small as 1 m. in length and above 45 cm. in girth are readily saleable. Among misc. species, timber and poles of bija, saja, birra, dhaora, garari, tinsa, khair, rohan, tendu were earlier readily sold. But due to arrival of important timber from neighbouring east, the sale of these produce have come downconsiderably.The imported timber could not replace teak, but has replaced miscellaneous timber. Salai, mowai and semal logs above 45 cms. girth are preferred for packing

cases. Salai has limited market during orange season at Nagpur. Semal log above 75 cm. girth are preferred in match industry. Poles are used as pit props by collieries. The species commonly used are tendu, bhirra, dhaora, surya, garari, lendia and ain etc. of 24 to 25 cm. in girth and 4 to 5 m. in length. To fetch better prices and for proper utility, poles should be sold as early as possible after harvesting.

3.2.10. FIRE WOOD :- There is a kin demand of fire wood in plains. Wood pieces of any species and size are used as fire wood. Dikamali, garari and dhaora are considered to be the best fuel wood species. Fuel wood is stacked in the form of fuel beats usually of size 2 m. x 1.2 m. x 1 m. and sold in open auction or sold locally from the depots. If the stacks contain sound pieces of wood above a girth of 45 cm at the center, they are separated and taken out by the purchasers and are sold as chalk timber pieces for carpentry works. In order to obtain better sale results, the fuel stacks should be sold as early as possible.

3.2.11. (B) MINOR FOREST PRODUCE :-

3.2.12. TENDU:-It is one of the most important revenue earning forest produce of the Division. It is sold by tender. The lump sum system of tendu tender has been adopted since 1991-92. There is keen demand of tendu leaves for manufacture of bidis. The leaves, after collection, drying and packing are stored in godowns by the licencees and there after transported to bidi manufacturing centres within or out side the state. On demand, some packed leaves are directly transported to consumption centres.

3.2.13. GRASS :- The broom grass is sold in open auction. Other grasses are consumed by locals.

3.2.14. (C) OTHER FOREST PRODUCE :- Moha flowers and seeds, charoli, gum,honey,wax, edible fruits, non edible fruits, roots , bark, leaves of palas, fencing material, hides, horns etc. are other marketable produce. Some produce in the notified area are collected by T.D.C. through the local tribals. With the enactment of Forest Conservation Act,1980, quarrying and removing of earth, murum and stones require prior approval of the Government of India.

SECTION - 3 :- LINES OF EXPORT

3.3.1. ROADS :- There is an adequate net work of forest roads throughout the division. Many of these roads have been strengthened and upgraded by the B & C Department and Z.P. and converted in to metal and asphalt roads. These roads are being maintained by either B & C deptt. or Z.P. The tract is served with macadam roads of B & C deptt. A number of fair weather roads and cart tracks link the remote forests of this division. Inaccessibility of innermost reaches of the division has been reduced considerably after the formation of Gadchiroli district.

3.3.2. Wadsa – Bramhapuri - Nagbhid- Sindewahi-Mul; Nagbhid- Nagpur; Nagbhid- Chimur- Warora; Mul- Sawali- Gadchiroli; Brahmapuri- Armori; Sindewahi-Pathri-Gadchiroli etc. are the main lines of road

transport to which many feeder roads are linked.

3.3.3. Construction of new bridge across Wainganga on Wadsa-Bramhapuri road in the recent past has reduced the distance between Wadsa and Nagpur. Construction bridges across Wainganga between Mul-Gadchiroli and Wadsa-Bramhapuri and across her tributories in the recent past has tremendously improved the line of road communication. Though many forest roads have been converted in to metal and asphalt roads, further efforts are being made to up grade and strengthen more and more interior roads so as to facilitate the mobility of police to curb naxalite's activities in the interior portion of the tract.

3.3.4. Some of the forest roads being maintained by the Forest Department are given in the **Appendix No.VI**.

3.3.5. The list of existing Forest Roads in the tract is given in **Appendix No. VI.**

3.3.6. **RAILWAYS :-** Brahmapuri, Sindewahi and Nagbhir on Chandrapur - Gondia railway line on the Eastern Railways serves as the main line of transport of fire wood, charcoal, harra and bahada to Nagpur. The major rail head for the transport of timber to the other parts of the country is Ballarshah on the central Railway's Delhi-Madras line.

SECTION 4 :- METHODS OF HARVESTING AND THEIR COST

3.4.1. **AGENCY FOR HARVESTING :-** Till 1980 forest coupes for timber and fire wood were worked through three agencies viz; (i) Departmental agency, (ii) Forest labourer's co-operative society and (iii) Contractors. However, as per the policy decision taken by Govt. of Maharashtra vide its R & F D No.FCT/1581/ 93544/F-1, dated 04/04/1981, harvesting by contractor system was totally stopped, with few exceptions, with effect from July,1981. Now main felling and thinning coupes are either worked departmentally or through F.L.C.S. However, due to the expiry of the Kartar Singh's Working Plan for the then East Chanda Dn. and West Chanda Divisions, the felling is completely stopped since the year 1991-92 and 1987-88 respectively. Some of the subsidiary silvicultural operations are worked departmentally.

3.4.2. In the absence of Working Plan, though the annual coupes are not being worked for timber and fire wood harvesting, but other workings, particularly like bamboo harvesting is continuing uninterrupted to avoid congestion in the bamboo clumps. Bamboo harvesting is carried out departmentally in order to supply the same to the locals for nistar as well as for its sale in open auction at Govt. Depots.

3.4.3. Tendu leaves trade has been nationalized by the Govt. of Maharashtra Act No. LVII of 1969. Tendu leaves were collected by the department through agents till 1990 season. Since 1991 season tendu units are being sold on lumpsum basis. This system is continuing and at present, the harvesting of tendu leaves is being done by the licencees appointed by the government. The tendu units are sold in open auction by inviting tenders and the licencees are appointed to collect the leaves

through the labourers. The area of Bramhapuri Forest Division is divided into 24 units/group of units having a notified yield of 54400 standard bags. The collection of tendu leaves commences from the last week of April each year and continues upto the first week of June. The labourers deliver the leaves at various collection centres called 'Phadis' At each centre the leaves are dried an processed and then packed in gunny bags. The quantity of tendu leaves is measured in Standard bag.

3.4.4. Some of the M.F.P. is harvested by T.D.C. Other minor forest produce is sold by the department by unit (normally a forest range) by auction.

3.4.5. METHOD OF FELLING AND EXTRACTION :- Usually marking is completed up to the end of previous year and the felling starts after the end of rainy season. First the timber and pole trees are felled and after that firewood trees are felled. Axe continues to be the main implement for felling of trees, where as cross cutting of trees and conversion in to timber and poles is done by saw. Firewood is prepared with saw and axe. Labourers are very slow to take up to the modern logging methods. Dragging or carting of timber, poles and fuelwood upto jungle depot is done by bullocks and bullock carts or trucks and tractors. Fuelwood is cut into billets and stacked in the coupe in the form of beats of size 2.0 m x 1.20 m x 1 m. It is stacked at the sale depot in appropriate lines of 1 m. height and is recorded in terms of number of beats.

3.4.6. The trees are marked as timber or fuel depending upon its capability of producing timber, pole or firewood. The estimates of volume for timber and firewood are prepared by using local form factors.

3.4.7. After felling and conversion into logs and poles, measurements are taken and are embossed at the butt end of the logs, with digit nails, along with the tree number and number of log. Besides this, the mark of passing hammer is also made. The poles are classified into girth classes and their average volume is taken.

3.4.8. After arrival of the log in the sale depot, it is given a serial number and re-measured. The differences in measurements at the jungle depot and at the sale depot are reconciled.

3.4.9. All the logging operations are done by engaging local labourers in the departmental working and by the members of the F.L.C.S . in case of coupes worked by F.L.C. Most of the items of work are done on fixed job rates.

3.4.10. Bamboo is cut with the help of axe and classified in to different girth and length classes. In sale depots bamboo is stacked girth and length class-wise.

3.4.11. Tendu leaves are plucked, tied in to bundle called as 'pudas', each of 70 leaves and then pudas are dried, processed and packed in to gunnuy bags and transported. Each gunny bag iscalled as trade bag. One Standard bag amounts to 1000 pudas.

3.4.10. COST OF HARVESTING :- The Govt. of Maharashtra has increased the minimum wages for daily wage labourers in the forest department with effect from 1- 4-88, as per G.R. No. FLC/1087/75180/ P.K. - 545/F-9, dated 25-4-88. As per the above G.R. the minimum daily wage rate fixed is as follows :

TABLE - VIII

Sr. No.	Nature of work	Rates	
		For 8 hours work	For 6 hours works
1	Light unskilled work	Rs. 14.00	Rs. 10.50
2	Heavy unskilled work	Rs. 16.00	Rs. 12.00
3	Skilled work	Rs. 18.00	Rs. 13.00

3.4.13. In the above rates the cost of living allowance, as sanctioned by the labour commissioner, is added every year. The cost of living allowance with effect from August 1, 2003 to 31st July 2004 was Rs.59.80. Due to this increase in daily wages, the job rates are also increased every year. The piecework rates job rates) are fixed by the Wage Board Committee at the circle level and the current wage board rates (job rates) for the year 2003-2004 in the North Chandrapur and South Chandrapur Circles are reproduced in **Appendix No. XXIII.**

3.4.14. As per the Tender notice inviting offers for permission to collect and remove tendu leaves for the season 2003, the Rate of collection for tendu leaves for the 2003 season from Government land in Bramhapuri Forest Division of North Chandrapur Circle have been fixed as Rs. 660/- per Standard bag. And this rate is at Rs.680/- per standard bag in case it is purchased from growers.(Other than Government) One standard bag contains 1000 bundles of 70 leaves each i.e. 70,000 tendu leaves. The payment of labour charges should be made to the labourers on the same day on which the leaves are received from them.

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CHAPTER - IV

STAFF AND LABOUR SUPPLY

SECTION - 1: STAFF:

4.1.1. The forests of the tract being dealt with are in the administrative control of Bramhapuri Forest Division which was carved out of the East Chanda Division and West Chanda Division in 1983 as a result of reorganization of the Forest Department. The areas of this Division originally belonged to the North Chanda Division which was reorganized vide G.R.No.FDM/1358/3093-II-J, Bombay-1, dated 5th May, 1959 to East Chanda and West Chanda Divisions and a portion was transferred to the Central Chanda Division subsequently. Vide G.R. Of the R. & F. Department No. FDM/1880/F-2, dated the 29th August 1983, the East Chanda Division and West Chanda Division were again split and reorganized into Wadsa, Bramhapuri and Gadchiroli Divisions.

4.1.2. The present charge held by Forest Guard, Round Officers and Range forest officers, were too extensive to be managed effectively. It was, therefore, essential that the beats should be divided and rounds should be reorganised from development and protection point of view for greater convenience in the execution of works. Accordingly as per Tata Consultancy Service Report, Bramhapuri Forests Division have been reorganised into five Ranges for Protection and five Ranges for Development. Similarly Rounds and beat have been reorganised in to Protection and Development categories respectively. The detail activities and works allotted to the various categories of field in the development and protection wings have already been decided and it is reproduced in the para no. 10.1.7 of chapter X of part II of this plan. Accordingly the existing five Ranges have been divided into Development and Protection Ranges. The details of which have been reproduced in the **Appendix No. X.** Because of this system is not working satisfactorily, there is a chance of going back to the original system.

4.1.3. A list of officers who held the charge of the division from 1983 on wards is given in **Appendix No. VII.**

4.1.4. There are 144 permanent employees and officers & 317 temporary employees and officers in the Bramhapuri Forest Division with whom the entire division have been reorganized into Development and Protection wings. The following statement shows the permanent and temporary staff as on 1st January, 2002.

TABLE - I

Sr. No.	Category And Designation	No. of Posts			Pay Scales
		Permt.	Temp.	Total	
1	2	3	4	5	6
	I. GAZETTED Class – I				
1	Dy.Conservator of Forests	-	1	1	Rs.10000-15200 (Senior Time Scale) Rs.12000-16500 (Jr.Administrative Grade)
2	Assistant Conservator of Forests	-	3	3	7450-11500
3	Class – II Range Forest Officer	4	6	10	6500-10500
	NON GAZETTED Class – III				
4	Head Clerk	-	1	1	5000-8000
5	Forester	15	30	45	4000-6000
6	Accountant	-	8	8	4500-7000
7	Jr.Statistical Assistant	-	1	1	4000-6000
8	Surveyor	1	-	1	4000-6000
9	Clerk	8	11	19	3050-4590
10	Driver	-	4	4	3050-4590
11	Forest Guard	111	42	153	2750-4400
	Class – IV				
12	Naik	1	-	1	2610-4000
13	Daftari	-	1	1	2610-4000
14	Peon	2	-	2	2550-3200
15	Choukidar	1	2	3	2550-3200
16	Dak-runner	-	1	1	2550-3200
18	Sweeper	-	1	1	2550-3200
19	Forest Labour	-	205	205	2550-3200
20	Khalasi	1	205	205	2550-3200
Total -		144	317	461	

4.1.5. Forest Labourers under plan or non-plan schemes, who had served the forest department as casual daily wage labourers for continuous five years, with at least 240 working days in each year as on 1.11.1994, were appointed on temporary supernumerary posts of forest labourers in class IV, vide R & FD, G.R. No. LAV 1094/CN 252/F-9, Mantralaya, Mumbai 400032, dated 31st January 1996. These posts will stand abolished automatically on the superannuation. As on today there are 205 posts of such forest labours working in Bramhapuri Forest Division.

4.1.6. The details of Revenue and Expenditure in the Bramhapuri Forest Division for the period from 1991-92 to 2001-2002 have been given in the **Appendix No. XXXIV.**

TABLE - I

Statement Showing Total Revenue and Expenditure of Bramhapuri Forest Division, Bramhampuri.

S.N.	Year	Gross Revenue	Gross Expenditure	
			Conservation & Development.	Establishment (Salary & T.E.)
1	1991-92	35596056	5610991.00	7292689.00
2	1992-93	8902724	3239602.00	8202958.00
3	199-94	4963168	2842351.00	9526085.00
4	1994-95	6377555	2340130.00	9975762.00
5	1995-96	10571143	5634504.00	15324541.00
6	1996-97	5041607	9374515.00	19817226.00
7	1997-98	4986058	10027919.00	20888974.00
8	1998-99	3386152	12825056.00	24398499.00
9	1999-00	3612139	2010061.00	42725596.00
10	2000-01	3032337	1076986.00	31515000.00
11	2001-02	2044645	4290697.00	31416000.00

TABLE - II

Statement Showing the expenditure incurred in salary and T.A.from 1997- 98 to 1999 - 2000 in Bramhapuri Forest Division, Bramhampuri.

Year	Item.	Expenditure ¼in lakhs rupees½				
		Non-plan	Plan	Tendu	EGS	Total
1997-98	Salary	182.80	0.54	11.49	8.88	203.71
	T.A.	3.94	0.06	1.02	0.15	5.17
1998-99	Salary	219.67	0.57	14.25	4.03	238.52
	T.A.	4.61	0.14	0.40	--	5.15
1999-2000	Salary	379.72	0.99	22.82	15.31	418.84
	T.A.	7.75	0.25	0.42	--	8.42

SECTION – 2 :- LABOUR SUPPLY

4.2.1. In general the tract is sparsely populated and density of population in interior hilly portion is very less. Besides forestry and agricultural activities, the tract being a part of T.S.P. Other departments are also carrying out area, other upliftment and developmental schemes and programmes. The villagers are not willing to work on many occasions in a year. The tribals perform festival named "Pola" and on that day the entire population would simply enjoy. They would not do any work even if the work is of due important nature or even if one can get enough return in shape of money for the same. With the introduction of developmental

activities and in course of time as these villagers are coming in close contact with the modern civilization, though the process is extremely slow, some change is observed in their attitude. It is only in course of time things will improve. Because of these factors, labourers are becoming an increasingly scarce resources with stepping up of the pace of development of this tract. Acute shortage of labour is felt when the agricultural sowing and reaping operations are in full swing. The labour force, therefore, has to be imported from outside. Considerable numberof labourers come even from Andhra Pradesh and Madhya Pradesh. During summers large number of labourers come from other parts of Chandrapur and Bhandara districts for plucking of tendu leaves.These labourers stay in camps and are commonly called as "Kafla Labourers".

4.2.2. With the intensification of forestry operations, shortage of labour may be felt further. To tide over this, possibilities of having mobile labour gangs and importing labourers may be investigated.Proper planning of forestry works should be done specifically when paddy is transplanted and harvested.Since paddy transplantation is done after the rains are sufficient to fill the paddy fields, if the plantations are started as soon as the rains start, by the time the fields are ready for paddy transplantation, planting works can be completed. Close observation of timings of other agricultural operations in nearby villages and accordingly arranging labourers for forestry operations can help a lot not only in getting the works done timely and effectively, but also in giving employment to local labourers.

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CHAPTER - V

PAST SYSTEMS OF MANAGEMENT

SECTION - 1 :- PAST HISTORY OF THE FORESTS

5.1.1 The tract dealt with under the present working plan covers basically two types of forests areas, (A) Reserved Forest Areas A - class and B – class, commonly called as Old Reserved Forests and (B) Protected Forests, these which were Ex-Proprietary Forests and major areas of which have been declared as Reserved Forests in 1992; and these newly reserved areas are commonly called as New Reserved Forests. These two types have different histories and hence are being discussed separately.

5.1.2 (A) RESERVED FORESTS :-

5.1.3 The old Reserved Forests dealt with under the plan were reserved in 1879 under the Indian Forest Act (VII th of 1878) vide the Central Province Gazette Notification No. 917(i) dated 24th February, 1879. These old reserved Forest Areas form a major percentage i.e. 65.35 % of this Forest Division area. No description of the forests at the time of reservation is available, but the absence of large sized trees, as observed by Shri C.E. Hewetson in his plan 1936-37 to 1945-46 shows that the Forests were subjected to maltreatment by shifting cultivation and to illicit fellings for meeting the local demand. After reservation of these forests, the quantum of protection also increased. Fire Protection works were introduced in 1879 and were gradually extended over all the reserves.

5.1.4 Commutation system introduced after reservation was in force upto 1889. The commuters could remove their requirements as per their choice from any part of the forest convenient to them. Thereafter this system was replaced by extraction on licences. The licence holders used to select and cut the material from any part of the forest till 1893, after which timber, green fuel and bamboos were felled from localized areas. Grasses, dry fuel and minor forest produce were obtained from the forest, in general. Earlier Kosa cultivation was permitted over whole area, but later on it was restricted to only excised area.

5.1.5 Originally, administratively, the old Reserved Forests covered under the present plan were part of Brahmpuri, Gunjewahi and part of Warora Ranges of Chanda Forest Division in the dusk of 19th century. Later, in 1901, after reorganization, these Ranges came under the control of North Chanda Division.Thus after the amalgamation of the Ex-Propriotery Forests with the North Chanda Division, it was reorganised into East and West Chanda Division and a portion was transferred to Central Chanda Division vide Govt. Agriculture and Forests Department Resolution No. FDM/1358/3093-II-J; Bombay, Dated 5th May, 1959. Ranges were also divided in East amd West Chanda Forest Division as under-

TABLE

Division	Old Range	Reorganised Ranges	Remarks
1) East Chanda Division	1) Sindewahi	1) North Sindewahi 2) South Sindewahi	
	2) Wairagarh	1) Armori 2) Wadsa 3) Gadchiroli 4) Dhanora 5) Chatgaon 6) Kurkheda	
2) West Chanda Division	1) Warora	1) Warora	
	2) Mohorli	1) Mohorli 2) Chimur	
	3) Mul	1) Mul 2) kolsa	
	4) Brahmapuri	1) Nagbhid	Name was Changed
	5) Chanda	1) Chanda	

5.1.6 North Chanda division was reorganized in to East and West Chanda Division in 1959 as above and after this reorganization these forest areas came under the control North Sindewahi, South Sindewahi, Chimur, Nagbhir and part of Warora of East and west Chanda Forest Division. On further reorganization in 1983 vide Government of Maharashtra GR no. FDM/1880-F2, dated 29/08/1983, East Chanda Forest Division was divided into Wadsa, Gadchiroli and Brahmapuri divisions and finally with this latest reorganization the areas being dealt with came under the administrative control of Brahmapuri Forest Division. The latest position is that out of four newly formed ranges in Brahmapuri Division, these forest areas are covered by North Sindewahi,South Sindewahi, Chimur and Nagbhid Ranges.

5.1.7 (B) PROTECTED FORESTS :-

5.1.8 The Protected Forests of the tract dealt with were owned by Jamindars up to 1951. Jamindaris were the feudal grants given to the influential local persons of the tract apparently for the purpose of keeping some sort of order in parts, too remote and difficult for the ready exercise of sovereign's direct authority. No documents survive to show the terms of original grants even at the time of preparation of Prabhu's scheme. The tradition of the ruling families was singularly meager. Neither the Gond nor the Maratha Sovereigns recognized any proprietary title to the soil on the part of Jamindar, and there are instances that Jamindars were made and unmade at the pleasure of Raja, the sovereign. Each Jamindar was assessed to a small tribute and he was bound to furnish a contingent of men-at-arms as and when required, and if he complied with these conditions, he was doubtless left pretty much to his own devices.

5.1.9 When the Chanda District came under British rule, it was held that, the Jamindars had no absolute right on the soil. It rested with Government to confer that right attaching such conditions to its exercise as that tenure should be indivisible and untransferable to save, to the nearest male heir and then only subject to the approval of the Chief Coimmissioner

that the estate should be held by one person, the Jamindar for the time being and subject to the conditions of loyalty, good police administration and the improvement and cultivation of the estate.

5.1.10 Under the provision of Madhya Pradesh Abolition of Proprietary Rights (Estate, Mahals, alienated) Act, 1950 (1 of 1951), Jamindaries have vested in the state government on 31st March, 1951 and were taken over by the Revenue Department. These forests were transferred from time to time to the forest department as per the instructions contained in Madhya Pradesh, Government, Revenue Department No. 2249/286-XII, dated 6th April, 1951 and No. 7177/CR-617-12 of 4th December, 1951 with an object of managing these forests on scientific lines. Subsequently these forests were declared as Protected forests under sec. 29 of I.F.A., 1927, Notified vide M.P. Gazetteer Notification No.3056-1216-XI, dated 4th June,1955 and Bombay Gazette Notification No. FLD/1056-12623-F dated 8th August, 1957, published on 3rd October, 1957. Further the Government of Bombay declared their intension to constitute these forests as reserved forests under sec. 4 of I.F.A., 1927 vide Bombay government gazette Notification No. FLD/1258/II-3314-E, dated 30th May,1959 which was published 20th August, 1959.

5.1.11 For the purpose of completion of enquiries in to the rights over these forests,the Forest Settlement Officer was appointed for Sindewahi, Brahmpuri, Warora and Mul tahsils on 12 th February 1960. The Forest Settlement Officer completed his enquiries about the settlement and submitted his final report with his recommendations to the Commissioner, Nagpur vide his letter no. WS/FRSO/1340/75, dated 13th September, 1975.The Govt. of Maharashtra has approved the recommendations of the F.S.O. and the forests have been reserved under section 20 of the Indian Forest Act, 1927, vide Notification No. FLD 3685/ 9316/ CR-42/ F-3, dated 5th May 1992 vide this Notification the Government has declared 11302.41 ha forest areas as the Reserved Forest in the tract dealt with.

SECTION - 2 :- PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS

5.2.1 In the tract dealt with, the past management of old Reserved Forests differed a lot from that of Ex-proprietary Protected Forests and hence the two managements are being discussed separately.

5.2.2 (A) RESERVED FOREST

5.2.3 For the purpose of giving past systems of management of the Reserved Forests covered by the tract dealt with, right from resting of this region to the British, the following periods can be distinguished :-

(i) Pre-reservation period from 1853 to 1878.

(ii) Early reservation period from 1879 to 1898.

(iii) Period of regular working under different working plans from 1899 onwards.

5.2.4 (I) Pre Reservation period from 1853 to 1878 :- Prior to reservation of these forests in 1879, the tract was in a very undeveloped state. There was no regulation or control over the fellings in the forests. The accessible areas adjoining to the villages were excessively harvested in a very irregular way

5.2.5 (II) Early reservation period from 1879 to 1898 :- The forests of this division were declared as Reserved Forests in 1879. After reservation of these forests, some protection measures were taken. Certain species such as teak, bija, shisham, kusum, haldu and kowah could not be removed without a licence. The felling of fruit trees of moha, harra and achar was also prohibited. Since reservation the commutation system was more or less in force until 1888, when it was replaced by the licence system. From 1893, these indiscriminate fellings were put a stop to, and localised fellings of timber, green fuel and bamboos were permitted, while other produce could still be obtained from any part of the forests. However, there was no scheme to regulate the fellings and, in fact the purchasers could obtain their requirements from any part of the forests they liked. This resulted in over harvesting of accessible areas.

5.2.6 (III) Period of regular working under different working plans from 1899 0n wards :- The Reserved Forests areas of the tract dealt with originally belonged to the Brahmapuri, Gunjewahi and part of Warora Range of Chanda Forest Division. The following working plans were in operation since beginning.

5.2.7 THE WORKING PLAN OF MR C.M HANSON FOR BRAHAMPURI AND GUNJEWAHI RANGES AND MR POONA SWAMI FOR WARORA RANGE

5.2.8 The first working plans were introduced between 1900-1926 and were prepared by ranges. The C. M. Hanson's Working Plan for Brahmapuri and Gunjewaji Ranges and Mr. Poona Swami's Working Plan for Warora Range were the first working plans for the Reserve Forests of the present tract dealt with. Hence present Chimur, Nagbhid, North and South Sindewahi Ranges of Bramhapuri Forest Division were covered by these working plans. This plan was sanctioned w.e.f. the year 1899-1900 by the then officiating Chief Commissioner, Central Provinces, in the Revenue Department, vide No.143, dated the 11th January, 1901.

5.2.9 The C. M. Hanson and Poona Swami's Plan described that; no good forests existed in these Ranges the hills in Chimur, Palsgarh, Nagbhir and Rajoli-Nawargaon blocks contained some small teak scattered here and there. The working plan originally prescribed improvement fellings and coupes were opened for felling by pitty purchasers who could remove any trees not marked for reservations. Such working were very heavy in Brahmapuri and Gunjewahi Ranges than any other Ranges. Part of Warora Range was worked for props required in colliery, as well as for clear felling. Natural regeneration was generally poor owing to unregulated fellings, unrestricted grazing and frequent fires. It also described that the chief dangers to the crop were from fire and grazing and measures were being taken to reduce those by extending fire protection and regulating grazing.

It is mentioned that prior to this plan people were allowed to extend "Kosa" silk cultivation over the whole area and the extension of "Kosa" silk cultivation was also injurious to the crop but that was later restricted only to B1 Class forests called excised areas.

5.2.10 In brief the main objects of this first plan were, to obtain small timber and fuel for agricultural classes, to supply special demand of dhaura axels, to replace badly grown crop as far as demand will admit with better growth from stools, to encourage reproduction of more valuable species and to tend and protect immature, promising stems of teak and other valuable species by favouring them at the expense of less valuable individuals.

5.2.11 The plan was quite simple in its prescriptions and prescribed Improvement fellings all over the area. This was subsequently changed in to coppices with standard in some felling series. Long rotation of 30 years was fixed owing to the grazing requirements per cattle head 2.98 acres of open Reserved Forests land was available to grazing. Besides, large malguzari forests were open for this purpose.

5.2.12 **Results :-** Since the area was heavily worked for clear felling and coupes were opened to the purchasers who could remove any trees not marked as reserves. Forests in which there was sufficient demand, were worked well but the value less trees were not felled, while in the coupes where the demand was less, only best of the unreserved stems were removed. Owing to the limited demand and large proportion of inferior timber, the method of improvement fellings failed to attain completely the object in view, but there was no doubt that the method had improved the condition of crop considerably by opening up congested crops and removing over mature stuff. Subsequently intensive cultural operations, thinnings, cleanings and climber cutting were carried out with great benefit to the forests. Fire protection work was started in 1888 in Gunjewahi, 1897 in Brahmapuri and 1894 in Warora Ranges.It was found to be too elaborate and several fire lines were subsequently abadoned. The system of rigid fire-protection was followed till 1913-14 when early burning was introduced.

5.2.13 WORKING PLAN OF MR. VAHID (1927-1937) :-

5.2.14 This plan was one of the first prepared in the Working Plan branch. It was prepared after carrying out detailed inspection of forests and was based on detailed quality class stock mapping, showing the same on toposheets.This plan covered the then North Chanda Forest Dn. consisting of the then Warora,Moharli, Mul, Chanda, Brahampuri, Gujenwahi and Wairagarh ranges.The area being dealt with in the present plan was covered by Brahmapuri, Gunjewahi and part of Warora Ranges only. However, to have an idea about past treatment in and around the area dealt with in the present plan, plan of Mr. Vahid is being discussed as under.

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5.2.15 This plan prescribe the intensive management. To obtain the greatest possible yield, the fundamental principles of forests management were.

(i) The attainment of the normal forest.

(ii) The establishment of regeneration to the normal extent.

5.2.16 These forests were the state's property and the principal object was to manage them on a financial basis with a view to securing the greatest possible sustained or expanding annual revenue. As these forests were situated in the middle of a populous agricultural tract, great importance was given to satisfy the domestic requirements of local populations for timber, fuel, minor produce and grazing. Considerable importance was given to the question of water supply for irrigation with the view that maintenance of forests conserves the water supply better than any other system of land culture and any system of management which aims at preservation of forests will serve the aim of water preservation also.

5.2.17 Based on the above facts the objects of management of forests were :-

(i) To obtain largest possible sustained annual yield.

(ii) To supply the local demand.

(iii) To maintain the forest as a forest in the interests of the war supply.

(iv) To aim at creation of normal forests with a normal series of age classes and with normal regeneration.

(v) With the minimum damage to the forests and with the minimum hindrance to the realization of above objects, to provide grazing for local cattle.

5.2.18 Subject to the satisfaction of other demands, revenue was the main consideration for method of treatment to be adopted. The ordinary laws of supply and demand was obeyed and management of forests was dictated by the consideration of kind of produce which could be grown and the market demands which operated then or could be forecasted. With this, and further, major species being light demanders, the method of treatment was aimed at conversion of these forests to the uniform system, consisting of a normal series of age classes in even aged stands with normal regeneration. This was applied at once to all teak forests and those mixed forests which were in good demand. The very poor forests which were degraded were treated as unworkable and were left untouched and attention was confined to the better type of forests from revenue yielding view.

5.2.19 This plan prescribed five working circles, viz. (1) High Forest Working Circle, (2) Coppice with Standard Working Circle, (3) Low Forest Working Circle, (4) Low Forest Unworked Circle and (5) Bamboo Working Circle

5.2.20 The Reserved Forests of present plan were kept under Low Forests Working Circle and Low Forest Unworked Circle.The other working circles also are being described so as to have an idea about their results.

5.2.21 HIGH FOREST WORKING CIRCLE :-

5.2.22 Best Forest areas were placed under this Working Circle where uniform system of management was prescribed. This working circle contained eleven felling series, in each of which, the forest was to be converted into a series of age classes in 60 or 80 years according to average quality of the forest.

5.2.23 COPPICE WITH STANDARD WORKING CIRCLE :-

5.2.24 Under this circle medium quality forests were placed on a 30 years rotation with teak and bija being prescribed as the most suitable standards. Eight felling series were formed.

5.2.25 LOW FOREST WORKING CIRCLE :-

5.2.26 Teak and mixed forests considered unfit for producing large size timber were allotted to this working circle. Rotation of 30 to 40 years was fixed according to the quality of each felling series. This working circle contained 55 felling series. The worked A Class Reserved Forest areas of the present plan belonged to this working circle andwas covered by 21 Felling Series in the then Brahmapuri and Gunjewahi Ranges. Total 134 Compartment Nos. were allotted to this W.C. System prescribed was clear felling with certain modifications in both the coppice with standards and the high forest working circles.

5.2.27 The prescription was clear felling expected coppice which were likely to restock the area. The clear felling was modified to the extent that fruit bearing trees of real individual importance to the surrounding population were preserved unless at the undue expense of silviculture. Understocked forests and forests in which the process of filling up by annular group extension was in progress were excluded. Provision was made to retain tree growth along the nalas and over areas liable to erosion. Climber cuttings, two and four years after the main fellings in climber infested areas and mid rotation thinnings in all the felling series were prescribed.

5.2.28 As more open areas frequently showed the signs of gradual filling up, importance was given to natural method of restocking blanks and it was prescribed that nothing must be done to hamper the process of natural filling up of gaps through natural regeneration.

5.2.29 In the A - class forest areas included in the present plan, main fellings were carried out fairly completely except that in nearly all the felling series one coupe remained unworked owing to the general uprising caused by civil disobedience movement in 1930 and the slump in the fuel trade of 1931-32. Thinnings were not carried out partly because of insufficient

demand and partly because many coupes did not need thinning.

5.2.30 4. LOW FOREST UNWORKED CIRCLE :-

5.2.31 Remaining poor areas were allotted to this working circle in which no regular working was prescribed. Out of total A Class Reserved Forest areas of the tract dealt with, Compartment No. 2, 3, 14, 17, 24, 45,and 59 of Brahmapuri and Compartment No. 80, 108, 111, 114, 116, 117, 124, 127, 128, 140-147, 150-156, 161, 186, 199 and 200 of the Gunjewahi Range were kept under Low Forests Unworked Circle.

5.2.32 Management of B Class forests was not taken up.The plan described that the condition was unsatisfactory and it was suggested that forest department be given power to restrict irregular fellings and to open felling series in these forests also. It was pointed out that unsettled Ryotwari forests and that the custom of people to take up survey numbers solely to exploit the forest produce on them entailed undesirable and irregular competition with government forests resulting in to unsatisfactory state of forests.

5.2.33 The Low Forest Unworked Circle and management of B Class Reserved Forests were put under Miscellaneous Regulations.

5.2.34 No area of the present tract dealt with was kept under Bamboo Overlapping Working Circle. Deterioration was observed on 3 years rotation in the last Working Plan and hence the rotation period in this plan was kept 4 years.

5.2.35 The degree of fire protection works were prescribed on the basis of working circles. High Forest, Low Forest and Coppice with Standard Working Circles were covered by special protection while the rest under the general.

5.2.36 In grazing, goats and sheep were excluded totally from A Class Reserved Forests. By splashing the tree trunks with geru demarcation of outer boundaries of areas closed to grazing was prescribed and only listed villages were to be permitted.

5.2.37 The plan of Mr.Vahid needed revision at the end of 8th year. The failure to obtain natural reproduction in the High Forests of opening the overwood and the failure to recognise that vigorous bamboo allows little to exist in competition with it were the defects of this plan. However, the area of the tract dealt with was kept under less important Low Forest Working Circle and Low Forest Unworked Circle, the results on these W.Cs. completion of this working plan are not described any where.

5.2.38 THE WORKING PLAN OF MR. HEWETSON :- (Period from 1936 to 1946)

5.2.39 The earlier Working Plan of Mr. Vahid was revised within eight years by Mr Hewetson. Mr. Hewetson's plan was for the then North Chanda Forest Division consisting of the then Warora, Moharli, Mul, Chanda, Brahampuri, Sindewahi and Wairagarh ranges. Though the area

covered by the present plan belongs to Brahmapuri, Sindewahi Ranges only, the plan as a whole with specific attention to above Ranges, is being described for general idea of past management.

5.2.40 After careful observation of the results obtained during the 8 years, that Mr. Vahid's plan was in force, Mr. Hewetson analysed the causes for the failure of certain prescriptions. He concluded that clear felling was unsatisfactory for the areas having bamboos except where established reproduction of teak was sufficient to form future crops and that it was equally unsuitable for non bamboo areas of low density where trees were either too large to coppice or were bad coppicers. He, therefore, recasted Vahid's plan and modified the prescriptions suitably. He mainly reshuffled the areas under High Forest and Coppice with Standard Working Circles of Mr. Vahid and redistributed the areas.

5.2.41 Under this plan the better quality forests continued to be managed for production of large timber. The silvicultural prescriptions recognised the important fact that regeneration will only be possible when advance growth is established under the mature crop. The forests of poor quality were managed for the production of poles and fuel. In such forests, regeneration was expected to be chiefly by coppice.

5.2.42 All inferior and open forests and those too distant from the market were excluded.

5.2.43 The following working circles were formed :-

5.2.44 (1) HIGH FOREST WORKING CIRCLE WITH 80 YEARS ROTATION

5.2.45 Only small area of same Working Circle in Mr. Vahid's plan suitable for growing large valuable timber and all highest quality areas of Coppice with Standard Working Circle in Mr. Vahid's plan were allotted to this Working Circle. Obviously, this Working Circle did not cover areas of tract dealt with in the present plan. Characteristics of the high forests were the deficiency of the lower girth classes, the general absence of advance growth and the presence of dense bamboo under a rather open overwood. Conversion to a normal series of age classes in even aged woods started under Mr. Vahid's plan continued during this plan. In the dense bamboo forests, which covered a large part of the circle, deficient reproduction of tree species was observed. So it was prescribed to fell bamboos some years in advance of main fellings and also postponement of overwood fellings until sufficient advance growth had established it self. It was also prescribed to supplement natural regeneration by planting of teak and other useful species. The areas from Mul, Chanda, Mohorli and small blocks in South Warora Ranges were proposed in this Circle

5.2.46 (2) COPPICE WITH STANDARDS WORKING CIRCLE WITH 40 YEARS ROTATION.

5.2.47 The rotation was fixed at 40 years. The rotation for standards was not fixed due to lack of growth statistics of the species

concerned. This working circle was allotted all areas taken out of High Forest Working Circle of previous plan as well as other areas situated fairly close to markets and in which the forest growth was sufficiently dense and valuable to make exploitation possible. This working Circle comprised the workable forests of the then Bramhapuri Range I.F.S., Sindewahi 12 F.S. the area of the tract dealt with, were allotted to this circle.

5.2.48 Two main types namely, bamboo forests and forests with few or no bamboo were distinguished and the silvicultural treatment varied with the presence or absence of bamboo.The presence of bamboo was thought to be the one of causes of failure of coppice regeneration. Mr. Hewetson mentioned that trees of the smaller size classes is deficient in dense bamboo and large proportion of overmature trees existed in such areas. When the bamboos were not clearfelled with the tree forest, they had responded vigorously to the extra light and had heavily suppressed whatever coppice reproduction survived. Evenwhen bamboos were clear felled with the tree forest, they recovered more vigorously then any coppice except teak. Considering these observations Mr. Hewetson prescribed the essentiality of weakening of the bamboo growth in advance of main felling and prescribed clear felling in non bamboo forests. In dense bamboo coupes it was prescribed that bamboos must be clearfelled three years in advance of the main felling to allow the reproduction of tree species to become established. Experiments were suggested for the method of felling.

5.2.49 Experimental controlled burning in the month of February and March in advance of felling was prescribed with the object of stimulating reproduction. It was also prescribed that in the areas of younger age class and deficient in advance growth, the invasion of grass should be prevented and the bamboo should be restrained until seedlings of tree species were recruited by keeping the over wood sufficiently dense. Reservation of saplings below 9" (22.86 cm.) was enforced from 1943. C.B.O. was to be done after the contractor relinquished the coupe. Climber cutting and c-grade thinnings were to be done at the age of 15 years.

5.2.50 Poor and under stocked areas, steep slopes, areas liable to erosion and strips along water courses were not to be worked. Healthy fruit bearing mahua was to be reserved in localities where the local villagers collected their fruit.

5.2.51 (3) MISCELLANEOUS WORKING CIRCLE :-

5.2.52 Areas having inferior and open forests and those too remote from the markets for profitable exploitation were placed in this working circle.

5.2.53 Irregular working, removal of dead and dying trees and improvement or selection fellings under the orders of Conservator of Forests was prescribed.

5.2.54 Compartment Nos. 2-6, 10-17, 19, 21-24, 32, 45, 49 of Bramhapuri Range, Compartment nos. 80, 81, 103, 108, 114, 116, 117, 123, 124, 127-131, 134, 139-147, 150-156, 161, 170, 176, 178, 179, 186,

199 and 200 of Sindewahi Range of the present tract dealt with were allotted to this working circle

5.2.55 Some of the areas allotted to this working circle were worked under the method of working approximated to the coppice with standard system.

5.2.56 (4) BAMBOO WORKING CIRCLE (OVERLAPPING) :-

5.2.57 This was overlapping with the high forest and coppice with standards working circle. No area of the present tract dealt with was allotted to this working circle.

5.2.58 The felling cycle was of four years. The felling rules were relaxed in case of advance clear felling in coupes of high forest and coppice with standard working circle. It was first time when retention of minimum 8 culms over one year was prescribed in each clump.

5.2.59 B Class Reserved Forests covering the large area of the present tract, remained in from 1899 onwards.

5.2.60 Under Miscellaneous regulations prescriptions for grazing, fire protection etc. were given.

5.2.61 Though the Conservator could open any coupe as soon as the reproduction had reached the safe height, 10 years closure to grazing was prescribed in coupes subjected to final fellings. All coupes under regeneration were to be kept under special fire protection till the regeneration was out of danger. All coupes closed to grazing were to be specially fire protected but even when a coupe was to be opened to grazing, it was to remain under special fire protection for 10 years if there was much grass or inflammable material. Other areas were kept under general fire protection.

5.2.62 Though the areas covered under the present plan belonged to Coppice with Standard and Miscellaneous Working Circle only, other areas also being important from working point of view, results are being described for all working circles.

5.2.63 In case of High Forest Working Circle, the felling operation of bamboos before the main fellings was not properly attended during the years of war due to shortage of labour. The cultural works prescribed were not carried out very well during the war years. Results were fair in non bamboo areas while in bamboo areas it was unsatisfactory. The areas without adequate advance growth were opened up far heavily resulting in to monopoly of bamboo and weeds. The opening of the canopy in areas devoid of reproduction and to cut bamboos to free the existing regrowth led to serious failures in some areas.

5.2.64 The worst feature, was the damage done by fires to young crops. Repeatedly burnt coupes were left with miserable, stunted crop of pure teak poles which had replaced mixed teak forests. A gradual change of plant association to more xerophytie type was clearly perceptible. The

unallotted block was subjected to very heavy selection felling during the then last decade in order to meet the heavy demand for timber during the war.Silvicultural considerations did not always receive due attention and the forests as a whole were impoverished. The increased demand for fire wood and charcoal was also responsible for heavy fellings.

5.2.65 In case of Coppice with Standard Working Circle, the results of the treatment were said to be satisfactory in non-bamboo forests. But in places larger trees failed to coppice satisfactorily. In bamboo bearing forests heavy fellings gave disappointing results. The subsidiary cultural operations and thinning after 15 years were not carried out properly and in the coupes the crop was congested.

5.2.66 In Miscellaneous Working Circle, as irregular working including the removal of dead and dying trees and improvement or selection fellings under the order of the Conservator of Forests was permitted, some of these areas were worked heavily to meet the increasing demand of fire wood and charcoal, particularly for war supply.

5.2.67 Bamboos were exploited regularly on fouryear cycle by the local villagers as well as purchasers from Wardha and Yeotamal districts. Owing to the large size of the coupes, supervision was difficult and felling rules were often violated.

5.2.68 Favourable situation of the forests and the facility for export provided by Eastern and Central Railways, at that time, caused a heavy demand on them for logs, poles, firewood and charcoal during the period of war and considerable heavy advance felling were carried. Even the future coupes of the conversion block did not escape heavy exploitation.

5.2.69 WORKING PLAN OF Mr. SINGH AND Mr. MAJUMDAR (1949-50 to 1963-64)

5.2.70 This was a more systematic planwhich was prepared after intensive study of forests. This plan was for the then North Chanda Forest Division comprising of the then Warora, Moharli, Mul, Chanda, Brahmapuri, Sindewahi and part of Wairagarh ranges. The area of present plan belongs to the then Brahmapuri, Sindewahi and part of Warora ranges. Though, only the part of this plan covered with todays Brahmapuri Division, objects of managements and prescriptions of the Working Circles were applicable to the forests covered by the present plan, in brief the total management prescribed by Mr. Singh and Mr. Majumdar are being given.

5.2.71 After taking in to consideration the facts influencing the general objects of management, the objects of managements were as follows :-

(i) To obtain 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 forest perpetually productive and to maintain and improve the pasture in area specially set apart for grazing purposes.

(iv) To satisfy the demand of timber, bamboos and other products for industries.

(v) To increase the proportion of the valuable species by preferential treatment and by plantations. Poor crops were to be discouraged and suitable mixture was to be maintained in the growing stock.

(vi) To combat the ill effects of soil erosion.

(vii) To aim at the creation of normal forests.

(viii) To conserve species suitable for the plywood industry wherever they occur.

5.2.72 According to the recommendations contained in memorandum No. 5076, dated the 28th September, 1948 from the Chief Conservator of Forests, Central Provinces and Berar, to the Secretary to Government, Forest Department, Central Provinces and Berar, the forests were classified for the first time on the functional basis in to tree forests, minor forests, pasture land and miscellaneous forests.

5.2.73 The forests of the tract dealt with in the present plan belonged to minor forests class only, but all classes and their treatments are being described in brief for an idea about working in the past in different adjoining forests.

5.2.74 TREE FORESTS :- All the better quality forests were put in to this class. These were principally managed for the supply of timber and firewood and other forest produce and for production of revenue. The grazing restrictions were laid down according to the silvicultural needs of the crop rather than the grazing demand. An average grazing incidence of 3 acres per cow unit was fixed. Special provisions were made for the conservative treatment of "Protection Forests" which were too small to be classed separately.

5.2.75 The treatments prescribed were :- Conversion operations with artificial regeneration in case of better quality area and Selection-cum-Improvement fellings on cycle of 40 years in case of some other areas and Coppice with Reserves system on a rotation of 50 years in case of inferior quality areas. Compartments with too poor growth were not to be worked. Provisions were made to check erosion in hilly and undulating areas. No area covered under the present plan belong to this class.

5.2.76 MINOR FORESTS :- The entire R.F. A -class forests covered by the present plan were classified as minor forests. All workable

areas which were not capable of producing large sized timber, but could grow medium sized timber, poles and fire wood were classed as minor forests.

5.2.77 The chief object of management was to provide grazing to the maximum possible extent consistent with the management of these forests on the basis of sustained yield of smaller timber, firewood and fodder to satisfy the local demand. Grazing restrictions were laid down with the view to preserve and improve the forest growth and to provide grazing to the maximum extent.

5.2.78 The incidence was fixed at 2 acres per cow unit on the average area open to grazing. Besides, periodic closures at regular interval were prescribed in the interest of reproduction as well as pasture. Apart from closure after working, a second closure was to be enforced at half rotation to improve the pasture. The areas subject to more intensive grazing and liable to erosion were also to be closed during the monsoon to check further deterioration of the pasture.

5.2.79 The treatment prescribed for these forests was Coppice with Reserves system on a rotation of 40 years with a provision for thinning at the age of 20 years.

5.2.80 PASTURE LANDS :- Areas having no or little tree growth were classed as pasture.

5.2.81 The lands were to be managed as grazing grounds to provide grazing to the maximum possible extent consistent with the maintenance of pasture. No fellings were prescribed, but tree growth could be sacrificed in the interest of pasture. Monsoon closures were prescribed to maintain and improve the pasture. Few compartments of Brahmapuri Range were viz compartment Nos. 2-5, 12,13, 14, 50 covered by the present plan was classed as pasture.

5.2.82 MISCELLANEOUS FORESTS :- This class comprised grass 'birs' of the then Nagbhid and Warora Ranges and forest village areas viz Compartment Nos. 23B, 24B, 25B, and 26B of Ghorajhari Forest Village of Nagbhid Range Compartment Nos. 30 and 13 From Sonegaon Forest Village of Warora Ranage.

5.2.83 No working was prescribed in these areas, though valuable forest growth in forest village area could be exploited under proper authority. Grass birs were to remain closed to grazing.

5.2.84 As discussed above, the forests of tract being dealt with in the present plan were classed as minor forests, and hence as far as Reserve Forests of Brahmapuri Division are concerned, they were allotted to Coppice with Reserves and Miscellaneous Working Circles. However, all Working Circles are being discussed in brief so as to get an idea about past treatment given to the adjoining areas.

5.2.85 Keeping in view the above classification of forests, the following Working Circles were formed -

5.2.86 (i) PLANTATION WORKING CIRCLE :-

5.2.87 This included better quality tree forests. No area of the tract being dealt with covered this Working Circle, but the area from Chanda Range specially Junona and Lohara Forests were allotted to this working circle.

5.2.88 The Chief object of constitution of this working circle was to convert as much of the high quality mixed forests to a normal series of age classes with new crops containing a high proportion of valuable species. Planting of annual area was prescribed as reproduction as advance growth of such species was scarce.

5.2.89 The areas were allotted to different periodic blocks and preferential treatments were proposed so as to make the crop corresponding to a normal series age classes. Teak was the most favored species and the rotation was fixed at 100 years. After teak, bija, semal, shisham, saja, bhira, dhaora and tinsa were other favourable species in this order. Trees capable of yielding edible fruits and flowers were to be retained. No felling was to be done in narrow steeps along the nalas, in the areas liable to erosion. Understocked areas were to be excluded from working. Advanced growth and reproduction of valuable trees was to be given preferential treatment. C.B.O. was prescribed after felling when extraction was over. Thinnings were prescribed. Climbers were to be cut. Gardenia latifolia was either to be reserved or to be suitably thinned in dense patches of the same.

5.2.90 The plan prescribed in detail the felling rules and subsidiary silvicultural operations. Bamboos were checked in the regenerated coupes as long as this was essential and if suppressing young saplings, whole clumps were to be felled.

5.2.91 (ii) SELECTION-CUM- IMPROVEMENT FELLING WORKING CIRCLE

5.2.92 No area of the tract dealt with in the present plan was allotted to this Working Circle, but the areas from Mohorli, Mul and Chanda Ranges were allotted to this circle.

5.2.93 It comprised of all the better quality forests and the growing stock was characterized by the presence of number of species. Besides teak other important species were bija, ain, shisham, dhaora, bhira, surya, garari, tendu, kusum, mahua etc.

5.2.94 The treatment was to increase the proportion of teak and other valuable species and to free the existing reproduction of teak and valuable species. Intensive fellings were permitted in patches having sufficient reproduction and advanced growth. The fellings were to be carried out with the object of increasing the volume and value of the growing stock and trees putting on value increment were to be reserved

while it was thought to be justifiable to exploit the mature growing stock. Fellings were confined to trees over the selection girth but only if their retention is not necessary on silvicultural grounds and for soil protection. Thinnings were prescribed in congested areas in favour of teak and other valuable species.The areas liable to erosion, within one chain on either side of nalas and understocked areas were excluded from working. Edible fruits and flowers bearing trees were reserved. The rotation of teak was fixed at 100 years.

5.2.95 The plan prescribed detailed felling rules and subsidiary cultural operations. Climber cuttings, reservation of Gardenia latifolia and thinning of the same in case of its dense stand, removal of whole clumps of bamboo interfering with the young crop, D-grade thinning in teak pole crops were some of the important prescriptions.

5.2.96 (iii) COPPICE WITH RESERVES WORKING CIRCLE :-

5.2.97 This Working Circle covered practically the whole of workable areas of the then North Chanda Forest Division. The forests were much varied in composition, density and quality of growing stock. Practically few minor forests and few tree forests which could not be conveniently separated for management were allotted to this Working Circle. It included all exploitable forests situated closed to the markets and in which the forests growth was sufficiently dense and valuable to make their exploitation possible.

5.2.98 Apart from other areas of other ranges, it included the more accessible workable forests of the then Brahmapuri, Sindewahi and some part of Warora Ranges. In view of the general increase in demand for fire wood for the manufacture of charcoal for export, the part of forests of the then Brahmapuri and Sindewahi Ranges which were not worked so far, were also allotted to this Working Circle and new felling series were formed.

5.2.99 The forests belonging to the present Bramhapuri Division covered total 23 felling series out of which I.F.S. with 54 No. of Compartments from Bramhapuri Range and 14 F.S. with 100 No. of Compartments from Sindewahi Range of present Brahmapuri Division were allotted to this Working Circle.

5.2.100 The chief object of management was to supply on sustained basis the small size timber, poles, firewood and fodder and grazing to the maximum possible extent. The reasons were given for unsuitability of clear felling in these forests. These were low proportion of valuable species, absolute necessity of maintenance of forest cover in poorly stocked areas and areas liable to erosion, harmful effect of clear felling in forests containing dense under growth of bamboo and in areas deficient in younger age classes and reproduction.

5.2.101 Special treatment was prescribed for forests having dense under growth of bamboo. Keeping in view the past experience, felling of bamboos three years in advance was prescribed to help the existing

reproduction to establish. In case of deficient young age classes over wood was to be kept dense to keep down bamboos weeds and grass until new recruitmrnt.

5.2.102 In the forests containing few or no bamboos, the method of treatment aimed at coppicing all growth that had attained financial maturity provided its retention was not necessary on silvicultural grounds. Trees putting on valuable increment were, however, to be reserved. Preferential treatment was prescribed for trees of class-I and class-II. Fruits and flowers bearing trees were reserved. Gardenelia latifolia, all semal and bija below 4'-6" (137 cm.) In girth at breast height, all advance growth below 9" (23 cm) at b.h. Except garari were to be reserved all over. Besides, at least 30 reserves per acre up to 2' to 3' girth were to be retained in the well stocked areas and their number was to be kept 40 to 50 per acre in the medium and low stocking forests. In well stocked areas having sufficiently extensive teak patches, at least 30 well grown poles of species other than teak and garari were to be reserved to obtain a suitable mixture. Areas with precipitous and steep slopes, under stocked areas with density below 0.4 and areas liable to erosion were excluded from working. However, dead and over mature teak trees could be removed at the discretion of the D.F.O. No felling was allowed within 66' on either side of nala except those dead, dying, over matured and very unsound trees.

5.2.103 The rotation was fixed at 40 years and the regulation of Yield was by areas.

5.2.104 C.B.O. in the year following the main fellings, cleanings in the 8th year after the working of coupe and thinnings in the better quality teak and mixed forests in the 20th year after the main fellings were prescribed.

5.2.105 All coupes were closed to grazing for a period of 7 years from the year of working. Further, in moderately grazed areas three year closure was prescribed after the mid rotatation in heavily grazed areas. Besides, monsoon closures were prescribed.

5.2.106 (**iv) MISCELLANEOUS WORKING CIRCLE :-**

5.2.107 It comprised the forests which were too remote to be exploited, hilly areas with an open stocking and forest villages.

5.2.108 As far as forests of the Brahmapuri Division are concerned, compartment No. 30 of Sonegaon Village from Warora Range and 20 Nos. of Compartments from Brahmapuri Range and 29 Nos. of Compartments from Sindewahi Ranage were allotted to this Working Circle.

5.2.109 These forests were not kept under the regular working but dead and dying trees could be removed and Selection - cum-Improvement fellings could be carried out in any area under the orders of the Conservator of Forests. The forest villages were to be managed according to the instructions contained in the para 68 and 69 of Central Province and Berar Forest Mannual.

5.2.110 (v) PASTURE WORKING CIRCLE :-

5.2.111 Compartment No. 2-5, 12, 13, 14 and 50 from Brahmapuri Range of the present Brahmapuri Division was covered by this working circle.

5.2.112 The main object of management of these forests was to provide grazing to the maximum possible extent consistent with reservation and improvement of pasture

5.2.113 The working circle described a summary of some experiments on pasture lands and the conclusions derived there from on rotational grazing, rotational closures, monsoon closures, incidence of grazing, unrestricted grazing etc. There is mention of the conclusions of the Bombay experiments, the United Provinces experiments and the Madras experiments. Keeping in view the feasibility, it prescribed the closure of one of the two sections during monsoon for four months from 1st July to 31st October every year in rotation so as to enable the cattle to graze during the monsoon in the area open to grazing and the whole area for remaining eight month of the year. Because of heavy grazing demand and to accommodate maximum number of cattle it proposed grazing incidence at one acre per cow unit instead of Desirable two acres per cow unit

5.2.114 (vi) BAMBOO (OVERLAPPING) WORKING CIRCLE :-

5.2.115 Some area of Brahmpuri Forest Division belongs to this working circle. The Major areas of Chanda, Mul and Moharli Ranges were included in this working circle. These were under commercial Bomboo felling series and the bomboo was used for Ballarpur Paper Industries. Rest of the areas of these ranges and area of present Bramhapuri Forest Division were allotted to Nistar Bamboo fellig series. The Ratnapur Nimdhela Bamboo felling series area 6451acre and about 3477 acre was mainly comprised under this Division respectively.

5.2.116 In order to safe guard the demand of some of the local population, about 1/10 th of the total C.B.F.S. acres were even set apart in some areas cases and rest of the Nistar Bamboo Felling Series was reserved for local use for Nistaries.

5.2.117 Felling cycle was of four years and compartment wise working was prescribed.

5.2.118 (vii) SEMAL (OVERLAPPING) WORKING CIRCLE :-

5.2.119 No area of Brahmapuri Forest Division belongs to this. The aim of creating this working circle was to meet the great demand for match and plywood industries and so to regulate its exploitation on a sustained basis.

5.2.120 B Class Reserved Forests :- B Class Reserved Forests were not allotted to any working circle. These forests were subjected to unrestricted grazing by bovine animals and to browsing by goats and sheeps. Due to this and due to fires, illicit fellings even better forests also deteriorated rapidly. Areas not colonized by that time were recommended

to be transferred to A -class to arrest further degradation. During the period of this plan large areas of B class Reserved Forests were transferred to A class Reserved Forests vide Madhya Pradesh Govt., Forest Department's letter No. 1694-1458-XI, dated 29-5-1952.

5.2.121 KOSA CULTIVATION :- Kosa cultivation areas were to be made available from B-class forests.

5.2.122 FIRE PROTECTION :-

5.2.123 The forests were classified into three classes as prescribed in para. 86 to 89 of the Central Provinces and Berar Forest Manual Vol. I.

5.2.124 All regenerated areas under C.W.R. working circle, all plantations, experimental plots, sample plots and grass birs were classified as class-I. Remaining A-class forests were classified as class-I and remaining areas i.e. B class forests were classified into class-III. Old fire lines were to be maintained and coupe boundaries were to be maintained as internal fire lines for 15 years.

5.2.125 Fire protection operations, cutting and burning of coupes lines and fire lines and keeping watch through staff and fire watchers specially appointed during fire season, was carried out year after year. It was felt to improve the fire discipline amongst the staff.

5.2.126 The Reserved Forests A-class area of Bramhapuri Forest Division was allotted to Coppice with Resreves and Miscellaneous Working Circles. As no regular working was prescribed in Miscellaneous W.C., the results of working in these areas are not described.

5.2.127 The results of CWR working circle were as under:-

a) Areas subjected to light to moderate grazing regenerated well but in the areas subjected to heavy grazing, specially in small isolated blocks, the regeneration failed to establish and severe soil erosion was noticed.

b) Cleanings in the 8th year were not carried out. This did not materially affected the miscellaneous crop which was to yield fuel, but timber species suffered from congestion and a heavy infestation of climbers resulted in good quality areas.

c) Mid rotation thinnings were noticed to be usually heavy, amounting to felling of reserves. The trees reserved at the time of main fellings were found to be removed against the working plan prescription.

5.2.128 WORKING PLAN OF MR. KARTAR SINGH (1977-78 TO 1991- 92)

5.2.129 The working plan of erstwhile North Chanda Division prepared by Mr. Singh and Mr. Majumdar expired in 1963-64 after running the full period of 15 years. The revision of this plan could not be undertaken in due time, i.e. in 1962, because the working plan for Allapalli and Pedigundum Ranges was under revision at that time. In 1966 it was decided to prepare separate plans for East Chanda, West Chanda and part of Central Chanda divisions which had, by then been carved out of West Chanda Division. Working on the 1977-78 plan of Mr.Kartar Singh was started

by him sometime in 1972.

5.2.130 Mr. Kartar Singh set his objectives according to the National Forest Policy guidelines & classification of the forest areas based on functional basis as Protection Forests,Tree Forests, Minor Forests, Pasture lands and Grass Reserves vide Govt. of Maharashtra Revenue and Forest Department Resolution No. MFP/1365/13221/-Y,dated, 6th December, 1969.

5.2.131 Keeping in view the above principles, the method of treatment adopted by Mr. Kartar Singh was based on the functional classification of forests in to Tree Forests, Minor Forests, Grass Reserves and the Remaining forests. (B-class Reserved Forests)

5.2.132 OBJECTS OF MANAGRMENT :- Keeping in view the general aims and the facts mentioned above the main objects of management were as given below -

(i) The preservation and improvement of tree forests for the production of big-sized timber, especially teak to the extent possible and to aim at progressively increasing yield of the same.

(ii) To increase the proportion of the valuable species such as teak, semal, bija, sisham etc. by giving preferential treatment and by plantations.

(iii) The preservation and improvement of minor forests to obtain progressively increasing yield of poles and firewood.

(iv) To create grass reserves ('grass birs') in heavily populated areas where the demand
of fodder grass is heavy and improve the quality of grasses.

(v) To combat ill effects of soil erosion wherever it has started and to prescribe preventive measures.

(vi) To reboise the understocked patches and thus enrich the growing stock

(vii) To raise concentrated plantations of teak and other industrial woods to meet the
likely demands of the forest based industries.

(viii) To aim at the creation of normal forest with all that it implies.

(ix) Consistent with the above objects, to derive the maximum revenue for the State
for all times to come.

5.2.133 METHOD OF TREATMENT :-

The method of treatment adopted by him was based on the functional classes of forests.

5.2.134 In accordance with the above classification, Sri Kartar Singh's plan prescribed the following working circles :

(i) Conversion Working Circle.

(ii) Coppice with Reserve Working Circle.

(iii) Improvement Felling Working Circle.

(iv) Kuran Working Circle.

(v) Miscellaneous Working Circle.

5.2.135 The Reserved Forests of Brahamapuri Division were covered by all above five Working Circles.

5.2.136 (1) CONVERSION WORKING CIRCLE :-

5.2.137 Compartment Nos. 80, 82, 79, 90-98, 120-122, 138A, 138B, of North Sindewahi and Compartment Nos. 168B, 169B, 173B, 174, 175, 180A and 180B in South Sindewahi and Compartment Nos. 200-202, 205 and 206 of Warora Range and Compartment Nos. 23B, 26B, 28A, 28B of Chimur Range were allotted to this Working Circle.

5.2.138 This Working Circle was constituted out of better quality forests (mostly III and IVa) for more intensive management. All these areas were considered to be suitable for clear felling and raising teak plantations. The forests included in this working circle were mostly of miscellaneous species. The soil was generally well drained sandy loam with patches of laterites.

5.2.139 The crop consisted of mainly ain, dhaora, bija, tendu, mahuwa, lendia and garari. Teak occurred in small patches. Density of over wood varied from 0.50 to 0.70. Regeneration of teak occurred in patches and that of other miscellaneous species was scanty. Age classes mostly varied from young to middle aged with a few mature patches. Bamboos were absent. The valuable trees taken together formed a very low percentage of growing stock. Emphasis was laid on the artificial regeneration.

5.2.140 The soil and climatic factors were considered to be suitable for growing good quality teak forests. As large areas borne mixed crop of comparatively little economic value, it was thought that good soil potential was not fully utilized. Because of construction of bridges and upgrading the roads, the forests on east of Wainganga were opened up.

5.2.141 These all factors led to conclusion that the good quality mixed forests in the interior which were capable of bearing good quality teak needed to be converted.

5.2.142 OBJECTS OF MANAGEMENT :-

5.2.143 The special objects of management were :-

(i) To convert the existing uneven aged crop containing large proportion of inferior species into an even aged crop containing high percentage of teak.

(ii) To aim at deriving maximum sustained yield of large sized timber and maximum revenue there from.

(iii) To meet the local demand of forest produce to the extent without impairing

the productive capacity of forests.

(iv) Consistent with the above, to derive the maximum financial benefit.

(v)

5.2.144 The main object of management of this working circle was to convert the uneven aged and irregular mixed forests to uniform even aged crop of valuable species, mainly teak. As the natural regeneration of teak was inadequate, clear felling and planting of desired species was prescribed. Teak was the principal species to be planted preferably at 2 m x 2 m spacing. Other important timber species to be tried were shisham and semal. Patches not suitable for raising teak, like under stocked areas with poor drainage and shallow soil were to be planted with species like
neem sissoo, siras, khair, tendu and mahua.

5.2.145 Rotation was fixed at 100 years and conversion period for 80 years. Four periodic blocks of 20 years felling cycle were formed. P.B.I. areas were fully allotted and the rest were grouped to form unallotted periodic block. P.B.-I areas included better quality miscellaneous forests having preponderance of mature trees, young to middle aged miscellaneous forests which could not be conveniently separated from management point of view and plantable understocked areas. P.B. unallotted areas consisted of mainly young to middle aged misc. forests having varying quality and density and capable of sustaining teak forests.

5.2.146 TREATMENT IN P.B. I AREAS :-

5.2.147 The areas included and treatment to be given in P.B.1 area was as under.

5.2.148 (A) Unworkable areas :- These comprised areas with steep slopes of 25 % or more, severely eroded areas and areas liable for erosion, water logged areas, 20 m on both sides of nalas and around tanks. Only dead trees could be marked for felling.

5.2.149 (B) Patches containing advanced growth of teak (750 seedlings and/or saplings per ha and not less than 1/2 ha. in extent) and plantations :- All over wood, except healthy semal was to be marked for felling, all malformed saplings of teak were to be cut back, D-grade thinning was to be done in well grown natural pole crops of teak up to 45 cm. girth at B.H.

5.2.150 (C) Areas of clear felling and planting :- This included best available areas fit for clear felling and planting of teak and failure old plantation areas. Clear felling was prescribed except for young healthy semal and plantation of teakand shisham with 2 x 2 mtrs. spacing in separate strips was prescribed. 50 lines of teak were to be followed by 5 lines of shisham, bija, khair, sissoo so as to make 10 % proportion of non teak species. Semal was to be planted at 15 m x 15 m.

5.2.151 (D) Understocked areas having density of 0.4 and below considered unfit for teak plantation :-- No felling was prescribed. Afforestation was to be done with neem, sissoo, siras,khair, tendu or moha.

5.2.152 TREATMENT IN PB UNALLOTED AREAS :-

5.2.153 The areas included and treatment to be given in P.B. unallotted areas was as under :--

1. Unworkable area.

2. Patches containing advanced growth of teak and Plantation.

5.2.154 In both of the above cases the areas included and treatment prescribed were similar to those in P.B.-I.

5.2.155 (**C) Remaining areas** :- All dead and unsound trees were to be marked for felling. In areas bearing coppice, growth of 30 cm. and below at B.H., the coppice shoots on each stump to be reduced to 2 to 3 per stool spaced well apart. Garari of 45 cm of girth at b.h. and above was to be marked for felling.

5.2.156 Subsidiary silvicultural operations like weeddings and replacement of casualties in plantations, cleaning in the 6th year and thinnings in the 12th year, climber cutting, removal of miscellaneous species interfering with teak etc. were prescribed in P.B.I areas.

5.2.157 Results :-

5.2.158 Conversion Working Circle :- The total area under PB I in this working circle was about 2288 ha, out of which 50% was clear felled and planted with teak. Though the site quality of the area is good but the survival percentage is poor because of biotic pressure and not attending the plantation with care and casual approach in implementation of the plantation scheme by the field and supervisory staff. Since no treatment maps were prepared and no proper record of under stocked areas was maintained, it is very difficult to ascertain under stocked areas and that afforestated with miscellaneous species, however, during the course of time no successful plantation in under stocked areas have been noticed. The P.B. unallotted is basically to accord the healthy silvicultural treatment to attain the growth. However only part of it has been covered. Moreover, such conducive treatments have not been scrupulously followed. Therefore, the crop is highly irregular in nature with great variation in ages and sizes and growth pattern. Bulk of these forests were worked under C.W.R. in previous plan with the rotation of 40 years. There has been no clear felling and planting due to ban imposed by the Govt. of India on clear felling in natural forest.

5.2.159 (2) COPPICE WITH RESERVE WORKING CIRCLE

5.2.160 Compartment Nos 78, 79, 81, 82, 86, 87, 99, 100-102, 104-107, 125, 126, 128-131, 140, 141, 146, 147, of North Sindewahi Range; Comptt.Nos. 34-41 of Chimur Range and Compartment Nos. 27A, 28A, 29A, 30A, 32A, 34-36, 37A, 38-47 of Nagbhid Range of Sri Kartar Singh Plan were allotted to this Working Circle.

5.2.161 This working circle included well stocked forests of inferior quality capable of producing small to medium sized timber, poles and firewood. Mostly the forests were of IVa to IVb qualities with a few small patches of quality III also.

5.2.162 The forests allotted to this Working Circle extremely varied in composition, density and quality. The crop was mostly young to middle aged with patches of matured trees in under stocked areas and along nalas. Density varied from 0.40 to 0.70 and occasionally below 0.40 and above 0.70. Coppice regeneration was found to be satisfactory.

5.2.163 OBJECTS OF MANAGEMENT

5.2.164 The main objects of constitution of this Working Circle were :-

I. To obtain maximum yield of fire wood and small timber to meet the local demand,

II. To improve the forests, both in density and composition by tending the reproductions and by carrying out compensatory plantations and

III. To meet the grazing and fodder requirements of local population to the maximum possible extent.

5.2.165 The forests of this Working Circle belonged to the class of minor forests as per the classification on functional basis. As the crop varied in composition quality and density from place to place and further most of the species composing these forests were good coppicers, a flexible Coppice with Reserve system was applied to these forests.

5.2.166 Teak, bija, shisham, semal, ain, tinsa, haldu & semal received preferential treatment in selecting the trees for reservation, in subsidiary cultural operations and thinning.

- Rotation was fixed at 40 years.
- Regulation of yield was by area.

5.2.167 TREATMENT :- The treatments prescribed were as under :-

5.2.176 (A) Unworkable Areas :- These included precipitous and steep slopes, understocked areas of density below 0.40, eroded areas and areas liable to erosion and 20 m wide strip along nalas and around tanks. No felling was prescribed except dead trees and climbers cutting.

5.2.168 (B) Areas fit for clear fellings with some reservations :- These were well stock forests having density 0.70 & above and capable

of restocking the areas after clear felling from the resultant coppice and the advance growth already present.

5.2.169 Marking for felling of all trees except the following was prescribed :-

(i) Advance growth up to 30 cm.,

(ii) Well grown poles of teak, bija, semal, shisham, ain and haldu upto 45 cm in girth.

(iii) Edible fruits and flowers bearing trees of mahua, achar, tendu, aonla.

(iv) Well grown trees of special economic importance like semal, kullu, khair, harra and behada.

(v) Healthy living trees of any shape, size and species in blanks.

5.2.170 (C) Areas to be clear felled for raising teak :- There were teak suitable areas with deep well drained soil. Clear felling of all the trees except young healthy semal and planting with teak at 2 m x 2 m was prescribed.

5.2.171 (D) Remaining areas with density 0.40 to below 0.70 :-

Marking for Improvement fellings consisting of following operation was prescribed.

(i) Cutting of all climbers and high stools, dead, dying, unsound, malformed, heavily burnt or otherwise vary badly damaged trees.

(ii) Thinnings in the groups of saplings and poles of teak, bija, shisham, ain and haldu with spacing of 1/3 of average height.

(iii) Removal of over wood in case of established teak regeneration in at least over 1/2 ha area and above.

Subsidiary cultural operations like weddings and casualty replacements in plantations, C.B.O. cleanings in the 6th year and thinnings in the 21st year were prescribed.

5.2.172 Results :- Coppice With Reserve Working Circle

5.2.173 As clear felling had been prescribed in areas of density 0.70 and above the bio-diversity was lost in favour of coppice and miscellaneous species having advance growth only. This lost the opportunity to get the high forest of miscellaneous nature. Obviously due to such felling yield of coppice perpetuated the coppice with decreasing vigour.

5.2.174 Further suitable areas of mixed forest have been clear felled except semal for raising teak, which have been mostly successful. However, it will take very long period to restore the status of the site, which otherwise would have been improved. In the under stocked areas dead,

dying and unsound trees were to be removed. Improvement felling did not help to improve these areas. No treatment map were prepared as per the prescriptions by Sri Kartar Singh Plan for this working circle. This system has resulted to total failure because of the rooted stock left after coppicing have constantly been hacked for firewood by local villagers and the grasses have invaded the area, which have become good grazing ground for local cattle. Further the area is repeatedly burnt by local people for good flushing of grasses, which has destroyed the growth of rooted stock in the area. Only a few trees can be seen which too were in very bad shape. No plantations have been noticed to be raised in this working circle. In view of this the area of this working circle have become unproductive for production of timber and firewood. Most of the area of this working circle has been proposed to be included in afforestation working circle, pasture working circle and kuran working circle in this plan as per local preference.

5.2.175 (3) IMPROVEMENT WORKING CIRCLE :-

Compartments Nos. 83-85, 88, 89, 124, 103, 108 to 114, 115, 134A, 135A, 136, 137, 139A, 116A, 117, 119, 132A, 133, 127, 142 to 145, 148-160, 161A to 163A, 164, 165A, 166, 167, 168A, 169A, 170-172, 173A, 277, 176-179, 276, 181-185, 187-190, 192, 295, 296, 275A, 196A, 197-199A, 201A, 297 from North and South Sindewahi Ranges and some of the areas from Chimur and Nagbhid Ranges of Sri Kartar Singh's Plan are allotted to this Working Circle.

5.2.176 This Working Circle comprised marginal areas which generally failed to regenerate due to adverse biotic factors. These areas were degraded and were liable to erosion. Forests transferred from B-class to A-Class Reserve Forests which were subjected to unrestricted grazing were also included in this Working Circle. These forests were surrounded by heavy population and were subjected to unrestricted heavy grazing and illicit felling. These inferior miscellaneous forests were of stunted growth. Soil was shallow and liable to erosion due to open forests, lack of regeneration and grass. The crop was mostly young to middle aged with patches of matured trees, under stocked areas and nallas. Density was generally 0.50 and below.

5.2.177 OBJECTS OF MANAGEMENT :- The main objects of management in the constitution of this Working Circle were :-

(a) To maintain and improve adequate soil cover.

(b) To improve existing malformed crop by tending operations.

(c) To help the regeneration of various species to establish and supplement the same by taking up afforestation of under stocked areas.

(d) To take anti-soil erosion measures for raising the productive capacity of the soil and maintaining the same.

5.2.178 As these forests were highly degraded due to heavy grazing, fires and illicit fellings, it was necessary to allow a period of rest in order to

restore the forest capital. The improvement prescriptions included removal of only dead and worth less trees, tending of regeneration and planting of understocked areas with suitable species. Teak as the principle species got the preferential treatment followed by bija, shisham, tinsa,haldu,ain and semal.

(i) No rotation was fixed. Felling cycle of 20 years was fixed.

(ii) Regulation of yield was by area.

5.2.179 TREATMENT :- The treatment included following :-

5.2.180 (A) Understocked and eroded areas having density below 0.4:- In such areas no felling except climber cutting and clearing of brush wood in patches for taking pits for plantation. Planting of neem, sissoo, siras, khair, tendu, mahua, at 3 m x 3m spacing in 30 cm x 30 cm x 30 cm pits . Nalla and gully plugging with brush wood and boulders.

5.2.181 (B) Remaining Areas :-The prescriptions wereas under.:–

(i) Removal of all dead, dying unsound trees,

(ii) Except that of semal, removal of over head canopy in patches containing advance growth of teak,

(iii) Reduction of coppice shoots to 2 to 3 healthy shoots per stool spaced well apart,

(iv) Felling of garari of 45 cm girth and above,

(v) D-grade thinning in teak pole crop up to 45 cm in girth at b.h. aimed at spacing of 1/3 of height of the pole crop.

5.2.182 Subsidiary cultural operations like weedings and replacement of casualties, thinning at the age of 10 years were also prescribed.

5.2.183 Results :- Improvement Working Circle.

- This working circle comprised of marginal areas which have generally failed to regenerate due to adverse biotic factors in the last plan and included degraded miscellaneous forest and the areas were liable to erosion. These areas have high pressure of grazing & illicit cutting. However 20 years felling cycle was kept and yield was regulated. In the areas of density below 0.4 climber cutting was prescribed. The brushwood and bamboo were to be cleared to take pits for plantation of ain, sisoo, siris, khair, mahua. In the remaining areas, the improvement fellings were prescribed. Therefore, under stocked areas could not be improved. Further due to practice of calling the whole areas as unworkable the improvement in better areas was arrested.

- In the Improvement Working Circle, the coupe was treated according to two criteria. For understocked area, planting has to be carried out at 3mX3m spacing in pits of size 30cmx30cmx30cm cube. The species also

have been prescribed in this working plan. The plantation in this working circle have been carried out as per the prescription of this working circle but plantation resulted as failure due to biotic pressure as well as these areas are too close to inhabitation. The soil type also did not support the species like Sisoo & Khair as soil are mostly degraded and Sisoo has preference for soil having high water table.

- In the remaining areas the most important prescription was the D grade thinning in teak pole crop and at a spacing of one third of height of dominant pole. Since the prescriptions were not followed, the inferior crop composition have been noticed. Repeated fire and excessive grazing in these areas also further deteriorated the existing stock in this area. It was not possible to confirm 2 to 3 healthy stumps in the name of removal unsound trees. A large number of trees have been removed which were silviculturally reserved. Further illicit removal of pole crops by the local villagers have deteriorated the crop composition of the tract, despite the ten years of silvicultural rest given to this crop. Thus it is a need to continue this system in the new working plan.

5.2.184 (4) KURAN WORKING CIRCLE :-

5.2.185 The main aim of formation of this Working Circle was to create grass reserves, locally called as "grass birs" so as to meet the high demand of fodder through stall feeding.

5.2.186 OBJECTS OF MANAGEMENT :-

5.2.187 The main objects to raising the plantations for receiving the different types of improved grass varieties, to increase the yield of fodder grasses and to protect the areas vulnerable to soil erosion by maintaining adequate soil cover.

5.2.188 TREATMENT :-

5.2.189 Method of treatment prescribed included year wise operations and was as under :-

(A) Area suitable for introducing better fodder :-

(i) Cutting of Kuran (grass reserves) and complete closure to grazing and working of
area on 5 years cycle.

(ii) Along the contour ploughing of strips 2 mtr. wide spaced 3 m apart and planting
of tussocks of sheda, paonia, mushan or marvel grasses at 30 cm x 30 cm.

(iii) Nala bunding and gully plugging.

(iv) Three weedings and removal of inferior grasses in November and December after seeding.

(v) In 2nd year and 3rd year operations, uprooting of weeds and coppice shoots and
repairing of gully plugging.

(B) Areas which needed heavy openings of trees :-

(i) With the exception of trees having fodder values e.g. bija, gular, neem, pipal, siras, movai etc., uprooting of rest of the all trees along with bushes and climbers,

(ii) Gully plugging and nala bunding.

(iii) Cutting of inferior grasses before seeding good varieties only after seeding.

(iv) In 2nd year and 3rd year operations removal of weeds, climbers, bushes and seedlings of tree species already removed and repairing of gully plugging.

(C) Protection and unworkable areas :- These included nala banks and eroded areas. Prescriptions were as under :-

(i) Removal of only dead trees,

(ii) Gully plugging with brushwood or boulders.

5.2.190 Results :- Kuran working circle:-

- Kuran Working Circle had the objective of improving the quality & quantity of fodder grasses, which could hardly be done. Working Plan prescriptions were not followed regularly. The practice of rotational grazing as prescribed, could not be implemented successfully in the field. So, heavy grazing without any improvement works, resulted in further deterioration of pasture areas. They could not be effectively closed to the cattle since majority of them were not wire-fenced or provided with cattle proof trenches. This led to the further deterioration of the areas. People's response towards cutting and purchasing the fodder to stall-feed their cattle is also not found to be very encouraging mainly due to the availability of the forest adjoining to the villages.

- Since there is no grazing settlement in this area, the effective number of cattle to be permitted for grazing could not be controlled. Because of that there is a need for grazing settlement of this area. Due to non-implementation rotational grazing effectively area have further deteriorated. Because of that it is proposed to have two independent working circles namely Pasture working circle and Kuran working circle where grazing will be strictly prohibited and stall feeding will be allowed in Pasture working circle where grazing will be regulated on rotation basis. Because of grazing by goat occasionally, the tussocks have been uprooted from the soil which further reduced the grass stock from the area.

5.2.191 (5) MISCELLANEOUS WORKING CIRCLE :-

5.2.192 The areas of 10.12 ha. from Warora Range, 287.75 ha. from Chimur Range, 1424.88 ha. from Nagbhid Range, 531.33 ha. from North Sindewahi Range and 664.50 ha. From South Sindewahi Range were allotted to this Working Circle.

5.2.193 This Working Circle comprised all remaining forests not included in the previous Working Circles. These included compartments of Reserve Forests which were under the process of disforestation, under the temporary leases for Kosa cultivation and B-class Reserve Forests.

5.2.194 No method of treatment was prescribed for this Working Circle.

5.2.195 (B) EX-PROPRIETARY PROTECTED FORESTS :-

(1) These forests of Brahmapuri Forest Division will be placed for the first time under scientific management under this plan. Prior to this these forests were not managed under any scientific, systematic or silvicultural basis. Prior to abolition of proprietary rights by the then Madhya Pradesh Govt. in 1951, these forests were under the control of Jamindaries. Under the provisions of Madhya Pradesh Abolition Proprietary Rights (Eastate, Mahals, Alienated) Act, 1950, Jamindaries were vested in the state government on 31 st March, 1951 and these forests were taken over by the Revenue Department and later on were transferred from time to time to the Forest Department for their scientific management. These forests were declared as Portected Forests in 1955, 1957 and 1959 and major parts of these forests have declared as Reserved Forests in 1992.

(2) Prior to acquiring these forests, the Jamindars have disposed off most of the valuable timber, specially teak, bija and ain from the accessible areas so as to replenish their windling finances.

(3) Up to 1951 and even beyond, Jamindary Forests were administered under the Revenue Law and Rules made there under which proved ineffective mainly because they were executed by non professionals. As a result, these forests were deprived of scientific management. The protection part was entirely neglected. The Rules under Revenue Laws at no stage provided for even elementary fire protection.

(4) For the purpose of giving past systems of management of these Ex-proprietary forests, the following periods can be distinguished. -

(i) The period of practically no control, up to 1888.

(ii) The period of wild control from 1889 to 1917.

(iii) The period of some control from 1918 to 1951.

(iv) The period after abolition of proprietary rights from 1951 to 1998.

5.2.196 (1) PERIOD OF PRACTICALLY NO CONTROL UP TO 1888.

5.2.197 The only very general provision was that the forests were to be managed as per the rules which government may lay down time to time. Some restrictions were placed over the cutting of so valuable timber species like teak, ain, bija, shisham etc. Contracts for extraction of timber was under the general control of the Deputy Commission whose

sanction was also necessary for the grant of lease covering more than 1000 trees of the reserved species and running into a term of more than one year.

5.2.198 The construction of railways in the early eighties was a landmark in the history of jamindari forests. Certain jamindars, fell easy prey to the tactics of unscrupulous contractors, who could obtain lease at terms minus to the jamindars. These contractors were also responsible for much over exploitation and depletion of forest wealth. Government was obliged to take a very serious view of the state of affairs and this led to the second period, the period of wild control.

5.2.199 (2) PERIOD OF WILD CONTROL (FROM 1889 TO 1917) :-

5.2.200 After realizing the seriousness of exploitation and degradation of forest wealth a new set of rules were drawn up for the management of jamindari forests and were incorporated in the Land Revenue Act, 1889. The effective provisions of these rules were:-

(i) No shifting cultivation was to be permitted in tracts in which it was prohibited by the Deputy Commissioner.

(ii) In tracts especially reserved under orders of the Deputy Commissioner, no timber was to be cut except under express permission of the Deputy Commissioner.

(iii) Should the rules be infringed, the Government was at liberty to take reserved tracts under direct management for such periods as they thought fit.

5.2.201 The new rules were in force for over a decade, but it was felt that they were also not very effective. Owing, to the demand for railway sleepers, the forests were being recklessly cut. The position was most deplorable in Bilaspur Jamindaris. It was at this time that a forest officer came in to the picture. Mr. A.A. Dunber Brander was deputed to enquire in to the conditions prevailing in the jamindaries. According to him, the main difficulties in managing the jamindary forests were :-

(i) The absence of any continuity of action or definite forest policy and of an officer on the spot capable of framing and executing the same.

(ii) The non recognition of state and village forests as separate areas with different destinies.

5.2.202 The Revenue Officer also themselves felt that owing to the want of expert knowledge and of time, they were unable to apply such powers of control, as they possessed. Where they interfered, their efforts were nullified by lack of expert knowledge.

5.2.203 (3) THE PERIOD OF SOME CONTROL (FROM 1918 TO 1951)

5.2.204 This period starts with the enactment of the Central Provinces Land Revenue Act 1917 (II of 1917).

5.2.205 Section 202 of the Act and the rules made there under, governed the management of the jamindari forests. The effective clauses of these rules were :-

(i) No trees of any species were to be cut, removed or burnt for the manufacturing of charcoal, nor any of the following species of fruit trees were to be cut without the previous permission of the Deputy Commissioner :-

- Mango, tamarind, mahuwa, achar, jamun, harra, beheda, sindhi, palmyra and sago palms and fruit bearing tendu.

(ii) No forest growth was to be cleared for cultivating the land within a radius of 1.5 miles from the limit of any municipal or notified area committee.

(iii) When an application for cutting any forest growth for extending cultivation was made by the proprietor, the Deputy Commissioner might refuse to grant the same if he considered this necessary in public interest.

(iv) Forest growth might be cut under proper sanction subjeced to the following restrictions :-

(a) No shifting cultivation should be carried out on the land.

(b) At least 30 seed bearing trees of the principal kind and a minimum of 90 evenly distributed trees, should be left per acre.

(c) All timber and brushwood should be cut flush with the ground and no culm of bamboos less than two years old should be cut;

(d) No cutting should be done within 20 yards of either bank of a stream, ordinarily retaining water till January.

(e) No lease or license for unrestricted cutting should be given by the Proprietor without the permission of the Dy. Commissioner.

(v) The Deupty Commissioner might at any time suspend cutting to investigate whether the operations were in accordance with the rules or not.

5.2.206 The Act also empowered the Deputy Commissioner to proclaim that the forest growth of the jamindari or mahal (unit of revenue assessment) would be protected by Government, if the proprietor of any other person was guilty of violation of the rules.

5.2.207 In about ten years, however, it was realized that even these new provisions (which were considered very strict when they were originally drawn), did not go very far. The Deputy Commissioner had neither the staff nor the expertise to see that the protection and

management of these forests was properly carried out. The revenue authorities, even if they found time to tour in the forests, did not possess the specialized knowledge necessary to assess if the forest were being exploited on correct lines.

5.2.208 An achievement of these rules, however was the drawing up of simple working prescriptions for some of the dominant forests by qualified Forest Officers, but the area covered was very small and the prescriptions were also primitive.

5.2.209

5.2.210 (4) THE PERIOD AFTER ABOLITION OF PROPRIETARY RIGHTS. (FROM 1951 TO 1965) :-

5.2.210 As section 202 of the Land Revenue Act ceased to be effective to start with, a new section, section 218-A, was inserted in the Land Revenue Act and rules were framed under the same. The rules were in essence the same as the old rules, but a larger number of species were reserved.

5.2.211 As per general policy of the state government the Ex-jamindari forests in blocks were transferred to the forest department time to time for their management on scientific lines. The forest department, in turn, took necessary steps for Notification of these forests as Protected Forests under the Indian Forest Act. The department also arranged for their demarcation and survey and for preparation of Working Plans or Working Schemes. Practically this was transition period when there was no forest management and these forests were left unprotected for major part of that period due to the absence of Rules.

5.2.212 The Protected Forests dealt with in this Division were part of Madhya Pradesh State till 31st October, 1956.

5.2.213 It was decided by the then Government of Madhya Pradesh, in a meeting held in June 1956 in Pachmari, that all the ex-proprietary forest areas transferred to the Forest Department should be scientifically managed to improve their condition and to maintain their productivity in perpetuity. Accordingly, survey, demarcation and preparation of maps of these forests started and Working Scheme units for preparing their management plans were sanctioned.

5.2.214 In accordance with the above decision, as well as subsequent decisions of the Forest Department, a Working Scheme for the ex-proprietary forests of Kurkheda, Dhanora and Gadchiroli Ranges of East Chanda Forest Division was prepared for the period from 1965-66 to 1974-75 by Mr.V.K.Prabhu. But no any type of such scheme was prepared for the area of 53074.24 ha covered under this Division. About 11302.41 ha. area of these Ex-proprietary Protected Forests have been declared as Reserved Forest in 1992.

5.2.215 The Protected Forest areas covered under the Scheme were notified under Section 4 of the Indian Forest Act, 1927 with an intention to declare them in to Reserved Forests. The Forest Settlement work, there after, could not be completed till 1975. Later even after the Government of

Maharashtra accorded their approval to the Forest Settlement Officer's recommendations in 1985, formal notification under Section 20 was yet to be issued. Therefore a considerable uncertainty as to the legal status of these areas prevailed till 1992, when finally some of these forests were declared as Reserved Forests. The reservation, if and when notified, would have to be followed by survey and demarcation of the new-reserves, thus bifurcating the existing compartments, which would create management problems.

5.2.216 In the period after 1974-75, work of revising the Working Plans for the Reserved Forests of East and West Chanda Forest Divisions was in hand and was completed only in 1977-78 with implementation of these working plans.

5.2.217 The ex-proprietary forest areas of Brahmapuri Forest Division, now spread over all the five Ranges viz, Brahamapuri, Sindewahi, Sawali, Chimur, and Nagbhid belong to Brahmapuri, Sindewahi and part of Warora Ranges of ex-East Chanda Division not covered by the Working Scheme of Mr.V.K.Prabhu. These areas today account for 43,643.47 ha of the total forest area of the Division.

SECTION :- 3 :- ANALYSIS OF PRESCRIPTIONS AND OTHER TECHNICAL AND ADMINISTRATIVE PARAMETERS

5.3.1 At the time of preparation of the scheme, and even today, almost all the Ex-proprietary Protected Forests had been surveyed only on 1 inch to 1 mile scale. Village maps were, however, available at 16 inches to 1 mile scale. The requisite 4 inches to 1 mile toposheets, essential for the preparation of stock maps, as well as the basic management maps, were not prepared by the Survey of India. Shri V.K.Prabhu, therefore, had to resort to pantographic enlargement of the 1 inch to 1 mile sheets to the 4 inches to 1 mile scale. The existing village maps on 16” = 1 mile Scale were reduced to 4 inches to 1 mile scale and were superimposed on the enlarged toposheet. Forest Compartments were laid down on maps prepared in this manner. Compartments included both the forest as well as non forest areas. Analysis of maps, prepared at that time, reveals large scale pantographic errors. None of the management maps depict the longitudinal and latitudinal lines. Almost all the maps suffer from faulty direction, in the sense that the North-south direction on the maps does not tally with that depicted in the toposheets. As a consequence, the compartments laid down on the maps do not match with the direction of the topographical features on the toposheets. This has led to a lot of managerial problems in the field specially at the time of laying out coupes, ascertaining forest boundaries, demarcating nistar zones etc. ascertaining forest boundaries, demarcating nistar zones etc. This discrepancy of location of forest land has now be taken away by preparing the maps using GIS tools wherein village maps have been registered by using Geomedia/MG software. Karwai map have been used to avoid any area discrepancy.

5.3.2 The forest in general and Ex-proprietary Protected Forests in particular have suffered greatly from the onslaught of biotic pressures like,

illicit felling, encroachment, unregulated grazing and fire. The Government had formulated protection strategy for Protected Forests well ahead of the implementation of working Scheme by issuing notifications under Section 30 and 32 of the Indian Forest Act, 1927 vide letter no. FLD – 4657/193064E dated 19/12/1958 regarding the acts prohibited in the Protected Forests and the regulation of the Acts permitted in these forests respectively.

5.3.3 In the notification under section 30 of the Indian Forest Act, 1927 there are three clauses.

I. Section 30(a) lists out the class of trees which are reserved. (45 species have been reserved)

II. Section 30(b) declares that certain areas be closed for a period of 30 years and that nistar rights of private persons would be suspended during that period.(The areas 66 ft of either side of permanent nallah having water upto 1st January) and lastly,

III. Section 30(c) lists out acts prohibited in Protected Forests which include quarrying of stones, the burning of lime or charcoal, the subjection to any manufacture of any forest produce, the collection or removal of any forest produce and breaking up or clearing for cultivation, for building, for herding cattle etc.

5.3.4 Out of these three clauses only the clause 30(b) had a time limit of 30 years which expired on 25th January, 1988. The remaining two clauses were perpetual and without any time limit. It appears that the local officers felt that all the provisions of section 30 and 32 have expired on 25th January,1988. The offences were therefore booked under section 33 of the Indian Forest Act, 1927 or offences under section 30 or for the breach of rules notified under section 32 of the Act. Because of that these forests in general and Protected Forests in particular have suffered greatly from tremendous biotic pressures like illicit felling, encroachment, unregulated grazing and fire. The offences in protected forest are also non compoundable.

5.3.5 As was the universal practice, the working plan/working schemes prepared during that period were guided to a great extent by the National Forest Policy guidelines. Classification, in the policy guidelines, of forests into Protection Forests, Tree Forests, Minor Forests, Pasture Lands, and Remaining Areas, which more or less defined the usage and therefore, provided for geographically separated units, which was not followed while forming the working circles under the scheme. Protection forests were not separated out and kept under a separate working circle. The tree forests were divided into Selection-cum-Improvement Working Circle and the Coppice With Reserve Working Circle on the basis of presence or absence of commercial value of tree species with inferior area going to the Coppice with Reserve Working Circle. Since enumeration was not carried out at the time of preparation of the scheme, this scheme was prepared on the basis of ocular estimation. Enumeration and subsequent analysis of the results prior to preparation of the scheme would have

perhaps led the author to correctly constitute the different working circles. The Minor Forest Working Circle comprised of tree forests round about human habitations belonging to both the previous Working Circles. Allotment of similar areas to different working circles and prescribing different technical prescriptions on the basis of usage and not on any technical basis was a shortcoming. It was perhaps over looked because of the conditions prevailing than.

5.3.6 The compartments formed, included forest as well as non-forest areas such as, habitations, cultivations etc. with only outer boundaries demarcated. This gave rise to serious protection problems later. Protected Forests in the vicinity of villages have, as a consequence of this, suffered from large scale encroachments.

5.3.7 From coppice areas, which included areas of the Coppice With Reserve as well as Minor Forest Working Circles, many important timber species have diminished in occurrence. These include bija (Pterocapus marsupium), ain (Terminalia alata), mokha (Schrebera swietenoides), beheda (Terminalia bellerica), harra (Terminalia chebula), bhirra (Chloroxylon swietenia), khair (Acacia catechu),semal(Bombax ceiba) as well as a host of other species which are poor or no coppicers or which coppice only up to a certain age. All the trees do not have the capacity to coppice and all those, which do have the capacity, do not exhibit the same capacity at all stage of their life cycle. Further, in coppice areas strict adherence to post harvesting prescriptions is very vital for the maintenance of proper shape, size and general health of the trees. Enumeration and subsequent analysis of the results prior to preparation of the scheme would have perhaps led the author to restrict the coppice prescriptions to fair coppicers only, thus averting the present loss. A preliminary survey of the forest areas maintained under the Coppice With Reserve System reveals that these areas have greatly suffered from a virtual lack of post harvesting care, fire protection as well as general protection have therefore, severely suffered. There is a preponderance of malformed trees. Absence of singling operations after the main felling has led to bushy growth. Lack of protection from illicit felling and grazing has led to not only denudation but also a virtual loss of natural regeneration over most of these areas.

5.3.8 The forest areas allotted to the Minor Forest Working Circle were part of the same compartments which were allotted to the two main Working Circles i.e. Selection-cum-Improvement and Coppice With Reserve Working Circles. The forest areas forming this working circle appear that these were not demarcated from the remaining forest areas, the Forest Department never exercised control over these areas, the nistar supply was never regulated by the Divisional Forest Officer, and the Divisional Forest Officer was not even aware that these areas were under his control. As a result, most of these areas have either been encroached or pattas have been allotted by the Revenue Authorities. The remaining areas have been severely degraded due to incessant and unrestricted harvesting for small timber, fuel and grazing. Putting these areas under a

separate working circle was perhaps guided more by the need for supply of nistar rather than the main object, i.e. forest improvement, for which these areas were handed over to the Forest Department. Prescribing a short rotation of 20 years for these areas was another step which took into consideration, the need for fulfilling nistar demands rather than the need to manage forests on sound scientific basis. Perhaps guidelines existed then, for making such compromises with the forest management gained upper hand.

5.3.9 Forest areas belonging to the Brahmapuri Forest Division are mostly miscellaneous in composition with Teak Forests forming only a very small proportion, i.e. less than 5 % of the total forest area. In such areas, the forest management should have favoured the dominant species in accordance with the principles of ecological succession and not teak which was no where near the list of dominant trees in majority of the areas. A preliminary survey of the plantation area also suggested that teak plantations in most cases have suffered from poor survival and growth. More caution should have been applied while converting miscellaneous forests into teak plantations which would have lead to monoculture.

SECTION 4 :- AREA ALLOTED TO FDCM

5.4.1 The following compartments of Reserved Forests have been handed over to FDCM in 1997 vide GR No No.FDC-1094/CR – 578/ F-5 dated 23rd September, 1997 and hence these areas have been excluded from this working plan, the details of which is as under.

Areas Allotted to FDCM

S.N.	Name of the Ranges	Compartments Allotted to FDCM	Total Area (in ha)
1	Brahamapuri	54,128,51,53,56,57,60,61,62,76,77,58.	5096.62
2	Naghbhid	48,18,72,73,74,71,20,21,280,70,69,50,14,12, 19,52	7028.99
3	Sindewahi	45,129,172,173,170,169,168,139,134,171, 130,115,146,147,140,141,137,136,135,131.	7625.98
4	Sawali	148,158,198,197,196,297,199,201,167,166, 165,164,154,159,161,157,156,149,155,153, 152,151,150,163,162,160.	11075.05
5	Chimur	39,56,26,54,20,25,53,44,43,281,55,21,19,18, 17,57,59,41,40,1.	8645.91
		Total	**39472.55**

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CHAPTER – VI

STATISTICS OF GROWTH AND YIELD

SECTION – 1 STATISTICS OF RATE OF GROWTH OF TEAK AND MISCELLANEOUS SPECIES

6.1.1. No study has been conducted with regard to the growth either of teak or miscellaneous species in this tract and therefore, statistics pertaining to other divisions are reproduced below.

GROWTH OF TEAK :-

6.1.2. STEM ANALYSIS :- During the preparation of Singh and Muzumdar's plan, the growth data for teak was compiled from stem analysis of 60 teak trees, distributed in better quality forests of Moharli, Kolsa and Chanda Ranges. The forests from which samples were taken are similar and adjoining to the tract dealt with. The results of stem analysis are reproduced below :-

TABLE – I

Age in Years	Height in mt	D.B.H. (O.B.) in cm.	G.B.H. (O.B.) in cm.	Stem timber volume in cum
10	04.88	4.57	14.36	--
20	08.53	9.65	30.32	--
30	11.58	14.48	45.49	--
40	13.72	19.30	60.63	0.0286
50	15.54	23.88	75.02	0.1286
60	17.37	28.45	89.38	0.3143
70	18.90	32.77	102.95	0.5143
80	20.12	36.58	114.92	0.7143
90	--	(39.62)	(124.47)	0.9000
100	--	(42.16)	(132.45)	1.0286

6.1.3. The figures in the brackets are obtained from extrapolation of the curves.

6.1.4. From the above tables following conclusions can be drawn.

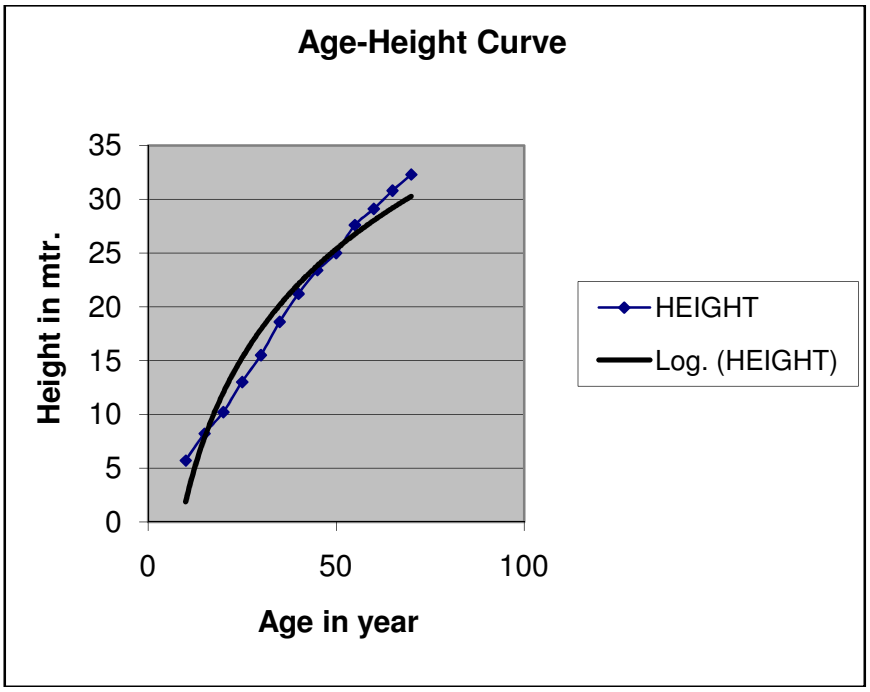
i) The areas are capable of growing sound trees upto 22.0 m.in height and 42.16 cm. DBH (OB) in 100 years.

GROWTH OF MISCELLANEOUS SPECIES *:-*

6.1.5 (I) GROWTH OF SHISHAM :- Analysis of Growth of Shisham(Stem Analysis) have been carried out in Nagpur Forest Division and the related data regarding Age-Height, Age-Volume, Age-Diameter, CAI-MAI and diameter increment & volume increment have been calculated and results of stem analysis are reproduced below.

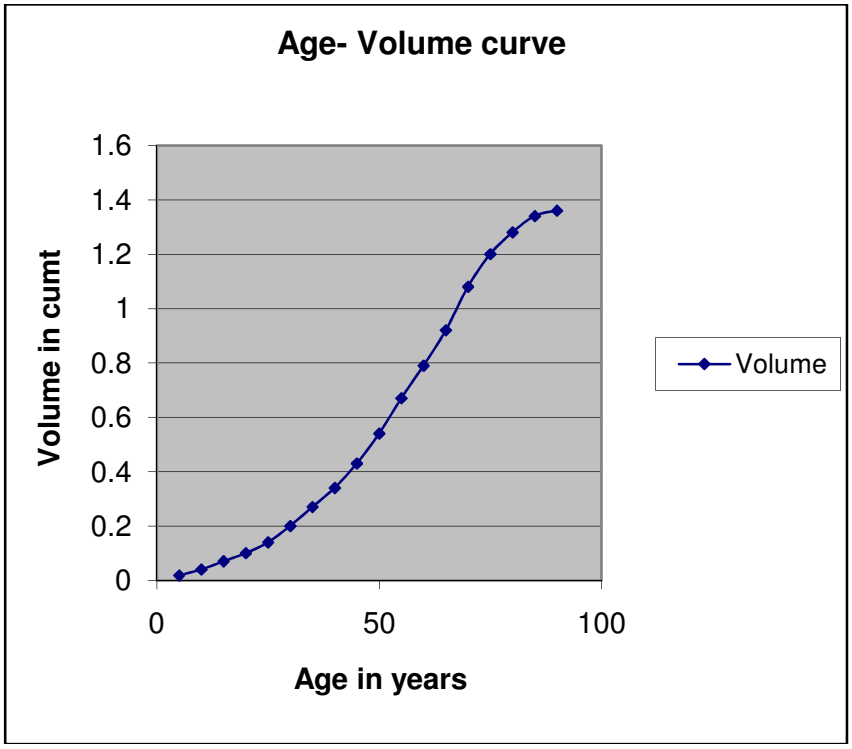
A. Age- Height Curve.

AGE	HEIGHT	AGE	HEIGHT
5	2.7	50	25
10	5.7	55	27.6
15	8.2	60	29.1
20	10.2	65	30.8
25	13	70	32.3
30	15.5	75	33.4
35	18.6	80	34.5
40	21.2	85	36
45	23.4		



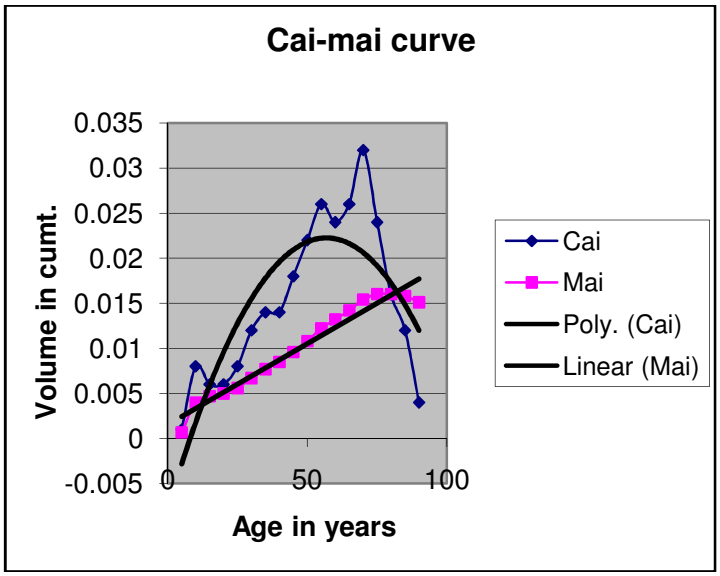
B. Age- Volume Curve

Age	Volume	Age	Volume
5	0.018	50	0.54
10	0.04	55	0.67
15	0.07	60	0.79
20	0.1	65	0.92
25	0.14	70	1.08
30	0.2	75	1.2
35	0.27	80	1.28
40	0.34	85	1.34
45	0.43	90	1.36



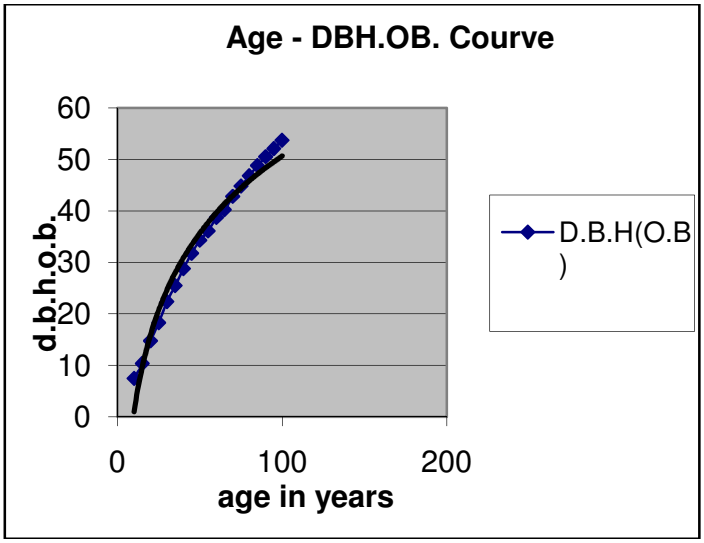
C. CAI – MAI Chart.

Age	Cai	Mai	Age	Cai	Mai
5	0.001	0.0007	50	0.022	0.0108
10	0.008	0.004	55	0.026	0.0122
15	0.006	0.0047	60	0.024	0.0132
20	0.006	0.005	65	0.026	0.0142
25	0.008	0.0056	70	0.032	0.0154
30	0.012	0.0067	75	0.024	0.016
35	0.014	0.0077	80	0.016	0.016
40	0.014	0.0085	85	0.012	0.0158
45	0.018	0.0096	90	0.004	0.0151



D. Age Diameter Curve.

Age	D.B.H(O.B)	Age	D.B.H(O.B)
5	3.2	55	36.1
10	7.5	60	38.7
15	10.4	65	40.2
20	14.8	70	42.8
25	18.3	75	44.8
30	22.4	80	46.8
35	25.5	85	48.8
40	28.8	90	50.5
45	31.8	95	52.1
50	34.3	100	53.7



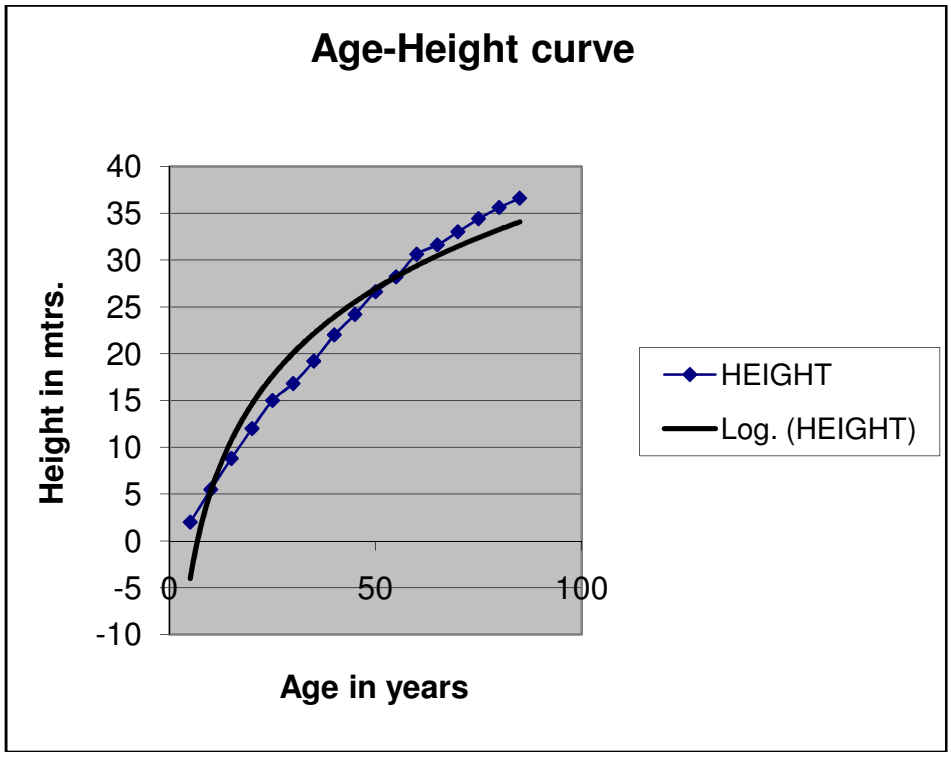
E. Statement Showing the diameter increament & volume increment.

Sr.No.	Age in yrs.	Ht. In mtrs.	Dbh.ob. (cms)	Volume (cumt)	Cai (cumt)	Mai (cumt)	Diam. Incr.	Volume Incr.
1	5	2.7	3.2	0.018	0.001	0.0007	0	0
2	10	5.7	7.5	0.04	0.008	0.004	16.07477	15.1724138
3	15	8.2	10.4	0.07	0.006	0.0047	6.480447	10.9090909
4	20	10.2	14.8	0.1	0.006	0.005	6.984127	7.05882353
5	25	13	18.3	0.14	0.008	0.0056	4.229607	6.66666667
6	30	15.5	22.4	0.2	0.012	0.0067	4.029484	7.05882353
7	35	18.6	25.5	0.27	0.014	0.0077	2.588727	5.95744681
8	40	21.2	28.8	0.34	0.014	0.0085	2.430939	4.59016393
9	45	23.4	31.8	0.43	0.018	0.0096	1.980198	4.67532468
10	50	25	34.3	0.54	0.022	0.0108	1.512859	4.53608247
11	55	27.6	36.1	0.67	0.026	0.0122	1.022727	4.29752066
12	60	29.1	38.7	0.79	0.024	0.0132	1.390374	3.28767123
13	65	30.8	40.2	0.92	0.026	0.0142	0.760456	3.04093567
14	70	32.3	42.8	1.08	0.032	0.0154	1.253012	3.2
15	75	33.4	44.8	1.2	0.024	0.016	0.913242	2.10526316
16	80	34.5	46.8	1.28	0.016	0.016	0.873362	1.29032258
17	85	36	48.8	1.34	0.012	0.0158	0.83682	0.91603053

6.1.6 GROWTH OF KHAIR :- Analysis of Growth of Khair (Stem Analysis) have been carried out in Nagpur Forest Division and the related data regarding Age-Height, Age-Volume, Age-Diameter, CAI-MAI and diameter increment & volume increment have been calculated and results of stem analysis are reproduced below.

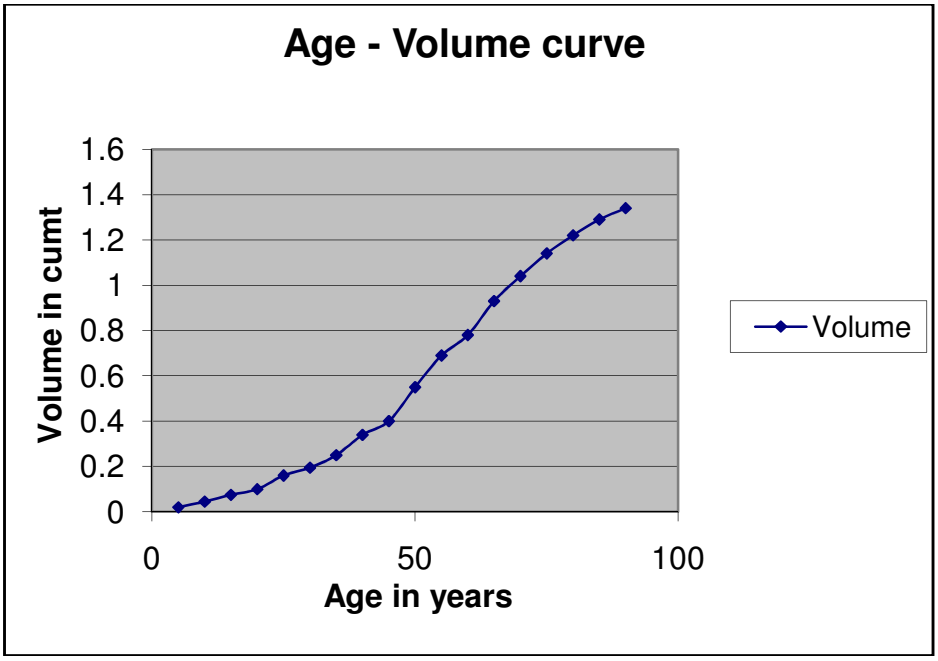
A. Age Height Curve.

AGE	HEIGHT	AGE	HEIGHT
5	2	55	28.2
10	5.5	60	30.6
15	8.8	65	31.6
20	12	70	33
25	15	75	34.4
30	16.8	80	35.6
35	19.2	85	36.6
40	22	90	37.4
45	24.2	95	38.2
50	26.6	100	39.1



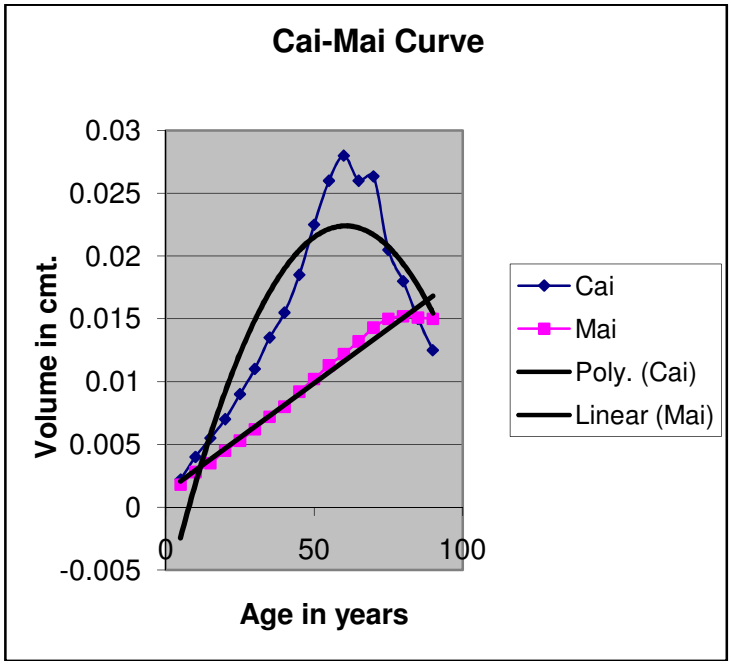
B. Age Volume Curve

Age	Volume	Age	Volume
5	0.02	50	0.55
10	0.045	55	0.69
15	0.075	60	0.78
20	0.1	65	0.93
25	0.16	70	1.04
30	0.195	75	1.14
35	0.25	80	1.22
40	0.34	85	1.29
45	0.4	90	1.34



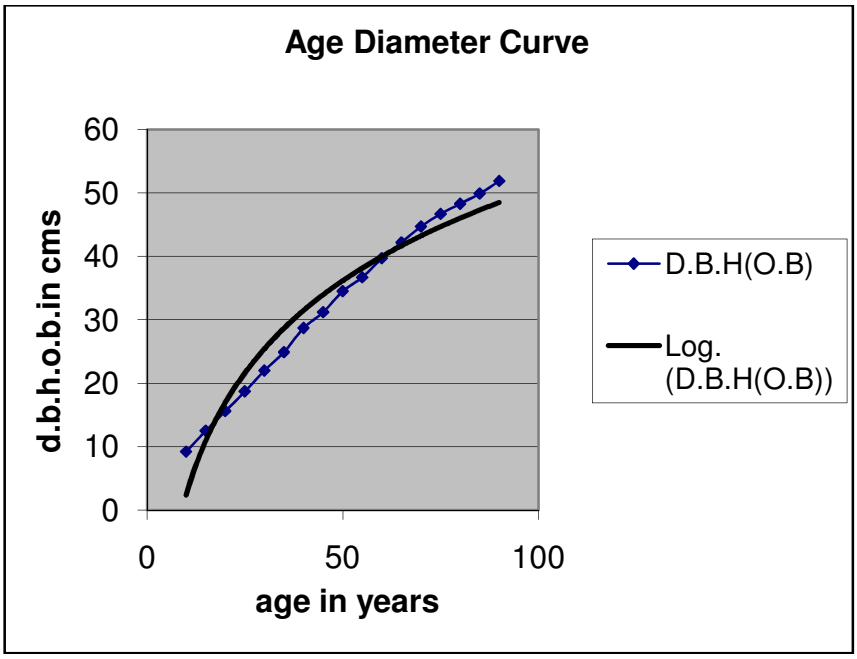
C. CAI - MAI Curve

Age	Cai	Mai	Age	Cai	Mai
5	0.0022	0.0018	50	0.0225	0.0102
10	0.004	0.0028	55	0.026	0.0113
15	0.0055	0.0035	60	0.028	0.0122
20	0.007	0.0045	65	0.026	0.0132
25	0.009	0.0053	70	0.02635	0.0143
30	0.011	0.0062	75	0.0205	0.015
35	0.0135	0.0072	80	0.018	0.0152
40	0.0155	0.008	85	0.015	0.0151
45	0.0185	0.0092	90	0.0125	0.015



D. Age Diameter Curve.

Age	D.B.H(O.B)	Age	D.B.H(O.B)
5	3.8	55	36.7
10	9.2	60	39.7
15	12.5	65	42.2
20	15.6	70	44.7
25	18.7	75	46.7
30	22	80	48.3
35	24.9	85	49.9
40	28.7	90	51.9
45	31.2	95	53.7
50	34.5	100	55.5



E. Statement Showing the diameter increament & volume increment.

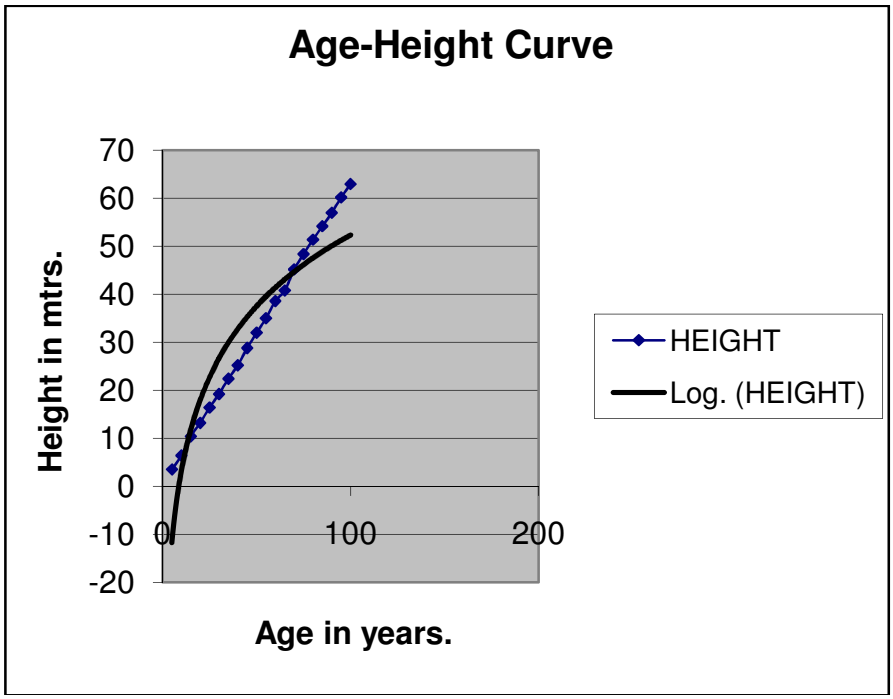
Age in yrs.	Ht. In mtrs.	Dbh.ob. (cms)	Volume (cumt)	Cai (cumt)	Mai (cumt)	Diam. Incr.	Volume Incr.
5	2	3.8	0.02	0.0022	0.0018	0	0
10	5.5	9.2	0.045	0.004	0.0028	16.61538	15.38462
15	8.8	12.5	0.075	0.0055	0.0035	6.082949	10
20	12	15.6	0.1	0.007	0.0045	4.412811	5.714286
25	15	18.7	0.16	0.009	0.0053	3.61516	9.230769
30	16.8	22	0.195	0.011	0.0062	3.243243	3.943662
35	19.2	24.9	0.25	0.0135	0.0072	2.473348	4.94382
40	22	28.7	0.34	0.0155	0.008	2.835821	6.101695
45	24.2	31.2	0.4	0.0185	0.0092	1.669449	3.243243
50	26.6	34.5	0.55	0.0225	0.0102	2.009132	6.315789
55	28.2	36.7	0.69	0.026	0.0113	1.235955	4.516129
60	30.6	39.7	0.78	0.028	0.0122	1.570681	2.44898
65	31.6	42.2	0.93	0.026	0.0132	1.221001	3.508772
70	33	44.7	1.04	0.02635	0.0143	1.150748	2.233503
75	34.4	46.7	1.14	0.0205	0.015	0.875274	1.834862
80	35.6	48.3	1.22	0.018	0.0152	0.673684	1.355932

85	36.6	49.9	1.29	0.015	0.0151	0.651731	1.115538

6.1.7 GROWTH OF DHAWDA :- Analysis of Growth of Dhawda (Stem Analysis) have been carried out in Nagpur Forest Division and the related data regarding Age-Height, Age-Volume, Age-Diameter, CAI-MAI and diameter increment & volume increment have been calculated and results of stem analysis are reproduced below.

A. Age Height Curve.

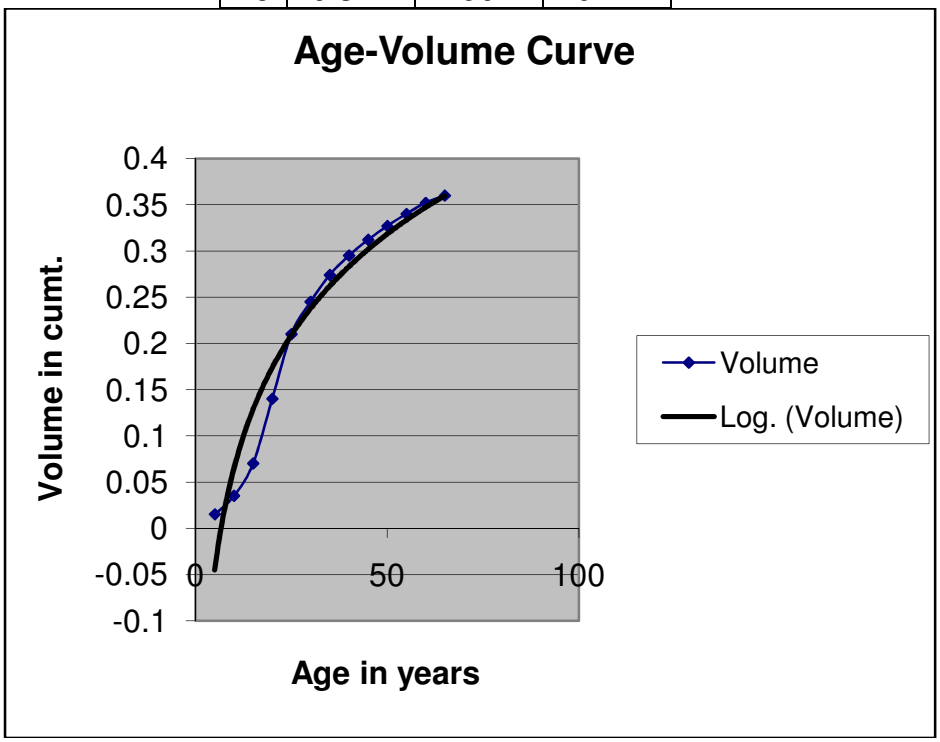
AGE	HEIGHT	AGE	HEIGHT
5	3.5	55	35
10	6.4	60	38.6
15	10.4	65	40.8
20	13.2	70	45.2
25	16.4	75	48.4
30	19.2	80	51.4
35	22.4	85	54.2
40	25.2	90	57
45	28.8	95	60.2
50	32	100	63



B. Age Volume Curve.

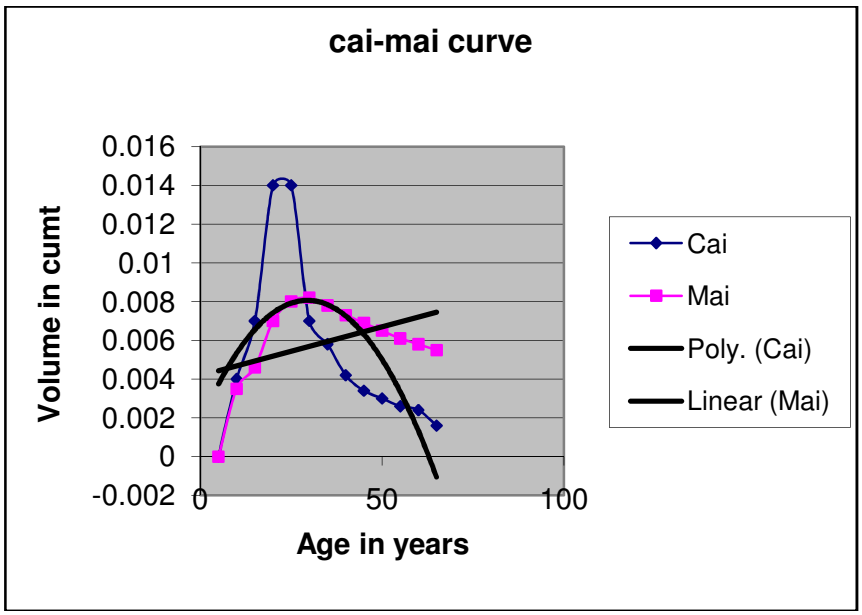
Age	Volume	Age	Volume
5	0.015	50	0.327
10	0.035	55	0.34
15	0.07	60	0.352
20	0.14	65	0.36
25	0.21	70	0.37
30	0.245	75	0.38
35	0.274	80	0.388
40	0.295	85	0.397

45	0.312	90	0.41



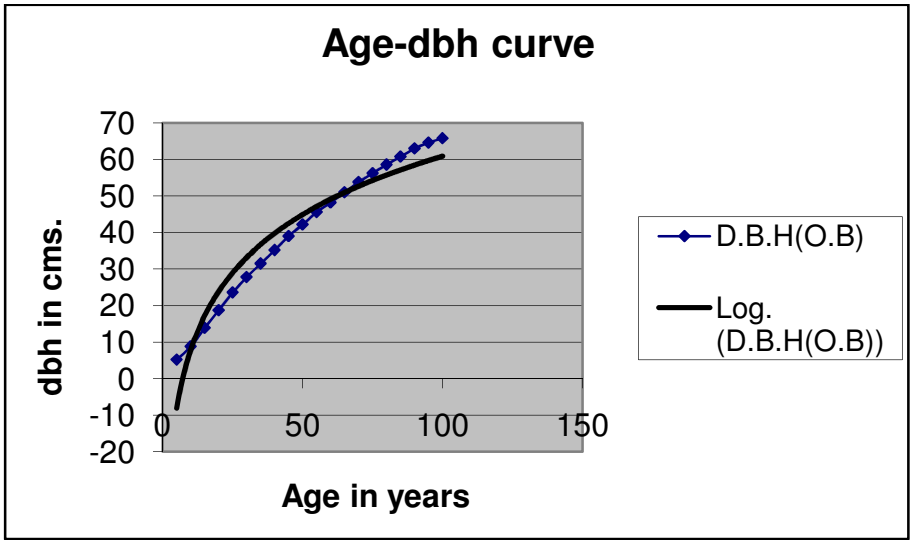
C. CAI - MAI Curve

Age	Cai	Mai	Age	Cai	Mai
5	0	0	40	0.0042	0.0073
10	0.004	0.0035	45	0.0034	0.0069
15	0.007	0.0046	50	0.003	0.0065
20	0.014	0.007	55	0.0026	0.0061
25	0.014	0.008	60	0.0024	0.0058
30	0.007	0.0082	65	0.0016	0.0055
35	0.0058	0.0078			



D. Age Diameter Curve.

AGE	D.B.H(O.B)	AGE	D.B.H(O.B)
5	5.2	55	45.6
10	8.8	60	48.2
15	13.9	65	51
20	18.7	70	53.8
25	23.6	75	56.2
30	27.8	80	58.6
35	31.5	85	60.8
40	35.2	90	63
45	39	95	64.6
50	42.2	100	65.8



E. Statement Showing the diameter increament & volume increment.

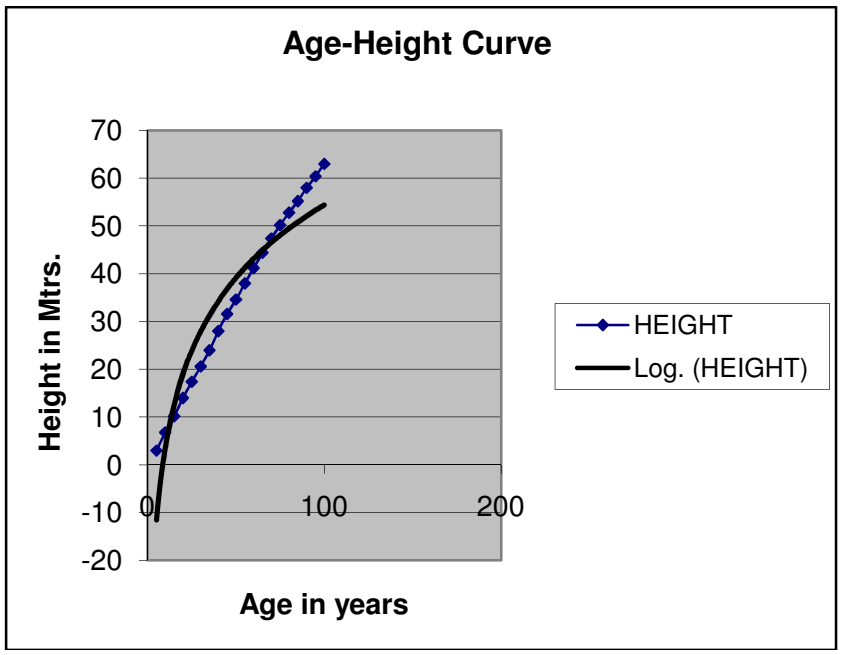
Age in yrs.	Ht. In mtrs.	Dbh.ob. (cms)	Volume (cumt)	Cai (cumt)	Ma i(cumt)	Diam. Incr.	Volume Incr.
5	3.5	5.2	0.015	0	0	0	0
10	6.4	8.8	0.035	0.004	0.0035	10.28571	16
15	10.4	13.9	0.07	0.007	0.0046	8.986784	13.33333
20	13.2	18.7	0.14	0.014	0.007	5.889571	13.33333
25	16.4	23.6	0.21	0.014	0.008	4.63357	8
30	19.2	27.8	0.245	0.007	0.0082	3.268482	3.076923
35	22.4	31.5	0.274	0.0058	0.0078	2.495784	2.235067
40	25.2	35.2	0.295	0.0042	0.0073	2.218891	1.476274
45	28.8	39	0.312	0.0034	0.0069	2.048518	1.120264
50	32	42.2	0.327	0.003	0.0065	1.576355	0.938967
55	35	45.6	0.34	0.0026	0.0061	1.548975	0.77961
60	38.6	48.2	0.352	0.0024	0.0058	1.108742	0.693642
65	40.8	51	0.36	0.0016	0.0055	1.129032	0.449438
70	45.2	53.8	0.37	0	0	1.068702	0.547945
75	48.4	56.2	0.38	0	0	0.872727	0.533333

80	51.4	58.6	0.388	0	0	0.836237	0.416667
85	54.2	60.8	0.397	0	0	0.737018	0.458599

6.1.8 GROWTH OF TENDU :- Analysis of Growth of Tendu (Stem Analysis) have been carried out in Nagpur Forest Division and the related data regarding Age-Height, Age-Volume, Age-Diameter, CAI-MAI and diameter increment & volume increment have been calculated and results of stem analysis are reproduced below.

A. Age Height Curve.

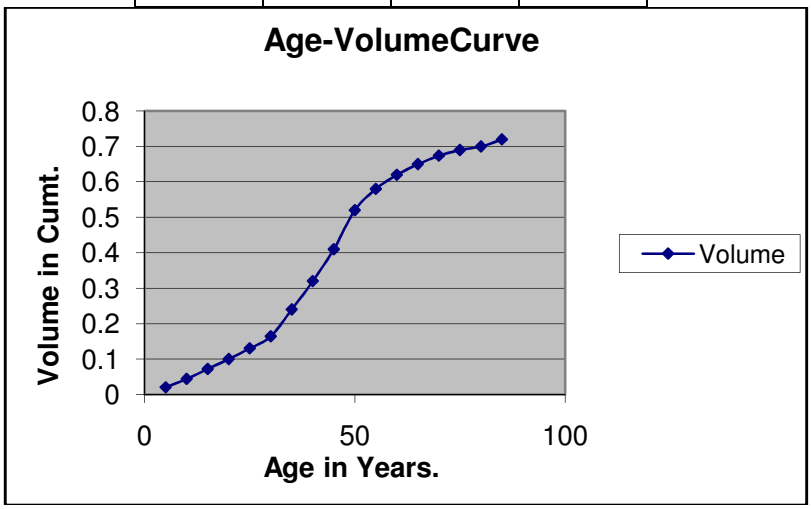
AGE	HEIGHT	AGE	HEIGHT
5	3	55	38
10	6.8	60	41.2
15	10.2	65	44.4
20	14	70	47.4
25	17.4	75	50.2
30	20.6	80	52.8
35	24	85	55.2
40	28	90	58
45	31.6	95	60.4
50	34.6	100	63



B. Age Volume Curve

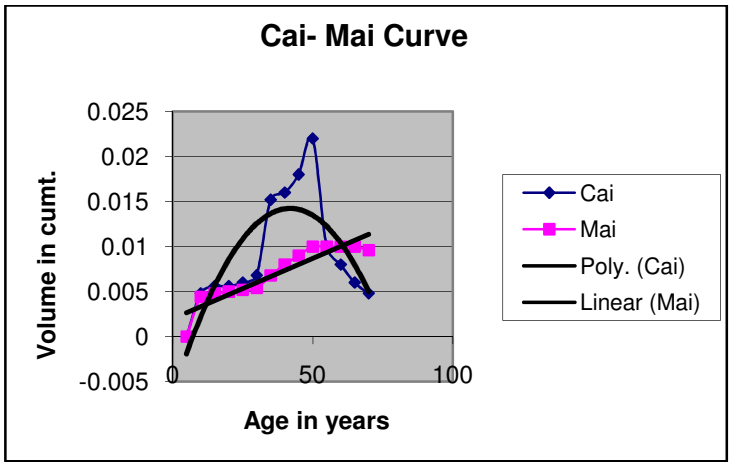
Age	Volume	Age	Volume
5	0.02	45	0.41
10	0.044	50	0.52
15	0.072	55	0.58
20	0.1	60	0.62
25	0.13	65	0.65
30	0.164	70	0.674

35	0.24	75	0.69
40	0.32	80	0.7



B. CAI – MAI Curve

Age	Cai	Mai	Age	Cai	Mai
5	0	0	40	0.016	0.008
10	0.0048	0.0044	45	0.018	0.009
15	0.0056	0.0048	50	0.022	0.01
20	0.0056	0.005	55	0.01	0.01
25	0.006	0.0052	60	0.008	0.01
30	0.0068	0.0054	65	0.006	0.01
35	0.0152	0.0068	70	0.0048	0.0096



D. Age Diameter Curve.

Age	D.B.H(O.B)	Age	D.B.H(O.B)
5	4.5	55	38.5
10	7.9	60	41.1
15	11.8	65	43.5
20	16.4	70	45.1
25	20.8	75	46.5
30	25.1	80	47.5
35	28.7	85	48.7
40	31.1	90	49

45	34.1	95	50.7
50	36.1	100	51.5

E. Statement Showing the diameter increament & volume increment.

Age in yrs.	Ht. In mtrs.	Dbh.ob. (cms)	Volume (cumt)	Cai (cumt)	Mai(cumt)	Diam Incr.	Volume Incr.
5	3	4.5	0.02	0	0	0	0
10	6.8	7.9	0.044	0.0048	0.0044	10.96774	15
15	10.2	11.8	0.072	0.0056	0.0048	7.918782	9.655172
20	14	16.4	0.1	0.0056	0.005	6.524823	6.511628
25	17.4	20.8	0.13	0.006	0.0052	4.731183	5.217391
30	20.6	25.1	0.164	0.0068	0.0054	3.747277	4.62585
35	24	28.7	0.24	0.0152	0.0068	2.67658	7.524752
40	28	31.1	0.32	0.016	0.008	1.605351	5.714286
45	31.6	34.1	0.41	0.018	0.009	1.840491	4.931507
50	34.6	36.1	0.52	0.022	0.01	1.139601	4.731183
55	38	38.5	0.58	0.01	0.01	1.286863	2.181818
60	41.2	41.1	0.62	0.008	0.01	1.306533	1.333333
65	44.4	43.5	0.65	0.006	0.01	1.134752	0.944882
70	47.4	45.1	0.674	0.0048	0.0096	0.722348	0.725076
75	50.2	46.5	0.69	0	0	0.611354	0.469208
80	52.8	47.5	0.7	0	0	0.425532	0.28777
85	55.2	48.7	0.72	0	0	0.49896	0.56338

SECTION – 2 ESTIMATION OF GROWING STOCK

6.2.1. (I) GENERAL VOLUME TABLE :- Forest Survey of India has conducted the Forest Resources Survey of Ballarshah catchment areas during 1971-75. During this survey data for felled tree volume of teak and miscellaneous species was calculated 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 equation was derived for them.

The following types of regression equations were tried :

i) $V = a + b\ D^2\ H$

ii) $V/D^2H = a + b/D^2H$

iii) $V = a + b\ D^2\ H + c\ (D^2H)^2$

iv) $\text{Loge}\ V = a + b\ \text{Loge}\ D + c\ \text{Loge}H$

v) $V/D^2 = a + b/D^2 + cH^2$

Where V = Volume (in cum under bark) upto 5 cm top over bark diameter.
D = Diameter (in m) at breast height (1.37 m from ground)
H = Height in metres.

6.2.2. Since the tract dealt with comes within the Brahampuri catchment of the above study, the general volume and 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 equation and meaningful interpretation of the equation for different species :

TABLE – XII

S.N.	Species	General Volume Equations
1	Tectona grandis(37)	$V/D^2H = 0.30446 - 0.0023/D^2H$ for $D^2H < 1.5$
2	Terminalia alata(41)	$V = 0.08758 + 0.24432\ D^2H$ for $D^2H > 1.5$ $V = 0.00012 + 0.20302\ D^2H$
3	Pterocarpus marsupium(42)	$V = 0.03611 + 0.33714\ D^2H$
4	Diospyros melanoxylon(34)	$V/D^2H = 0.38217 - 0.00856/D^2H$
5	Anogiessus latifolia (30)	$V = 0.00931 + 0.38507/D^2H$
6	Phyllanthus emblica (23)	$V = 0.0124 + 0.34322\ D^2H$
7	Lagerstroemia parviflora(26)	$V/D^2H = 0.35949 - 0.00088/D^2H$
8	Boswellia serrata (36)	$V/D^2H = 0.36068 - 0.00761/D^2H$
9	Lannea Coromandelica(33)	$V = 0.35751\ D^2H$
10	Madhuca latifolia (43)	$V/D^2H = 0.36089 - 0.00951/D^2H$
11	Buchanania lanzan	$V = 0.01475 + 0.29820\ D^2H$

12	Cleistanthus collinus	$V = - 0.00185 + 0.32352\ D^2H$
13	Rest of species (111)	$V/ D^2H = 0.33352 + 0.00042/ D^2H$

6.2.4. Figures in brackets after the name of species denote the number of trees on which the equations are based.

6.2.5. On the basis of the above equations the general volume tables prepared for all above mentioned species are given in **Appendix No. XV.**

6.2.6. **(II) LOCAL VOLUME TABLE :-** 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:-

$V = a + bD^2$

$V = a + b\ D + c\ D^2$

$V = a + b\ D + c\ D^2 + d\ D^3$

$\sqrt{V} = a + b\ D$

$V/D = a + b/D + cD$

$V/D = a + b/D + c\ D + d\ D^2$

$V/ D^2 = a + b/ D^2$ $\qquad$ $V/ D^2 = a+b/ D^2+c/D$

$V/ D^2 = a+b/ D^2+c/D + dD$ $\qquad$ $\text{Loge } V = a + b \text{ loge } D$

6.2.7. The following local volume equations were selected for different species taking into consideration the same criteria as for general volume equations :-

TABLE – XIII

S.N.	Species	Local Volume Equations
1	Tectona grandis(30)	$\sqrt{V} = - 0.106720 + 2.562418\ D$
2	Terminalia alata(266)	$V/D = - 0.397340+0.011283/D + 4.704700D +2.369640\ D^2$
3	Pterocarpus marsupium(59)	$V = 0.107059 – 1.010240D + 7.685670\ D^2$
4	Diospyros melanoxylon(140)	$V/D = - 0.975148 + 0.033867/D + 8.255412D$
5	Anogiessus latifolia (112)	$V/D = - 0.36762 - 0.006854/D +4.5577D +5.25567D^2$
6	Phyllanthus emblica (49)	$V/ D^2 = 5.000428-0.013485/ D^2$
7	Lagerstroemia parviflora(39)	$\sqrt{V} = - 0.130340 + 2.824203\ D$
8	Boswellia serrata (38)	$V/D = - 2.641645 + 0.153684/D+ 15.056400D – 6.2061\ D^2$
9	Lannea Coromandelica(44)	$\sqrt{V} = - 0.138286 + 2.729368D$
10	Madhuca latifolia (78)	$V= 0.074069 –1.23002D+7.726902D^2$
11	Buchanania lanzan (67)	$V = - 0.00767+0.2654D+1.0385\ D^2 + 7.527\ D^3$
12	Cleistanthus collinus (320)	$V = - 0.019404+3.80207\ D^2$

13	Rest of species (402)	V/D = - 0.610255 + 0.020853/D +6.10823D +0.637781 D^2

Where V = volume in cum. D = DBH in metre.

6.2.8. Figures in brackets after the names of species denote the number of observations on which the equations for the species are based.

6.2.9. The local volume tables for above mentioned species with the help of above regression equations were prepared during the preparation Gadchiroli Forest Division's plan which are given in **Appendix No. XIV.**

6.2.10. (III) TREE ENUMERATION :- Under the guidance of the Chief Forest Statician, the part tree enumeration was carried out by the unit of Forest Resource Survey, working under the control of the Dy.Conservator of Forests, Working Plan Division No.2,Chandrapur during 1996 - 97.And remaining part of tree enumeration was carried out by Dy.Conservator of Forests,Working Plan Division No.1,Chandrapur with the help of field staff supplied by Dy.Conservator of Forests Bramhapuri Forest Division during the year 2001-02 & 2002-03. The object of the survey was to assess the local growing stock of all species. All the species were enumerated separately in 15 cm. girth classes down to 15 cm gbh.

6.2.11. SAMPLING PLAN :- The felling series was taken as unit and the strip sampling method was followed for enumeration. The intensity of sampling the Reserve Forest as well as P.F. was 1 % of the growing stock in the area.

6.2.12. (IV) EXISTING GROWING STOCK (CUBICAL CONTENTS) :-Working circle wise and Range wise growing stock per ha has been calculated which is given in **Appendix No. LVII.**

SECTION 3 :- YIELD

6.3.1. COMMERCIAL VOLUME TABLE :- Commercial volume table which is in practice in Central Chanda Forest Division prepared by collecting data from the worked coupes and given in the working plan of Rajura, is reproduced below :

TABLE – XIV

Girth class In cm	Timber in cum	Firewood (Solid volume)	Total volume in cum
15 - 30	0.014	--	0.014
30 – 45	0.028	--	0.028
45 – 60	0.070	--	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 & above	0.570	0.430	1.000

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CHAPTER - VII

WILDLIFE PRESERVATION

SECTION – 1 :- DISTRIBUTION OF WILDLIFE

7.1.1. The wildlife in the tract dealt with is seriously depleted due to the indiscriminately shooting during the jamindari regime. Hunting by local tribals also contributed in the decline of wildlife even in the interior hilly areas having good forests. Apart from indiscriminate shooting, poaching and hunting, the population explosion and economic developments have led to the severe degradation of natural habitat of wildlife. The food, water and shelter, the basic needs of the wild animals have become scarce in plain, accessible areas. The division is rich in wild life. This is also facilitated due to corridor adjoining Andhari Wild Life Sanctuary and Tadoba National Park. The common wildlife found in the tract is as under.

CARNIVORA :-

7.1.2. (i) Tiger (Panthera tigris) :- Commonly known as Patta Wagh or Wagh, this animal is found in dense plain forests and sheltered valleys in hilly areas. In the summer this animal is mostly confined to wooded banks of big rivers and areas in vicinity of stagnant pools in bigger streams. The number of this animal in the recent past has been fast dwindling. The census of wild animal including tiger was carried out in the month of May, 2001,the figures of which is given in the **Appendix No. XXV.**

7.1.3. (ii) Panther (Panthera pardus) :- It is commonly known as Bibat. It is more common than tiger because it is able to live and thrive almost anywhere. Like tiger it is not restricted to forest or heavy cover and thrives as well in open country as among rocks and scrub. In spite of its ability to thrive in varying conditions of living, its number has declined in the recent past. The census of wild animal including panther was carried out in the month of May, 2001,the figures of which is given in the **Appendix No. XXV.**

7.1.4. The census figures of various wild animals carried out in the month of May,2001 has been given in the **Appendix No. XXV.**

7.1.5. **HERBIVORA :-** The herbivorous animals that are found in these forests are; Sambar (Corvus unicolor), Cheetal (Axix axis), Nilgai (Boselaphus tragocamelus), Wild boar (Sus cristatus), Sloth bear (Melursus ursinus), Barking deer (Muntiacus muntjak), Langur (Prebytis entellus).

7.1.6. **RODENTS :-** The smaller animals that are common in tract; Jungle stripped squirrel (Funambulus sublineatus);Thee stripped palm squirrel (Funambulus pennanti), Porcupine (Hystrix indica), Hare (Lepus ruficaudatus).

7.1.7. **AVIFAUNA :-** The commonly seen birds are Pea fowls (Pavo cristatus), Jungle fowls (Gallus sonnerataii), Quails (Coturnix coromandelicue), Patridges (Francolinus pondicerianus), Crane (Grus

antigone), Ducks (Casarca rutila), Snipes (Capella galaliangs), Green pigeon, Crows, Tites, Babblers, Bulbuls, Robins, Fly catchers, Shrikes, Drongos, Warbles, Myna, Weaver birds, Munias, Buntings, Wagtails, Wood packers, Cuckoos, Parakeets, Bee-eaters, King fishers, owls, Vultures, Doves, Egrets etc.

SECTION – 2 GENERAL HISTORY OF WILDLIFE

7.2.1. In the past, due to inaccessibility wildlife habitat was favourable and wild animals and birds enjoyed natural protection.

7.2.2. Before some forests were reserved in 1889 and 1895, the local population indulged in unrestricted hunting over extensive areas. After reservation attempts were made to regulate shooting in these old Reserved Forests. Special permits were issued from time to time for shooting of carnivora. The forests were divided into regular shooting blocks. During Kartar Singh's plan – some areas of the tract dealt with were in South Sindewahi and North Sindewahi shooting areas. These areas cover Sindewahi and Aikari blocks in North Sindewahi and Rajoli and Asola Blocks in South Sindewahi Range. In Chimur Range some of the areas were divided into Kasarbodi and Khadsangi Block in the category I and the area from Nagbhid Range were divided into Ghodezari and Brahmapuri Block in category III. Out of three categories viz; I – Permanently closed, II – provisionally closed and III – open to hunting, these blocks of the tract dealt with find place under "open to hunting" category during Kartar Singh's plan. With the number of animals to be shot in each block, destruction of animals was controlled and hunting was permitted in the areas having abundant wildlife, while the deficient areas were closed for hunting.

7.2.3. In the Expropriator forests, before vesting of them to the State Government, no game rules were in force and these forests were the common hunting grounds for the Jamindars/Malgujaars and their guests. Killing of animals for the pot by the local population was also very common. After declaration of these forests as Protected Forests, hunting and shooting of wild animals in these forests was also regulated by fixing shooting blocks and issuing licenses. In the Jamindari regime the local population undoubtedly hunted extensively in these forests. Even after abolition of Proprietary Rights and vesting of these forests to the State Government, poaching was very common in the accessible portion and along the roads in these areas. The more inaccessible interior hilly portions were comparatively free of poaching at that time. Compare to the amount of poaching which went on, the cases actually brought to the book were negligible. The villagers as well as the untrained subordinates could not appreciate the principals of wildlife preservation.

7.2.4. Of late human population explosion, acute land hunger, improved road network, better means of transport and higher range weapons have proved to be a considerable threat to the no exception. Commercial trade in wildlife products and poaching are no exception.

There was no specific management as such for the conservation and development of wildlife except sport. The wildlife management including the working plan. All these factors have adversely affected the number of animals as well as their habitat

SECTION – 3 :- LEGAL POSITION

7.3.1. The provisions under Berar Forest Law, 1886, amended in 1891 and the Indian Forest Act, 1878 (made applicable w.e.f. 13th October, 1911) were applicable in old R.F. in the initial stage. These provisions were of extremely primitive in nature as the importance of Wildlife Conservation was not realized then. There was no concept of biodiversity. Later on, 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 – VIII of M.P. Forest Mannual, Vol.-II, combined with the Wild Birds and Animals Protection Act, 1912 and there after by the C.P. and Berar Game Act of 1935. This Act of 1935 Promulgated with a view to conserve game, gave some powers to forests, Police and Revenue Officials to deal with offences. Later on, shooting block systems was started. Under this systems, the Conservator of Forests in Consultation with the Divisional Forest Officer declared certain blocks of Reserved Forests with abundant game as open for shooting. The Divisional Forest Officer used to issue permits for shooting. Hunting was permitted in the areas having abundant wildlife, while the deficient areas were closed to hunting. Subsequently, a sliding of scale of animals to be shot annually in each block was introduced.

7.3.2. Shooting permit granted specified the kind and number of animals to be shot. After hunting of permissible limit of game animals, particular shooting block was given rest by keeping it closed to hunting for one to three years. Initially, individual permit had restrictions of number and size of meat animals like deer and antelopes to be hunted. However, permission for unrestricted hunting of carnivores resulted into indiscriminate hunting. Crop protection guns issued after 1936 increased illicit shooting in the vicinity of villages. Indian Forest Act, 1927 and Shooting Rules framed there under offered no protection to the wildlife outside Reserved or Protected Forests areas.

7.3.3. In case of Ex-proprietary Forests, before their vesting in State Government, no game rules were enforced.

7.3.4. Under the provision of the “Abolition of Proprietary Rights (Estate, Mahals, Alienated Lands) Act, 1950 (1 of 1951) the jamindaries were vested in State Government and in order to regulate shooting in the village forests, the Government framed rules vide Ex Madhya Pradesh Government and Reforms Department’s Memo No. 1780 2319-XXVIII, dated 18th August, 1953.

7.3.5. These forests were declared as "Protected Forests" under Section 29 of the Indian Forest Act of 1927 (XVI of 1927). The management of wildlife was therefore, regulated under rules framed under Section 32(j) and 76(d) of the Indian Forest Act of 1927 (XVI of 1927) together with the then prevalent rules under C.P. and Berar Games Act, 1935 and Game Block Rules as specified in M.P. Forest Mannual, Vol. II.

7.3.6. After reorganization of states in 1956, the Bombay Wild Animals and Wild Birds Protection Act, 1951 for the protection of wildlife was extended to Vidarbha Region with effect from 1/6/1961. The lacuna of I.F.Act, 1927 of not affording protection to the wildlife outside the Reserved and Protected Forests areas was removed after enactment of this Act of 1951. Though this act did not propose a significant change in the management of game in reserved and Protected Forests, it was important as it operated in areas outside Reserved and Protected Forests also. Under the provisions of this Act arms license holders for sports were required to register themselves with the Wildlife Preservation Officer. This Act prescribed a closed season for hunting and classified game 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 products. The statutory wildlife Advisory Board was constituted under this Act, to advice the Government on various important matters concerning wildlife.

7.3.7. 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 Part and Wildlife Sanctuaries. A comprehensive and unified National and State Park Act, 1971 was passed which provided for appointment of an "Advisory Committee" to advice in constitution and declaration of National Park and Sanctuaries and Formulation of administrative policy. The parliament then enacted the wildlife (Protection), Act, 1972, which came into force in Maharashtra State w.e.f. 1st June, 1973 vide Government of India, Ministry of Agriculture (Department of Agriculture) Notification No. GSR/F-11014/3/72-FRY/WLP, dt. 1st June, 1973. On the commencement of this Act, any 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 :--

(i) The Wildlife (Stock Declaration) Rules, 1973 (became effective in Maharashtra w.e.f. 1st June, 1973).

(ii) The Wildlife (Transaction and Taxidermy) Rules,1973, (become effective in Maharashtra w.e.f.1st June, 1973).

(iii) Wildlife (Protection) Rules, 1975 (became effective w.e.f. 6th March, 1975.

(iv) The Wildlife (Protection) Licensing (Additional Matter for consideration) Rules, 1983 (became effective w.e.f. 13th April, 1983).

(v) The Wildlife Protection Act was amended to be called as Wildlife(Protection) Amendment Act, 1986 and it came into force w.e.f.25th November, 1986.

7.3.8. In 1991, the Central government has further amended the Wildlife (Protection) Act and has passed the wildlife (Protection) Amendment Act, 1991, which come into force w.e.f. 2nd October, 1991 except the Section 33 A, 44(ii) (c) 55(C) Chapter III A and Chapter IV A.

7.3.9. At present the incidence of wildlife as dwindled to a very serious extent due to biotic interference and reduction of natural habitat of wild fauna. Since the wild animals constitute a very important unit of nature's ecosystems, it is obligatory on the part of the administration to preserve the important constituent wild fauna.

7.3.10. The wildlife (Protection) Act, 1972 is a piece of comprehensive legislation which provides for effective protection and preservation of wildlife restriction on hunting and regulation of trade in wild animals articles made out of wild animals.

7.3.11. 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 if they are threat to or cause damage to life or property, and animals in schedule-II has become so disabled or diseased as beyond recovery.

7.3.12. Animals specified in schedule-II (Part-I), III & IV were prohibited from hunting, except under and in accordance with specific license 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.

7.3.13. Hunting of young and female of any wild animals 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 as well as trophies etc in their control, custody or possession.

7.3.14. The Government of India, vide letter dated September 18, 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.

7.3.15. Government of India, vide letter No. 1 E-11011/3/75/FRY-9-(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. The export will be regulated by the Ministry of Commerce.

7.3.16. 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 dated April 5, 1976.

7.3.17. 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.

7.3.18. The wildlife Protection Act was again amended to be called as Wildlife (Protection) Amendment Act, 1986 and it came into force from November 25, 1986. Under Section-44 of the Wildlife) Protection) Act, 1972, the Government vide letter No.WLP/1682/100208/CR-43 (1)/F-5 permitted the trapping of cobra and Russell vipers by a licensed 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 November 25, 1987. The Government of India vide letter no. F-No.1-2/91/WL/1,dated October 21, 1991, further amended the Wildlife (Protection) Act, 1972. The following are the important amendments.

(a) The plants have also been included under the purview of this Act.

(b) The zoo and circus have been defined and included under this Act.

(c) The game reserves have been dropped.

7.3.19. 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.

7.3.20. The following are the restrictions on hunting as per section 17 of Wildlife (P) Act, 1972. The following acts are prohibited, i.e.

I. Hunting any wild animal, from or by means of a wheeled or mechanically propelled vehicle on water or land or by aircraft.

II. Use of mechanically propelled vehicle for the purpose of driving or stampeding any wild animals.

III. Use of chemical, 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.

IV. Hunting of special game or big game other than with a rifle, unless specially authorised by the licence.

V. Setting fire to vegetation for the purpose of hunting.

VI. Using artificial light for the purpose, of hunting except when specially authorised to do so under a liecnece in the case of carnivore over a kill.

VII. Hunting during night, except when specially authorised.

VIII. Hunting any 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-goose.

IX. Hunting any wild animal on any land not owned by Government without the consent of the owner, or his agent or lawful occupies of such claim.

X. Hunting during closed period as per section 16.

XI. Hunting with the help of dogs, any wild animals, except water-bird, chakor, partridge or quail.

7.3.21. In 1991, the Government of India has passed the Wildlife (Protection) Amendment Act, 1991, which came into force with effect from October 2, 1991,except the Sections 35, 44, 55(c) , Chapter III A and Chapter IVA. The salient features of this amended Act in brief are as follows.

(i) The words “game reserves, big game and small game” have been omitted from the Act.

(ii) Hunting the wild animals specified in Schedule I, II, III and IV of the Act has been banned, except as per the provisions of sec.11.

(iii) A new chapter III-A has been introduced for the protection of specified plants. The specified plants have been included in a new schedule.

(iv) 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.

(v) A new section has been added in the Act to provide 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.

(vi) A ban has been imposed on dealing with the imported ivory and articles made there from.

(vii) A new chapter, IVA has been introduced to provide for central Zoo Authority and reorgnisation of zoos.

(viii) Commercial felling and exploitation of wildlife (Flora and Fauna) has been banned in Wildlife Sanctuaries just as it is in National Parks.

(ix) The penalties for wildlife offences have been enhanced substantially. Section 39 of the Act has been amended to the effect that vehicle, vessel, weapon, trap, or tool which have been used for committing an offence and have been seized shall become the property of the Government.

(x) Section 48 A has been introduced which provides for restriction on transportation of wildlife i.e. no person shall accept any wild animals (other than vermin) or any animal article, or any specified plant or part or derivative thereof, for transportation except after exercising due care to ascertain that permission from the Chief Wildlife Warden or any other officer authorized by the State Government in this behalf has been obtained for such transportation.

(xi) Trade in imported ivory and products carved from it has been banned with effect from 2nd April 1992. Thus will plug the loophole some dealers have been using to cover up acquisition of illegally obtained ivory of Asian elephants. Thus the trade in ivory and its carvings has been totally. Even their display in commercial establishments has been banned. However or some ivory traders continue to illegally sell and display ivory. Public vigilance is needed to apprehend them.

(xii) Section 55 of the Wildlife Protection Act has been amended and the power to investigate into the wildlife offences by the Police has been taken away unless specifically authorized by the Chief Wildlife Warden or by the State Government in this behalf and further Section 55 (C) has been added which says that " Any person who has given notice of not less than sixty days in the manner prescribed, of the alleged offence and of his intention to make a complaint, to the Central Government or the State Government or the Officer authorised as aforesaid.

(xiii) 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 – 4 :- RIGHTS AND CONCESSION

7.4.1. No rights and/or privileges are granted to any person over wildlife. But a member of scheduled tribe can, subject to the provision of Chapter IV, pick, collect or posses in the district he resides any specified plant or part or derivative thereof for his bona-fide personal use. However, permits can be granted by the Chief Wildlife Warden, with prior approval of the State Government, for the special purposes of education, scientific research and collection of specimens for recognized Zoos, Museums and similar Institutions.

SECTION – 5 :- INJURIES TO WHICH THE WILDLIFE IS LIABLE :

(A) HUMAN AGENCIES :-

7.5.1 (i) Poaching :- Poaching is a great menace in this area. The hunting habit of local population is deep rooted since Jamindari rigime. Even now poaching by tribals is common and compare to the amount of poaching which goes on the cases actually brought to book are negligible. Though the recorded instances are negligible, poaching of wild animal by local tribals mainly contributes for depletion of wild fauna in the tract. The local tribals generally kill the animal for the pot. Besides, poaching by locals, other than tribals and also outsiders is a great threat. Some part is adjacent to M.P.State and the interior areas remains inaccessible for some months. This situation favours the poaching. The illegal killing of wild animal and wild birds take place for its meat, skin antlers and other trophies. Poachers usually shoot animals on water holes at the time of sunset or dawn when the animals visit them for drinking water. Nets or traps are used for trapping birds, hares, antelopes and deers.

7.5.2. The following table shows the detail of poaching cases detected in Brahmapuri Division since 1990 - 1991 to 2001-2002.

TABLE

Year	Species of wild animals and their number								
	Tiger	Panther	Sambhar	Chital	Nilgai	Deer	Wild bore	Bhedki	Total
90-91	---	---	2	3	3	1	---	---	9
91-92	---	---	---	5	1	1	---	---	7
	Tiger	Panther	Sambhar	Chital	Nilgai	Deer	Wild bore	Bhedki	Total
92-93	---	---	---	4	1	1	1	2	9
93-94	---	---	1	2	---	---	1	---	4
94-95	---	1	---	3	1	2	---	---	7
95-96	5	---	---	---	1	3	---	---	9
96-97	---	2	---	1	3	---	---	---	6
97-98	---	2	1	8	5	2	1	1	20
98-99	---	1	1	4		1	1	1	9
99-00	---	---	---	---	2	---	---	---	2
00-01	---	---	---	---	---	---	---	---	---
01-02	---	---	---	1	---	---	3	---	4

7.5.3. (ii) Fire :- Forest fire are of very common occurrence these days. The most damaging in tendu season, when in many cases willful fire is caused by tendu leaf contractors with a popular belief that it results in profuse flush of tendu coppice shoots and leaves. Besides fire

for Mahuave flower collection and by negligence is also common. In general, the area is so badly effected by repeated fires that by the end of summer hardly any part is left intact without having very seriously suffered from fire. Reccuring fires deteriorates and destroys the natural habitat of wildlife. 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 for poacher's guns or local villager's weapons. These fire aggravate the already existing water scarcity and expose these animals to above mentioned risks. Besides, because of repeated fires, the shock to wild animals brings changes in their habit, ultimately affecting their life and future very adversely.

7.5.4. (iii) Encroachment and illicit cutting :- In the absence of boundary demarcation, in adequate protection of forest from increasing population, large scale encroachment and illicit cuttings in the vicinity of human settlements etc. have already deteriorated and destroy the considerable part of natural habitat of wildlife. The process is continuing. This leads to shrinkage in the natural habitat of wildlife and increase pressure on the remaining forests, ultimately affecting the wildlife very adversely.

(B) OTHER AGENCIES :-

7.5.5. (a) Diseases :- Due to contamination of the local cattle with herbivores, the diseases of the local cattle spread into wild animals and damage is done to them. The main disease caused due to such contamination is foot and mouth diseases and species of deer are most affected by them. The disease reduces the population of herbivore on a large scale. As a result of this the carnivore suffers and driven by hunger, many, in the absence of natural pray to cattle killing.

7.5.6. (b) Grazing :- There is steep rise in the cattle population. Further, due to mass encroachment and the desforestation, forest have been deteriorate and thus grazing pressure has been increase in multifolds, with extremely high incidence in plains and beyond capacity around habitation in hills. Apart from disturbance to wildlife, heavy grazing damages the natural habitat of wildlife directly and indirectly.

7.5.7. (c) Scarcity of water :- The rivers and nalas which contain perennial water in small stretches and were known for wild animals in the past have become dry and with this, the experiences acute water scarcity in summer, when water table recedes and most of the tanks and streams dry up. Then the wildlife has to depend on very few, limited sources like natural springs, small stagnated pools in some nallas and jhiras in the interiors areas. The number of these sources decreases in the latter part of summer. In summers almost all water sources in plain and most of the sources in interior areas are frequently used for drinking by cattle. Further, there hardly remains any water source undisturbed or unused by tendu labourers in tendu season. Besides, large number of

small temporaryjhiras are dug up by tendu labourers for their drinking water during this season. Due to such frequent, exhaustive uses of all most all water sources, the wildlife is affected very badly in this period till onset of monsoon. The frequent fire drives the wild animals away from the better interior areas toward the near by areas of human habitation, while the water scarcity compels them back to search and visit the water source in interior areas. This situation disturb the normal course of life and affects the wildlife very adversely.

SECTION – 6 :- MEASURES ADOPTED FOR PROTECTING WIDLIFE

7.6.1. Besides the legal provision under the Wildlife (Protection) Act, 1972 amended time to time and the various rules made there under, following measures are being adopted to protect the wildlife.

7.6.2. As per the provisions contained in Government Resolution's No. WLP/1570/224482-X-II, dated 30th September, 1971 and No. MSC-1071/113554/F-I, dated 25th March, 1977, and No. WLP/1579/6200/4/F-I, dated 29th May, 1979, compensation is paid to the owner whose cattle is killed by tiger in the forest area. Vide G.R.No.WLP/1576/116974/F-5, dated 22nd August, 1984, these provision were extended for the cattle killed by panther also and also killing by tiger or panther outside the forest area.

7.6.3. Provision has been made for payment for compensation in case of death or injury to human life by wild animals vide G.R. No. WLP/1002/CR-258/F-1, dated 17th January, 2003. As this per this G.R compensation in case of death or permanent disability of a person has been increased to Rs.200000/- and to Rs.100000/- in case of a minor (below 18 years of age). In case of serious injury the compensation is Rs. 50000/- and in case of minor injury it is Rs. 7500/- per injured person. The detail procedure and criteria of compensation has been given in this G.R.

7.6.4. In 1972, with a view to check illicit shooting of wild animals, the State Government sanctioned the grant of reward to the informants in respect of unlicensed shooting, provided that the information is found to be valid and leads to the conviction of the offender. In addition the State Government has decided to grant reward, equal to 50 % of the compensation actually recovered from the offender for illicit shooting, to the Gram panchyat or its office bearers or individuals, who rendered cooperation in detecting such illicit shooting.

7.6.5. With the coming into effect of Wildlife (Protection) Amendment Act, 1991, the protection of wildlife will become more effective.

7.6.6. Besides the above mentioned legal provision for protection of wildlife, public opinion and willing support for preservation of wildlife is being created through the Wildlife Weak, which is being celebrated from 1st to 7th October every year since 1951.

SECTION - 7 :- GENERAL MEASURES SUGGESTED FOR THE PROTECTION CONSERVATION AND DEVELOPMENT OF WILDLIFE.

7.7.1. The general measures suggested are as follows.

(i) The area should be strictly and effectively protected from fire.

(ii) To keep vigilant watch on poachers/villagers.

(iii) Water pools, which provide water to wild animals during summer, should be kept under constant watch.

(iv) Informers should be promptly rewarded

(v) Salt licks should be developed.

(vi) Shelter and hiding places should be developed at the required places.

(vii) Construction of bunds, anicuts, forest tanks etc. on nalas at suitable places should be carried out for providing permanent water holes to the wild animals.

SECTION – 8 :- ASSESSMENT OF PAST WORKING

7.8.1. Though wildlife management is part and partial of the forest management, nothing has been done in the division for the benefit of wildlife. The wildlife management has no consideration in the forest management including the working plans. The previous working plan did not make any specific prescriptions for the management of wildlife. Sri Kartar Singh's Plan prescribed only the need of poaching control and shooting by permit holder. Till the ban on shooting, issuing of shooting permit and regulation of shooting was misconceived and management of wildlife and hence nothing was done for its conservation and development, even when the wildlife was very much depleted. Regular census of various wild animals and birds is not being carried out except that of tiger and panther. All these factors coupled with mainly increased biotic interference have resulted in deterioration of wildlife habitat.

7.8.2. Due to biotic interference the natural habitat of wild fauna has deteriorated and almost disappeared around human settlements and it has been disturbed very seriously even in interior areas also where the population of wild fauna is approaching to disappearing stage very fast.

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CHAPTER – VIII

ESTIMATE OF CAPITAL VALUE OF FORESTS

SECTION – 1 :- TANGIBLE AND INTANGIBLE BENEFITS

8.1.1. IN TERMS OF TANGIBLE BENEFITS :- Since the market rates for timber and firewood and also the production and extraction cost is increasing every year an 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.

8.1.2. IN TERMS OF INTANGIBLE BENEFITS :- As the forests are depleting fast, the intangible benefits of the forests are getting more and more important day by day. During an unique research done in the Banaras University, it is found that a single tree of about fifty years age is worth :-

I.	Exhales oxygen worth	Rs.2.50 lacs
II.	Inhales CO_2 and thus purifies air worth	Rs.5.00 lacs
III.	Prevents soil erosion worth	Rs.2.50 lacs
IV.	Regulates water supply worth	Rs.3.00 lacs
V.	Provides shelter to wildlife worth	Rs.2.50 lacs
VI.	Causes synthesis of proteins worth	Rs.0.20 lacs
		Rs. 15.70 lacs

8.1.3. Thus from a middle aged tree we get intangible benefits worth about Rs. 15.70 lacs. It is also estimated that well stocked wood land on one hectare area absorb 3.70 tonnes of Carbon dio oxide from atmosphere and give about 2.5 tonnes of life sustaining oxygen.

8.1.4. As per the guidelines issued by the Government of India in the Ministry of Environment, Forest and Wildlife vide No. 11-6/85/FRY(Cons.),dt. 13th January, 1986 regarding cost benefit analysis for de-reservation of forest land under Forest Conservation Act, 1980, they have given a thumb rule as follows :--

One ha of fully stocked forest (Density = 1.00)

a. Avoids soil erosion,
b. Affects hydrological cycle,
c. Provides wildlife habitat,
d. Improves micro climate, and
e. Maintains ecological balance

Worth Rs.126.74 lacs to accrue over a period of 50 years. This shows the tremendous value of the forests.

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PART - II

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

CHAPTER - I

BASIS OF PROPOSALS

SECTION - 1 :- NATIONAL FOREST POLICY

1.1.1. National forest policies for India were enunciated in the years 1894, 1952 and 1988. The changes in the policy were brought out depending upon the prevalent national needs and public requirements, both local and general.

1.1.2. FOREST POLICY 1894 FOR INDIA :- The general forest policy was enunciated in the year 1894 by Government of India vide Resolution No. 22F,dated October 19, 1894. As per this policy the forests were to be administered solely for the public benefit, both local and general. The outstanding principles of the above policy were as under :-

(i) The preservation of climatic and physical conditions of the country was the foremost.

(ii) The preservation of the 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.

a) Cultivation to be given priority over forestry,

b) Satisfaction of the needs of the local people free or at non-competitive rates to be given priority over revenue and

c) 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 :- Since the enunciation of 1894 policy, considerable developments 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) 13-1-52, 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 in 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 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 State Govt. 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 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 Centre for the preservation and development of the Nation's forest resources which are so vital to its general well being.

1.1.6. NATIONAL FOREST POLICY OF 1988 :- Over the years, forests in the country suffered serious depletion because of relentless pressures arising from ever increasing demand for fuelwood, fodder and timber, inadequacy of protection measures, diversion of forest lands to non forestry purposes 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 utilisation, restoration and enhancement of the natural environment, was enunciated in December 1988.

1.1.7. The basic objectives governing the new 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 fuelwood, fodder, minor forest produce and small timber of the rural and tribal population.

(vi) Increasing the productivity of forests to meet essential National needs.

(vii) Encouraging efficient utilisation of forest produce and maximising substitution of wood.

(viii) Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests.

1.1.8. The forest policy further states that in the management of the existing forests and forest land 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 scheme and projects which interfere with forests that clothes steep slopes, catchment of rivers, lakes and reservoirs.

II. No working of forests without the Government having approved the management 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 tribals should be protected. Their domestic requirements of fuelwood, fodder, minor forest produce and construction timber should be the first charge.

VII. Forest management plans to take special care of the needs of wildlife conservation.

VIII. Effective action to be taken to prevent encroachments on forest land and not to regularise the existing encroachments.

IX. Forest based industries to raise the raw material needed by themselves in arrangement with the private cultivators.

X. Survey of forest resources to be completed on scientific lines for updating informations.

SECTION :- 2 FACTORS INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT

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

(i) Large tract of forests that were managed under the coppice with reserved system of previous plan and scheme have suffered due to heavy grazing, illicit felling and lack of coppice regeneration, with the result that bulk of forest areas have became under stocked and open and fail to regenerate. These forest may respond if they are restocked under afforestation scheme coupled with soil and moisture conservation work.

(ii) The increasing demand by local population for firewood, small timber and fodder grass in thickly populated areas. Adequate provisions have to be made in the plan for meeting the demands.

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

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

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

(vi) There is increasing demand for the timber of teak and other important species in the market.

(vii) Owing to the excess cattle population, the demand of fodder and grazing is in multi-fold.

(viii) Restoration of degraded environment as national object.

SECTION – 3 :- GENERAL OBJECTS OF MANAGEMENT

1.3.1. The National forest Policy of 1988 will be the guiding principle to decide the general objects of management. The new policy has emphasized the need for environmental stability as the prime objective. Keeping in view the above factor and the other principles laid down in the National Forest Policy, the functions the forests have to perform as per State Government's Orders, the objects of scientific management, the rapid depletion of growing stock due to over harvesting, heavy grazing and illicit cutting, the general objects of management will be as under.

(i) To preserve forest cover on steep hill slopes, along the nala banks and water courses and to prevent soil erosion and to preserve site and environment.

(ii) To enrich the growing stock in other natural forests and to restock all the under stocked and degraded forests, to achieve normality of growing stock in shortest possible time.

(iii) To meet the requirement of small timber, fuelwood, 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 objectives to ensure maximum sustained yield.

SECTION - 4 :- ANALYSIS AND VALUATION OF THE CROP:-

1.4.1. The Reserved Forests in 31 compartments of the Division were stock mapped for the first time in 1949-50 on 4"=1 mile scale during the preparation of working scheme by Sri Singh and Sri Mujumdar. At the time of revision of the same by Sri Kartar Singh did not change the stock mapping of the previous scheme. The Protected Forests of the erstwhile division comprising of present Bramhapuri Division were stock mapped for the first time in 1965-66 during the preparation of working scheme by Sri Prabhu. These areas were not surveyed by the Survey of India Department on 4"=1 mile scale and therefore, maps on 4"=1 mile scale were prepared by reducing village maps on 16"=1 mile scale to 4"=1 mile scale and then superimposing on them the enlarged topographical maps on 1"=1 mile scale to 4"=1 mile by pentograph.

1.4.2. 1% strip sampling method was adopted for tree enumeration. The part enumeration works have been carried by the SOFR unit in the

year 1996-97(completed in April 1997) and the remaining part of enumeration have been carried out in the year 2001-02 & 2002-03 (completed in June 2002) by the office of Dy. Conservator of Forest, Working Plan Division No.1, Chandrapur with the help of field staff of Bramhapuri Forest Division. The statement showing the number of stems per ha with distribution of stems among different species and girth classes has been given in **Appendix No. LXIV.**

1.4.3. The Stock Maps have been prepared in GIS cell at Nagpur by running NDVI under the Administrative control of Conservator of Forest, Working Plan Circle, Nagpur. The Reserved Forest have been captured from the toposheet, whereas the protected have been acquired from the village maps.

1.4.4. Quality classification based on the average height of mature dominant trees has been used for showing the site qualities. The following five quality classes have been recognised for the purpose of stock mapping of the growing stock.

TABLE – I

Quality Class	Average height of matured dominant trees in m.
I	Above 27 m.
II	21 to 27 m.
III	15 to 21 m.
IVa	12 to 15 m.
IVb	Upto 12 m.

The quality classes are distinguished within the following types.

1.4.5. **A. TEAK TYPE :-** The forests in which the percentage of teak is more than 20% of the growing stock are classified as teak forest.

1.4.6. **B. MIXED MISCELLANEOUS TYPE :-** The forests in which the percentage of teak is less than 20% of the growing stock are included in the mixed miscellaneous type of forests.

1.4.7. The bamboo quality is locally decided as follows:-

TABLE – II

Quality Class	Height in m.	Girth at Ist internode
1st	10 m. & above	12.5 cm. & above
2nd	Below 10 m.	Below 12.5 cm.

1.4.8. Stock Maps have been prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle, Nagpur, the necessary standard symbols to represent the Site quality, density and occurrence of important species have been shown on the stock maps prepared in the GIS cell at Nagpur.

1.4.9. The Stock maps have been prepared in the GIS Cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle, Nagpur, area statement of

compartments by type, quality classes and other features have been prepared from the data received from the office of the Conservator of Forest, Working Circle, Nagpur.

SECTION – 5 CLASSIFICATION OF FORESTS

1.5.1. The broad and general principles for the classification of the forests are embodied in the Resolution No. MEP-1365/132211-Y, dated December 6, 1968, issued by the Govt.of Maharashtra in Revenue and Forest Department. Taking the above principles into consideration, the forests of the state are to be managed as follows:-

1.5.2. PROTECTION FORESTS :- This includes forests which occur on very steep slope (25 degree and above) 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 aim 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.

1.5.3. 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.

1.5.4. MINOR FORESTS :- This includes forests that are interspersed with cultivated lands and are capable of producing small timber and firewood and providing grazing, which are the indispensable needs of the adjoining agricultural population.

1.5.5. PASTURE LANDS :- These are openly stocked 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.

1.5.6 MISCELLANEOUS FORESTS :-

(a) Grass Reserves :- Which are small blocks of forests 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 needed for other purposes.

1.5.7. Classification :- On the above functional basis forests of Bramhapuri Forest Division are classified as under.

TABLE – III

S.N.	Class of Forest	Area in ha			Total Area	% of total
		RF	PF	UN		
1	Tree Forest	65401.28	14649.25	0.00	80050.53	68.32
2	Minor Forest	6575.97	29281.09	1266.24	37123.30	31.68
Total		71977.25	43930.34	1266.24	71977.25	100.00

1.5.8. Protection forest have not been identified separately as they form part of the compartments included in one of the above categories. However, adequate care has been taken for such areas in the respective working circles.

SECTION – 6 :- METHOD OF TREATMENT

1.6.1. The New Forest Policy has laid emphasis on conservation of biodiversity and meeting the demands of the local people. Accordingly the objects of management of the forest have been fixed. To achieve these objectives, new approach has been adopted in the management of forest. For the conservation of biodiversity and the site, soil and moisture conservation works will be taken. These works will be taken on watershed basis. The working of forest will be rearranged so as to coincide with the watershed boundaries. 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 local demand of the people, an assessment of their requirement will be made and efforts will be made to meet these requirements from the forests. Provision will be made to fill the gap between supply and demand from outside the forest through Social Forestry. Involvement of local people in plantation and other forestry activities has been proposed as per the guidelines of Joint Forest Management issued by Government of Maharashtra and Government of India from time to time which have been reproduced in the chapter of Miscellaneous Regulation in part two of this plan. The functional classification of the forest has been made by taking into consideration the above aspects besides the growing stock and condition of site. The various types of forests will be treated as follows.

1.6.2. PROTECTION FORESTS :- These areas will be excluded from commercial felling. The degraded and erosion prone areas in the proposed working plan under the different working circles will be adequately protected by providing suitable safeguards in the marking rules. The forest areas having density less than 0.40 will be allotted to the Afforestation Working Circle, Fodder Management Working Circle.

1.6.3. TREE FORESTS :- This type of forest includes the better quality forest capable of producing large sized timber, which are comparatively away from villages and pressure of local people on them is less. They have been worked under S.C.I. and C.W.R. Systems of Prabhu's Scheme. They will be managed to produce large sized timber. The steep slopes will be excluded from harvesting but will be covered under soil and moisture conservation works. The natural regeneration in most of these areas is adequate and will be properly tended. In areas where natural regeneration is inadequate, planting of timber species will be taken. To enhance the productivity of the area, some portion will be taken for canopy removal and will be planted with teak in that patch so as to improve the stocking. This will be worked under Selection Cum Improvement Working Circle or Improvement Working Circle. Denuded areas will be afforested. Thinning will be carried out in the teak plantation according to the schedule.

1.6.4. MINOR FORESTS :- This type of forest includes forest areas mainly near the human habitation. This will be managed primarily to meet the local need of small timber, poles, fuelwood and grasses & fodder. The growing stock is mainly of low quality mixed with patches of better quality. The density in large areas is below 0.40. Natural regeneration is by and large deficient in open and eroded areas. The eroded and degraded areas require immediate attention. These forests will be managed under Afforestation Working Circle, Pasture Working Circle & Kuran Working Circle. The planting of suitable indigenous species, specially for small timber poles, fodder and fuelwood will be taken.

1.6.5. MISCELLANEOUS FORESTS :- This will include those areas which were not included in aforesaid classes. This will include 805.32 ha Zudpi Jungle which has been transferred to the Forest Department and in the possessation of Forest Department. These areas have been proposed to be transferred in to Reserve Forests and required notification under section 4 have been sent to the government. The statement showing Range, village and survey number wise area is enclosed in **Appendix No. XXXVI**.

SECTION – 7 :- FORMATION OF WORKING CIRCLES

1.7.1. Based on the above consideration and on the basis of the results of results of past system of management of these forest following working circles have been proposed.

TABLE – IV

S.N.	Name of the Working Circles.	Area in ha
1	Selection Cum Improvement Working Circle	9748.68
2	Improvement Working Circle.	69082.04
3	Afforestation Working Circle	18344.17
4	Fodder Management Working Circle.	
4a	A. Pasture Working Circle	9477.83
4b	B. Kuran Working Circle	9301.30
5	Non -Timber(Overlapping) Working Circle	117173.83
6	Old Teak Plantation Working Circle	1219.81
7	Wildlife (Overlapping) Working Circle	117173.83

1.7.2. The details of the compartments that are allotted to the above working circles are given in **Appendix No. XLIII, XLV, XLVI.** The extent of working circles by ranges is as under :-

TABLE – V

Area of the Working Circle in ha	Name of the Ranges				
	Bramhapuri	Nagbhid	Sindewahi	Sawali	Chimur
SCI WC	3307.91	2633.55	1705.36	---	2101.86
IWC	18757.45	20945.65	10155.66	8421.77	10781.51
Affor. WC	4569.80	2275.22	2883.00	6247.26	2378.69
Pasture WC	2340.98	2593.63	2330.66	2202.76	0.00
Kuran WC	2287.94	2733.80	0.00	2131.61	2147.95
Wildlife(O) WC	32088.98	31617.32	17377.59	19003.40	17086.54
Old T.P. WC	804.90	0.00	302.91	0.00	112.00
NTFP(O) WC	32088.98	31617.32	17377.59	19003.40	17086.54

SECTION - 8 :- BLOCKS AND COMPARTMENTS

1.8.1. The total area of the Bramhapuri Forest Division have been divided into 1856 compartments. The Statement of the Reserved Forests and Protected Forests by Compartments, and Range is given in **Appendix No. XLI, XLII & XLIII.**

SECTION - 9 PERIOD OF THE PLAN

1.9.1 The period of the plan is fixed at 10 years with effect from 2004-2005 to 2013-2014 after which it will be revised. The performance of this plan will be reviewed after five year of it's implementation.

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CHAPTER – II

WORKING PLAN FOR THE SELECTION-CUM-IMPROVEMENT WORKING CIRCLE

SECTION - 1 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE

2.1.1. The following types of areas have been included in this working circle :-

(i) All those areas under conversion working circle in Sri Kartar Singh's plan.

(ii) Better stock areas of CWR Working Circle and Improvement Working Circle of Sri Kartar Singh's plan

2.1.2. These forests occur in four Ranges of Bramhapuri Forest Division. The total area included in this working circle is 9748.68 ha. The Range-wise break up of the areas covered under this working circle is given as follows:-

TABLE – 1

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Bramhapuri	3307.91	10.31	2.82
2	Nagbhid	2633.55	8.33	2.25
3	Sindewahi	1705.36	9.81	1.46
4	Chimur	2101.86	12.30	1.79
	Total	9748.68		8.32

The statement showing the allotment of compartments to this working circle is given in the **Appendix No. XLIII, XLV, XLVI.**

SECTION :- 2 GENERAL CHARACTER OF THE VEGETATION

2.2.1. This working circle comprises the good quality miscellaneous forests, forests with dense bamboos and forests which are mostly situated in hilly areas. Teak is found in a scattered patches mostly confined to sites alongside nallas and other watercourses. These forests support a great genetic diversity.The main tree species are ain, bija, dhaora, shisham ,tendu, bhirra, haldu, garari, moha and surya. The crop changes in quality, density and composition from place to place and often within short distances. The density of the crop is generally varying from 0.40 to 0.60 with patches of under stocked areas too. The quality of the crop is III to IVa with some open patches of IVb mixed with above qualities. The overall status of natural regeneration of almost all miscellaneous species is satisfactory. The advantage of this regeneration will be taken to regenerate the area. Though the forest consists mainly of miscellaneous species yet it is capable of a growing teak. Therefore, to increase the value of the crop and productivity of the area teak will be introduced by way of gap planting

so that the overall percentage of teak becomes 10 to 15% in the resultant crop.

SECTION :- 3 BLOCKS AND COMPARTMENTS

2.3.1. The details of blocks and compartments allotted to this working circle are given in **Appendix No. XLIII, XLV, XLVI.**

SECTION :- 4 SPECIAL OBJECTS OF MANAGEMENT

2.4.1. The forests allotted to this working circle belong to the category of Tree forest. The special objects of management of these forests will be:-

i) To produce large sized trees to meet the requirement of timber.

ii) To increase the proportion of valuable tree species in the composition of the crop by giving preferential treatment to the naturally regenerated seedlings and by planting timber species, mainly teak in the gaps as well as where the natural regeneration is not sufficient.

iii) To maintain and improve the soil cover by way of soil and water conservation
measures particularly on the basis of water shade management.

SECTION : 5 ANALYSIS AND VALUATION OF THE CROP :

2.5.1. STOCK MAPPING :

2.5.2. The Stock Maps have been prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle,Nagpur & will be supplied by the office of Conservator of Forest, Working Plan Circle, Nagpur.

2.5.3. ENUMERATION :-

2.5.4. 1% strip sampling method was adopted for tree enumeration. The part enumeration works have been carried by the SOFR unit in the year 1996-97(completed in April 1997) and the remaining part of enumeration have been carried out in the year 2001-02 & 2002-03(completed in June 2002) by the office of Dy. Conservator of Forest, Working Plan Division No.1,Chandrapur with the help of field help of field staff of Bramhapuri provided by Dy. Conservator of Forests, Bramhapuri Forest Division, Bramhapuri. The statement showing the number of stems per ha with distribution of stems among different species and girth classes has been given in **Appendix No. LXIV.**

2.5.5. DENSITY AND AGE CLASSES

2.5.6. The crop is mostly middle aged to mature trees with scattered over mature trees. Density generally varies from 0.40 to 0.60. Some understocked and blank patches are also included.

2.5.7. REGENERATION

2.5.8. The overall regeneration status of miscellaneous species like ain, dhaora, bija,etc. is satisfactory where as that of teak is poor. Coppice regeneration of garari, lendia is profuse.

SECTION - 6 SILVICULTURAL SYSTEM

2.6.1. The best suitable system to achieve the objectives will be Selection-Cum-Improvement felling cum overwood removal over limited area with better site quality. While selection felling will allow the growth of left over trees to a higher girth class above selection girth, improvement felling will allow the proper growth of advance growth and establishment of natural regeneration. In most of the areas natural regeneration will be sufficient to restock the area. But in patches where the natural regeneration is not sufficient suitable timber species will be planted. Patches of well stocked better site quality areas with site quality IVa and above will be selected for overwood removal followed by teak plantation to increase the productivity of such areas. In suitable sites stump planting of teak in gaps will be undertaken so that the overall percentage of teak becomes 10 to 15% in the resultant crop. Bamboo will be planted at all suitable sites and in 4^{th} year in teak planted areas.

SECTION - 7 :- CHOICE OF SPECIES

2.7.1. Since teak is the most valuable species and comes above all miscellaneous timber species, therefore, it will be given top priority, wherever present. The miscellaneous species to be favored in the existing crop in order of their priorities are bija, shisham,haldu, ain, kalam, saja, tiwas, dhaora, bhirra, rohan, garari and lendia. However, in inferior areas with degraded soil rohan, bhirra, khair, garari and lendia will be preferred.

2.7.2. In the artificial regeneration teak will be planted in areas with well drained soil and khair will be planted in inferior area. Besides, edible fruits and flower yielding plants, semal and kutha will be reserved from felling. In the plantation some shade bearing trees like ficus, gular etc. will also be planted for the benefit of wildlife.

SECTIONS - 8 :- HARVESTABLE GIRTHS

2.8.1. Since the growth conditions are usually vigorous, most of the areas included in this working circle are capable of growing trees of 90 to 150 cms. in girths at breast height (O.B.). The growth study for major tree species were worked out by stump analysis at the time of preparation of the working plan for East Chanda Division by Shri Kartar Singh. Based on the above growth studies, the harvestable girth of various species will be as follows:-

1)	Teak, ain(saja), bija, shisham, haldu	120 cms.
2)	Garari, khair, lendia	45 cms.
3)	All other timber species.	90 cms

The yield calculation have been carried out for the girth class 120cm, 90 cm & 45 cm gbh.

SECTION - 9 :- FELLING CYCLE

2.9.1. The felling cycle of 20 years has been adopted.

SECTION - 10 :- FORMATION OF FELLING SERIES AND COUPES

2.10.1. The total area allotted to this working circle is 9748.68 ha which have been divided into 5 felling series. The Details of which is given in **Appendix No. XLVII**. Each felling series has been divided into 20 coupes. The sequence of felling in SCI Working Circle has been given in **Appendix No. XLVIII**

SECTION - 11 REGULATION OF YIELD

2.11.1. The annual yield will be regulated by area by making coupes as far as possible equiproductive in each felling series. The coupes of 100 to 150 ha will be laid down.

2.11.2. K.P.Sagreiya's modification of Smythies formula has been applied for yield calculation.

Exploitable girths (gbh) are as follows :-

(a) Ain, bija, shisham, teak & haldu. 120 cms.
(b) Lendia & garari. 45 cms.
(c) All other timber species. 90 cms.

2.11.3. NUMBER OF STEMS PER HA :- From the enumeration data obtained after calculations for S.C.I. working circle of all four ranges, the average number of trees per ha has been calculated which is as follows.

TABLE – II

Girth classes	Ain,Bija,Shisham, Teak, Haldu	Garari, Lendia	Other Timber Spp.	Total
15/30	13.11	33.28	46.13	92.52
30/45	8.10	18.43	25.51	52.04
45/60	6.34	10.13	18.88	35.35
60/75	5.73	6.10	14.52	26.35
75/90	5.46	3.49	11.17	20.12
90/105	5.30	2.00	9.86	17.16
105/120	4.57	0.81	6.95	12.33
120/135	3.88	0.34	5.09	9.31
135& above	4.46	0.16	6.23	10.85
Total	56.95	74.74	144.3	276.00

2.11.4. SURVIVAL PERCENTAGE :- The percentage of trees that will be reaching to the harvestable girth has been calculated on the basis of number of trees that should have been in each girth class if the

present stock was evenly balanced. The expected number of trees in different girth classes in an evenly balanced growing stock is what is obtained from the law of F.De. Liocourt.

FRANCOIS DE LALLEMENT DE LIOCOURT'S LAW :-

2.11.5. The theory states that in a fully stocked Selection Forest i.e. the normal growing stock of the uneven aged forest the no. of stems falls off from one diameter class to the next higher diameter class in a geometrical progression with a constant ratio, which means that the percentage reduction in the stem number from one diameter class to the next is constant. Besides, although the numerical value of the ratio varies from one forest to another, the general form of the distribution follows an exponential curve of the inverse - J shaped.

2.11.6. The constant ratio of decrease in numbers of trees as diameter increases is a fundamental characteristic of the uneven aged condition which provides the basis for the concept of uneven aged normalcy.

2.11.7 Thus according to De Liocourt, the number of trees in successive diameter/girth classes represent a geometrical series of the form,

$$a,\ ar,\ ar^{-1},\ ar^{-2},\ ar^{-3} \ldots \ldots$$

2.11.8. Where a represents the number of trees in the lowest diameter/girth class, ar the number in the next higher diameter/girth class, and so on and `r' represents the common ratio of the geometrical progression. If the value of `r' and the number of stems in any class are known, the whole series can be worked out and this would give the proportionate distribution of stems or an evenly balanced composition in an Ideal Selection Forest. It was initially assumed that the F.De. Liocourt theory of Normal Distribution is applicable only to temperate forests and has no relevance in tropical forest, but it was shown later that this distribution also holds good in tropical Forest.

2.11.9. The numerical value of r, which is the ratio of the geometric series, can easily be calculated if the stand table of such an ideal forest is available. By dividing the number of trees in a given diameter class by the number of trees in the next higher diameter class will give the value of r, which will be constant throughout all diameter/girth classes if the distribution is balanced. Ideally it is impossible to attend a normal forest in a heterogeneous crop as it consists of many different species, each having different growth pattern individually. But in actual, such balanced distribution does not exist due to a number of reasons. In order to visualize an ideal distribution for a given actual distribution, the above law is applied. For a given stand table the values of `r'' and `a' are obtained as follows:

A. CALCULATION OF 'r':

2.11.10. There are three methods to calculate r. These are as follows.

(a) The average (arithmetic mean) of the successive ratios. If a1, a2,..... a9, are no. of stems in 9 girth/dia classes, then

$$r = 1/8 (a1/a2 + a2/a3 + ... + a8/a9)$$

(b) Since, $a1/a2 = a2/a3 = ... = a8/a9 = r$

and so

$$\frac{a1+a2+.....+a8}{a2+a4+.....+a9} = r$$

and (c) Since $a1/a2 = a2/a3 = ... = a8/a9 = r$

and therefore, $(a1/a2).(a2/a3).....(a8/a9) = r^8$

or ,
$$r = (a1/a9)^{1/8}$$

The value of r can be calculated from any of the three methods, mentioned above. But (a) and (b) involves all terms of the series to find out the average value whereas the last one only two and so these two are more appropriate.

Between (a) and (b), (a) includes ratios of higher girth classes, which contains fewer trees and so the chance of error is more and the estimate of `r' may have more standard error. And, therefore, method (b) appears to be the most appropriate one and the same is being applied in the subsequent calculations.

2.11.12. B. CALCULATION OF FIRST TERM OF G.P.

The sum of n terms of a G.P.is given as

$$S = a + ar + ar^{-1} + ar^{-2} + ar^{-3} + ... + ar^{-(n-1)}$$

Where a is the number of stems in the lowest girth class.

Multiplying both sides by `r' and subtracting it from the former, we get as follows :

$$a = S \times [\{(r^{n-1}) \times (1-r)\}/(r^n - 1)]$$

Here, S is the sum of stems of all girth/diameter classes which is known and `r' has been calculated as above. Therefore, the value of `a' can be found out.

From these ‘a’ and ‘r’, the whole series of an ideal distribution for a given stem distribution can be found out. The same principle is applied hereafter to construct the table for different exploitable girths.

2.11.13. HARVESTABLE GIRTH 120 cm :- Yield regulation for Teak, Ain, Bija, Shisham and Haldu group.

TABLE – III

Girth class in cms		Stems per ha	Stems per ha as per Liocourt	% of survival	Stems per ha reaching harvestable size(2 x 4)	Years required to pass over next girth class	Average annual recruit ment.-
	1	2	3	4	5	6	7
I	15-30	13.11	9.97	48.17	6.32	14	0.451R1
II	30-45	8.10	8.98	53.46	4.33	13	0.333R2
III	45-60	6.34	8.09	59.35	3.76	14	0.269R3
IV	60-75	5.73	7.29	65.87	3.77	13	0.290R4
V	75-90	5.46	6.57	73.12	3.99	13	0.307R5
VI	90-105	5.30	5.92	81.16	4.30	12	0.358R6
VII	105-120	4.57	5.33	90.10	4.12	13	0.317R7
VIII	120 & up	8.34	4.80	100.00	8.34	16	0.521R8
	Total	56.95					

$$\text{Here} \quad r = \frac{(13.11 + \ldots\ldots + 4.57)}{(8.10 + \ldots\ldots + 8.34)} = \frac{48.61}{43.84} = 1.11$$

$$a = S \times [\{(r^{n1-}) \times (1-r)\}/(r^n - 1)]$$

$$= 56.95 \times [\{(1.11^{n1-}) \times (1 - 1.11)\}/(1.11^n - 1)]$$

$$= 9.97$$

2.11.14. RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- The number of trees that will be recruited during felling cycle of 20 years is given below :-

Felling Cycle	Total recruitment during the felling cycle
Ist	16R8 + 4R7 = 9.604
2nd	9R7 + 11R6 = 6.791
3rd	R6 + 13R5 + 6R4 = 6.089

2.11.15. REALIZABLE RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- All the recruitment during the period of a felling cycle is not realizable , because in the first year coupe, recruitment of only one year is available, in the second year coupe , recruitment of 2 years only is available and so on till the 20th coupe in which all the recruitment for 20 years will be available. The total realizable recruitment in a felling cycle can be calculated by Sagreiya's formula, viz.

$$Rr = 1/2[Rn - P(Rn/F - Rx)]$$

Where, F = The felling cycle
Rn = Total recruitment during the felling cycle
P = Period during which the initial rate of recruitment operates.
And Rx = The initial rate of recruitment.

The recruitment realizable during 3 felling cycles is therefore as follows.

2.11.16. A. FIRST FELLING CYCLE :-

Rr = 1/2[Rn - P(Rn/F - Rx)]

Hence , Rr1 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[9.604 - 16 x (9.604/20 - 0.521)]

= 4.474

Available recruitment in 1st cycle

Ra1 = Rn – Rr1

Hence, Ra1 = 9.604 – 4.474

= 5.130

2.11.17. B. SECOND FELLING CYCLE :-

Here , Rr2 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[6.791 - 9 x (6.791/20 - 0.317)]

= 3.294

Available Recruitment in the 2nd cycle,

Ra2 = Rn – Rr2

= 6.791 – 3.294

= 3.497

2.11.18. C. THIRD FELLING CYCLE :-

Here , Rr3 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[6.089- 1 x (6.089/20 - 0.358)]

= 3.071

Available Recruitment in 3rd cycle,

Ra3 = Rn – Rr3

= 6.089 – 3.071

= 3.018

The accumulating recruitment in one cycle is realizable in the next cycle along with latter's realizable recruitment. Thus the total numbers of trees realizable in the felling cycle are as follows :

TABLE – IV

Felling Cycle	Total Recruitment	i) Realisable ii)Accumulation	Net realizable recruitment	Annual average recruitment	Annual average volume in cum
1	9.604	(i) 4.474 (ii) 5.130	4.474	0.224	0.141
2	6.791	(i) 3.294 (ii) 3.497	8.424	0.421	0.265
3	6.089	(i) 3.071 (ii) 3.018	6.568	0.328	0.207

2.11.19. YIELD IN FIRST THREE CYCLES :- The existing number of stems/ha above 120 cm girth is 8.34 which will be liquidated in the first three cycles. The annual liquidation will be 0.139 stem/ha or 0.088 cum per ha. Thus the annual average yield per ha in first three felling cycles will be 0.229 cum, 0.353 cum and 0.295 cum respectively. Reserving 50 % as future safeguard the utilizable yield per ha in three cycles will be 0.115 cum, 0.177 cum, 0.148 cum respectively and the estimated annual yield for the whole working circle, in three cycles will be 1116.22 cum, 1720.64 cum and 1437.93 cum respectively.

2.11.20. HARVESTABLE GIRTH 90 CMS :- Yield regulation for other timber species.

TABLE - V

Girth class in cms		Stems per ha	Stems per ha as per Lioc-court	% of Survival	Stems per ha reaching harvestable size(2 x 4)	Years required to pass over next girth class	Average annual recruitment
	1	2	3	4	5	6	7
I	15-30	46.13	35.45	33.91	15.64	13	1.203R1
II	30-45	25.51	29.80	49.87	12.72	11	1.156R2
III	45-60	18.88	25.04	59.35	11.21	12	0.934R3
IV	60-75	14.52	21.04	70.63	10.26	13	0.789R4
V	75-90	11.17	17.68	84.06	9.39	14	0.671R5
VI	90-105	27.63	14.86	100.00	27.63	14	1.974R6
	Total	143.84					

$$\text{Here} \quad r = \frac{(46.13 + \ldots\ldots + 11.17)}{(25.51 + \ldots\ldots + 27.63)} = \frac{116.21}{97.71} = 1.190$$

$$a = S \times [\{(r^{n1-}) \times (1-r)\}/(r^{n} - 1)]$$

$$= 143.84 \times [\{(1.190^{n1-}) \times (1 - 1.190)\}/(1.190^{n} - 1)]$$

$$= 35.45$$

2.11.21. RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- The number of trees that will be recruited during felling cycle of 20 years is given below :

Felling Cycle	Total recruitment during the felling cycle
Ist	16R6 + 4R5 = 34.268
2nd	10R5 + 10R4 = 14.600
3rd	4R4 + 13R3 + 3R2 = 18.766

2.11.22. REALIZABLE RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- All the recruitment during the period of a felling cycle is not realizable , because in the first year coupe, recruitment of only one year is available, in the second year coupe, recruitment of 2 years only is available and so on till the 20th coupe in which all the recruitment for 20 years will be available. The total realizable recruitment in a felling cycle can be calculated by Sagreiya's formula , viz.

$$Rr = 1/2[Rn - P(Rn/F - Rx)]$$

Where, F = The felling cycle

Rn = Total recruitment during the felling cycle

P = Period during which the initial rate of recruitment operates.

And Rx = The initial rate of recruitment.

The recruitment realizable during 3 felling cycles is therefore as follows :-

2.11.23. A. FIRST FELLING CYCLE:-

$$Rr = 1/2[Rn - P(Rn/F - Rx)]$$

Hence , $Rr1 = 1/2[Rn - P(Rn/F - Rx)]$

$= 1/2[34.268 – 16 \times (34.268/20 – 1.974)]$

$= 19.219$

Available recruitment in 1st cycle

$$Ra1 = Rn – Rr1$$

Hence, $Ra1 = 34.268 – 19.219$

$= 15.049$

2.11.24. B. SECOND FELLING CYCLE :-

Here , $Rr2 = 1/2[Rn - P(Rn/F - Rx)]$

$= 1/2[14.600 - 10 \times (14.600/20 – 0.671)]$

$= 7.005$

Available Recruitment in the 2nd cycle,

Ra2 = Rn – Rr2

= 14.600 – 7.005

= 7.595

2.11.25. C. THIRD FELLING CYCLE :-

Here , Rr3 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[18.766 - 4 x (18.766/20 - 0.789)]

= 9.085

Available Recruitment in 3rd cycle,

Ra3 = Rn – Rr3

= 18.766 – 9.085

= 9.681

2.11.26. NET REALISABLE RECRUITMENT:- The accumulating recruitment in one cycle is realizable in the next cycle along with latter's realizable recruitment. Thus the total number of trees realizable in the felling cycle are as follows :

TABLE – VI

Felling Cycle	Total Recruitment	i) Realisable ii)Accumulation	Net realizable recruitment	Annual average recruitment	Annual average volume in cum
1	34.268	(i) 19.291 (ii) 15.049	19.291	0.965	0.328
2	14.600	(i) 7.005 (ii) 7.595	22.054	1.103	0.375
3	18.766	(i) 9.085 (ii) 9.681	16.680	0.834	0.284

2.11.27 YIELD IN FIRST THREE FELLING CYCLE :- The existing number of stems per ha above 90 cm girth is 27.63 which will be liquidated in the first three cycles. The annual liquidation will be 0.461 stems/ha or 0.157 cum per ha.

2.11.28 Thus, the annual average yield in the first, second and third cycle will be 0.485 cum, 0.532 cum and 0.441 cum per ha respectively. Reserving 50 % as the future safeguard, the utilizable yield per ha in three cycles will be 0.243 cum, 0.266 cum and 0.220 respectively and the estimated annual yield for the whole working circle in three cycles will be 2364.54 cum, 2593.25 cum, and 2147.44 cum respectively.

2.11.29. HARVESTABLE GIRTH 45 CM :- Yield regulation for Garari and Lendia group.

TABLE - VII

Girth class in cms		Stems per ha	Stems per ha as per Lioc- court	% of survival	Stems per ha reaching harvestable size(2 x 4)	Years required to pass over next girth class	Average annual recruitment
	1	2	3	4	5	6	7
I	15-30	33.38	33.27	5.59	1.87	16	0.117R1
II	30-45	18.43	18.69	9.95	1.83	20	0.092R2
III	45-60	10.13	10.50	16.80	1.70		
IV	60-75	6.10	5.90	31.56	1.93		
V	75-90	3.49	3.31	56.18	1.96		
VI	90 & up	2.00	1.86				
	Total	73.53					

$$\text{Here} \quad r = \frac{(33.38 + \ldots\ldots + 3.49)}{(18.43 + \ldots\ldots\ldots + 2.00)} = \frac{71.53}{40.15} = 1.780$$

$$a = S \times [\{(r^{n1-}) \times (1-r)\}/(r^{n} - 1)]$$

$$= 73.53 \times [\{(1.78^{n1-}) \times (1 - 1.78)\}/(1.78^{n} - 1)]$$

$$= 33.27$$

2.11.30. RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- The number of trees that will be recruited during felling cycle of 20 years is given below :-

Felling Cycle	Total recruitment during the felling cycle
Ist	20R2 = 1.840
2nd	16R1 + 4R2 = 2.240
3rd	16R2 + 4R1 = 1.940

2.7.31. REALIZABLE RECRUITMENT IN SUCCESSIVE FELLING CYCLES :- All the recruitment during the period of a felling cycle is not realizable, because in the first year coupe, recruitment of only one year is available, in the second year coupe, recruitment of 2 years only is available and so on till the 20th coupe in which all the recruitment for 20 years will be available.The total realizable recruitment in a felling cycle can be calculated by Sagreiya's formula , viz.

$$Rr = 1/2[Rn - P(Rn/F - Rx)]$$

Where, F = The felling cycle

Rn = Total recruitment during the felling cycle

P = Period during which the initial rate of recruitment operates.

And Rx = The initial rate of recruitment.

The recruitment realizable during 3 felling cycles is therefore as follows :-

2.11.32. A. FIRST FELLING CYCLE:-

Rr = 1/2[Rn - P(Rn/F - Rx)]

Hence , Rr1 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[1.840 - 20 x (1.840/20 - 0.092)]

= 0.920

Available recruitment in 1st cycle

Ra1 = Rn – Rr1

Hence, Ra1 = 1.84 – 0.920

= 0.920

2.11.33. B. SECOND FELLING CYCLE :-

Here , Rr2 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[2.240 - 16 x (2.240 /20 - 0.117)]

= 1.160

Available Recruitment in the 2nd cycle,

Ra2 = Rn – Rr2

= 2.240 – 1.160

= 1.080

2.11.34. C. THIRD FELLING CYCLE :-

Here , Rr3 = 1/2[Rn - P(Rn/F - Rx)]

= 1/2[1.940 - 16 x (1.940 /20 - 0.092)]

= 0.930

Available Recruitment in 3rd cycle,

Ra3 = Rn – Rr3

= 1.940 – 0.930 = 1.010

2.11.35. NET REALISABLE RECRUITMENT :- The accumulating recruitment in one cycle is realizable in the next cycle along with latter's realizable recruitment. Thus the total number of trees realizable in the felling cycle are as follows.

TABLE – VIII

Felling Cycle	Total Recruitment	i)Realisable ii)Accumulation	Net realizable recruitment	Annual average recruitment	Annual average volume in cum
1	1.840	(i) 0.920 (ii) 0.920	0.920	0.046	0.0032
2	2.240	(i) 1.160 (ii) 1.080	2.080	0.104	0.0073
3	1.940	(i) 0.930 (ii) 1.010	2.010	0.101	0.0071

2.11.36. The existing number of stems/ha above 45 cm girth is 21.72 which will be liquidated in first three cycles. The annual liquidation will be 0.362 stems/ha or 0.025 cum/ha.

2.11.37. Thus the annual average yield for first three felling cycles will be 0.0282 cum/ha, 0.0323 cum/ha, 0.0321 cum/ha respectively. There should not be any reservation for this class. The yield in these felling cycles for this working circle will 274.91 cum, 314.88 cum and 312.93 cum respectively.

2.11.38. The total yield for all three harvestable girth classes will be as follows.

TABLE - IX

Felling Cycle	Annual average yield per ha in cum harvestable girth in cm.				Annual average estimated yield for SCI Working Circle
	120 cm	90 cm	45 cm	Total	
1	0.115	0.243	0.0282	0.566	5519.70
2	0.177	0.266	0.0323	0.761	7421.67
3	0.148	0.220	0.0321	0.674	6571.59

2.11.39. The above method for yield calculation requires improvement as it is not strictly applicable to miscellaneous selection forest. Besides, in it the number of trees only has been considered for all calculation. While taking volume will be more appropriate.

2.11.40. The details of the yield calculation & its prescriptions should properly be explained to the field officers and employees in order to implement the prescriptions of this working circle effectively.

SECTION - 12 :- AGENCY FOR HARVESTING

2.12.1. The main felling of coupes, after marking, will either be worked departmentally or through FLCS. However, subsidiary silvicultural operations, thinning, soil and moisture conservation works, planting and fire protection works will be carried out departmentally.

SECTION - 13 :- DEMARCATION OF COUPES , PREPARATION OF TREATMENT MAPS AND MARKING TECHNIQUE.

2.13.1. DEMARCATION :- Main felling coupes will be demarcated one year in advance of main felling as per procedure laid down under miscellaneous regulations.

2.13.2. PREPARATION OF TREATMENT MAP :- Soon after the demarcation of main felling coupe, a treatment map will be prepared by RFO after thoroughly inspecting the area. It will be verified by the ACF in charge. The treatment map will show the following areas distinctly:-

2.13.3. Type A :- Protection areas:
These will include,

I. Areas on slopes above 25 degree,

II. Area eroded or liable for erosion.

III. 20 meter wide strip on either side of Nalla banks and river courses.

2.13.4 Type B :- These are under stocked areas. These will include all areas with crop density less than 0.4.

2.13.5 Type C :- Group of young poles will be included in this category. It includes patches of well grown pole crop of teak and miscellaneous species suitable for retention as future crop. The patch will not be less than 0.50 ha.

2.13.6 Type D Areas :- Well Stocked Area :- Areas with crop density above 0.4 are included in this category. These areas have been further divided into two sub groups.

2.13.7 Type D1 Areas :- These are the areas having deep and well drained soil with the site quality IVa or above. Suitable well drained areas of site qualities more than IVa or above to the extent of nearly 20 ha per coupe will be selected for canopy removal and will be planted with teak. There may be more than one patch depending upon the site conditions.

2.13.8 Type D2 Areas :- Remaining well stocked areas.

2.13.9 MARKING TECHNIQUE & TREATMENT :- Marking will be done in the same year in which demarcation will be done. Soon after the receipt of approved treatment map, marking will be done. The marking technique has been described in details in the miscellaneous regulations. The bamboo clumps will be harvested as per the rules given in Bamboo overlapping working circle.The marking rules for each type of area, besides climber cutting and cleaning of bamboo clumps will be as follows

.**2.13.10 Type A Areas :-** Protection areas. :- No marking will be done in such areas. However seed sowing of Neem, Maharukh will be carried out. At good sites, the stump planting of Sisoo, Shivan will be carried out.

2.13.11 Type B Areas :- Under stocked areas : Marking will not be carried out except in the following cases. The understocked patches more than 5 ha will be planted and in an annual coupe not more than 20 ha will be planted in each felling series.

(i) All dead trees after retaining 2 dead trees per ha.

(ii) All live high stumps.

(iii) All but one vigorously growing coppice shoot/stool.

2.13.12 Type C Areas :- The advance growth upto the extent of 0.50 ha and above will be demarcated and thinning will be carried out up to a spacing of one third of the top height of the healthy pole, intended to be retained. In the plantations thinning will be done as per the quality classes and year of plantation. The number of stems to be retained will be as per the yield table given in **Appendix No. XXXVIII.**

2.13.13 Type D1 Areas :- In areas fit for canopy removal planting with teak at a spacing of 2m x 2m will be done after removal of canopy. The selection of ideal sites for the teak plantation is left to field staff. Following marking will be followed.

a) All young to middle aged fruit bearing trees up to 20 trees/ha should be retained.

b) Young to middle aged trees of Semal, Khair, Rosewood and other superior miscellaneous species up to 20 trees/ha uniformly spread over the area should be retained.

c) No felling will be done on either side of Nallah, Stream and River beds up to 30 m.

d) The section size at a place will not exceed 20 ha.

e) A 20 m. strip of natural forests will be retained on all sides of the section.

In addition,

f) The plantation will be fire protected.

g) Superior planting stock will be planted.

2.13.14 Type D2 Areas :- All edible fruit and flower yielding trees of moha, char, tendu, aonla, chinch, sitafal, harra, bel and trees of kulu will be reserved from felling. All trees above selection girth and approach class will be enumerated, before marking, in 15 cms girth classes. The following trees will be marked for felling:-

(i) The percentage of selection trees to be marked for felling for various species groups has been worked out in regulation of yield. Fifty percent of the trees above exploitable girth will be

(ii) marked for felling. Marking will start from the highest girth class trees and trees of less importance as described earlier.

(iii) All dead and malformed trees, after retaining 2 trees/ha will be marked for felling. A tree will be treated as malformed if it does not have a clean bole upto at least 2 m above the breast height.

(iv) All live high stumps will be marked for felling.

(v) All but one vigorously growing coppice shoots per stool where the density is less will be retained.

(vi) No sound tree will be removed unless it is sillviculturally available.

(vii) 50 % trees above selection girth shall be retained and uniformly spread over the whole area of the coupe. It will start from highest girth class and trees of less importance. Besides these principles the marking shall be done only when the trees are available silviculturally.

SECTION - 14 SUBSIDIARY SILVICULTURAL OPERATIONS

2.14.1 The following works will be carried out in the following year of the main felling and in the subsequent years.

2.14.2 A. CUTTING BACK OPERATIONS :- These will be done in the following year of the main felling. They will involve following operations:-

(i) All standing trees and live high stumps marked for felling but not felled will be felled.

(ii) All trees damaged during main felling, which are not likely to recover, will be felled.

(iii) All climbers will be cut except the endangered & threatened species.

(iv) All coppice shoots where natural regeneration is adequate will be cut.

(v) All malformed regeneration upto 15 cm g.b.h. will be cut.

2.14.3. B. CLEANING :- In the sixth year from the year of main felling, the following operations will be carried out.

(i) Climber cutting except the endangered & threatened species.

(ii) Cutting of all coppice shoots where naturally regenerated or planted seedlings are adequate.

(iii) Removal of undergrowth interfering or likely to interfere with the growth of seedlings (natural or planted).

2.14.4. C. THINNING :- The first thinning will be carried out at the age of 10^{th} year from the year of formation and will be mechanical as the crown

distinction does not start at this age. The procedure of removal is given in the chapter of Working Plan for Old Teak Plantation Working Circle. During the next revision of this Plan will be transferred to Old Teak Plantation Working Circle.

2.14.5 The sequence of subsidiary silvicultural operations has been given in **Appendix No. LI.**

SECTION – 15 OTHER REGULATIONS

2.15.1. PROTECTION :- 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.

2.15.2. FIRE PROTECTION :- Special attention is needed to control the fire. The main felling coupes will be rigidly fire protected for a period of five years from the year of main felling. It is emphasised that the fire is the foremost reason of non-establishment of natural regeneration. Grazing comes next. Local villagers will have to be taken into confidence to ensure success. The details of fire protection schemes are given in miscellaneous regulations

2.15.3. CLOSURE TO GRAZING :- The main felling coupes will remain closed to grazing for a period of five years from the year of main felling. The closed coupes will specifically be mentioned in the grazing licence and the villagers will be made aware about them by regular meetings & persuasion. The local people will be persuaded to graze their cattle in areas other than closed areas. For cooperation extended by them in protecting the 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 a better understanding with them. The closed coupes will specifically be mentioned in the grazing licence and the villagers will be made aware about them by regular drum beating in the villages.

2.15.4. Measures to increase the carrying capacity of the forest In order to increase the availability of grass in the areas open to grazing, sowing of superior grasses like paonya, sheda, marvel may be taken in the suitable patches near villages but away from the closed coupes. These areas will be closed to grazing from July to November, during which the seeding of grasses will be over. This closure will be made only during the first year of sowing. For this work the villagers will be taken into confidence to ensure their cooperation.

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CHAPTER - III

WORKING PLAN FOR THE AFFORESTATION WORKING CIRCLE

SECTION - 1:- GENERAL CONSTITUTION OF THE WORKING CIRCLE.

3.1.1. The following types of areas have been included in this working circle: -

The compartments covered under C.W.R. Working Circle of Sri Kartar Singh's plan.

(i) All the compartments devoid of vegetations and severely eroded areas under Improvement Working Circle of Sri Kartar Singh's Plan.

(ii) All the areas with less than 0.40 density and areas under encroachments.

(iii) The compartment covered under Kuran Working Circle of Sri Kartar Singh's Plan.

(iv) All the areas of 'B' Class Reserved forest in 4 villages.

(v) Some areas under the categories of Zudpi Jungle & big tree forest areas in possessation of Forest Department.

3.1.2. Forest areas, mentioned under (v) and (vi) above, have been brought under systematic management in this plan for the first time.

3.1.3. The total areas included in this working circle are 18344.17 ha.

3.1.4. The distribution of area by Ranges is given as under: -

TABLE – 1

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Bramhapuri	4569.80	14.24	3.90
2	Nagbhid	2822.10	8.93	2.41
3	Sindewahi	2771.79	15.95	2.37
4	Sawali	6237.26	32.82	5.32
5	Chimur	1943.22	11.37	1.66
	Total	18344.17		

The statement showing the allotment of compartments to this working circle is given in the **Appendix No. XLIII, XLV, XLVI.**

SECTION – 2 :- GENERAL CHARACTER OF THE VEGETATION

3.2.1. Most of the compartments included in this working circle are degraded, and under encroachments. The rooted stock has become greatly depleted. The vegetation in such areas is mainly bushy in which shrubs like

dikamali, jilbili, kuda, kharata, bharati, kharasali and lokhandi predominate. The tree communities, though sparse, are similar to those found in tree forests of the division, with exception that percentage of the timber yielding species is far less than that of other areas.

3.2.2. The areas which are in the immediate vicinity of human habitations are under tremendous biotic pressure. Some areas have been encroached upon for cultivation. Due to heavy biotic interference like grazing and illicit cutting for firewood, 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 of soil and erosion. Due to this many patches have become almost blank. The rate of natural regeneration is poor. In some patches very good miscellaneous crop of 0.20 to 0.40 density is noticed. Common species found are bhirra, dhawada, saja, ain, tinsa, tiwas, lendia, mowai, palas, tendu, bija etc. The area needs soil and moisture conservation and afforestation works.

SECTION – 3 :- SPECIAL OBJECTS OF MANAGEMENT

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

(i) To reclaim the area by intensive soil and moisture conservation works and afforestation works to enhance the productivity through artificial regeneration containing mainly the indigenous species of small timber, firewood and fodder value to meet the local demand.

(ii) To meet the demand of local people for small timber, firewood and fodder to the maximum possible extent.

(iii) To maintain the biological diversity of forests by introducing mixture, and not the monoculture.

(iv) To involve local people in afforestation works under the scheme of people's participation in forest management.

SECTION – 4 :- BLOCKS AND COMPARTMENTS

3.4.1 This working circle includes Reserved Forests, Protected Forests, Zudpi Jungle, big tree forests and B Class forests in 4 villages. The details of blocks and compartments allotted to this working circle are given **Appendix No. XLIII, XLV, XLVI.**

SECTION - 5 :- ANALYSIS AND VALUATION OF THE CROP

3.5.1. STOCK MAPS :- The Stock Maps are being prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle,Nagpur & will be supplied by the office of Conservator of Forest, Working Plan Circle, Nagpur.

3.5.2. DENSITY :- The density of the crop varies from 0.0 to 0.4. The crop contains mostly bushy growth, stools and middle aged trees.

3.5.3. ENUMERATION :- 1% strip sampling method was adopted for tree enumeration. The part enumeration works have been carried by the SOFR unit in the year 1996-97(completed in April 1997) and the remaining part of enumeration have been carried out in the year 2001-02 & 2002-03(completed in June 2002) by the office of Dy. Conservator of Forest, Working Plan Division No.1,Chandrapur with the help of field staff of Bramhapuri provided by Dy. Conservator of Forests, Bramhapuri Forest Division, Bramhapuri.

3.5.4. The statement showing the number of stems per ha with distribution of stems among different species and girth classes has been shown in **Appendix No. LXIV.**

SECTION – 6 :- METHOD OF TREATMENT

3.6.1. The primary object of management of these areas is to restore the soil fertility and increase the productivity of land. Therefore, soil and moisture conservation works will be taken up and the areas will be afforested with suitable indigenous species. The species to be planted will depend upon the soil type, its depth and local requirement. The number of plants per/ha will be 1100 or less depending upon site and nature of species selected. No regular silvicultural system will be applied. The existing growth will be tended by suitable operations. The rooted stock present in the area which have been constantly hacked for firewood will be redressed properly to achieve the vigorous growth.

(i) These areas subjected to intensive biotic pressure, the primary object is to restore the fertility and productivity of the area. In hilly areas nala bunds and gully plugs at suitable site will be taken up from top to bottom.

(ii) Because of high pressure of grazing, selection of unsuitable species during old plantations and history of unsuccessful old plantations, only 20 ha area per year per coupe (Total 160 ha for the entire Division under this working circle) will be taken up for plantation. The concerned Assistant Conservator of Forests of the Division will select the area for such plantations. The method of planting and selection of species shall be decided by the A.C.F. & Dy Conservator of Forests after thorough inspection of the site and after consulting the local villagers and the local staff.

(ii) Existing natural regeneration will be tended properly and rooted stock will be redressed.

SECTION - 7 :- CHOICE OF SPECIES

3.7.1. The areas where there sufficient number of rooted stock is available, the tending operations will be carried out for improving the condition of the crop. However, in blank areas indigenous species for small

timber, firewood and fodder will be preferred. Teak up to 15% will be planted in areas suitable for teak, 5% indigenous edible fruit and flower yielding trees of local economic importance like Aonla, Charoli, Sitafal, Moha, Biba, Bel, Harra, Bahera. Ficus species will be planted at rate of two trees per ha. for wildlife. Species like Neem, Khair Maharukh, Sirus will be preferred. However the selection of species in general will be the discretion of the Dy. Conservator of Forest. Besides the local demand, the decision of government as well as orders issued in this regard should be considered while selecting the species to be planted.

SECTION - 8 :- FORMATION OF PLANTATION SERIES AND COUPES.

3.8.1 The Total allotted to this working circle is 18344.17 ha which is divided into 8 planting series and each has been divided 20 annual copes. The Details of which is given in **Appendix No. XLVII**. The sequence of working and allotment of compartment to annual copes has been given in **Appendix No. L & LV.**

SECTION - 9 :- IMPLEMENTING AGENCIES

3.9.1 All silvicultural operations including plantation and fire protection works will be carried out departmentally. Also in places where Forest Protection Committee are in existence, it should be implemented through them under the supervision of Dy. Conservator of Forests, Bramhapuri Forest Division.

SECTION – 10 :- DEMARCATION OF COUPE, PREPARATION OF TREATMENT MAP AND MARKING TECHNIQUE :-

3.10.1 DEMARCATION :- The main working coupes will be demarcated one year in advance of working :-

3.10.2. PREPARATION OF TREATMENT MAP :- Soon after Demarcation of the main working coupe a treatment map will be prepared, after thoroughly inspecting the area, by RFO and will be verified by the ACF.

3.10.3 Required tending operation will be carried out in these areas of this working circle in well stocked areas.

SECTION - 11 :- REGENERATION

3.11.1. The artificial regeneration mainly will be resorted in the areas selected for artificial regeneration. However, natural regeneration through coppice and seedlings will be treated as supplementary to artificial regeneration and will be properly tended.

SECTION – 12 :- ARTIFICIAL REGENERATION

3.12.1. 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.

SECTION - 13 :- OTHER REGULATIONS

3.13.1 FIRE PROTECTION :- Main working coupes will be rigidly fire protected for a period of five years from the year of main felling. The local Forest Protection Committee will be made responsible for this work. Fire tracing will be done for plantation areas.

3.13.2 GRAZING :- The areas will be closed for grazing for a period of five years from the year of planting. Raising of fodder grosses shall be undertaken in the fourth year of closure of each coupe and the seeds of fodder grasses shall be broadcasted to encourage the ground cover and to meet the local demand for fodder.

3.13.3 Local people shall be made aware of forest protection from fire, grazing and illicit felling and they will be involved actively in the afforestation and the protection works by forming village forest protection committees. Women shall be given due representation in this committees. The local staff shall be directed to pursue the local people and to explain them about the benefit of afforestation and importance of forest protection.

SECTION - 14 :- APPLICATION OF JFM

3.14.1 To implement the prescriptions of this working circle effectively, to achieve an excellent plantation & to regulate grazing, the participation and cooperation of local villagers are extremely necessary. It is therefore suggested that the areas where the prescriptions of this working circles are implemented, the JFM committees should be constituted in the concerned villages. JFM committees to be involved in effectively implementation of the prescription of this working circle. Also Forest Protection committees should be persuaded for protection of proper implementation and protection of such areas. The detail instructions as per the government orders about the application of JFM have been given in the chapter IX of Miscellaneous Regulation of this working plan which should be strictly followed.

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CHAPTER – IV

WORKING PLAN FOR IMPROVEMENT WORKING CIRCLE

SECTION – 1 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE

4.1.1. The following types of areas are proposed to be included in this working circle.

(i) The areas which were managed under Improvement Working Circle of Sri Kartar Singh.

(ii) The P.B. un-allotted areas which were managed under conversion Working Circle of Sri Kartar Singh's Plan.

(iii) The forests contained preponderance of malformed tree growth with less than 0.4 density and were subjected to unrestricted grazing and heavy biotic pressure.

4.1.2. These forests are surrounded by heavy population and, therefore, these areas are subjected to heavy biotic pressure.The areas are mostly open and understocked due to heavy biotic pressure. Mostly soil is lateritic which supports lesser vegetation.

4.1.3. This Working Circle includes a total area of 69082.04 ha. The Range-wise distribution of area under this Working Circle is given as under.

TABLE - 1

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Brahampuri	18777.45	58.52	16.03
2	Nagbhid	20945.65	66.25	17.88
3	Sindewahi	10155.66	58.44	8.67
4	Sawali	8421.77	44.32	7.19
5	Chimur	10781.51	63.10	9.20
	Total	69082.04	58.96	58.96

The statement showing the allotment of compartments to this working circle is given in the **Appendix No. XLIII, XLV, XLVI.**

SECTION - 2 :- GENERAL CHARACTER OF VEGETATION

4.2.1. Most of these areas are with inferior miscellaneous species of stunted growth. The forest is open, soil is shallow liable to erosion. The status of regeneration is poor. The density varies from 0.2 to 0.4. Site quality varies from IVA to IVB and at some place the site quality is III (P.B. unallotted areas of Sri Kartar Singh's plan). Regeneration of teak occur in patches and that of misc. species is scanty. There are areas which are very much degraded. The soil is generally well drained, sandy loam with patches of laterites. The growing stock is badly hacked at

places. There are multiple coppice shoots. The crop consisting of mainly garadi, ain, moha, aonla, salai, khair, bel, tendu, lendia, char with patches of bija, rohan, dhaoda, and teak appears in some patches over bettersoil.Hingan, bharati, lokhandi, dicamali,kharata appear as shrubs. Common climbers are chilati, yeroni, karangi.

SECTION – 3 :- SPECIAL OBJECT OF MANAGEMENT

4.3.1. 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, they 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 give silvicltural rest and to prepare the crop for management under SCI Working Circle in future. Thus the special objects of management of these forest are.

(i) To maintain and improve the vegetative cover, to improve the stocking, composition & condition of growing stock and to improve the existing malformed crop by appropriate tending operation.

(ii) To help natural regeneration of various species to establish and supplement the same by taking of afforestation works in under-stock area.

(iii) To get maximum sustained outturn of small sized timber and firewood which are in local demand for nistar as far as possible.

(iv) To convert the existing uneven aged crop containing large percentage of inferior species into an even aged teak forest.

(v) To obtain maximum sustained yield of teak timber of commercial value.

SECTION – 4 :- STOCK MAPPING

4.4.1. The Stock Maps have been prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle, Nagpur & will be supplied by the office of Conservator of Forest, Working Plan Circle, Nagpur.

4.4.2. ENUMERATION :- 1% strip sampling method was adopted for tree enumeration. The part enumeration works have been carried by the SOFR unit in the year 1996-97(completed in April 1997) and the remaining part of enumeration have been carried out in the year 2001-02 & 2002-03(completed in June 2002) by the office of Dy. Conservator of Forest, Working Plan Division No.1, Chandrapur with the help of field staff of Bramhapuri Division provided by Dy. Conservator of Forests, Bramhapuri Forest Division, Bramhapuri. The statement showing the number of stems per ha with distribution of stems among different species and girth classes has been given in **Appendix No. LXIV.**

SECTION – 5 :- SILVICULTUREL SYSTEM

4.5.1. Based upon the object of management and the general condition of the crop most suitable silvicultural system will be improvement felling cum overwood removal in patches. All damaged trees and climbers will be removed & coppice shoots will be reduced to one or two per stools. Inferior growth which interfere with the teak or misc. trees will be removed. Damaged and mal-formed polls will be cut back. A spacing of the plantation to be taken should be 1/3rd of the average height of adjoining trees. Soil and moisture conservation work will be taken up to increase the protective capacity of the soil. Teak will be planted in the overwood removal areas at a spacing of 2mx2m.

SECTION - 6 :- CHOICE OF SPECIES

4.6.1. Teak will be the principal species. The other major timber species will preferably be like Bija, Sisam, Ain, Haldu, Lendia, Movai, Garari. In blank areas indigenous species for a small timber, firewood and fodder should be taken to establish and supplement the natural regeneration.

SECTION – 7 :- BLOCKS AND COMPARTMENTS

4.7.1 The details of blocks and compartments allotted to this working circle are given in **Appendix No. XLIII, XLV, XLVI.**

SECTION – 8 :- FORMATION OF FELLING SERIES AND COUPES

4.8.1 The entire area of this working circle have been divided into 30 felling series. The Details of Which is given in **Appendix No. XLVII.** And each felling series has been divided into 20 Annual coupes. The sequence of working has been given in **Appendix No. XLIX.**

SECTION – 9 :- Felling Cycle

4.9.1 The felling cycle will be of 20 years.

SECTION – 10 :- Rotation

4.10.1 No rotation is fixed as the basic object of management is to improve the growing stock by tending of recruitment, thinning in the whole plantations, removal of dead and deceased trees and taking of plantations to improve the composition.

SECTION – 11 :- REGULATION OF YIELD

4.11.1 The yield will be regulated by area, however, fluctuations will be in the annual yield owing to irregular nature of crop. The crop is generally young to middle aged. The felling will be limited to improvement of the crop & and as per prescription of canopy removal under para no. 2.13.13 & 2.13.14 of the chapter on SCI working

circle. Therefore the yield will vary and consist of small wood, poles and firewood only. Hence no yield regulation is prescribed.

SECTION – 12 :- IMPLEMENTING AGENCIES

4.12.1. All silvicultural works like cleaning, thinning, weeding, soil and moisture conservation work, planting and fire protection work will be carried departmentally. The demarcation and marking of the coupes will be done departmentally. Felling and disposal of the forest produce shall be done departmentally. The small timber, poles and firewood will be made available to the local people on priority and the balance shall be sold in open auction departmentally. The areas allotted to this working circle can also be undertaken under Joint Forest Management as per guidelines issued by the State Government from time to time. But the overall supervision of the works shall be of the Forest Department.

SECTION - 13 :- DEMARCATION OF COUPES

4.13.1 The main working coupes will be demarcated one year in advance of the main felling.

4.13.2 PREPARATION OF TREATMENT MAPS :- After demarcation a treatment map of the area will be prepared by Range Forest Officer and it shall be verified by the A.C.F. after thorough inspection of the area. A broad treatment map will be generated through geomedia cell in the office of the Conservator of Forests, Working Plan, Nagpur showing different types of areas which will require more fine details. These details will be shown by the Range Forest Officer concerned and checked by the Asstt. Conservator of Forest. The maps will be basically of two types viz. management maps showing management details and stock maps. The treatment maps will show the following area.

4.13.3 TYPE – A : PROTECTION AREAS :- This will include the following areas:

(i) The area having steep slopes i.e. more than 25 degree slope areas.

(ii) Eroded or liable for erosion.

(iii) 30 meter wide strip on either side of water courses.

(iv) Riperian Zones.

(v) Sacred groves.

In these areas no trees will be marked for felling.

4.13.4 TYPE – B :- UNDERSTOCKED AREAS :- The forests having less than 0.4 density are included in this category. In these areas the marking shall be done in the following manner: In these areas marking shall be done in the following manner.

(i) All dead trees will be marked living two per ha.

(ii) All live high stumps.

(iii) Areas upto 10 ha having density below 0.40 & suitable for teak and other economically important species plantation will be selected by concerned Assistant Conservator of Forests of the Division.

(iv) Rooted stock will be tended.

4.13.5 TYPE C Areas :- GROUPS OF YOUNG POLES

4.13.6. Thinning will be carried out to upto the extent of the one third of the top height of the dominant pole intended to be retained.

4.13.7 TYPE D Areas :- Well Stocked Area :- Areas with crop density above 0.4 are included in this category. These areas have been further divided into two sub groups.

2.13.8 Type D1 Areas :- These are the areas having deep and well drained soil with the site quality IVa or above.

2.13.9 Type D2 Areas :- Remaining well stocked areas.

SECTION - 14 :- MARKING RULES AND TREATMENT

4.14.1. Marking will be done in the same year in which demarcation will be done. Soon after the receipt of approved treatment map, marking will be done.

4.14.2. The marking rules for each type of area will be as under.

4.14.3 TYPE A Areas :- PROTECTION AREA :- No marking will be done. The area will be sown with seeds of neem, maharukh, khair Sitafal etc. The area with moderate soil depth will be stump planted with neem, shivan & sisso etc.

4.14.4 TYPE B Areas :- UNDERSTOCKED AREA :- All edible fruit and flower yielding trees will be reserved from felling. The following trees will be marked for felling:

(i) All dead and malformed trees after retaining two dead trees/ha.

(i) All but one vigorously growing coppice shoot per stool.

(iii) All live high stumps.

(iv) Suitable area with good soil depth upto the extent of 10 ha per coupe, if available will be planted with various suitable species for the local soil & climatic conditions. Total 1100 plants will be planted in pits.

4.14.5 TYPE C Areas :- GROUPS OF YOUNG POLES.

4.14.6 The group of young pole will be spaced to the extent of one third of the top height of the dominant tree intended to be preserved as a future crop. In the natural young crop thinning marking will be done on the

basis of weighted average gbh and site quality with the help of yield table or normal stand table as described in Teak Plantation Working Circle of this plan.

4.14.7 Well Stocked Areas :- Type D1 Areas :- The areas have been selected for canopy removal. Canopy will be removed subjected to the following condition and will be planted with teak at a spacing of 2 m. x 2 m. The selection of ideal sites for the teak plantation has been left for the field staff. Following conditions will be adhered to while marking in such areas.

a) All young to middle aged fruit bearing trees up to 20 trees/ha should be retained.

b) Young to middle aged trees of Semal, Khair, Rosewood and other superior miscellaneous species up to 20 trees/ha uniformly spread over the area should be retained.

c) No felling will be done on either side of Nalla, Stream and River beds up to 30 m.

d) The section size at a place will not exceed 20 ha.

e) A 20 m. strip of natural forests will be retained on all sides of the section.

f) The plantation will be fire protected.

g) Superior planting stock will be planted.

4.14.8 Type D2 Areas :- All edible fruit and flower yielding trees of moha, char, tendu, aonla, chinch, sitafal, harra, bel and trees of Kulu will be reserved from felling. All trees above selection girth and approach class will be enumerated, before marking, in 15 cms girth classes. The following trees will be marked for felling:-

(i) The percentage of selection trees to be marked for felling for various species groups has been worked out in regulation of yield. Fifty percent of the trees above exploitable girth will be marked for felling. Marking will start from the highest girth class trees and trees of less importance as described earlier.

(ii) All dead and malformed trees, after retaining 2 trees/ha will be marked for felling. A tree will be treated as malformed if it does not have a clean bole upto at least 2 m above the breast height.

(iii) All live high stumps will be marked for felling.

(iv) All but one vigorously growing coppice shoots per stool where the density is less will be retained.

(v) No sound tree will be removed unless it is sillviculturally available.

(vi) 50 % trees above selection girth shall be retained and uniformly spread over the whole area of the coupe. It will start from highest girth class and trees of less importance. Besides these principles the marking shall be done only when the trees are available silviculturally.

SECTION – 15 :- SUBSIDIARY SILVICULTURAL OPERATIONS

(A) CUTTING BACK OPERATIONS :-

4.15.1 The following operations will be carried out in the next year of the main felling in the D type area.

(i) All badly damaged trees not likely to recover will be cut.

(ii) All live high stumps marked for felling but not felled will be felled.

(iii) All climbers will be cut except the endangered & threatened species.

(iv) All coppice shoots where natural regeneration is adequate, will be cut.

(v) All malformed regeneration upto 15 cm g.b.h. will be cut.

(B) CLEANING :-

4.15.2. Cleaning operations will be carried out in the Sixth year of the main felling in D type areas.

(i) All climbers will be cut except the endangered & threatened species.

(ii) Coppice shoots will be reduced to one or two per stool.

(iii) Inferior growth which may interfere with the teak or miscellaneous species will be removed.

(iv) Damaged and malformed poles will be cut back.

(C) THINNING :-

4.15.3. First thinning will be carried out in the 10th year of formation and will be mechanical thinning. At the time of revision of the plan, these planted areas will be included in old teak plantation working circle and managed accordingly.

The sequence of subsidiary silvicultural operations has been given in **Appendix No. LII.**

4.15.4. The coupes worked during the operation of this plan will come for thinning after the expiry of this plan period. So thinning during the operation of this plan will be limited to areas worked during the previous plan.

SECTION – 16 :- OTHER REGULATIONS

4.16.1. FIRE PROTECTION :- Main felling coupes shall be fire traced and rigidly fire protected for a period of five years from the year of planting. The areas of plantation inside the coupe shall also be fire traced separately and rigidly fire protected for a period of five years from the year of planting. Young growth badly damaged by fires shall be cut back immediately after fires.

4.16.2. CLOSURE TO GRAZING :- A special attention should be given to check grazing. The main felling coupes shall remain close to grazing for a period of five years from the year of planting.The closed coupes will be specifically mentioned in the grazing license and the villagers will be made aware about them regularly. While taking up plantations in the understocked areas palatable fodder grasses like sheda and paonea will be seed sown so that at the end of five years when the coupe will be opened for grazing the villagers will have enough fodder for the their cattle on rotational harvest basis from such coupes.

4.16.3. Participation :- The local people shall be made aware of the importance of protection to the forests from fire, illicit grazing, illicit cutting and encroachment. Participation of local people shall be encouraged in protection and afforestation of forests. For this purpose, regular camps shall be arranged to explain the people about the importance and benefit of regeneration and protection of forests. Village forest protection committees shall be formed and a comprehensive forest protection scheme shall be undertaken.

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CHAPTER V

WORKING PLAN FOR THE FODDER MANAGEMENT WORKING CIRCLE

SECTION - 1:- GENERAL CONSTITUTION OF THE WORKING CIRCLE

5.1.1 This Working Circle comprises of such denuded, useless stocked scrub forests which are located along areas adjacent to villages & producing milk. The vegetation includes shrubby growth with sporadic occurrences of trees in stunted form. The special object of management will be to cater to the fodder requirements of pedigree milk cattle in the main milk producing tracts of the division. The forests which are not capable of producing timber or firewood to any appreciable extent and where demand for grazing is acute are included in this working Circle. The areas included in this working circle are conveniently located adjoining the villages and can easily meet the local demands for the fodder.

5.1.2 There is great demand of fodder grass in the adjoining villages situated near intensively cultivated areas and in towns in Bramhapuri Forest Division. Because of that some areas have been selected for the production of fodder grass which will be cut and extracted. These grass reserves are known as grass birs and are located near the metal road so that the transport of grass in rainy season may be possible and will serve Mul, Rajoli, Sindewahi,Saoli, Vehad and Talodhi towns and surrounding villages.

5.1.3 Total area allotted to this working Circle is 18779.13 ha. On the basis of demand of fodder of the local population & from the adjoining villages and towns, this working circle have been divided into two working circles as under

TABLE - I

S.N.	Working Circle	Area Alloted (in ha)
1	Pasture Working Circle	9477.83
2	Kuran Working Circle	9301.30
	Total	18779.13

A. WORKING PLAN FOR THE PASTURE WORKING CIRCLE :-

SECTION – 2 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE :-

5.2.1 The areas included in this working circle are conveniently located adjoining the villages and can easily meet the local demands for the fodder. The following types of areas scattered have been included in this working circle: -

I. All such denuded, useless stocked scrub forests which are located along areas adjacent to villages & producing milk.

II. Some of the compartments covered under Kuran Working Circle of Sri Kartar Singh's Plan.

III. Some compartments covered under C.W.R. Working Circle of Sri Kartar Singh's plan.

IV. All the compartments of new reserve forests, protected forests & Zudpi jungles devoid of vegetations and severely eroded areas under Improvement Working Circle of Sri Kartar Singh's Plan.

5.2.2 The areas included in this working circle are scattered & total area at a particular place is more than 100 ha. The distribution of areas in various Ranges are as under.

TABLE – II

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Bramhapuri	2340.98	7.30	2.00
2	Nagbhid	2593.63	8.20	2.21
3	Sindewahi	2330.46	13.41	1.99
4	Sawali	2212.76	11.64	1.89
	Total	9477.83		

The statement showing the allotment of compartments to this working circle is given in the **Appendix No. XLIII, XLV, XLVI.**

SECTION – 3 :- GENERAL CHARACTER OF THE VEGETATION

5.3.1 The areas included in this working circles belong to site quality IVb & are mostly devoid of any appreciable tree growth or sparsely wooded with ain, lendia, tendu, rohan, achar, dhaora & bija etc. The vegetation is of low quality and contains mostly miscellaneous species of varying composition. The principal species are ain, moyan, lendia, tendu, rohan,achar, dhaora, bija and occasional patches of teat. Hingan, bharati, lokhandi, dikanali, kharata and jilbili appear as shrubs. Bhurbhusi (Andropogon pumilus), ghonal, (Anthistiria ciliata), kusul (Andropogon contertus), mushan (Lesilema laxum), paonia (Lschasmum suleatum), phukis (Andropogon serratus), polki (Acluda varia) etc. are the grasses coming up in the open patches.Good fodder grasses like paonia, marvel, sheda and mushan are rare.

5.3.2 The areas, which are in the immediate vicinity of human habitations, are under tremendous biotic pressure. Some areas have been encroached upon for cultivation. Due to heavy biotic interference like grazing and illicit cutting for firewood, 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 of soil and erosion. Due to this many patches have become almost blank. The rate of natural regeneration is poor. In some patches very good miscellaneous crop of

0.20 to 0.40 density is noticed. Common species found are bhirra, dhawada, saja, ain, tinsa, tiwas, lendia, mowai, palas, tendu, bija etc.

SECTION – 4 :- SPECIAL OBJECTS OF MANAGEMENT

5.4.1 Special objects of management of this working circle will be as follows :-

(i) To improve the quality and quantity of fodder grasses by introducing the better varieties of fodder grass tree species suitable for the locality.

(ii) To meet the local demand for fodder and to reduce the heavy grazing pressure on the forests.

(iii) To augment the production of fodder grass.

(iv) 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 – 5 :- BLOCKS AND COMPARTMENTS

5.5.1 This working circle includes Reserved Forests Protected Forests and Zudpi Jungle. The details of blocks and compartments allotted to this working circle are given **Appendix No. XLIII, XLV, XLVI & LVI.**

SECTION - 6 :- WORKING SERIES AND FORMATION OF COUPES.

5.6.1 The entire area allotted to this working circle has been constituted into four working series of twenty annual coupes each. Part area of each coupe will be taken up for a special improvement operation every year.

SECTION - 7 :- METHOD OF TREATMENT

5.7.1 The main object of management of forest areas in this working circle will be provide grazing to maximum possible extent, consistent with preservation and improvement of pasture. Limitation of incidence of grazing and grazing closure to enable seeding and establishment of grasses is of paramount importance for the maintenance and improvement of the grazing grounds.

5.7.2 The following shall be the major method of treatment in this working circle.

I. All obnoxious weeds and thorny shrubs & bushes shall be uprooted. The unpalatable grasses such as Kushal, Bhurbhusi etc. shall also be eradicated in the pre flowering stage only.

II. 10 % area of the coupe will be ploughed and grass seeds of suitable species will be broadcasted on it and it will be then closed to grazing for three years.

III. All existing trees shall be retained.

IV. The area under treatment will be effectively fire-traced every year. Controlled grazing will only be allowed after 31st October to 31st May from the 4th year onwards.

SECTION – 8 :- CHOICE OF SPECIES :-

5.8.1 Seed broadcasting and tussock planting of superior fodder grasseslike paunya (Isccoemum sulcatum), marvel (Andropogan annulatus), sheda (Isccoemum laxmum) etc. shall be taken up.

SECTION – 9 :- IMPLEMENTING AGENCY

5.9.1 All prescription under this working circle shall be carried out departmentally. Also in places where Forest Protection Committee are in existence, it should be implemented through them under the supervision of Dy. Conservator of Forests, Bramhapuri Forest Division.

SECTION - 10 :- GRAZING REGULATION

5.10.1 ROTATIONAL GRAZING :- Grazing Regulation will be adopted on the basis of rotational grazing principle. It will be not be feasible to close the whole area of this working circle during the monsoon when grazing is most needed. On the basis of past experience and knowledge it is clear that the most practical and beneficial method of grazing would be to divide all the compartments of each coupe into three sections (A,B & C) and close one section for grazing for three years. The remaining two section will remain open for grazing. This will enable the cattle to graze in the two section through out the year. The sections laid out so as to cause the least inconvenience in respect of access to the open areas. The Grazing will be according to grazing settlement report. The territorial staff will have the sole responsibility to implement the prescriptions in most effective manner.

5.10.2 Almost all the areas of this working Circle are subjected to heavy grazing pressure and restriction of grazing incidence to 2 acres per cow unit although very desirable is not possible in practice as a large no of cattle will have to be excluded.

SECTION - 11 :- OTHER REGULATIONS :-

5.11.1 During the monsoon i.e. Ist July to 31st October, extraction of grass from the closed area will be prohibited. Experimental cutting may be permitted under the orders of the Conservator of Forests in limited areas.

5.11.2 In order to enforce the monsoon closures, the staff may be deployed in such areas & no posts should remain vacant in respect of such areas of this working circles.

5.11.3 Frequent inspection will be carried out with a view to ascertain the results of closure. The observation should be specially recorded in the annual report.

5.11.4 Main working coupes shall be fire traced every year and will remain closed to grazing.

SECTION - 12 :- APPLICATION OF JFM

5.12.1 To make rotation grazing successful & to implement the prescriptions of this working circle effectively, the participation and cooperation of local villagers are extremely necessary. It is therefore suggested that the areas where rotational grazing have been proposed, the JFM committees should be constituted in the concerned villages. JFM committees to be involved in effectively implementation of the prescription of this working circle. Also Forest Protection committees should be **persuaded** for protection of proper implementation and protection of such areas. The detail instructions as per the government orders about the application of JFM have been given in the chapter IX of Miscellaneous Regulation of this working plan which should be strictly followed.

B. WORKING PLAN FOR KURAN WORKING CIRCLE

SECTION – 13 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE

5.13.1 There is great demand of fodder grass in the adjoining villages situated near intensively cultivated areas and in towns in Bramhapuri Forest Division. Because of that some areas have been selected for the production of fodder grass which will be cut and extracted. These grass reserves are known as grass birs and are located near the metal road so that the transport of grass in rainy season may be possible and will serve Mul, Rajoli, Sindewahi,Saoli,Vehad and Talodhi towns and surrounding villages.The areas included in this working circle is 9301.03 ha.

5.13.2 Grass birs are to be formed in areas or adjoining areas where acute demand for fodder grasses existed such as Mul, Rojoli, Gadchiroli, Armori, Vyahad and a large number of other villages. These grass birs will remain permanently closed to grazing and are to meet the demand for the supply of fodder grass to stall feed the cattle.

5.13.3 The following types of areas have been included in this working circle : -

I. All such denuded, useless stocked scrub forests which are located along areas adjacent to villages & producing milk.

II. Some of the compartments covered under Kuran Working Circle of Sri Kartar Singh's Plan.

III. Some compartments covered under C.W.R. Working Circle of Sri Kartar Singh's plan.

IV. All the compartments of new reserve forests, protected forests & Zudpi jungles devoid of vegetations and severely eroded areas under Improvement Working Circle of Sri Kartar Singh's Plan.

5.13.4 The areas included in this working circle are scattered & total area at a particular place is less than 100 ha. The distribution of areas in various Ranges are as under.

TABLE – III

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Bramhapuri	2287.94	7.13	1.95
2	Nagbhid	2733.80	8.65	2.33
3	Sawali	2131.61	11.22	1.82
4	Chimur	2147.95	12.57	1.83
	Total	9301.30		

The statement showing the allotment of compartments to this working circle is given in the **Appendix No. XLIII, XLV, XLVI.**

SECTION – 14 :- GENERAL CHARACTER OF THE VEGETATION

5.14.1 Being s
ituated in the immediate vicinity of human habitations, these areas are under tremendous biotic pressure. The vegetation is of low quality and contains mostly miscellaneous species of varying composition. The areas included in this working circles belong to site quality IVb & are mostly devoid of any appreciable tree growth or sparsely wooded with ain, lendia, tendu, rohan, achar, dhaora & bija etc. The vegetation is of low quality and contains mostly miscellaneous species of varying composition. The principal species are ain, moyan, lendia, tendu, rohan,achar, dhaora, bija and occasional patches of teat. Hingan, bharati, lokhandi, dikanali, kharata and jilbili appear as shrubs. Bhurbhusi (Andropogon pumilus), ghonal, (Anthistiria ciliata), kusul (Andropogon contertus), mushan (Lesilema laxum), paonia (Lschasmum suleatum), phukis (Andropogon serratus), polki (Acluda varia) etc. are the grasses coming up in the open patches.Good fodder grasses like paonia, marvel, sheda and mushan are rare.

5.14.2 The areas, which are in the immediate vicinity of human habitations, are under tremendous biotic pressure. Some areas have been encroached upon for cultivation. Due to heavy biotic interference like grazing and illicit cutting for firewood, 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 of soil and erosion. Due to this many patches have become almost blank. The rate of natural regeneration is poor. In some patches very good miscellaneous crop of

0.20 to 0.40 density is noticed. Common species found are bhirra, dhawada, saja, ain, tinsa, tiwas, lendia, mowai, palas, tendu, bija etc.

SECTION – 15 :- SPECIAL OBJECTS OF MANAGEMENT

5.15.1 Special objects of management of these areas will be as follows :-

(i) To improve the quality of fodder grasses by introducing the better varieties of fodder grass suitable foe the locality.

(ii) To augment the production of fodder grass.

(iii) To protect areas vulnerable to soil erosion by maintaining adequate soil cover.

SECTION – 16 :- BLOCKS AND COMPARTMENTS

5.16.1 This working circle includes Reserved Forests Protected Forests, Zudpi Jungle, big tree forests and B Class forests in 4 villages. The details of blocks and compartments allotted to this working circle are given **Appendix No. XLIII, XLV, XLVI & LVII.**

SECTION - 17 :- FORMATION OF WORKING SERIES AND COUPES.

5.17.1 The entire area allotted to this working circle has been constituted into four working series of twenty annual coupes each. Every coupe will be taken up for a special improvement operation every year.

SECTION – 18 :- METHOD OF TREATMENT :-

5.18.1 The areas selected will be developed as Kurans (Grass Reserves) and will be closed to grazing. No felling have been prescribed in this working circle.

5.18.2 Every Coupe will be taken up for a special improvement operation every year. The coupe will be demarcated. There after the coupe will be thoroughly inspected by Range Forest Officer and a treatment map will be prepared showing the following areas.

(i) Areas suitable for introducing better fodder grasses:- Well drained plain to gentle slopping areas with at least 15 cm depth of soil and not less than 2 ha at one place will be selected. Total extent of such area will be about 10 % of the coupe area.

(ii) Protection and Unworkable Areas :- These will include nalla banks and eroded areas.

5.18.3 Treatment :-

First Year Operation :- Type (i) Areas.

(i) 10 % area selected for improvement will thoroughly ploughed and clods will be broken.

(ii) Seeds of Sheda, Paonia, Mushan or Marvel will be broadcasted just before monsoon.

(iii) The nalla bunding and gully plugging will be carried out wherever necessary.

(iv) All weeds will be uprooted from the intervening strips.

(v) No grass from the treated areas will be cut in the year of treatment, however in the following year it will be allowed to cut.

Type (ii) Areas :- No working is prescribed except for protecting the area from grazing.

SECTION - 19 :- IMPLEMENTING AGENCIES

5.19.1 All silvicultural operations including plantation and fire protection works will be carried out departmentally. Also in places where Forest Protection Committee are in existence, it should be implemented through them under the supervision of Dy. Conservator of Forests, Bramhapuri Forest Division.

SECTION - 20 :- OTHER REGULATIONS :-

5.20.1 During the monsoon i.e. Ist July to 31st October, extraction of grass from the closed area will be prohibited. Experimental cutting may be permitted under the orders of the Conservator of Forests in limited areas.

5.20.2 In order to enforce the monsoon closures, the staff may be deployed in such areas & no posts should remain vacant in respect of such areas of this working circle.

5.20.3 Frequent inspection will be carried out with a view to ascertain the results of closure. The observation should be specially recorded in the annual report.

5.20.4 Main working coupes shall be fire traced every year and will remain closed to grazing.

SECTION - 21 :- APPLICATION OF JFM

5.21.1 To implement the prescriptions of this working circle effectively, to achieve excellent grass birs & to regulate grazing, the participation and cooperation of local villagers are extremely necessary. It is therefore suggested that the areas where the prescriptions of this working circles are implemented, the JFM committees should be constituted in the concerned villages. JFM committees to be involved in effectively implementation of the prescription of this working circle. Also Forest Protection committees should be persuaded for protection of proper implementation and protection of such areas. The detail instructions as per the government orders about the application of JFM have been given in the chapter IX of Miscellaneous Regulation of this working plan which should be strictly followed.

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CHAPTER – VI

WORKING PLAN FOR THE OLD TEAK PLANTATION WORKING CIRCLE.

SECTION - 1 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE

6.1.1 The teak plantation taken up in the previous working plans as per the prescription contained in them have been included in this working circle. The areas are gently undulating and the soil is well drained, flat alluvial and free from water logging. This working circles includes the PBI areas of Teak conversion working circle, and Improvement working circles of Shri Kartar Singh's working plan. This working circle also includes all teak plantation which have been taken in the previous working plans beginning from 1957 to 1992. The total area allotted to this working circle is 1219.81 ha. The area of this working circle is not in consolidated patch, rather in scattered patches spread over entire division. This Working Circle has been created to provide better managerial attention to otherwise neglected teak plantation. The Range-wise distribution of the area allotted to this working circle is given in following table.

TABLE

S.N.	Name of The Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Bramhapuri	804.90	2.51	0.69
2	Sindewahi	302.91	1.74	0.26
3	Chimur	112.00	0.66	0.10
	Total	1219.81	1.04	1.04

SECTION - 2 :- GENERAL CHARACTER OF THE VEGETATION :-

6.2.1 The plantations are mostly successful and conform with the stand table. The site quality varies from III to IVa and the crop density is 0.5 to 0.70. The natural regeneration of teak and other miscellaneous species is scanty and the crop is young to middle aged. The area is fully stocked. Due to non-observance of the subsequent silvicultural operations after planting, the proportion of miscellaneous species in the plantation are fairly high. Therefore, the growth parameters expected as per yield table is not found in general. Plantation areas where thinning and other silvicultural operations were expected as per the prescription of the previous working plans could not be carried out because of expiry of the previous plan as well as the delay in revision of the previous working plan in due time. Plantation areas where thinning and other silvicultural operations were carried out in the past, the expected growth parameters are found close to those of yield table. The plantations raised on sandy loam soils on well-drained clayey loam soil with high exchangeable calcium are doing very well. The plantations raised either on clayey soils or red soils and those close to habitat have not done well. No attempt in the past has been done to reboise them.

SECTION - 3 :- BLOCKS AND COMPARTMENTS :-

6.3.1 The details of blocks and compartments allotted to this working circle are given **Appendix No. XLIII, XLV, XLVI.**

SECTION - 4 :- SPECIAL OBJECTS OF MANAGEMENT:-

6.4.1 The main objective of teak plantation 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 previous working plan after taking plantations. But this could not be observed meticulously mainly due to paucity of funds, which resulted in poor growth than expected. The proportion of miscellaneous species has increased beyond limit. Therefore, to achieve the goal of the plantations to the greatest extent, the objectives of management are as follows.

I. To carry out thinning as per the yield table on the basis of age and site quality.

II. To improve the crop by carrying out required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.

III. To cover thinning in all overdue plantations in the shortest possible time and to ensure thinning & other silvicultural operation in other plantations when they are due.

IV. To convert the existing uneven aged crop containing large percentage of inferior species into an even aged teak forest.

V. To obtain maximum sustained yield of teak timber of commercial value.

VI. Consistent with the above to utilize the maximum production capacity of forest.

SECTION - 5 :- SILVICULTURAL SYSTEM.

6.5.1 Consistent with the objects of the management of this working circle the silvicultural system shall be thinning in plantation areas in the 10th year, 15th year of the formation of the plantation and thereafter on a 10 years cycle. This will help to improve the crop by carrying out required silvicultural operations so as to achieve growth parameters comparable to those in the yield table. The first thinning will be mechanical. During first mechanical thinning trees in one pole from a cluster of three trees in a diagonal will be removed. At this stage, since the crown differentiation is not there, thinning will be purely mechanical. The subsequent thinning will be silvicultural, largely C grade as crown differentiation by that time has started.B grade thinning will be done in the unattended plantation.

SECTION - 6 :- FELLING CYCLE :-

6.6.1 Thinning in the plantation will depend upon the age of past plantation.

SECTION - 7 :- IMPLEMENTING AGENCY :-

6.7.1 All silvicultural operations will be carried out exclusively by the department under the strict supervision of the Conservator of Forest and Dy. Conservator of Forests.

SECTION - 8 :- FORMATION OF FELLING SERIES AND COUPES :-

6.8.1 This working circle has been divided into one felling series and ten annual coupes for carrying out thinning in the old teak plantation. The compartments allotted to this felling series and their sequence of working is given in the **Appendix No. LVIII.** In the teak plantation areas the silvicultural operations shall be done and the sequence of thinning is given in **Appendix No. LVIII.**

SECTION – 9 :- REGULATION OF YIELD :-

6.9.1 Yield shall be regulated at the basis of area, though the annual coupes will be equal in extent, the annual yield is bound to vary because of irregular nature of crop. No regular is prescribed due to nature of this working circle.

SECTION – 10 :- ANALYSIS AND VALUATION OF THE CROP :-

6.10.1 STOCK MAPS :- The Stock Maps have been prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle, Nagpur & will be supplied by the office of Conservator of Forest, Working Plan Circle, Nagpur.

6.10.2 DENSITY :- Generally the crop is fully stocked.

6.10.3 AGE AND QUALITY :- Plantations taken right from 1957 to 1992 are included in this working circle. The site quality varies from III to IVa.

SECTION - 11 SILVICULTURE OF TEAK :-

6.11.1 Teak (Tectona grandis Linn.f.) belongs to the family Verbenaceae and is mostly distributed in the Peninsular and Southern parts of India. The first teak plantations were raised in 1840 in the state of Kerala popularly known as Conolly's teak plantations. The tree is a pronounced light demander, it does not tolerate suppression at any stage of its life and requires complete overhead light as well as fair amount of side room for its proper development. The leading shoot is intolerant of irritation of any sort. There seems to be certain relationship between light and growth, branching and flowering of teak. Single tree or trees bordering the plantations produce profuse branching. In close stands, flowering occurs only in dominant and co-dominant trees, and is confined to the upper parts which are exposed to bright sunlight; the trees do not produce inflorescence on the lower parts which are inaccessible to sunlight. Curtailment of light results in the delay of not only the initiation of flower-buds, but also their development into fruits. Seedlings require an intensity of light to the tune of over 90 per cent. Saplings are often found growing

under the light shade of bamboos, and even to some extent under other trees, but the growth of such plants is generally found to be slower than of the plants with complete freedom overhead. Saplings growing under bamboos endeavour to make their way through are often found to have their leading shoots damaged or killed, since bamboo acts as a 'whip', thus the leading shoot of the teak is very intolerant of irritation of any kind.

6.11.2 The tree is capable of thriving on variety of soils and geological formations, but requires good sub-soil drainage. It does best in trap soil. The teak produces a large superficial root-systems. At first a long thick tap root is formed. This may persist or may disappear, but in either case strong lateral roots are produced. Teak is sensitive to frost, seedling and coppice-shoots being particularly liable to injury. In its natural habitat, severe frost seldom occurs, poles being killed at the top or down to ground-level; experiments carried out for five years subsequently showed that trees badly damaged by frost were capable, when coppiced, of producing vigorous stool-shoos. Teak is also sensitive to drought. In the abnormal droughts which occurred from time to time in the Peninsula it suffered more severely than any other species.

6.11.3 Teak coppices and pollards vigorously, and sometimes retains the power of coppicing to a considerable size.All the coppice shoots originated in one of two ways – (1) callus growth developed inside the bark and situated between the bark and the wood at the edge of the cut surface, or (2) from the side of the stool below the cut surface, the shoots appearing through the bark. The former, which may be termed as 'callus shoots' are of adventitious origin, while the latter, which may be termed 'side shoots', appear to arise from dormant buds. High coppicing appears to prevent the formation of callus shoots owing to the rapid drying and shrinking of the wood at the cut surface, causing separation from the bark; also that, subject to further confirmation, present evidence seems to show that it is the best to coppice teak low shortly before the commencement of vegetative activity, when as little of the dry season as possible remains, or if felling must be done in the season of rest, high felling may be preferably, so that the base of the stump will still remain alive if the upper part dies.

SECTION - 12 DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAPS AND MARKING TECHNIQUES.

(i) Demarcation :-

6.12.1 The main annual thinning coupes shall be demarcated one year in advance along with other coupes due for cleaning and thinning.

(ii) Preparation of treatment map :-

6.12.2 The treatment map will include demarcation of area suitable for thinning as well as the areas unsuitable for it. The concerned Range Forest Officer shall prepare the treatment maps & concerned Assistant Conservator of Forests will verify the same.

6.12.3 Marking Techniques :-

6.12.4 The standard marking techniques which have been prescribed in the Chapter on Miscellaneous regulations shall be followed and adopted.

SECTION - 13 :- SUBSIDIARY SILVICULTURAL OPERATIONS :-

6. 13.1 These operations shall be carried out departmentally and shall include the following.

6.13.2 Cutting back operations :- These operations will be carried out departmentally in the year following the year of first mechanical thinning. The operations consists of the following:-

I. Climbers cutting over whole area of the coupe except the endangered & threatened species.

II. Felling all badly damaged or broken trees.

III. Cutting back of malformed advance growth of teak.

IV. Cutting back of valuable growth damaged during the felling.

V. Freeing young growth of teak and other valuable species from interference of bamboos and other inferior species.

VI. All stools will be cleared of felling debris.

VII. In eroded areas and areas liable to erosion, gullies and small nallas will be plugged with nearby debris or stones to check washing away of the soil and deepening and widening of the gullies and nallas.

6.13.3 Cleaning :- A cleaning operation will be carried out in the 5th year commencing from the year of first mechanical thinning.

I. All climbers will be cut over the whole are of the coupe, if necessary except the endangered & threatened species.

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 2.50 meter depending on the height growth.

VI. In plantations of teak, weed growth may be cleared within a radius of 1 m from each surviving plant and intensive soil mulching carried out immediately after the rainy season is over.

6.13.4 Thinning :- Thinning in plantation areas will be carried out at 10th year, 15th year and thereafter on a 10 years cycle. The first thinning will be mechanical. During first mechanical thinning trees, one tree from a triangle line will be removed. The subsequent thinnings will be silvicultural aiming at the spacing in congested crop according to the yield table. A ten year cycle has been prescribed to silviculturally prune the branches.

6.13.5 Thinning in teak plantation :- Teak is most widely planted species, mainly due to its ever increasing economic value. The species is very versatile in its presence, starting from Western Aravallis to East of Mahanadi and in practically all along the Indian Peninsula and occasionally pure in composition, mainly due to pre-climax attended due to edaphic or biotic conditions. It finds easy to establish in many adverse conditions, though the growth is lesser. It thrives the best in well drained sandy loam soil and clayey loam soil, with high exchangeable Calcium ions (Ca++) and good aeration and low Carbon/Nitrogen (C/N) ratio preferably less than 20. It fails miserably in clayey soil and fairs badly in lateritic soil. Due to its long growing period varying from February to November, it thrives well in the soil with high water holding capacity. The nursery technique and art and science of raising teak plantation has been standardized for almost a century.

6.13.6 Mechanical thinning :- Teak is traditionally planted at a spacing of 2m x 2m 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:-

TABLE

Year	No./ha. (for site quality –III)	Spacement
1st Year	2500	2m x 2m
5th year	1767(after 1st Mechanical thinning of removing alternate digonal)	2 x 2√2 m
10th year	1250(after 2nd Mechanical thinning of removing alternate digonal)	2√2 x 2√2 m

6.13.7 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.

6.13.8 Procedure for Mechanical thinning :- 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 poll shall 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 provide the growth stimulation. 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. In unattended old plantation, B grade thinning will be done. A thinning cycle of 10 years have been prescribed to provide a clean bole of the plant.

6.13.9 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 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 a 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.

6.13.10 Removal :- The average diameter of the crop should be calculated, by taking all trees in plot (5 chain x 2 chain). At the time of removal, the maximum number of removal should be from the trees below this average girth. All suppressed, 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. Trees/poles and 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.

SECTION - 14 :- METHOD OF EXECUTING THINNING.

6.14.1 Cleaning of the area will be carried out before marking for thinning. Thereafter, the following operation will be carried out.

I. The number of stems per ha and their distribution among different girth/diameter classes will be obtained by sampling.

II. The age and site quality will be decided. Site quality is measured in terms of average height of dominant trees in the plantations.

III. Corresponding to age and site quality the number of stems per ha and their distribution girth/diameter classes will be obtained from the yield table, which is given in the **Appendix No. XXXVIII.** Comparing the actual stand table with that obtained from the yield table, the number of stems to be retained in each diameter class will be obtained.

IV. To carry out thinning work, sample plot of 50m X 50m size for every 5 ha area will be taken in which thinning will be done in presence of an officer not below the rank of Range Forest Officer. After marking and before felling, basal area per ha should be obtained by using a wedge prism of power 0.50 or 1.00 excluding trees already marked for felling. The comparison of it with that of yield table value, the correctness of thinning marking will be checked. As per the sample marking, marking for thinning will be done in whole plantation area. Again using the wedge prism the correctness of thinning marking will be done as above. The number of retention per ha will be calculated from average basal area.

V. The detail enumeration and marking list will be prepared and the same will be kept in record.

VI. At an interval of 5 years, the measurement of diameter and height will be recorded. Yield from thinning should also be recorded.

VII. Coppice shoots will be cut unless they do not create permanent gap. Climbers will be cut except the endangered & threatened species. Dead & deadly damaged trees will be removed.

SECTION – 15 :- OTHER REGULATIONS

6.15.1. PROTECTION :- The success of the prescriptions of this working circle will depend upon the protection of all areas from fire and control on grazing. The vulnerable areas will be protected from illicit cutting also.

6.15.2. FIRE PROTECTION :- Special attention is needed to control the fire. The main working coupes will be rigidly fire protected for a period of five years from the year of working. Local villagers will have to be taken into confidence to ensure success. The details of fire protection schemes are given in miscellaneous regulations

6.15.3. CLOSURE TO GRAZING :- The current coupes will remain closed to grazing for a period of five years from the year of working. The local people will be persuaded to graze their cattle in areas other than closed areas. For cooperation extended by them in protecting the 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 a better understanding with them. The closed coupes will specifically be mentioned in the grazing licence and the villagers will be made aware about them by regular drum beating in the villages.

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CHAPTER VII

WORKING PLAN FOR NON-TIMBER FOREST PRODUCE

(OVERLAPPING) WORKING CIRCLE

SECTION - 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 117173.83 ha. The non-timber forest produce includes both non timber forest produce (NTFP) and also the medicinal plants found in this tract.

SECTION – 2 MINOR FOREST PRODUCE OF THE TRACT

A. MINOR FOREST PRODUCE

7.2.1. There are numerous minor forest produce available in this tract and are found in almost all Ranges with varying extent. This contributes a sizeable revenue to the State exchequer as well as generate employment tribals. These play an important role in rural economy.

7.2.2. The important minor forest produce, found in this tract, are Moha flower and fruits, Tendu, myrabolons, Gum, Broom grass etc. The statement showing stems per ha and their distribution in different girth classes of few such important species is given in **Appendix No. LXIV.**

B. MEDICINAL PLANTS :-

7.2.3. The tract is rich in variety of medicinal plants which are used for curing various ailments by the local people and therefore medicinal plants occupy an important position in the socio-cultural, spiritual and medicinal arena of local villagers/tribes. Their sustainable management and harvesting can conserve bio-diversity, sustain human and environmental health, generate employment and earn foreign exchange by promoting exports.

7.2.4. The special task force set up by the Planning Commission for Conservation and sustainable use of medicinal plants stressed the need for conservation and preservation of medicinal plants. The per capita annual consumption of drugs of Rs. 125/- in India is the lowest in the world mainly because medicinal plants constitute the principal health care resources for the majority of the population in India. The World Health Organisation (WHO) estimated that 80% of the population of developing countries rely on traditional medicines mostly plant drugs for their primary health care needs. The modern pharmacopoeia still contains at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants. Transition from synthetic analogues built on microbially produced antibiotics to plant based drugs is rapidly gaining acceptance. Global resurgence in the use of plant based drugs is an opportunity for India to attain self reliance and boost the export of herbal drugs. The demand on plant based therapeutics is

increasing in both developing and developed countries due to the growing recognition that they are natural products, being non-narcotic, having no side-effects, easily available at affordable prices and some times the only source of health care available to the poor. The conservation and sustainable use of medicinal plants are issues on which immediate focus is required in the context of conserving bio-diversity and promoting and maintaining the health of local communities, besides generating productive employment for the poor with the objective of poverty alleviation in tribal and rural areas.

7.2.5. At present 90% collection of medicinal plants is from the wild, generating about 40 million mandays employment and since 70% of plants collections involve destructive harvesting, many plants are endangered or vulnerable or threatened. Currently medicinal plants are collected without having a complete knowledge about their maturity and use. They are also not stored properly which results in deterioration of their medical value.

7.2.6. For sustainable and equitable development of medicinal plants it has been realised that medicinal plants conservation areas need to be identified and field surveys and studies are required to be conducted in order to take necessary steps for their *in situ* conservation. The task force had also recommended the establishment of "Vanaspati Van" covering and area of about 3500 to 5000 hectares each for the intensive production of medicinal plants and their propagation which will produce quality herbal products and generate productive employment to the local people specially women who are skilled in herbal production, collection and utilisation. These "Vanaspati Vans" can be managed under Joint Forest Management Programme for benefit sharing to altercate poverty of local people/tribals.

7.2.7. The important medicinal plants which have been identified in this tract have been given in the **Appendix No. XXVIII**.

SECTION - 3 :- SPECIAL OBJECTS OF MANAGEMENT

7.3.1. As per the National Forest Policy, 1988 the proper utilization of Minor Forest produce (MFP) has been one of the objectives in the Forest Management. Therefore, consistent with the above policy, the special objectives of management are as follow :-

i) To increase the growing stock of various non-timber forest produce species in the area.

ii) To manage MFP scientifically to utilize the existing potential optimally and thereby to enhance the production and productivity of the same.

iii) To generate mandays for providing works to the local people and thereby improving their socio-economic conditions.

iv) To take measures for conservation and sustainable use of N.W.F.P.

v) To manage MFP and medicinal plants scientifically and to utilise the existing potential optimally and thereby to enhance the productivity and production of the same.

vi) To provide better and improved quality and culture supporting items to the local tribals.

vii) To identify and conserve the forest areas rich in M.F.P. and medicinal plants.

SECTION – 4 :- METHOD OF TREATMENT

7.4.1. The treatment to be given will be different for different types of minor forest produce. Therefore, each MFP will have separate treatment as follows.

(1) MOHA

(i) MOHA FLOWER :- USE AND NUTRITIVE VALUE

7.4.2. Moha flower is rich source of sugar, vitamins and calcium. The flower, in its ripe form, has almost 73% of all sugars and is, therefore, a better medium than grapes even for fermentation.

7.4.3. Moha flower are eaten raw or cooked. They are eaten also after frying or baking in to 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 foods or as sweet meat. 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 the tribal diet. Moha flower are largely used in the preparation of the distilled liquor in the area dealt with.

7.4.4. A syrup of good quality is prepared from the corollas by extraction with hot water and clarification with activated charcoal and evaporation under vacuum. The syrup with very high sugar content (61%) has golden yellow colour with the odour of fresh flowers. It is a substitute for honey. Apart from human consumption, moha flower offers an excellent food to the livestock and wild animals as well. Nutritive value of flower showed digestible crude protein 3.08, total digestible nutrients 73.70 and starch equivalent to 55.10 kg/100 kg. The flesh of animals particularly of pigs, fed on moha flowers, acquires a delicate flavours.

7.4.5. Besides this, moha trees have an important place in tribal folk lore and religious belief. For example, moha flowrs are uised to forecast rain and moha tree is worshiped in the form of deity called "Mahugorla" in parts of Bastar District of Madhya Pradesh.

7.4.6. The madias prefer to bury or cremate their dead bodies under a Moha tree.

ii) MOHA FRUIT :-

7.4.7. USE AS NUTRITIVE VALUE :- A ripe fruit has cream coloured epicarp, which is edible. Moha berries are eaten raw or cooked. They are also eaten by cattle, sheep, goats, monkey and parrots. They have medicinal value as well. Fruits after falling on the ground are easily attacked by insects and ants and thus become unfit for human consumption.

7.4.8. The moha seeds yield oil. A thick oil, light yellow in colour, is extracted from the seed, and is used by forest tribes as edible oil, as an illuminance and as 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 buttermilk to mask the disagreeable odour. This oil finds use in medicines too.

7.4.9. Crude oil has deep colour, high acidity, unpleasant odour and bitter taste. Refining and hydrogenation yield product similar to mutton tallow or cocoa butter. 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 greases and fatty alcohol. This oil is also used for candle, as a batching oil in Jute Industry and as a raw material for the production of satiric acid.

7.4.10 The yield of oil from the seeds depends on the efficiency of the equipments employed for crushing them. It is 20-30% by weight of the kernels when crushed in 'Ghanis', 34-37% in expellers and 40-48% when extracted by solvents.

7.4.11 ISI standards prescribed for Moha oil are as follows :-

TABLE – I

S.N.	Characteristics	Grade		
		I	II	III
1	Moisture and insoluble impurities % by mass maximum	0.10	0.25	0.50
2	Colour in a ¼ in cell on the Loviband scale expressed as Y + 5R not deeper than	20	30	50
3	Refractive index at 40 degree C.g.	1.459 to 1.460		
4	Sp. Gravity at 90/30 degree C.g.	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 maximum	0.5	20.0	>20

7.4.12 YIELD :- Moha tree starts bearing flowers and fruits between 10^{th} to 15^{th} Year of its planting. A study with reference to the yield of moha flower and fruit has been conducted by the MVSS, Chandrapur in Compartment No.195 in Tadgaon Range of Bhamragarh Forest Division in

the year 1992. The trees of different shapes and girth where selected for the purpose of the study.

7.4.13 Result obtained are as given below.

TABLE - II

S.N.	G.B.H. in cm.	Weight in Kg.	
		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	2.70

7.4.14. FORMATION OF UNITS AND COUPES :- The Range will be unit of working for the purpose of this working circle. Since operation is to be carried annually through out the areas and so the unit will be the coupe in this case.

7.4.15. AGENCIES FOR COLLECTION :- Moha flower and seed is presently collected by individuals. Normally they confine themselves around their villages only to collect moha flower and seeds. For large scale collection FLCS or other agencies will have to be encouraged.

7.4.16. MARKET :- The collection of moha flower and seed is done by the tribals and purchase of the same is done by the TDC.

7.4.17. OTHER REGULATION

(i) Compartment wise list of moha trees should be prepared and maintained at Beat,
Round, Range and Division levels.

(ii) As it is a bare fact that one of the important reasons of the forest fire is the burning of the leaf litter on ground under moha trees by tribals to collect moha flower and fruit. Therefore, before the start of flower falling, the ground under the moha tree crown should be cleaned.

II. GUM

7.4.18. USE AND VALUE :- Kulu (Sterculia urens), Dhaora (Anoge-issue latifolia), and salai (Boswellia sesrrata) 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 medicine 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 adhesives, lacquers, oil cloth compositions, ink and perfumery. Kulu gum is the costliest gum and is having export potential. Dhaora gum is very good for preparation of many food articles.

7.4.19. YIELD :- The distribution of such trees in different girth class is given in **Appendix No. LVII**. The study of yield of gum 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 very potential field for employment generation and revenue earning. Besides this, the regulations of the collection is very important from of the protection of forest from fire point of view.

7.4.20. TAPPING RULES :- The rules for gum tapping prescribed by the FRI, Deharadun are as follows :-

a) The tapping season will commence from November and end at the end of may
each year. No tree below 90 cm in girth will be tapped.

b) 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.

c) Each tree will be taped for 3 years and will be given a rest of three years. The second tapping cycle will begin in seventh year after commencement of tapping season and will continue for another period of 3 years.

d) 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 adze having 7.5 cm wide blade. The blaze is made 0.6 cm deep in the bark.

e) Blaze may be made horizontally leaving approximately equal space between the blazes. The blazes should not have any loose fibre. The lower surface of the blaze should be slightly slopping outwards to avoid logging of guggul in the blazed pocket in case initial blazing is done by adze.

f) The guggul starts oozing out soon after blaze and may be collected initially after
a month i.e. by about December when the blazes may also be freshened. Subsequent collections and freshenings may be done fortnightly intervals up to May. Thus 12 freshenings may be required to be made during the year.

g) In each freshening the lower surface is not be freshened. The edge may be scraped so that only 3.8 cm is increased on either side in width at the end of 12 freshenings. This means that about 0.3 cm should be scraped off either side in width in each freshening.

h) The lowest row of blazes will be at one meter above the ground level. The next row of blazes will be made at the height of 60 cm from the lower i.e. at a total height of 1.6 meter from the ground level. The vertical portion of the blaze of upper row will alternate with similar portion of the row and no two blazes of the two rows will be directly one above at other.

i) The number of blazes to be made on each tree will depend on its girth at breast height as given below.

TABLE - III

S.N.	Girth at breast height	Maximum No. of blazes to be made on each trees.
1	0.9 m to 1.3 m	2
2	1.3 m to 2.0 m	3
3	2.0 m to 3.0 m	4
4	Over 3.0 m	1 blaze for every 45 cm girth in addition to category no. 3.

j) No fresh blaze will be made on the partially healed up surface or old wounds.

k) 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.

l) At the end of the season, the height of the blaze shall not be greater than 12.50 cm. Maximum permissible dimension of each blaze shall be 10 x 12.5 x 0.6 cm in width, height and depth respectively.

m) 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.

n) In the second cycle i.e. in the 7^{th} year (after three years rest), new blazes will be made in the same way on the unblazed portion, in between the blazed portion of the first cycle. This blazing will continue for another three years in the manner described above and the operations will remain continue till unblazed portion is fully covered.

7.4.21. FORMATION OF THE UNIT AND COUPES :- Range will be the unit for working in this working circle. Since working is annual and covering the entire area and so unit will also be the coupe. The working cycle will be of three years.

7.4.22. AGENCY :- All operations will be carried out either through FLCS or the agency decided by the Government.

7.4.23. MARKET :- The market is extended by the TDC under the provisions of Monopoly Act. Besides, the export of raw or finished goods should also be thought of.

7.4.24 OTHER REGULATIONS :-

a) The compartment wise list of such trees should be prepared and maintained at beat, round range and division levels.

b) Cleaning around the trees to facilitate gum collection and to avoid fire should be done.

c) To increase the population of salai trees soil should be dug up in the form of ring with radius 1.5 times that of crown. By doing so roots are disturbed and from which profuse shoots come out. Singling and tending will increase the population of this species. The same may be tried for kulu as well.

d) Gum producing trees should be reserved from felling.

e) A strict watch is necessary to enforce tapping rules and check unauthorized collection of gum and tapping during the period of rest.

7.4.25 TENDU

7.4.26 USES :- This is one of the most important minor forest produce of the tract which gives handsome revenue. This is used for manufacture of bidi. Presently, people are benefited from it only by way of getting wages for collection of leaves. But by setting a cottage industry for bidi manufacture will provide the maximum benefit from tendu to tribals. Bidi making is such an activity which can be started without any costly infrastructure. Besides, bidi making can be done at any leisure time.

7.4.27 YIELD :- The Revenue realized during the last ten years have been given in the **Appendix No. XXXI & XXXII**.

7.4.28. No scientific efforts are made to augment the tendu leaves production in this tract so far. On the contrary, every year pruning is carried out officially and burning unofficially to get good flush of leaves. Both these operation are detrimental to the future production of the leaves. During pruning all small size plants, whether seed origin seedling or coppice origin seedlings, are cut every year resulting into a threat to future said bearers. If such type of operations continue, the seed bearer will go on diminishing season after season. Besides this, in the greed of flush of leaves, entire forest is burnt every year which cause much more damages as compared to the benefits obtained out of it. This is undisputed fact that this is the most important reason of forest fire. This practice for so called augmentation of leaves production is required to be stopped forthwith.

7.4.29. FORMATION OF UNITS :- The tract is already divided into 24 units and group of units (11 units & 13 group of units) which is having a target of 54400 Standard Bags.

7.4.30. AGENCY :- With the enactment of "Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969", the trade in tendu leaves is nationalized. Under this Act, tendu Units are sold by tender. Prior to 1991, the standard bag system was in practice. But after that the lumpsum was system adopted. In the new system the pronounced illicit cutting of tendu trees have been observed. The penalties for illicit cutting is recovered from contractors. This is because of the fact that the contractors want to have more and more leaves by hook or crook. Therefore, the present system appears to be detrimental to the forests. In order to get rid of it instead of selling the unit to contractors the tender should be invited only for collection of leaves.

7.4.31. MARKET :- Under the present system the unit 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.

7.4.32. OTHER REGULATIONS :- (a) To augment the tendu trees population soil should be dug up 15 to 20 cm deep around the trees, in a circular ring of diameter equal to that the crown. The trees of g.b.h. more than 45 cm. should 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 trees.

(b) Pruning should not be done yearly. It should be done at an intervals of three 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.

IV. MYRABOLONS, DIKAMALI AND NIRMALI FRUITS

7.4.33. USE :- These forest produce 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 child in villages invariably for cold, cough and stomach dissorder. Dikamali and Nirmali fruits are used in chemicals and other industrial uses.

7.4.34. YIELD :- So far no study has been conducted to know the yield trees of such species.

7.4.35. FORMATION OF UNITS AND COUPES :- The Range will be the unit of working in this working circle. Since working is annual and covering the entire area and so unit will also be the coupe.

7.4.36. AGENCY OF HARVESTING :- The unit should be given on lease.The leasee will collect the same as per the direction of the Dy.Conservator Forests concerned. The lease period should be given 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 done if it is profitable and market is surveyed and assured.

7.4.37. MARKET :- Market should be surveyed and recorded so that in case of departmental working the same could be used.

7.4.38. OTHER REGULATIONS :- The details list of such species should be prepared and maintained at beat, round and division level.

V. BROOM GRASS

78.4.39. USE :- This grass is used in preparation of broom which is usually used in houses. It is a seasonal crop and localized one.

7.4.40. YIELD :- So far no study has been conducted to assess the yield of this grass.

7.4.41. FORMATION OF UNIT :- The Range will be the unit of working in this working circle. Since working is annual and covering the entire area and so unit will also be the coupe.

7.4.42. AGENCY :-The unit will be sold by calling tenders.

7.4.43. OTHER REGULATIONS :-

a) The area suitable for this grass should be sown.

b) The compartment wise details should be prepared and maintained at beat, round, range and division levels.

c) The area should be fire protected.

VI. SABAI GRASS (Eulaliopsis binata) :

7.4.44. 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.

7.4.45. PLANTING PATTERN :- This is planted at a close spacing of 45 cm. x 45 cm. In the intervening space in plantation, this can be planted. The villages around which silk/tussar cultivation has been in practice, the density of the forest crop is very poor. These areas can be regenerated by people's participation. In the tussar/silk plantation, the proposition of inter planting of this grass will be very much liked by the people, if the people are made aware of the return from it.

7.4.46. 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 are reproduced as follows :

7.4.47. The sabai grass planted in 1989 in 17 ha areas, was cut back, more by way of 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.

7.4.48. 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, have been designed and fabricated in West Bengal.

7.4.49. FORMATION OF UNIT AND COUPE :- The Range will be the unit of working in this working circle. Since working is annual and covering the entire area and so unit will also be the coupe.

7.4.50. AGENCY :- The plantation of Sabai Grass will be initiated under the umbrella of G.R. No. SLF-1091/C.N. 119/F-II, Mantralaya, Bombay dated 16th March, 1992 as a part of Joint Forest Management. As on experimental basis department should also take up such plantations in Afforestation Working Circle areas. The people should be involved towards use of grass right from the beginning of the scheme.

7.4.51 MARKET :- All the nearby cities and town will serve as its market. Besides, this will be used for bundling of bamboos in bamboo working coupes.

7.4.52 OTHER REGULATIONS :-

a) 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.

b) The training for making ropes to a few selected villagers on an experimental basis, should be imparted.

SECTION - 5 :- RESEARCH WORKS

7.5.1 There are so many minor 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. A list of such medicinal plants have been given in the **Appendix No. XXVIII**

SECTION - 6 OTHER IMPORTANT RULES

7.6.1. The following are important rules :-

(a) The annual estimates of collection of minor forest produce shall be based upon the experience.

(b) The annual estimates of collection of NTFP shall be approved by the Conservator of Forests.

(c) The Range Forest Officer of the respective Range shall issue the passes for collection of NTFP to the leasee and keep records of the collection etc.

(d) The minor forest produce lease units shall have distinct boundaries.

(e) NTFP collection estimates shall be based upon the inventories of forest resources**.**

(f) Schemes shall be formulated for improving minor forest produce e.g. plantations,
protection against disease etc..

(g) Measures shall be taken to maintain and improve the present output of the Non-
Timber Forest Produce (NTFP)

In addition to this for better scientific management of the existing NTFPs in the division, Dy. Conservator of Forests, Bramhapuri Forest Division, Bramhapuri should strictly follow the instructions & guidelines given by Chief Conservator of Forest (Evaluation & Nationalisation) Maharashta State which is reproduced in the **Appendix No. LXV.**

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CHAPTER - VIII

WILDLIFE (OVERLAPPING) WORKING CIRCLE

SECTION - 1 GENERAL CONSTITUTION OF THE WORKING CIRCLE

8.1.1. This is an overlapping Working Circle covering the entire area of the division. Total area of this Working Circle is 117173.83 ha. This tract represent a great variety of wild animals which were depleted owing to indiscriminate shooting in the regime of jamindari.

SECTION - 2 SPECIAL OBJECTS OF MANAGEMENT

8.2.1 Following are the special objectives of management.

a) To educate people and make them understand their mistakes which led to this poor state of wild animals in this tract. Self realization will create the environment of security for the wild animals. The principle of conservation should be taught so that indiscriminate hunting & poaching could be stopped and existing wild animals could be protected.

b) To Preserve and develop of the existing wildlife in this tract.

c) To ensure the maintenance of viable population of wildlife.

d) To conserve & preserve biodiversity of the area.

e) To maintain and develop of infrastructure facilities for wildlife existing in this tract, viz waterholes, anicuts, saltlicks etc. where needed.

SECTION – 3 DESCRIPTION OF THE HABITAT

8.3.1 The general condition and density of wildlife in the division is good, however, its distribution is quite uneven. This tract is covered with dense forest in the interior areas and hilly slopes whereas the forest cover is less dense in the vicinities of the human habitations. In the interior parts of the tract the population density is sparse and a variety of wild animals are restricted to these pockets of the forests. The general condition of vegetation has been prescribed in various working circles.

8.3.2 The forests of Bramhapuri Forest division has a variety of grasses and browse, like Themada trandra, Dendrocalamus strictus, Diacantan amilatan, Bahunia vahalii, Cassia fistula (only fruits), Emblica officinalis, Gmalina arborea, Syzygium, Terminala arjuna and Terminila tomantosa. These species provide very good fodder for big herbivores. Fruits of Aegle marmalos, Zizypus glabarma are also eaten by wild animals.

8.3.3 The forest of this area contains plenty of riparian zones which support variety of wildlife.

SECTION - 4 :- METHODS OF TREATMENT :-

8.4.1. 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 the protection of wildlife, Creation of environment of security to wild animals, increasing infrastructure for wildlife management and trying to restore the status of wildlife animals in this tract.

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 coupes will be done only if their number is more than 2 trees/ha. These trees will act as snags and den trees for nesting and resting of the wild animals. 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 three per ha., will be left in the forest to serve as shelter for wildlife.

d) In the plantations, few trees of fruit species will also be planted to provide food to the 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/licence.

f) 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.

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 wildlife 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) Salt lick will be developed.

k) A vigilant watch will be kept on poachers also at the checking gates erected to check/prevent the illicitly transport of forest produce.

l) To ensure scientific management of wildlife in the managed forests by undertaking measures like habitat management and water hole development and monitoring populations of the wild animals.

8.4.2. Tadoba Andhari Tiger Reserve adjoins the division, which are exclusively managed for wildlife protection and conservation. In order to provide effective corridor for free movement of wildlife from the park and the sanctuary and to reduce impact of biotic pressure on protected areas as well as to protect and conserve the special wildlife habitat and sensitive ecological sites in the division, the following prescriptions, in addition to the waterhole development & protection measures, have been made for implementation along with coupe operations and other treatment prescriptions, in the area-specific coupes.

a) It is prescribed that the division will undertake compilation of a floral and faunal resources as well as ecologically sensitive sites in the division 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. 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.

d) The Division will undertake census survey for estimation of the wildlife population at the frequency decided by the Conservator of Forests.

e) The areas adjoining to Tadoba National Park, where frequent sighting of wild animal like Tiger, Panther, Chital, Bison, Sambar, Blue-bull and many others wild animals are seen should be taken up for conservation and habitat management works on top priority. As per a report received from Dy.Conservator of Forests, Bramhapuri Forest Division, Bramhapuri, though this area is rich in wildlife, there is no specific management plan of wildlife. The compartments (old numbers) are 51, 52 and 47 of Chimur Round and 58, 60, 63 of Khadsangi Round having an area of 2700.59 ha should be taken initially for such wildlife conservation & habitat management works.

f) As per a report received from Dy.Conservator of Forests, Bramhapuri Forest Division, Bramhapuri, in addition to the above compartments of Chimur Range, the compartment numbers such as 22, 23, 35, 24, 45, 46, 32, 33, 34, 36, 37 & 38 of should be considered for wildlife conservation and habitat management works.

g) Similarly as per a report received from Dy.Conservator of Forests, Bramhapuri Forest Division, Bramhapuri, some of the compartments (old numbers) such as 80, 90, 91, 92, 93, 94, 95, 96, 97 and 279 of Bramhapuri Range are proposed for wildlife conservation and habitat management works on priority basis. In these compartments the sighting and movement of wildlife i.e. herbivores and carnivores is much more than other area during the summer time. Particularly in summer months Ekara tank is the

only permanent water source for wildlife & villagers which is adjacent to village Ekara. So there is a possibility of conflict between villagers and wildlife therefore the above compartments should be selected for the Wildlife Conservation and habitat Management works.

8.4.3 WATER HOLE DEVELOPMENT AND PROTECTION MEASURES.

(i) Water is a major limiting factor during the summers in these forests. Thus, all the perennial and ephemeral water holes will be identified, recorded and marked on divisional/range maps. De-silting, if required, shall be carried out.

(ii) The water hole density shall be commensurate with the density of wild animals found in the area. Creation of additional water holes (permanent and temporary) is prescribed so that undisturbed water holes are available within 2 to 3 kilometres of the areas frequented by the large herbivores.

(iii) Small nala bunds, underground bunds and other technically sound small water harvesting structures may be constructed across the streams to create water holes and habitat development.

(iv) Small water harvesting structures, including, forest tanks may be taken up in the areas. The water harvesting structure with submergence area less than 2 hectare should be considered as small structures. However, creation of water holes or water harvesting structure should not damage the riparian ecosystem.

(v) Special vigilance is proposed 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.

(vi) 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.

(vii) The areas near sensitive water holes frequented by the wildlife may be excluded from grazing, and specially mention in the grazing license. Inoculation of cattle grazing near sensitive wildlife habitat sites and waterholes frequented by wildlife.

(viii) 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.

(ix) 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.

(x) The village forest protection committees under Joint Forest Management Programme shall be made accountable for detection of offences related to the wildlife.

(xi) The special wildlife habitat sites shall be effectively protected from fire, grazing and other adverse influences.

(xii) Local staff should maintain list of sensitive wildlife areas for vigilance and special focus for their protection and conservation. Removal of flower, fruit and other medicinal parts and harvesting of herbs shall not be allowed in such sites as well as ecologically sensitive areas.

(xiii) The NTFPs harvesting should be watched and monitored to prevent loss of genetic material from the forest areas.

(xiv) Hoarding on wildlife importance and preservation should be exhibited at strategic places. Other publicity media should be explored to educate public for preserving the wildlife. These means should be imaginative, informative and inspiring.

(xv) These prescriptions should be explained to the field staff and should be followed while doing the regular working in the respective working circles.

(xvi) The provisions contained in the Wildlife (Protection) Amendment Act, 1991 will be enforced rigidly.

(xvii) Compartments important fro wildlife conservation point of view should be demarcated on priority basis.

(xviii) In the selected compartment are 4 to 6 open patches of about (depending upon the size of the compartment) 10 ha area should be selected for meadow development and palatable grass species will be planted.

(xix) To create eco-logical awareness among the villagers, training will be given to the local villagers.

SECTION - 5 :- ECO-DEVELOPMENT, AWARENESS GENERATION AND ECO- TOURISM.

8.5.1 This is a multidisciplinary approach for the development of local population and makes them to be self reliant for their domestic needs such as food, fodder, small timber etc. so that the dependency of the local population on the adjoining forests is minimised. 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 concerns 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. To this end, following initiatives and actions have been proposed in the forthcoming paragraphs.

8.5.2 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.

8.5.3. Each Eco-centre is proposed to have the following components at integral constituent at suitable places.

I. Nature and culture interpretation, awareness and display centre.

II. Audio-visual Aids and equipments, including modern optical, communication and fire fighting equipments.

III. Eco-Camps to provide camping facilities for visitors.

IV. Eco-trails; Nature walking trails near and around the Eco-centres.

V. Eco-Watch towers with binoculars, wireless handsets and fire fighting equipments.

VI. Water sports facilities, on Eco-centres at water bodies.

8.5.4 The villages adjoining sensitive sites are proposed to be taken up under eco-development program for their overall development. Eco-development plans comprising components such as eco-restoration, awareness generation, village development, providing alternatives, imparting skill in collection and value addition of NTFPs, eco-tourism, etc. are proposed to be prepared with the help of local communities.

8.5.5 It is also prescribed to delineate sacred sites/grooves and worship sites, including, sites for tribal deities with involvement of the local village communities on the basis of sustained tradition of local protection and continued use for the religious purposes and marked on the divisional/range maps.

8.5.6 Archeologically important sites identified as such 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.

8.5.7 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.

8.5.8 All trees and climbers in the sacred grooves will be enumerated and the tabulated abstract of the distribution of trees in girth classes species will be included in the Sacred Grooves section of the register. Similarly, location and species of the tree next to the Worship sites will be recorded in the Worship sites

section of the register. Location and extent of archaeologically important sites will also be entered in the appropriate sections of the register.

8.5.9 Awareness generation campaign shall 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.

8.5.10. Teaching institutions viz. schools, colleges, etc. and NGOs like Nature and Wildlife lovers shall be involved through nature interpretation camps, wildlife film shows, exhibitions, seminars, competition, etc.

8.5.11 MANAGEMENT OF RIPERIAN ZONES :- Riperian Zones are life veins of the forest and hence should be least disturbed area.The riparian zones are very sensitive, in which most of the animals are distributed because of least disturbance. Some of the animals perform migration through the riparian zones only. In these areas no plantation, no labour camps and rigid fire protection measures shall be taken up.

8.5.12. MANAGEMENT OF SNAGS AND DEN :- While carrying out enumeration for marking and inventory of snag trees should be separately prepared and especially those used by rare and threatened species. A minimum of 3 to 4 snag trees should be maintained. The snags used by rare and threatened birds should not be marked for felling. Species like Dalbergia paniculata with very low timber utility should be kept as reserve in large number. At least 20% of the trees in higher girth class should retained. Trees like Ficus bengalensis, Ficus glomerata should be reserved against felling. All old growth of miscellaneous species above g.b.h. 240 cm should be retained for wildlife. Besides this Provision has already been made in marking rules of different working circle leaving two dead trees per hectare preferably from inferior species.

SECTION – 6 :- CENSUS

8.6.1 It is an important aspect that speaks about population dynamics of wild animals. Census shall be carried out regularly as per the direction of wildlife wing. Census will give details about herbivores and carnivores ratio, male and female ratio of species, population increase and decrease and details about endangered species.

SECTION – 7 :- GENERAL RULES

8.7.1 Following general rules may be followed to preserve the biodiversity of the region.

I. Areas should be strictly protected from fires.

II. Strict vigilance against illicit felling & poaching should be adhered to.

III. Specific habitats of certain animals should be identified and protected.

IV. Fruit trees like sitafal, bor, ficus species, mango shall be planted.

V. No labour camps should be permitted nearby riparian areas or water holes.

VI. There should be a continuous vigilance at water holes in dry season.

VII. Local cattle population which enter for grazing in forest shall be vaccinated.

VIII. Salt licks shall be provided near water holes.

IX. Messages of wildlife importance shall be exhibited at important place.

X. Any persons who informs about poaching shall be rewarded promptly

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CHAPTER – IX

MISCELLANEOUS REGULATIONS

SECTION - 1 DEMARCATION OF COUPES AND PREPARATION OF TREATMENT MAP.

9.1.1 The coupe will be demarcated one year in advance and a treatment map will be prepared by the R.F.O., which will be verified by the A.C.F.. After that a coupe demarcation certificate along with 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._____W.C.on dated_____ Month_____ Year_____ and has prepared the treatment map as per the Prescriptions of the working plan. The area of the coupe is_____ ha.

C/s ACF Signature of the RFO with date

9.1.2 DEMARCATION OF COUPES :-

(i) Annual coupe will be demarcated by cutting and clearing bushy undergrowth on 3m 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 cms. 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.

TABLE - I

S.N.	Species	Girth at B.H.	Remarks
1	2	3	4

No trees bearing coupe demarcation bands will be marked for felling.

9.1.3 DEMARCATION OF SECTIONS :-

i) To control harvesting, each coupe marked for felling in SCI and Afforestation working circles will normally be divided into four approximately

equal sections. Sections will be demarcated by1.5m.wide cut lines by clearing brushwood unless the section line runs along a permanent feature e.g., nala.

ii) Trees above 45 cms. 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 cms apart, the lower coaltar band being at breast height. Just below the lower coaltar band, section number will be given

9.1.4. DEMARCATION OF PROTECTION AREAS :- Selected trees, on the periphery of the protection areas will be given two geru bands 15 cms 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 serial 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 areas, so that the trees on the periphery of protection area No. I will bear the Sr.No. I/1 and the similar trees on the periphery of protection area No. II will bear the No. II/1 etc. The serially numbered trees will be recorded in the following format in a register.

TABLE – II

S.N.	Species	Girth at B.H.	Remarks
1	2	3	4

9.1.5 DEMARCATION OF OTHER AREAS GIVEN IN THE TREATMENT MAP

9.1.6 The other categories of areas will be marked 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 cms above this

9.1.7 METHOD 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 mark at b.h.and at base on a clear blaze of size (10cm x 10cm).

ii) Following trees in addition will bear digit serial nos. both at b.h. and at base :-

a) All trees of teak, bija, shisham, ain, Tiwas,haldu, karam, dhaoda and siwan of 45 cms and over in girth at b.h.o.b.

b) Trees of all other species of and above 60 cms. girth at b.h.

iii) All remaining trees marked will bear serial numbers 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 numbers will be individually recorded in the prescribed table as under. :-

TABLE - III

S.N.		Species	Girth at B.H.	Remarks
Digit	Coaltar			
1	2	3	4	5

iv) Abstract of trees marked for filling will be made in 15 cms girth classes. Timber,
poles and firewood trees will be shown separately.

v) The numbers on the trees will be put in the vertical direction as shown below.

Tree No. 216 ⟶ 2 1 6

SECTION - 2 :- THE SPECIAL OBJECTIVE OF MANAGEMENT

9.2.1 Followings are the special objects of Management of boundary demarcation of forests areas.

(i) In order to keep the integrity of forests areas intact, strict vigilance over the forest boundary and periodic verification of the demarcation on the ground for the entire forest area has been prescribed. However, in view of the position of demarcation and boundary pillars on the ground, priority areas for the demarcation work have been identified. Such areas include the entire Protected Forests, all the unclassified forests and the Reserved Forests notified during the year 1992 and zudpi jungle in possessation of the Forest Department.

(ii) Objective of the demarcation and protection is to maintain territorial integrity of forest lands in the division by clearly delineating their boundaries by permanent pillar marks to act as psychological barriers.

(iii) Ensure effective protection of the forest resources of the entire Division against adverse influences.

SECTION – 3 :- APPROACH TO THE FOREST DEMARCATION :-

9.3.1 Forest areas vulnerable to boundary obliteration need to be identified for survey and demarcation so that forest encroachment on the forest fringes could be detected promptly. Presence of boundary marks also serves as psychological barrier against the forest encroachment. Well-defined forest boundary is a prerequisite for effective forest protection,

but forest boundary marks are either missing or in poor state. Artificial boundaries adjoining private land should receive the highest priority.

9.3.2. The gaps in the land records such as incomplete disforestation maps or unavailability of the authentic forest maps should be closed as soon as possible.

9.3.3 Forest maps for the Protected and the unclassified forests in possessation of Forest Department were prepared by manual scale manipulation using village maps for the Benakatti's Scheme.The same maps were used for the Reserved Forests declared during 1977–78. The present database for most of these areas are based on the Benakatti's maps. It is therefore necessary to improve the quality of the digital database using the appropriate maps. Forest maps in respect of Reserve Forests, Protected Forests and unclassified forests in possessation of Forest Department is being prepared in the GIS Cell at Nagpur under the Administrative control of Conservator of Forests Working Plan Circle Nagpur. The main objective is to improve the quality of digital database using appropriate maps. Demarcation on the ground for such forest areas is also not well defined. Hence, it is desirable to consolidate the boundary position at the earliest.

9.3.4 Lack of legal protection to the unclassified forests may be rectified by immediate notification declaring such areas as the Protected Forests and initiating the reservation process.

9.3.5 An extensive length of TCM (Trench-cum-mound) fencing has been dug up under various schemes for providing employment. However, the alignment was generally decided without proper survey, and deviation from the forest boundary is quite common. TCM around plantations also suffer from the same malady. Since field officials often consider TCM as the forest boundary, it is imperative to rectify the mistakes by creating boundary pillars at the actual boundary.

9.3.6 The Zudupi jungle areas were taken over by the Division, without due verification of records and demarcation on the site. Most of these areas were not demarcated before taking over the area. Further, parcel numbers have been changed after subsequent survey and land consolidation since the forest notifications. Hence, a thorough record examination, collection of authentic maps and demarcation of the area is essential for the entire Zudupi Jungle.

SECTION - 4 HARVESTING AND DISPOSAL OF FOREST PRODUCE

9.4.1 I) TIMBER AND FIREWOOD :- All coupes of main felling will either be worked departmentally or allotted to Forest Labourers Cooperative Societies. All timber and firewood will be extracted to the established Government depots for sale by open auction. The quantity of timber, poles and firewood to be given on nistar at concessional rates will be kept separately in these depots.

9.4.2 II) TENDU LEAVES :- With the enactment of "Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969" the trade in tendu

leaves has been nationalised. The disposal of this produce will be done in accordance with the provisions of this Act. Total of 23 tendu units/group of units have been formed in Bramhapuri Forest Division. Tendu leaves are auctioned by Chief Conservator of Forests, (Evaluation and Nationalization) M.S. Nagpur.

9.4.3. III) GRASS :- Disposal of grass from closed coupes will be done as per instructions contained in Govt. 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 may be sold on rated passes. In order to persuade the villagers to stall feed the cattle the grass may be allowed to be removed free of cost without damaging the forest.

9.4.4 IV. GUM, LAC AND SITAFAL FRUITS :- The right to Collect natural gum, sitafal fruits and cultivation of lac may be controlled as per the Government directions issued time to time. Cutting or making injuries to trees to collect gum is not permitted. Gum should be tapped as mentioned in NTFP(Overlapping) Working Circle.

9.4.5 V. HONEY, WAX, BROOM GRASS, HIDES AND HORN :- There are not much quantities available of these items. They may be allowed to be removed by local villagers either free or at nominal rates or as per the Government Directions from time to time.

9.4.6 VI. GENERAL:- Sound and young growth of all important species yielding minor 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 would constitute a source of availability of minor forest produce to the tribals and local people.

SECTION - 5 :- IRREGULAR HARVESTING

9.5.1. Irregular harvesting of timber, firewood and other minor forest produce is prohibited except in the following cases:

(i) Removal of dead fallen firewood and trees uprooted by wind or storm from 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 the availability of dead fallen firewood and trees uprooted by wind or storm to the concerned Range Forest Officer. The Range Forest Officer will then prepare compartment wise estimates for such material by marking these trees. Marking in a compartment will be done only if the number of such trees is more than 2 per ha. as this much number will be required to be left in the forest to decay in order to benefit the wildlife in the forest. After the approval of estimates by the Dy.C.F.,

harvesting will be done and the material will be taken out of the compartment.

(ii) Approval of felling of trees on fire lines will be given by the Dy. Conservator of Forests, without reference to the Conservator of Forests.

(iii) Approval of felling of trees under electric and telephone lines existing prior to coming in force of Forest Conservation Act 1980 may be given by the Dy.C.F. as they do not come under the purview of the Forest Conservation Act, 1980.

(iv) Felling of trees on forest land required by the other departments such as Irrigation, PWD. etc. will only be undertaken after the proposals for the use of forest land for non forestry purposes are approved by the Govt. 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.

(v) 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.

(vi) 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.

(vii) 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 the concerned Dy.C.F. well in advance. Felling should be strictly as per the objective of the work.

SECTION - 6 :- MAINTENANCE OF BOUNDARIES

9.6.1 The Protected Forests, New Reserve Forests converted from Protected Forests in the year 1992 & B-Class Reserved Forests boundaries do not exist at most of the places. The state of maintenance of boundary lines of these Forests is very poor. Under the survey and Demarcation scheme, some of the areas of the ex-proprietary protected forests under the forest department have been surveyed and demarcated in the field. But afterwards no efforts were made to maintain the boundary lines and pillars and therefore, at many places forest areas have been encroached. Recently, in the latter half of 1987, a scheme of demarcating the ex-proprietary forests with TCM and pillars had been taken up on the basis of available records. But this could not be completed. Therefore, the Dy. Conservator of Forests will prepare a five years scheme to demarcate these areas and will prepare the map showing the boundary pillars. One map should be supplied to the Dy. Conservator of Forests, Working Plan Division No.1, Chandrapur, for his record and for showing the pillar nos. on the master set maintained in his office. This work should be taken in the very first year of the implementation of this working plan. Besides, the compartment boundaries of newly created Reserve forests by 3 metre wide

clear line should be made and maintained by cutting undergrowth regularly. The external boundary demarcation of the forest must be done by R.C.C. Pillars for Reserve Forest and Protected Forest as prescribed by the Principal Chief Conservator Of Forests M.S. Nagpur vide his letter no.CF/LR/68/2000-2001 Nagpur Dated 29th May,2001.

9.6.2 The forest boundary lines are not in a proper state of repairs and need improvement. Therefore, a special programme should be launched by the Dy.C.F for the same as well by preparing a scheme. The work of boundary lines and repairing boundary pillars will be done departmentally.

9.6.3 The internal boundaries of the forest will be maintained according to the 1/5th boundary demarcation and verification scheme, given in **Appendix No. LVIII.** The boundaries of the forest will be maintained as given below.

9.6.4 The width of the cleared area of the outer boundary of the Govt. forest will be 12 metres. The clearing will consist of cutting down only all the undergrowth that impedes the view, preventing one forest boundary mark being seen from its neighbouring one. Trees on the boundary line will not be cut down so long as they do not obscure the view of the boundary marks one from the other. Except, where natural features form the boundary, demarcation will be done by cairns.

9.6.5 **BOUNDARY MARKS SPECIFICATION :-** The forest boundary marks will be as per the specification prescribed the Principal Chief Conservator Of Forests M.S. Nagpur vide his letter no.CF/LR/68/2000-2001 Nagpur Dated 29th May,2001. These specifications have been given in the **Appendix No. XII**.

9.6.6 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. The detail design of Boundary pillars have been prepared by the Forest Engineer which is given in the **Appendix No. XII**. 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 fresh series being given for each adjoining village. In addition to the boundary marks, tin plates will be fixed on the boundary trees at a height of 3m., preferably at the boundary of two compartments. These plates will indicate the compartment numbers with arrows and below them will be pillar numbers on either side of the plates. The metal plates will be of size 45 cms x 45 cms. They will be painted white and compartment number and boundary pillar number will be written in red.

9.6.7 While carrying out annual maintenance, the following points need special attention.

a. That the pillars are correctly located as per map and demarcation register,

b. That the forest boundary is cut to the required width,

c. That the repairs to the cairn is done and the wooden post is replaced where necessary,

d. That the boundary posts bear the correct number and the same is engraved and written with coaltar or paint,

e. That there are no encroachments. If there are any encroachments or are suspected, the matter should be pursued and the encroachments got removed.

9.6.8 RULES FOR INSPECTION AND MAINTENANCE OF FOREST BOUNDARY MARKS:-

(i) The forest guard of the beat will be responsible for the protection and maintenance 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 the beat guard at least once every year, and a record of his inspection will be entered in the diary.

(ii) The Round Officer will be responsible for the maintenance and protection of the boundary marks in the forests of his round and he will see that they are maintained in proper repair and colour washed by the beat guard, as directed. The Round Officer will check all the boundary marks in a year which come up for maintenance and repair as per the 1\5 th boundary demarcation scheme. A mention of this will be made by him in his diaries. The Round Officer will annually submit to the Range Forest Officer a certificate in the following format :--

"I, _____certify that the annual length of boundary lines in my jurisdiction as prescribed under the scheme given in Appendix.....……of the working plan for the forests of Bramhapuri Division has been verified by me personally on _____and that boundary lines and marks and pillars are found to be correct as per the demarcation registers and maps. I, further, certify that next cairn on either side of a cairn is visible and they are in proper condition and bear correct serial number. There are no encroachments or encroachments are as detailed below".

9.6.9 The Range Forest Officer will check at least 25% of the annual boundary line as per the 5 year pogramme and 5% verification will be carried out by the ACF.

9.6.10 MAINTENANCE OF COMPARTMENT BOUNDARIES :-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 cms x 30 cms 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.

9.6.11 LEGAL PROVISIONS AVAILABLE FOR PROTECTION OF THE BOUNDARY MARKS :- Under section 26(c) of the I.F.A., 1927

altering, moving, destroying or defacing any boundary marks of any forests to which the provisions of this Act apply, is punishable with imprisonment for a term which may extend to two years, or with fine, or with both. This offence is non compoundable under section 68 of the above Act. This legal provision should be made use of at all levels by the field staff. Strict watch will be kept on the persons who do so and they should be booked under the above provisions contained in I.F.A., 1927.

SECTION - 7 FIRE PROTECTION :-

9.7.1 Fire is the dominant factor for non-establishment of natural regeneration and degradation of forest in Bramhapuri Division. The operations prescribed in this plan can have beneficial effects only if rigid fire control is observed in the whole forest, in general, and the worked areas in particular. The mere ritual of fire protection works can not be of any help. For the purposes of fire protection the areas are classified as follows:-

CLASS I :- FOREST COMPLETELY PROTECTED

9.7.2. This class will include:

(i) All main felling and thinning coupes of SCI working circle, Improvement working
circles & Old teak plantation working circle come in this category. The above coupe areas are to be rigidly fire protected for 5 years of working.

(ii) All roads passing through the forest.

(iii) All Government depots.

(iv) Any other areas of special importance ordered by the Conservator of Forests.

9.7.3. All areas in this class will be isolated by means of fire lines and cut guidelines and will be patrolled by the fire watchers.

9.7.4. Any fire occurring in them will be a calamity and must be reported to the Dy. Conservator of Forests immediately, in writing, giving details of the area burnt and the various types of losses occurred to the forest crop.

CLASS II :- FOREST GENERALLY PROTECTED

9.7.5. This class will include the following areas.

(i) The remaining areas of Selection-cum-Improvement and Improvement Working Circle & Old teak plantation working circle.

(ii) Such other areas the Conservator of Forests may, for special reasons direct.

9.7.6. 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. Fire watchers will be engaged for patrolling in this area.

CLASS III FORESTS PROTECTED BY LAW ONLY

9.7.7 All other forests, not included in the above two classes, are included in this class.

9.7.8 In the forests of this class deliberate burning is prohibited, but no special measures for protection will be undertaken.

9.7.9 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 12 m.

(ii) 6 m. wide lines around all regeneration areas, natural or artificial, upto 5 years from the year of planting or tending of natural regeneration.

(iii) 3 m. 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 m. wide lines on both sides of all roads and cart tracks passing through the forests.

(v) 40 m. wide line on all sides of the timber, bamboo and firewood depots.

9.7.10. LEGAL PROVISION AVAILABLE :-

9.7.11. (I) PROVISIONS CONTAINED IN THE I.F.A.,1927 :-

The various legal provisions to protect the forest 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 Forest areas or in areas notified under section 4 of the I.F.A., 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 thereof whenever the fire is caused willfully or by gross negligence for such period as it thinks fit.

9.7.12. IN VILLAGE FORESTS PROVISIONS ARE AS FOLLOWS :-

(vi) Section 28(3) – All the above provisions apply in case of a village forests too.

9.7.13. IN PROTECTED FORESTS PROVISIONS ARE AS FOLLOWS

(vii) Any person who commits any of the following offences 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.

9.7.14 PROVISIONS CONTAINED IN THE MAHARASHTRA FOREST (PROTECTION OF FORESTS FROM FIRE) RULES, 1982. :-

9.7.15. 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 Forest From Fire) Rules, 1982". The various provisions made under rules 3 to 7 are given as under.

9.7.16. Rule 3 :- A ban is placed on kindling fire within a distance of one Km. from the boundary of the forests.

9.7.17. Rule 4 :- Under this rule any person desirous of clearing by fire any standing forest 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 m. 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 watcher to see that the fire does not spread in the forest area.

9.7.18. 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.

9.7.19. Rule 6 :- Under this rule any person collecting inflammable forest produce such as grass, firewood, leaves, bamboo on 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 areas to endanger the forests.

9.7.20. Rule 7 :- Under this rule all camping places along the boundary of and 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 grounds no fire shall be lighted within or along the boundary of the forest. All persons using these camping grounds shall light any fire 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.

9.7.21. Rule 8 :- Rules 3 to 7 will be relaxed during the rainy season from 15th of June to 31st of October.

9.7.22 II) PROVISIONS CONTAINED IN THE BOMBAY FOREST MANNUAL VOL- II, PART– IV.

9.7.23 Following provisions are there in this manual.

(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 reward 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.

9.7.24. (III) PROVISION FOR FIRE PROTECTION CONTAINED IN THE WILDLIFE (PROTECTION) ACT, 1972.

9.7.25. Following provisions are there to control the forest fire in this Act.

(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 shall as long as 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,

9.7.26. (IV) PROVISIONS CONTAINED UNDER THE MAHARASHTRA MINOR FOREST PRODUCE (REGULATION OF TRADE) ACT, 1969 :-

9.7.27. As per condition No. XII of terms and conditions of contract for tendu for 2003, the Licensee, his representatives 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.

9.7.28 (V) PROVISIONS CONTAINED IN "THE MAHARASHTRA FELLING OF TREE (REGULATION) ACT, 1964 .

9.7.29. 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 of the Revenue Department 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 an officer not below the rank of the R.F.O. The Dy.C.F. should get translate these 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.

9.7.30 STEPS FOR EFFECTIVE FIRE CONTROL

9.7.31 A. CUTTING AND BURNING OF FIRE LINES :-

(i) The cutting of the 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 stacked along the edge of fire lines and burnt before the fire season starts.

(iii) Except with the permission of the Dy. C.F., no fire lines will be burnt after the end of February. If such a permission is granted, the burning should be done in presence of R.F.O.

(iv) Modern fire fighting tools will be used for extinguishing the fire.

9.7.32 B. DEPLOYMENT OF FIRE WATCHERS AND STAFF :-

9.7.33 (i) There are a number of reasons intentional or accidental involved in lighting up are the local villagers. Therefore it is very much essential to have a open dialogue with villagers and they should be made aware of the disastrous effect of forest fire.Repeated dialogue and persuation can be of great help in solving the problem. Solution should be asked from them. After doing all these things, area should be identified around each village for protection 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. The list of fire watchers should be prepared with taking meeting of villagers and having dialogue with them and rotational employment of fire watcher 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 gangs 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 help in transport of fire fighting labourers, water and other equipment required for extinguishing fire.

9.7.34 C. OCCURRENCE OF FIRE :- As soon as the smoke is seen rising any where 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.

9.7.35. Utmost care will be taken to extinguish the fire and to quench the smoldering material absolutely. Filling earth over such material will be

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 left.

9.7.36. 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 B.F.M. Vol.-I, Rule 369.

9.7.37 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 inquiry by the Deputy Conservator of Forests.

9.7.38 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 R.F.O.s to be selected by the Dy.C.F. In case of common boundary between two divisions of the same circle, the above responsibility will be fixed by the 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 after mutual consultation, will fix the responsibility on one of the R.F.O.s

9.7.39. The Dy. Conservator Forest 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.

9.7.40. The Dy. Conservator Forest 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 by continuous inspections inquire 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 incidences of fire are common. He must, during his tour satisfy himself, by constant inquiries and inspections, that no fires in forest areas any where have gone unreported, and that the areas of reported fires have been accurately estimated. These checks required 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 good flush of tendu leaves. These fires are generally made between 1st of March and 15th of April each year.

9.7.41. 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 staffs that no delay occurs in receiving a report on outbreak of fire by him and in further transmitting it to the Dy.C.F.

9.7.42. 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 thorough inspection of the burnt area by himself.

9.7.43. The Dy.C.F. will submit monthly return (in prescribed proforma, Form No. IX-74 or in some other proforma prescribed from time to time) to the Conservator of Forests showing therein the serial number of fire, data of occurrence, cause, area burnt, extent of damage and measures taken to extinguish fire. This report will cover following areas.

(i) All fires in class I areas,

(ii) 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.

9.7.44. All records of fire 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 R.F.O. and Dy.C.F.

9.7.45 A fire record will be maintained in the office of the Dy.C.F. 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.

9.7.46 Area deliberately burnt for silvicultural reasons e.g to destroy felling debris or to stimulate reproduction, will be excluded 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 Dy.C.F.

SECTION - 8 :- Eco-Tourism :-

9.8.1 Eco tourism in the remote forest areas of the District should be given top priority and in this regard the instructions issued by Principal Chief Conservator of Forests, M.S. Nagpur vide Standing Order No. 002¼No.CCF/PT&SP/416, Dated 7th February, 2002 should be strictly followed by Deputy Conservator of Forests, Bramhapuri Forest Division. These instructions regarding eco-tourism have been reproduced in the **Appendix No. XL.** Till today the two places have been identified for Eco - Tourism in Bramhapuri Forest Division namely “Ramdegi Devasthan” & Satbahini “Tapovan Devasthan”.The details of activity proposed under Eco – Tourism have been given in part two chapter nine of this plan.

9.8.2 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.

9.8.3 Each Eco-centre is proposed to have the following components at integral constituent at suitable places.

(i) Nature and culture interpretation, awareness and display centre.

(ii) Audio-visual Aids and equipments, including modern optical, communication and fire fighting equipments.

(iii) Eco-Camps to provide camping facilities for visitors.

(iv) Eco-trails, Nature walking trails near and around the Eco-centres.

(v) Eco-Watch towers with binoculars, wireless handsets and fire fighting equipments.

(vi) Water sports facilities, on Eco-centres at water bodies.

9.8.4 The villages adjoining sensitive sites are proposed to be taken up under eco-development program for their overall development. Eco-development plans comprising components such as eco-restoration, awareness generation, village development, providing alternatives, imparting skill in collection and value addition of NTFPs, eco-tourism, etc. are proposed to be prepared with the help of local communities.

9.8.5 It is also prescribed to delineate sacred sites/grooves and worship sites, including, sites for tribal deities with involvement of the local village communities on the basis of sustained tradition of local protection and continued use for the religious purposes and marked on the divisional/range maps.

9.8.6 Archeologically important sites identified as such 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.

9.8.7 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.

9.8.8 All trees and climbers in the sacred grooves will be enumerated and the tabulated abstract of the distribution of trees in girth classes species will be included in the Sacred Grooves section of the register. Similarly, location and species of the tree next to the Worship sites will be recorded in the Worship sites section of the register. Location and extent of archaeologically important sites will also be entered in the appropriate sections of the register.

9.8.9 Awareness generation campaign shall 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.

9.8.10 Teaching institutions viz. schools, colleges, etc. and NGOs like Nature and Wildlife lovers shall be involved through nature interpretation camps, wildlife film shows, exhibitions, seminars, competition, etc.

SECTION - 9 :- ARTIFICIAL REGENERATION

9.9.1 PLANTING OF TEAK AND MISCELLANEOUS SPECIES :- 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 throug stump and miscellaneous species will be planted through polythene bag plants. The details of various works will be as follows:-

9.9.2 PREMONSOON WORKS:- They will be carried in the year of main felling, along with the felling. They will include following works:-

9.9.3 FENCING :- The whole coupe will be taken for fencing. T.C.M. of standard cross section of 1.90 m x 0.60 m x 1.0 m will be dug where the boundary runs along the contour. No 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 cms. apart and 3 inner rows, 50 cms apart, on which sowing of seeds of fast growing thorny trees like Acacia senegal, babool etc.and planting of cutting of shrubs like vitex, dodonea etc. will be done after the monsoon.

9.9.4 PIT DIGGING :- For planting of miscellaneous species pits of size 30 cms x 30 cms x 30 cms will be dug. The dug up soil will be kept on the upper side of the slope. The pit digging will be completed upto March and the soil will be allowed to weather during summer. Pit filling will be done at the end of May. The number of plants of teak and miscellaneous species will be 1100 per ha.

9.9.5 NURSERY :- TEAK :- Teak stumps will be prepared from one year old seedlings raised in the beds as per standard nursery technique. The stumps should not be below thumb thickness.

9.9.6. MISCELLANEOUS PLANTS :- The miscellaneous plants will be raised in the ploythene bags. The standard size of the polybag plants suitable for planting will be when the collar of the plant is approximately thumb thick and is woody in appearance. The height of the plants will vary from species to species. To achieve the optimum sized ploybag plants, the nursery work will be started latest by October in the previous year of planting. 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 10 cms. Care will be taken that each bag contains only one seedling. During shifting, the bags will be arranged in descending order of height. Suitable fertilizers 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. Besides the preparation of seedling in the polybag, the seedlings can be prepared by root trainer technique as per the instruction of Dy. Conservator Forest/Conservator Forest.

9.9.7 FIRST YEAR OPERATIONS :- As soon as the monsoon starts, seed sowing in the 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 cms and planting of shrub cutting on the inner 3 rows, will be done. Teak stump planting in crow bar holes and polybag planting in pits will also be done along with the planting on live hedge. The polythene bags will be planted in such a manner that their collars are at the ground level and it will be covered with soil upto a height of 5 cms above collar. All these operations will be completed in not more than 15 days after the break of monsoon.

9.9.8 SUBSEQUENT OPERATIONS :- Immediately after the completion of planting, first weeding will be started. Casualty replacement will be done along with the first weeding. Second and third weeding will be done in the month of September and October respectively. The last weeding will include soil working and mulching to reduce the evaporation losses. One more soil working may be done in the month of January, if there are winter rains, subject to the availability of funds. Weeding and soil working to the seedlings on live hedge will also be done in order to enhance their growth and survival.

9.9.9 In the second year of plantation, casualty replacement will be completed soon after the start of monsoon. Two weeding will be carried out in the month of August and October respectively. Soil mulching will be carried out at the time of second weeding. Debudding of teak plants, lagging in growth, will be done in the month of April/ May.

9.9.10 In the third year one weeding with soil mulching will be carried out in the month of September. Debudding will be done in second year.

9.9.11 BAMBOO PLANTING :- Bamboo will be planted, at a spacing of 6m x 6m, in the fourth year from the year of main felling or in other suitable areas as under planting. The details of various works will be as follows:

9.9.12 PREMONSOON WORKS :- They will be taken in the third year from the year of main felling. Pits of size 45 cms x 45 cms x 45 cms will be dug before March. The dug up soil will be kept on the upper side of the slope. The pits will be filled in the following year before the onset of monsoon.

9.9.13 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 rhizome banks at suitable sites in each range. Bamboo seeds will be sown in beds of size 12 m x 1.2 m x 0.3 m, two years in advance of planting. In the month of February and March of the year of planting, the seedlings from the beds will be transplanted into polythene bags after cutting their branches above 3 to 4 nodes. They will sprout within 15 to 20 days. After sprouting, suitable fertilizers will be given to get the vigorous growth.

9.9.14 FIRST YEAR OPERATIONS :- At the onset of the monsoon, the polypot seedlings will be transported to the planting site and will be planted in pits. At the time of planting suitable fertilizers and insecticides

will be given to each plant in the pits. Casualty replacement will be done at the end of July or in the first week of August. Three weeding and soil working will be done.

9.9.15 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/anti-termite will be used if there is termite attack.

SECTION - 10 :- SOIL AND MOISTURE CONSERVATION WORKS :-

9.10.1 With the increase in biotic interference in the forest areas, the forests of Bramhapuri division are becoming degraded. Adequate soil & moisture conservation works will be taken where required to check soil erosion.

9.10.2 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, specially 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 the run off from the forest floor. The rain water washes off along with it the exposed top layer of 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. In order to ensure the success of these works in improving the forest, soil and moisture conservation works are of primary importance. 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.

9.10.3 CONTOUR TRENCHING :- Continuous contour trenches 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 cms x 30 cms or as prescribed by the PCCF from time to time. 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 stabilization.The contour interval between the consecutive trenches will be 1.5 m. Depending upon the slope, the distance between the two consecutive trenches will vary. In order to bring the uniformity in working the distance between consecutive trenches is prescribed as below.

9.10.4 However, the actual spacing is to be determined after getting treatment map and doing the following calculations.

If a = Average annual rainfall in mm.

b = Rainy days in a year,

c = a/b, the average rainfall per rainy day in mm.

then, d = 10 c , is the rain fall in cubic metre/rainy day/hectare.

For the trench of size 0.60 m x 0.30 m (0.180 Sq m.) the length of trench in m. per hectare required to absorb water per rainy day per hectare completely can be calculated as follows.

L = D/0.18 in m. and accordingly the width between two consecutive lines can be determined. Taking an example of one hectare the width between two consecutive trenches comes to be 10,000/L in metre.

TABLE - IV

Slope in degree	Distance between consecutive trenches
Up to 15	8 m
15 to 25	5 m
Above 25	3 m

9.10.5 Trenches near the nallas will be discontinued and will be curved upwards, on both sides of the nalla, at an angle of 45 degree. This will prevent the run off of water, stored in the trenches, into the nalla. The curved portion will be of 5 m length on either side of the nala. The alignment of contour trenches may be done by a simple frame called "A" frame made of bamboo. The details of this frame are given in the **Appendix No. XXVII.**

9.10.6. NALLA BUNDING/CHECK DAMS :- The basic aim of nala bunds or check dams will be 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 this purpose Forest Engineer may be contacted for it's design and construction with strict adherence to the guidelines of Forest Conservation Act, 1980. 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 6 m bed width and (iii) between 6m to 8 m bed width. The details of nalla bunds are given in the **Appendix No. XI.** The important points to be kept in mind are as follows :-

(i) Nalla 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 by water.

(iii) The batter on upstream and downstream should be 2/1and1/1 respectively.

9.10.7. 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 nalla. For general guideline the distance between successive bunds for different slopes will be same as that for contour trenches.

SECTION - 11 :- GRAZING CONTROL :-

9.11.1. The success of regeneration will depend upon the effective control on grazing and protection from fire. The cattle population in the villages around the forest area is very large. Due to large population of cattle, the forests are subjected to heavy grazing. Further the cattle population is not uniformly spread over all forest area, therefore, some areas are more vulnerable to grazing.

9.11.2. A functional classification of the forest is given in Section 2 of chapter I, Part II as enunciated in the grazing policy formulated by the Govt. of Maharashtra vide its resolution No. MFP - 1385/132211-Y, dated 8-12-1968. Grazing will be controlled as per the prescribed grazing incidence for each class of forest in the interest of forests and pasture. As per the provisions contained in A-259 of 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.

9.11.3. Keeping in view the above provisions the grazing in various working circles of this plan will be regulated as under.

9.11.4. I. SELECTION-CUM-IMPROVEMENT WORKING CIRCLE & IMPROVEMENT WORKING CIRCLE :-

As per functional classification, this working circle comprises of tree forest and the maximum incidence of grazing prescribed for it is 1.2 ha per cattle unit. All main felling coupes will remain close to grazing for a period of 5 years from the year of main felling. Thus with a felling cycle of 20 years, 5/20th or 1/4th area will remain closed to grazing at any time after 5 years from the commencement of this plan. The average carrying capacity for these two working circle will be 50032 cattle units.

9.11.5. II. AFFORESTATION WORKING CIRCLE :- This working circle comprises of minor and degraded forest and the maximum incidence of grazing prescribed for it is 0.8 ha. per cattle unit. All main felling coupes will remain closed to grazing for 5 years from the year of main felling. Thus with a felling cycle of 20 years, 5/20 th or 1/4th area will remain closed to grazing at any time after 5 years from the commencement of this plan. The average carrying capacity will be 34803 cattle units.

9.11.6. Thus as per the prescriptions of the working plan 115908 cattle units can graze in the forest area at any time. The remaining cattle can be accommodated by taking the fodder development works in the community lands in these villages with the help of Social Forestry Department, Village

Panchayat, Forest Protection Committee or voluntary agencies. At the same time the villagers will be persuaded to stall feed their cattle, the grass for which will be allowed to be removed from the closed coupes. They will be made aware of the ill effects of excessive grazing on the forest growth. Besides the staff should have dialogue with the local villagers and discuss the issue. The Dy.Conservator of Forests should think for rotational grazing in areas which are not due for working. The experiment of silege preparation should be conducted and through this stall feeding should be advocated. The preparation of silege will solve the problem completely. People should be motivated for rearing cattle in less number but of better breed to have better return and less problem.

9.11.7. Grazing rules made applicable vide Govt. of Maharashtra Revenue and Forest Department Resolution No.MFP-1371/237035-Z,dated 3rd November, 1973 are given in **Appendix No. XIII.**

SECTION - 12 :- ILLICIT CUTTING

9.12.1. Though there is no large scale organized illicit cutting, except in areas adjoining to villages, but the large consumption of forest produce by the local people, as described in section 4 above, has put tremendous pressure on these forests. This has resulted in deterioration of forests adjoining to the villages. For effective control on illicit cutting two mobile units, consisting of one R.F.O., 4 foresters and 8 forest guards each with vehicle are proposed.These units will continuously patrol the forest areas vulnerable to illicit cutting.

9.12.2. The Government vide letter No. TRS 1087/102380/F-2 R & F.D., dated 18th June, 1981 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 Dy.C.F. within three days of the receipt of the report of the R.F.O. The general guidelines & instructions issued by Government for forest protection will be strictly followed by the territorial division.

9.12.3 The following time schedule has been prescribed for inspection of illicit cutting by the respective officers:

TABLE- V

S.N.	In situ value of Illicit cutting at a place	Designation of the Inspecting Officer	Period within Which inspection should be completed.
1	Up to 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 the receipt of information.
3	Above Rs.1,00,000,But not exceeding Rs. 5,00,000	Dy.C.F.	3 days from the receipt of information.
4	Above Rs.5,00,000	C.F.	7 days from the receipt of information.

9.12.4. 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 court for prosecution, unless the prosecution is difficult to succeed.

SECTION - 13 :- DEVIATIONS

9.13.1.

(1) The following works will not be constituted as deviation from the plan :-

(i) Removal of dead fallen firewood.

(ii) Petty felling carried out as mentioned in para under irregular harvesting.

(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 Govt. Resolution N0. FWP 1062/5625(II)-J, dated 25-5-1962.

(A) Deviation which would seek to alter the schedule of working given in the working plan the examples of which are

(i) Both non-working of 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 alternation in the silvicultural treatment, for example

(i) Stopping or curtailing fellings for planting because of shortage of labour, fund, material for plantation work, or unsuitability of terrain and soil for undertaking plantations to the extent prescribed by the working plan.

(ii) Extensive felling of dry trees killed by fire, fungus, insect attack or other natural calamities departmental works.

(iii) Felling of unusual size and extent for special departmental works.

(iv) Felling involving modifications in the prescribed marking rules.

9.13.2. The sanction to all these deviations will be obtained. Application for sanction to such deviation will be submitted sufficiently in advance, so that such may be received as far as possible before the deviation occurs and without fail before the annual list of deviation is submitted along with the control forms.

9.13.3. PROCEDURE FOR OBTAINING SANCTION FOR DEVIATION:- All deviation proposals require the approval of the Inspector General of Forests as per instructions contained in Govt. of India, Ministry of Agriculture No. 6-14/84/FRY/(W.P),dated 23-8-1984.

9.13.4. The DY.C.F. (territorial) will submit 8 copies of the deviation proposals to the Conservator of Forests through the DY.C.F., Working Plans, who on scrutinizing the proposals will forward them to the Conservator of Forests of the territorial circle with his opinion and report as to the manner the departure decided upon should be recorded. The Conservator of Forests will then pass on the proposal to the Chief Conservator of Forests through the Conservator of Forests, Working Plans Circle with his remarks.

9.13.5. The Government of India has created a working plan cell in the Ministry of Environment & Forests under the Director General of Forests. This cell has to be associated while considering any deviation from the prescriptions of the approved working plans and this deviation will be allowed only after obtaining the approval of the Inspector General of Forests. All proposals for deviations must be entered in a Register of Deviation maintained by the Division office. The proforma for submission of deviation proposals are given in **Appendix No. XVI**.

SECTION - 14 :- ROADS, CART TRACKS AND CULVERTS

9.14.1. The forest area of Bramhapuri Forest Division is well connected by roads and cart tracks. Brahampuri-Chandrapur via Nagbhid; Brahampuri-Chandrapur via Sawali; Brahampuri-Nagpur via Naghbhid, Pauni and Umred, Brahampuri -Raipur via Wadsa,Gadchiroli;Brahampuri to Raipur via Wadsa Korchi, Deori; Brahampuri-Gondia via Wadsa Korchi, Betkathi; Brahampuri-Sindewahi, Nagbhid-Nagpur, Brahampuri – Warora via Naghbhid ,Chimur are the main lines of road transport. Besides, there are feeder roads like Chimur- Bhisi,Bhisi- Umred, Shankarpur- Bhisi, Talodhi – Mendki – Bhuj, Sawali – Mundza-Gangalwadi, Sindewahi – Mendi, Mendki – Bhuj, sindewahi – Sawli. Within the forest areas many cart tracks exist. Many of the roads have been taken over by P.W.D. or by Zilla Parishad for maintenance. A proper record of these roads will be maintained dy the Territorial DY.C.F. The P.W.D. or Zilla Parishad should also be informed, in writing, that which of the roads passing through the forest are handed over to them permanently and which of the roads are handed over for maintenance only. The other roads and cart tracks will be maintained departmentally. Priority will be decided for maintenance depending upon the availability of funds. Top priority will be given to roads which are important from the point of view of forest protection. The list existing Forest Roads in Bramhapuri Forest Division is given in the **Appendix No. VI.**

9.14.2. Construction of bridges across Wainganga and her tributaries has tremendously improved the line of road communication. The forest roads generally pass through the boundaries of the compartments. On the fringes of the forest, generally exist small patches of forest land in between the road and the forest boundary. At many places it is observed that these patches between the forest roads and boundary line is neglected and in case of private lands adjoining the forest, there is every likelihood that these patches may be encroached by the adjoining cultivators. In future such land may be permanently lost. This point needs to be kept in mind at the time of 1/5th boundary demarcation also. Culverts are required to be constructed on some nalas to make the roads all weather roads.

SECTION - 15 :- BUILDINGS

9.15.1. The existing buildings are not sufficient for the staff, especially for the field staff, as the field staff has increased considerably after reorganization in the year 1983 and 2000. Non availability of accommodation in the interior of the forest adversely affects the forest protection work as well as the efficiency of the staff. It is, therefore, proposed that wherever there are no forest nakas, guard and round officers quarters, the same should be constructed on priority basis. At the same time some of the existing residential buildings which are quite old should be taken for special repairs to make them habitable. All the existing buildings should be maintained in good condition. Sufficient funds should be made available to construct new buildings and to maintain the existing buildings.

9.15.2. There are only a few rest houses and inspection huts in the tract dealt with under the present working plans. This leads inconvenience in inspection of forests. It is, therefore, suggested that at all the strategic points either rest houses or inspection huts should be constructed to facilitate the touring of the inspecting and executive officers/staff. The construction of these buildings should be taken up as early as possible after drawing a phased programme. The inspection huts should be pukka with two rooms with attached water closets, bathrooms and verandahs. The list of the existing building and Rest houses is given in **Appendix No. VIII**.

SECTION - 16 :- WATER SUPPLY

9.16.1. Due to erratic rains, water scarcity is felt in the summers during the year in which the rainfall is scanty. At some places shortage of drinking water occurs. Adequate arrangements are needed to supply drinking water to staff at such places. The nurseries will be located at such places, where the water availability is sufficient. The augmentation of water supply can be thought of by constructing anicuts at suitable places. Besides, deepening of the existing wells and creating tube wells by boring using modern machinery available can also be thought of.

SECTION – 17 :- PRIVILEGES AND CONCESSIONS FOR FOREST PRODUCE

9.17.1. As per the Forest Policy of 1988, the first rights on the forest produce is that of tribals and other 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.

9.17.3 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 at concessional rates, depending upon the availability of these produce. Depots will be opened at suitable places, throughout the division, so that people have to go to minimum possible distance to procure these produce. Range, Round or Beat head quarters will be chosen for this purpose, so that supervision and maintenance of these depots becomes convenient.

9.17.4. REMOVAL OF EDIBLE FLOWERS, FRUITS AND SEEDS AND OTHER MINOR FOREST PRODUCE :- Collection of moha flowers and seeds, charoli, tendu fruits, bor and other minor 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.

SECTION - 18 :- SURVEY AND MAPS

9.18.1. Reserved forests of Brahampuri Foerst Division have been surveyed on 4"=1 mile scale. The newly Reserved Forest and Protected forest have not been surveyed by Survey of India. All these forests have been stock mapped on 1:15800 toposheets in the past. The Stock Maps are being prepared in GIS cell at Nagpur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Circle,Nagpur & will be supplied by the office of Conservator of Forest, Working Plan Circle, Nagpur.As per the instructions contained in standing order No. 55 of Conservator of Forests, Working Plans, the following sets of maps will be prepared.

9.18.2. DIVISIONAL MAPS :- These are to be prepared on 4"=1 mile or 1:15800 sheets. However, whole area has not been surveyed by Survey of India on 4"-1 mile scale. The maps available on this scale have been obtained by reducing the village maps which are not so accurate. Besides, the toposheets on 1:15800 are available and therefore, same have been used for stock mapping and preparation of toposheets. In all 5 sets will be prepared out of which two sets will be cut and mounted and 3 sets will be uncut and mounted, the details of which are as under :

9.18.3 A. FOR DY.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.

9.18.4. B. FOR THE DY.C.F., BRAHAMPURI :- One uncut and mounted and two cut and mounted sets showing the management details will be supplied to the Dy.C.F., Brahamapuri. One copy of the cut and mounted set will be for the use of the DY.C.F. and the divisional Surveyors and the second cut and mounted set will be given to the concerned R.F.O.

9.18.5. Management maps for the territorial Conservator of Forests and the Conservator of Forests, Working Plans :- Two sets of maps on 1:50000 will be prepared, one copy each for the territorial Conservator and the Conservator of Forests, Working Plans respectively. These maps will show all the management details viz. compartments, working circles, felling series, range boundaries and other administrative details.

9.18.6. REFERENCE MAP :- A small reference map on 1:2,50,000 scale showing range boundaries, compartments, working circles, felling series, roads etc. have been prepared and attached to each copy of the working plan.

9.18.7. GRAZING MAP :- Two sets of maps on 1:2,50,000 scale showing grazing series have been prepared. One set will be kept in the DY.C.F., working plan's office and the other set will be supplied to the DY.C.F.,Brahampuri.

SECTION - 19 :- ENCROACHMENTS

9.19.1. 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. 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.

9.19.2 The encroachments on forest land between 1972 to 78 has been already regularized by the Government vide two resolutions R & FD, LEN-1078/3483-G-I, dated 27th December, 1978 and R.& F.D.-FLD-1079/1366-F-3, 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 regularized and taken place after 31st March 1978, should summarily be removed. There is need for a stringent measures against the encroachers. The Govt. of India has now issued the instructions that all encroachments after 1980 shall be removed summarily by 30th September,2002.

9.19.3 Eviction of encroachment :- The Govt. of Maharashtra has conferred the power of section 53,54, and 54-A of Land Revenue Code-1966 to Forest Officers for the purpose of removal of encroachments. According to section -262 of Cr.P.C. the offences having penalty upto one year can be tried summarily by the Court.

SECTION - 20 :- BEAT CHECKING

9.20.1 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 therein is apprehended or otherwise and whether the forest produce involved therein is recovered or not. As per the standing order 37, Chapter XI instructions issued for guidance and strict compliance with a view to tighten up the measures in regard effectual protection forest are as follows:-

The primary responsibility of forest protection devolves on the protective staff, which generally detects and the duties and responsibilities in regard to each category of the staff are broadly specified as below:-

9.20.2. BEAT GUARD :- Every guard 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.

9.20.3 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 to the Dy.C.F. through his Range Forest Officer.

9.20.4 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 1/4 area of the beat once in six months and report should be submitted to the Dy.C.F. punctually. In case of extensive illicit felling he will take prompt measures to inspect the beats thoroughly.

9.20.5. A.C.F. & DY.C.F. :- 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 felling, apart from normal inspection.

SECTION - 21 :- CHARCOAL KILNS

9.21.1 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 - 22 :- METEOROLOGICAL OBSERVATIONS

9.22.1 Since there is observatory at Brahampuri & Gadchiroli, there is no need of separate observatory for the department. However, the record of rainy days and quantum of rains are required to be maintained for plantation and other purposes and therefore, instruments for recording the same are required to be installed at suitable places.

SECTION – 23 :- PRESERVATION OF WILDLIFE

9.23.1 The distribution of wild animals and birds has been given in Chapter VII of Part I. The protective staff will take adequate measures to protect the wildlife also. The details of conservation & Protection measures have been dealt in detail in the Wildlife (Overlapping) Working Circle. Besides these following prescriptions will be followed for the conservation of the wildlife.

i) 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.

(ii) 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 trees /ha. These two trees will be required to provide snags and den trees for nesting and resting of the wildlife. Trees of commercially low utility may be used for this purpose.

(iv) 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 animals.

(v) In the plantations few trees of fruit species like gular etc. will also be planted to provide food to the animals.

(vi) The waterholes which are frequented most by wild animals will be excluded from grazing by making a special mention of such areas in the grazing permit license.

(vii) Suitable locations will be identified where forest tanks will be constructed to provide water to the animals.

(viii) Efforts will be made to inoculate the cattle grazing near about the waterholes.

(ix) A vigilant watch will be kept on poachers also at the checking gates erected to check/prevent the transport of illicit forest produce.

(x) The labour camps and transit depots will be established away from the area having density of wild animals.

(xi) Hoardings on the importance of wildlife and its protection will be exhibited at strategic locations.

(xii) The provisions contained in the wildlife(Protection) Amendment Act, 1991 will be enforced rigidly.

(xiii) 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 prescriptions could be given.

(xiv) Annual census of the wild animals should be conducted and recorded.

SECTION – 24 TUSSAR CULTIVATION

9.24.1. People have been doing the Tussar Cultivation practice in the natural forests for years together. The practice has become the part and parcel of their life. Some people are rearing silk/tussar worms on their own lands as well. Three crops in a year are taken. The period of first crop is form July to August, that of Second crop is form September to October and that of third crop is from November to December. The first crop takes minimum time because of the fact that from July to August the relative humidity is high. The Tussar Cultivation requires relative humidity more than 60 % for better production. The prescriptions of Afforestation Working Circle will be applicable to these activities. In this regard Government of India's instructions as per Forest Conservation Act, 1980 should be followed strictly.

SECTION – 25 :- RULES FOR TRANSIT OF FOREST PRODUCE

9.25.1. The transit of forest produce is regulated as per the Bombay Transit of Forest Produce (Vidarbha Region and Saurashtra and Katch Areas) Rules, 1960 which are published by the Agriculture and Forest Department under No IFA-1057/22947-(VI)-J, dated 23rd April , 1960.

9.25.2. 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 for more stringent. It has authorized certain officers to be called as authorized officer for the purpose of this Act, who will be competent to confiscate the vehicle involved in offence related to the illicit removal of timber and firewood.

9.25.3. 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.

10.25.4. Regarding transit passes & renewal of licences for saw mills, the instruction issued by the Government as well the decisions of supreme court delivered from time to time should be strictly followed.

SECTION – 26 :- APPLICATION OF JFM

9.26.1 The National Forest Policy of 1988 stressed upon the need to provide fuelwood, fodder and small timber requirements of the people living in and around Forest areas and therefore it was realised that an approach should be undertaken for facilitating the development of Forest Management partnership between village communities and the Forest Development, granting rights to all Non-wood Forest products and percentage share of final harvest to villagers that will help in protection and regeneration of the degraded forest lands.

9.26.2 The principle of JFM issued vide Government Resolution dated 16th March,1992 & GR No. MSC/2000/CR – 143/F-1 dated 25/04/2003 will be followed in the villages where the forest protection committee exists. Local people who are interested in participatory approach in Forest Protection and Management should be encouraged for effective implementation of the prescription of this working circle.

9.26.3 The local people in the villages which have been included in this working circle and where the forest protection committee have been formed & JFM works are going on should be encouraged to thrust special efforts to implement the prescribed works in these areas of this working circle. The prescribed works of this working circle should be included in the micro plan of the village.

9.26.4 In areas where the villagers are willing to participate in Joint Forest management plan, the concerned territotial Deputy Conservator of Forests shall prepare a microplan for the area to be tackled as provided in the Govt. of Maharashtra Resolution dated March 16,1992. The Micro Plan prepared for the particular village shall coincide with the prescriptions contained in Working Plan in so far as the village is concerned.

9.26.5 The execution of works and control shall be exercised strictly in accordance with the guidelines issued by the Govt. of India, Ministry of Environment & Forests letter No. 6-21/89-F.P. dated June 1, 1990, Govt. of Maharashtra Resolution No.SLF-1091/C.N.119/F-11 Mantralaya, Mumbai dated March 16,1992 & GR No. MSC/2000/CR – 143/F-1 dated 25/04/2003 as also the various guidelines, circulars and Resolutions issued by the Govt. of India in Govt. of Maharashtra from time to time and as are applicable to the state of Maharashtra.

9.26.6 The microplan and the Joint Forest Management Scheme shall be implemented through Forest Department or any other agency approved by the Government of Maharashtra. To implement the prescriptions of this working circle effectively, to achieve an excellent plantation & to regulate grazing, the participation and cooperation of local villagers are extremely necessary. It is therefore suggested that the areas where the prescriptions of this working circles are implemented, the JFM committees should be constituted in the concerned villages. JFM committees to be involved in effectively implementation of the prescription of this working circle. Also Forest Protection committees should be persuaded for protection of proper implementation and protection of such areas. The detail instructions as per the government orders about the application of JFM have been given in the chapter IX of Miscellaneous Regulation of this working plan which should be strictly followed.

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CHAPTER X

ESTABLISHMENT AND LABOUR

SECTION - 1 STAFF

10.1.1 The details of staff have been given in chapter IV of part I of this plan. The Ranges, Rounds and Beats have been given in **Appendix No. X.**

10.1.2 The Total area of the division 117173.83 ha. which is divided into 84 beats and therefore, on an average area of a beat comes 1395.00 ha. This shows the degree of workload on the executive staff. The main thrust of forest protection, execution of working plan prescriptions and other schemes lies on the field staff, that is, guards and foresters. They are the real executives of to have the quality of work timely execution of operation/schemes programmes, effective protection of the forest and to increase and maintain the efficiency of the staff, the work load on the staff is required to be reviewed judiciously.

10.1.3. The Division being more or less compact block and having less incidence of organized illicit felling. Though there is little scope of organized felling, proper supervision by the three Assisstant Conservator of Forests under the guidance of Dy.Conservator of Forests should be there on regular basis for better protection of forests and wildlife in the division. Further, for the better control and supervision, the concerned ACF's headquarters should be at suitable places.

10.1.4. Under the present plan, intensive silvicultural works like demarcation, marking, plantations, harvesting and subsidiary silvicultural operations have been prescribed. These works will run throughout the year. The average area of coupe in Selection Working Circle comes to about 100 ha. and that of Afforestation working circle comes to about 115 ha, that of pasture working circle comes to about 118 ha, that of kuran working circle comes to about 116 ha & that of Improvement Working Circle working circle comes to about 115 ha. Therefore, to carry out prescriptions of this working plan successfully from protection and conservation point of view strengthening of the present staff is essential.

10.1.5. Keeping in view the above mentioned facts, the present charge held by forest guard, round officers and Range forest officers, were too extensive to be managed effectively, It was, therefore, essential that the beats should be divided and rounds should be reorganised from development and protection point of view for greater convenience in the execution of works. Accordingly the existing five Ranges have been divided into Development and Protection Ranges. The details of which have been given in the **Appendix No. X.**

10.1.6. The present charge held by Forest guard, round officers and Range forest officers, were too extensive to be managed effectively. It was, therefore, essential that the beats should be divided and rounds should be reorganised from development and protection point of view for greater convenience in the execution of works. As per Tata Consultancy Service

Report, Bramhapuri Forests Division have been reorganised into five Ranges for Protection and five Ranges for Development. Similarly Rounds and beat have been reorganised in to Protection and Development categories respectively. Accordingly the existing five Ranges have been divided into Development and Protection Ranges. The details of which have been reproduced in the **Appendix No. X.**

10.1.7. Activities to be performed by Protection and Development Ranges are as tabulated below.

TABLE

S.N.	Protection Wing.	S.N.	Development Wing.
	A. General Protection Works		**A. Central Nursery. :-**
1	Offence cases	1	Preparation of beds
2	Beat inspection	2	Collection of sees and giving treatment before sowing
3.	Eviction of Encroachment	3	Sowing of deed
4	Inspection of Saw Mill	4	Weeding
5	Inspection of Check Naka	5	Application of fertilizer and insecticides
6	Office inspection of Round office	6	Watering beds
7	Court cases	7	Preparation of Teak stumps
8	Police cases	8	Sowing of sunhemp
9	Renewal of saw mill licences	9	Cris-Cross ploughing of nursery.
10	Grazing control	10	Repair to barbed wire fencing
11	Wildlife offences	11	Construction of overhead tank
12	Patrolling	12	Preparation/repairing inspection path
13	Work relating to felling of trees	13.	Preparation of compost
14	Forest ¼Conservation½ Act.	14	Repairing Well
15	Enumeration of trees coming under forest conservation Act proposal	15	Collection of material required for root trainer nursery
16	Preparation of village microplan	16	Preparation of Bamboo nursery.
17	Function of forest protection committee	17	Maintenance of oil-engine/electric motor/pipeline
18	Function related to Vruksh mitra Mandal	18	Construction of compost shade.
19	Sealing Checking post/Road	19	Exploitation of Timber of fuel work by Govt. agency. Timber- Felling of trees, fashions of timber giving chisal number taking measurement. Transport¼Haulage½ of timber to Depot, preparation /repairs to roads in the coupe. Construction of labour shades.
20	Conducting raids	20	Firewood- Felling bilating of firewood, preparing stacks, giving number, taking measurements, collecting to depot, repairing barbed wire fencing of depot.
21	Inspection of vehicle in transit		**B. Exploitation of coupes by F.L.C.S. :-**
22	Inspection of Brick & Charcoal kiln	1	Instruction of coupe
23	Spying	2	Checking of logging list.

24	Wireless setting	3	Handing over/taking over coupe to society.
	B. Survey Settlement	4	Preparing provisional account of the coupe
1	Survey of encroachment/sensitive area		**C. Natural Regeneration. :-**
2	1/5 th demarcation	1	C.B.O.
3	Repairs to cairns	2	Cleaning
4	Erection of new cairns	3	Thinning
5	Survey of new reserve	4	Cleaning/thinning of Bamboo
6	Erection of cairns in Zudpi jungle area.	5	Artificial regeneration
7	Surveying of big tree forest taken over from Revenue Deptt.	6	Nursery works
8	Updating record of forest land.	7	Plantation works under various plan and non plan, E.G.S. schemes of Govt. of Maharashtra and sponsored by Govt. of India, ¼ARY/JRY½.
9	Updating compartment history.	8	Cleaning
10	Updating control forms.	9	Thinning
11	Demarcation of coupe	10	Soil and moisture conservation
12	Preparation of treatment map.	11	Raising fruit plants, ornamental plants, Vanmahotsawa plants.
13	Marking of coupe.	12	Exploitation of Bamboo :
14	Preparation of estimate coupe	13	Felling, preparing bundle, transporting, stacking, supplying bamboo under nistar, Vidarbha Vikas repairs to roads in bamboo coupes.
	C. Fire and Protection Scheme	14	Construction of building under various plans schemes :
1	Cleaning of internal and external fire lines of coupes.	15	Construction of Van talav.
2	Protected/Reserved forest.	16	Demarcation of Zudpi jungle under E.G.S.
3	Taking fire lines along roads, railway track.	17	Depot maintenance :- Maintenance of depot. Preparation of timber and firewood lots as per classification. Measuring timber, giving number, Preparation of lot list, Upset price, sale of timber, firewoods, bamboo, bamboo bundles etc. Giving transit pass. Supplying bamboo, firewood, ballies under Nistar condition.
4	Appointment of fire watcher, for fire protections.		
5	Combacting accidental fire		
6.	Erection of Machaan		
7	Repair to Check Naka.		
8	Transport of seized material		
9	People awareness.		
	D. Exploitation of Bamboo through Paper Mill. :-		

1	Coupe inspection		
2	Calculating bundle/tonne ratio		
3	Inspection of bamboo at coupe depot.		
4	Issuing transport permit and keeping account.		
	E. Marking of coupes. :-		
1	Demarcation of coupes and enumeration.		
2	Marking of coupes.		
3	Laying out of coupes/ bamboo area for contractor/ Nistar.		
4	Laying out of sample plot of bamboo coupes.		
	F. Repair to Road & bridge. :-		
1	Repairing of metal road		
2	Repairing of murum road		
3	Repairing of tar road		
4.	C.D. Works		
	G. Repairs to building. :-		
1	Repair to Type-I to VI building.		
2	Repairs to all offices		
3	Repairs to forest rest houses /inspection huts/ labour sheds.		
4	Maintenance of gardens		
5	Repairing of well, water tank		
6.	Repair to fencing of forest colonies.		
7	Repairing of water pipe line of forest colony.		
	H. Conservation of nature and Protection of Wildlife. :-		
1	Construction of small water holes anicuts for making availability of drinking water to wildlife.		
2	Construction of Machaan for wildlife census.		
3	Compensation cases regarding pet animals killed by tiger.		
	I. Joint Forest Management under Maharashtra Forestry :-		
1	Preparation of village microplan.		
2	Selection of village.		
3	Constituting committee.		
4	Soil conservation work		
5	Developmental works.¼Entry point½		
6	Plantation work.		
	J. Duties of Range forest officer in Tendu Season. :-		
1	To issue book timely and recover the price from licence holder.		
2	Before beginning of season, to hand over tendu unit to licensee and submit handing over certificate to division office.		

3	To obtain various proformas from forest guard, Forester and Licensee within prescribed time limit and submit the same to division office.		
4	At the end of the season to take over the unit from licensee and submit the taking over certificate to superior along with the record obtained from him with due scrutiny.		
5	To see that the collection do not exceed 125% under any circumstances. Exploitation of standing tree growth on the holding belonging to tribals and disposing the same in open auction.		

SECTION - 2 :- LABOUR

10.2.1. The tract being sparsely populated, labourers are becoming an increasingly a scarce resource with the stepping up of pace of development of this tract. Besides, due to the opressive climatic conditions the villagers are lethargic. It is, however, felt that by handling them tactfully and prompt payments. It will be possible to attract labourers on Government works. In places where shortage of labourers is acute, the import of labourers from the neighbouring districts can be made. Attractive wages, providing good labour sheds, drinking water facility, easy medical aid, transport facility and provision of consumer's shop are some of the measures to attract the labourers from outside. To lessen the pressure of labour requirement in coupe working mechanised logging methods can be used. Efforts have also been made to scatter the works uniformly over the whole area so that with proper planning labour problem can be overcome and all the works can be successfully completed.

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CHAPTER XI

CONTROL AND RECORDS

SECTION - 1 :- CONTROL FORMS

11.1.1 The prescriptions regarding control and records are given in details in Chapter - IX of the working plan code, Bombay State which will be followed.

11.1.2 The records of all harvesting subsidiary silvicultural operation and regeneration works carried out according to the prescription of the plan will be maintained in the control forms. The prescribed Performa of control forms are given in **Appendix No. XVIII**. These are to exercise an effective control over the working of these forests under this working plan. The control forms for harvesting in each working circle have been prescribed separately whereas those for plantation and silvicultural operation are the same for all working circles. The set of control forms for each working circle will be kept in a separate control book which will have separate pages for each felling series. Two sets of control forms will be prepared. One set will be kept in the division office and other set will be flying set for the use of the Dy. Conservator of Forests, Working plan Division No.1, Chandrapur. The flying set will be sent annually by the Dy. Conservator of Forests to the Dy. Conservator of Forests, Working plan Division No.1, Chandrapur not later than 1st October of each year, after making the necessary annual entries. All entries showing the deviation from the prescriptions will be underlined in red. The Dy. Conservator of Forests, Working plan Division No.1, Chandrapur will scrutinize the entries and offer his remarks to the Dy. Conservator of Forests on receipt of replies from him, he will submit his report to the territorial Conservator of Forests, who will forward the report later than 1st February of the following year and the Conservator of Forests, Working plan in turn, will forward them to the Additional Principal Chief Conservator of Forests (Production & Management), M.S., Nagpur for perusal and orders where required.

SECTION – 2 :- COMPARTMENT HISTORIES

11.2.1 Compartment History will be maintained in form No. 1 to 5 given in **Appendix No.XVII**. Each Compartment will have a separate file for its records. Form No. 1 has been written for each compartment during the preparation of this plan and typed copies in duplicate will be supplied to the Dy. Conservator of Forests. Other records will be prepared immediately maintained by him. One copy of the compartment history will be kept in the Divisional Forest Office and the other in the Range Office. Every year, in July, the Range Forest Officer will fill in the columns in the compartment history forms and submit the same to the Dy. Conservator of Forests, who will get them scrutinized by the Astt. Conservator of Forests, who will get them and signed them. One copy of the forms will be filled in the divisional compartment history file and another copy will be returned to the Range Forrest Officer. The copies of annual compartment history files kept in division Office, after completion will be supplied yearly in the month of August to the Dy. Conservator of Forests, Working Plan Division No.1,

Chandrapur for filling in the compartment history files, maintained in his Office. After making entries in the compartment history files, maintained in the Office of Dy. Conservator of Forest, Working Plan Division No.1, the same will be returned to the Dy. Conservator of Forest, in the month of September.

SECTION - 3 :- PLANTATION AND NURSERY REGISTERS

11.3.1. Plantation register will be maintained for all areas regenerated artificially in the form No.1 to 9 given in **Appendix No. XIX**. Nursery registers will be maintained in Form No.1 to 10 given in **Appendix No. XX**.

SECTION - 4 :- DIVISIONAL NOTE BOOK

11.4.1. The matters of divisional importance will be recorded under standard headings. The Dy. Conservator of Forests must record every year his explicit opinion about the success or otherwise of the application of prescriptions of the working plan without reserve. A brief note of the plantations will also be recorded by the Dy. Conservator of Forests under the appropriate heads. The Divisional Note Book will contain the information on the following topics :

1) Record of seed years of various tree species and bamboo.

2) Note on insects.

2) Notes on fungi.

3) Notes on fire damage.

4) Notes on other causes of injury.

5) Notes on building, roads and paths.

7) General Note on export, sale etc.

8) Notes on Grazing.

9) Statistical information on out turn and rate of important trees species.

10) Auction results.

11) Black List of contractors, sportsmen and Government servants.

12) Annual record of market prices of various forest produce.

11.4.2 The form of Divisional Note Book has been given in **Appendix No. XXI.**

11.4.3 **FIRE RECORDS :-** This will be maintained as per the latest orders in force. A record of the same will also be maintained for each compartment.

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CHAPTER XII

FINANCIAL FORECAST AND COST OF THE PLAN

SECTION - 1 :- FINANCIAL FORECAST

12.1.1 FUTURE REVENUE :- National Forest Policy of 1988 lays main emphasis on the maintenance of environmental stability through preservation and restoration of ecological balance and no emphasis is laid on monetary consideration in the management of forest. The prescriptions of this working plan confirm to these principles. Most of the areas in Bramhapuri Forest Division were under tremendous biotic pressure in the past & a very good amount of such areas are being covered under scientific management for the first time. Because of that the main objective of this plan is conservation and preservation of the existing forest to improve. However, scientific management of the forest will permit removal of some silviculturally mature tree from Selection - Cum - Improvement Working Circle, Improvement Working circle & Old teak Plantation Working Circle. The major yield will be obtained from these the Selection - Cum - Improvement Working Circle & Improvement Working circle, besides this, some material in the form of polewood will be available from Old Teak Plantation Working Circle. Among the minor forest produce, Tendu will be major revenue earning produce. Besides tendu some Revenue will be coming from Minor Produce like Hirda,Gum,Moha flower ,Moha fruit & lac etc. The royalty received from the sanctioned quarries under F.C. Act 1980 may be utilized in implementing the prescriptions of the working plan. The table below gives a rough estimate of the future annual yield.

TABLE - I

S.N.	Kind of produce	Quantity	Remarks
1.0	Timber a. Teak b. Misc.	 275.00 cum 5245 cum	 (App.5%of timber yield) (App.95%of timber yield)
2.0	Firewood a. Teak b. Misc.	 83 beats 1574 beats	 (30% of timber) (30% of timber)
3.0	Tendu	54400	----
4.0	Misc., Hirda, Gum, Moha flower, Moha fruits, Lac etc.	5000 Qtl.	----

12.1.2 An accurate forecast of revenue is not possible as the prices of timber, firewood and other minor forest produce are not constant and stable. However, the table gives a rough estimate of revenue, based on current rate, expected from the sale of various forest produce in Bramhapuri Forest Division, Bramhapuri and adjoining forest divisions.

TABLE - II

S.N.	Kind of produce	Revenue in Lacs	Remarks
1	Timber a. Teak b. Misc.	 44.00 209.80	 @ Rs.16000/-per m3 @ Rs.4000/ per m3
2	Firewood a. Teak b. Misc.	 1.74 6.30	 @ Rs.2100/- per beat @ Rs. 400/- per beat
3	Tendu	272.00	@ Rs. 500/- per Standard bag
4	Hirda, Gum,Moha flower, Moha fruits, Lac etc.	20.00	@ Rs.400/- per Qtl
	Total	553.84	

12.1.3. In addition to this, the intangible benefits from the forests. Such as checking soil erosion, improving the water, providing employment and recreation, maintaining the ecological balance etc. are meaning and is difficult to quantify them in term of money. However, the environmental loss has been calculated by the ministry of Environment, Government of India for the purpose of the proposals under Forests Conservation Act, 1980. On this basis, the annual intangible benefits in terms of money is calculated as follows.

12.1.4. From the hectare of sully stocked forests, we get the benefits worth Rs.126.00 Lacs to be accrued over a period of 50 years. Hence in one year, we will get the benefit worth Rs. 2.52 Lacs. And from these forests having average density of 0.50, we are getting the benefits worth Rs. 1.26 Lakhs per ha. annually. The wooded area included in this plan is about 117173.83 ha. forests is worth Rs.147639.02 Lacs per year. Details have been given in chapter VIII of part I of this plan.

12.1.5. FUTURE EXPENDITURE :- An approximate estimate of the total expenditure on various activities as per the prescriptions made in this plan excluding proposed establishment has been made. The details of expenditure that would be incurred in carrying out the prescriptions of this plan are given in **Table-III**. Calculations have been made on the basis of wage Board rates for 2003 - 04 for both North and South Chandrapur Circles. Rates for plantation schemes are standard sanction Rates in the department and the same have been considered in calculations. The figures of rates for the 2005-06 were obtained by increasing 10% in previous year's rates and figures for subsequent years have been obtained by increasing previous year's figures by 10%. The expected expenditure for tendu collection has not been taken into account because of the fact that presently collection is done by the lessees and expenditure is borne by them. But as soon as the Govt. changes its policy as suggested in this plan, the expenditure on tendu collection will come in picture. The expected expenditure for executing activities as suggested under NTFP working

circle have not been estimated. As soon as these activities start, both expenditure and revenue will sharply go up.

12.1.6 COST BENEFIT ANALYSIS :- Without accounting for the intangible benefits, we cannot complete the cost benefit analysis for managing the forests whose prime function is to maintained the ecological balance.

12.1.7 Thus the C/B ratio is about 0.0054 (if intangible benefits are considered) and about 1.324 (if intangible benefits are not considered) for the year 2005-2006. This is because more than 90 percent area of this plan is under Afforestation Working Circle, Fodder Management Working Circle & Improvement Working Circle, where the main thrust is on conservation, protection & improvement of the existing crop and hence the direct benefit is comparatively low than SCI Working Circle. Expenditure and Revenue for the year 2005-2006, which were taken for C/B ratio, are Rs.806.40 Lacs and Rs. 609.22 Lacs respectively. Revenue obtained in para 12.1.2 pertains to the year 2004-2005, which was increased by 10% to have the figure for the year 2005-2006.

SECTION - 2 :- COST OF THE PLAN

12.2.1. The total expenditure incurred on the preparation of this plan is difficult to account for because the part tree enumeration and writing of P.W.P.R. for Bramhapuri Forest Division was carried out by Deputy Conservator of Forests, Working Plan Division, Amravati and the preparation of the final Draft plan has been completed by Deputy Conservator of Forests, Working Plan Division No.1, Chandrapur who is also preparing P.W.P.R. for Gadchiroli Forest Division therefore expenditure incurred can not be worked out separately for this plan.

TABLE – III (EXPENDITURE IN THOUSANDS)

S.N.	Items of the Work	2005-06	2006-07	2007-08	2008-09	2009-10
1	Demarcation & marking @ 4.5 MD or Rs.260/- per ha	1523	1675	1843	2027	2230
2	Coupe Working					
	a.Timber @7.7 MD/cum or Rs.445/-per cum	--	2456	2702	2972	3269
	b.Firewood @ 4.26 MD/beat or Rs.246/- per beat	--	408	449	494	543
3	Removal of windfallen (300 cum timber & 200 beat)					
	a. Timber @ Rs.400/ cum	120	132	145	160	176
	b. Firewood @ Rs.200/beat	40	44	48	53	59
4	CBO @ 6 MD per ha or Rs.347/- per ha	--	2033	2236	2460	2706
5	Cleaning @ 8 MD/ha or Rs.462/- per ha	--	--	--	--	--

6	Afforestation : Rate in Rs. Per ha Operation Mice Bam. Arjun	Total annual plantation considering unworkable areas = 1120 ha				
	PPO 10930 3607 23681	12242	13466	14813	16294	17294
	FYO 10836 1993 25195	--	12136	13350	14685	16153
	SYO 4050 1171 9503	--	--	4536	4990	5489
	TYO 1546 944 9503	--	--	--	1732	1905
	4th YO 821 821 9503	--	--	--	--	920
	5th YO 821 821 9503	--	--	--	--	--
7	Maintenance of Roads, Bridges, C.N. & Depot.	2500	2750	3025	3328	3660
8	Wages	5000	5500	6050	6655	7321
9	Office Expenses	1000	1100	1210	1331	1464
10	Petrol/Diesel	800	880	968	1065	1172
11	Vehicle	800	880	968	1065	1172
12	Material Supply	2000	2200	2662	2928	3221
13	Salary	30000	33000	36300	39930	43923
14	Traveling Allowance	1000	1100	1210	1331	1464
15	Miscellaneous	800	880	968	1065	1172
16	Fire Tracing & boundary demarcation works.	934300	981015	1027730	1074445	1121160
	Total	992125	1061655	1121213	1179010	1236773

TABLE – III (EXPENDITURE IN THOUSANDS)

S.N.	Items of the Work	2010-11	2011-12	2012-13	2013-14	2014-15
1	Demarcation & marking @ 4.5 MD or Rs.260/- per ha	2453	2698	2968	3265	3591
2	Coupe Working					
	a.Timber @7.7 MD/cum or Rs.445/- per cum	3596	3955	4351	4786	5265
	b.Firewood @ 4.26 MD/beat or Rs.246/- per beat	597	657	723	795	875
3	Removal of windfallen (300 cum timber & 200 beat)					
	a. Timber @ Rs.400/ cum	193	213	234	257	283
	b. Firewood @ Rs.200/cum	64	71	78	86	94
4	CBO @ 6 MD per ha or Rs.347/- per ha	2976	3274	3602	3962	4358
5	Cleaning @ 8 MD/ha or Rs.462/- per ha	--	2707	2977	3275	3603

6	Afforestation : Rate in Rs. per ha Operation Mice Bam. Arjun	Total annual plantation considering unworkable areas = 1120 ha				
	PPO 10930 3607 23681	19716	21687	23856	26242	28866
	FYO 10836 1993 25195	17768	19545	21500	23650	26015
	SYO 4050 1171 9503	6037	6641	7305	8036	8839
	TYO 1546 944 9503	2096	2305	2536	2789	3068
	4th YO 821 821 9503	1012	1113	1225	1347	1482
	5th YO 821 821 9503	920	1012	1113	1225	1347
7	Maintenance of Roads, Bridges, C.N. & Depot	4026	4429	4872	5359	5895
8	Wages	8053	8858	9744	10718	11790
9	Office Expenses	1611	1772	1949	2144	2358
10	Petrol/Diesel	1289	1418	1560	1716	1888
11	Vehicle	1289	1418	1560	1716	1888
12	Material Supply	3543	3897	4287	4716	5188
13	Salary	48315	53147	58462	64308	70739
14	Traveling Allowance	1611	1772	1949	2144	2358
15	Miscellaneous	1289	1418	1560	1716	1888
16	Fire Tracing & boundary demarcation works.	1167875	1214590	1261305	1308020	1354735
	Total	1296329	1358597	1419716	1482272	1546413

Yield :-Timber = 2030.00 cum and Firewood = 640.00 beat. Wage Rate for the year 2003 - 2004 = Rs.57.80

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