



GOVERNMENT OF MAHARASHTRA

WORKING PLAN

FOR

WADSA FOREST DIVISION

GADCHIROLI FOREST CIRCLE

**FOR THE YEAR
2012- 13 TO 2021-22**

VOLUME – I

**S. P. THAKRE, IFS
CONSERVATOR OF FOREST,
WORKING PLAN
CHANDRAPUR**



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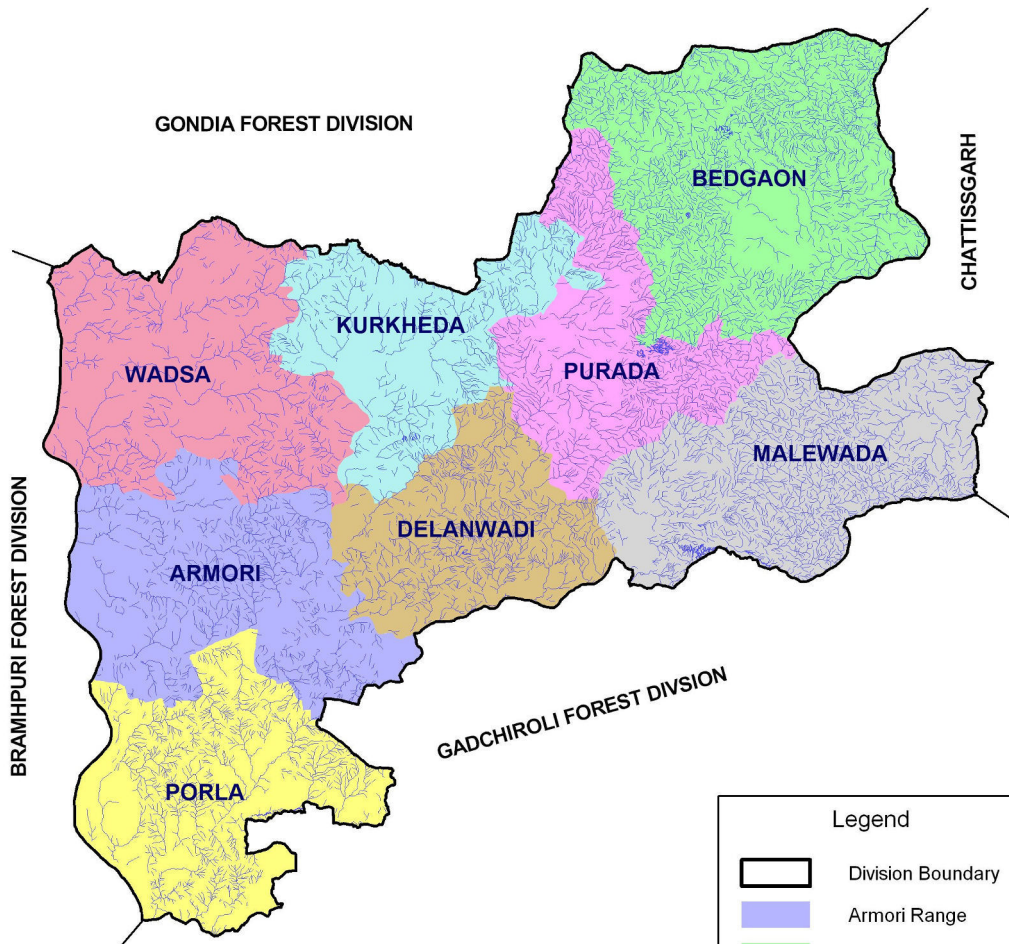
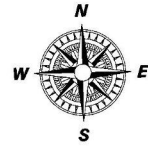
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MAP OF WADSA FOREST DIVISION



0.0 3.0 6.0 9.0 12.0 15.0

Legend

- Division Boundary
- Armori Range
- Bedgaon Range
- Delanwadi Range
- Kurkheda Range
- Malewada Range
- Porla Range
- Purada Range
- Wadsa Range

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INTRODUCTION

This working plan covers the entire Reserved, and Protected Forest areas of Wadsa Forest Division, which was the part of the erstwhile East Chanda Forest Division till 28th August, 1983. This replaces the Working Plan of Shri T.K.Choubey, IFS, Shri R.K.Pole, IFS & Shri D.R.Parihar, IFS for Reserved Forests, Protected Forests, Unmanaged Forest areas of tract dealt with.

- The period of working plan of Shri T.K.Choubey, IFS, Shri R.K.Pole, IFS & Shri D.R.Parihar, IFS for plan was from 2002-03 to 2011-12. For revision of this plan and to write up the plan for all these areas the field work have been completed during the year 2007-09 under the supervision of Shri Dilip Singh, IFS, Conservator of Forests, Working Plan Division No.1, Chandrapur and part work could be completed in the same year. The part of the tree enumeration works have been completed during the year 2007-08 & remaining enumeration of trees has been completed in the year 2008-09. Subsequently remaining field works, collection and compilation of information & writing of the preliminary working plan were carried out under the supervision of Shri S.P.Thakre, IFS, Conservator of Forests, Working Plan Division No.1, Chandrapur.
- The preparation of this Preliminary Working Plan was entrusted to me on in the year 2009-10. The Working Plan for Wadsa Forest Division encompasses the ideas of National Forest Policy of 1988 and therefore lays more emphasis on conservation, preservation and Protection of Forest, Wildlife and Environment. The ideas of people's participation in forest management has been incorporated in this Preliminary Working Plan.
- The meeting of PWPR-I was held on 27/28 February 2009 at Nagpur, in which formation of S.C.I. and A.W.C. were approved as in the ongoing plan. But WPO has suggested creation of Improvement Working Circle on the basis of enumeration results. These results were analyzed by Chief Forest Statistician, Nagpur. The data analysis clearly shows growing stock including, no. of sound trees in compitt.; per hectare density, girth class wise distribution, volume per hectare in both SCI and Afforestation Working Circle. On the basis of data analysis of Growing Stock it can be clearly seen that there is either very good density and distribution of trees in various classes that it will not be practical to carry out Afforestation activities in these compitts. These areas are more suitable for Improvement Working circles because of well distributed trees in all girth classes, but fewer no. of trees in maturity classes. The detailed discussion on these proposals are given in Chapters on SCI and IWC.
- The working circles proposed in this preliminary working plan are Selection-Cum-Improvement Working Circle, Improvement Working Circle, Bamboo (Overlapping) Working Circle, Non Wood Forest Produce (NWFP) (Overlapping) Working Circle and Wildlife (Overlapping) Working Circle and Joint Forest Management Working Circle(overlapping) which have been prescribed for better scientific management of the forest areas in order to

meet the ever growing demand for large size timber, bamboo and the small size timber for construction of houses, agricultural implements, firewood and fodder requirements. In addition to this, the present working plan also offers greater employment opportunities to the local people in forestry operations.

- This working plan has suggested for identification and demarcation of encroachment in the forest areas which are getting regularized under the Forest Rights Act if found eligible. The un eligible encroachments are to be removed.
- 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 will be prepared using GIS technology through Geo-media Software in the office of the Conservator of Forests, Working Plan Dn.1, Chandrapur and the same will be supplied with this working plan.
- I am also thankful to Sri A.K.Joshi IFS, the Principal Chief Conservator of Forests,(HOFF), 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 preliminary working plan.
- I am extremely thankful to Dr.S.K. Khetrpal IFS, Additional Principal Chief Conservator of (Production & Management), M.S., Nagpur for his keen interest and valuable guidance provided in the preparation of this preliminary working plan especially for the constitution of various proposed working circles. He has taken very keen interest & guided in writing up different chapters of this preliminary working plan.
- I am also highly grateful to Sri. T.K. Choubey, IFS, Chief Conservator of Forests, Working Plan Circle, Nagpur whose keen interest, valuable guidance and suggestions have helped me to complete this preliminary working plan in time. I am also thankful to Sri.G.R.K.Rao, IFS, Conservator of Forests, Chandrapur Circle, Chandrapur and Sri. P.R.Yeole, IFS, Conservator of Forests, Gadchiroli Circle, Gadchiroli and Sri.Ramanujam I.F.S. Dy. C.F. Wadsa forest Division and all other officers & staff of Wadsa Forest Division for extending cooperation in providing all the important information needed to complete this preliminary working plan.
- I am personally thankful to the staff of this Division who have made it possible to complete this preliminary working plan and they have put in their best endeavour in the preparation of preliminary working plan. I am extremely thankful to Shri V.G.Parwate,Range Forest Officer, Shri B.C.Madavi, Ranger Surveyor,S.B.Waghmare Ranger surveyor and Shri P.Y.Mahitkar, Shri D.G.Shendre, Shri M.V.Ghormare, 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.

- 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 V.G.Parwate, R.F.O, Shri R.V. Thakre, Chief Account, Sri. V.S.Chakinapurwar, Steno Typist, Shri R.G.Muraskar, Steno, Shri S.S.Nalguntwar, Accountant, Shri Yusuf, Forest Guard, Sri K.M.Chahande, Driver, Sri S.V.Choudhary & Shri M.P.Bhale, 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 and 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 :- 15/01/2011

(S.P.Thakre)
Conservator of Forests
Working Plan Division No.1,
Chandrapur

SUMMARY OF THE WORKING PLAN FOR WADSA FOREST DIVISION FOR THE PERIOD FROM 2012-2013 TO 2021-22

PART-I

SITUATION:

This working plan deals with the entire forest areas of Wadsa Forest Division, which was the part of the erstwhile East Chanda Forest Division. On reorganization of the Forest Department, the Wadsa Forest Division was carved out from erstwhile East Chanda Division in 1983 vide Government of Maharashtra Resolution No. FDM/1880-F-2 dated 29.08.1983. Wadsa Division was under the administrative control of Conservator of Forests, North Chandrapur Circle, Chandrapur but now as per Government of Maharashtra, Revenue and Forest Department Resolution No. FDM/2010/C.No.2/F-2, Dated 3rd March 2010, Wadsa Division is under the administration control of Conservator of Forests, Gadchiroli Forest Circle, Gadchiroli. This is the second independent consolidated working plan of Wadsa Forest Division. This Working Plan replaces the working plan of Shri T.K.Choubey, R.K.Pole, and D.R.Parihar.

CONFIGURATION

The tract lies at elevation varying from 201.47 m. (661 feet) to 588.57 m (1931 feet) above mean sea level. Most of area of the tract in general is flat or undulating broken by solitary hillocks and ranges of low hills. The slopes are moderate to steep and ground below is cut up by numerous nalas. Forest of the tract is situated on the triangle of high lands forming a table land which runs the entire length of the western portion of the division. Numerous hills rise in these table lands mainly on the North Eastern, Eastern and Eastern sides. There are three main ranges or group of hills in the tract viz. Satnala in the North-East, Khobramendha and Tipagarh in the South-East.

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 29.4°C and the mean minimum temp, is about 13.7°C. during winter. The highest and lowest temperature recorded are 47.8°C. and 5°C. 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 village are not maintained. Un surveyed villages are still without proper boundary demarcation.

RIGHTS AND CONCESSIONS: Reserved Forest are not burdened with rights. However some concessions have been granted to agriculturist. In the protected forest areas nistar rights are recorded in the Nistar patrakas of the concerned village.

DISCRIPTION OF THE FORESTS:-The forest of this tract belong to the groups "Tropical Dry Deciduous" Forest and sub-group 5A/C3-Sourthern Tropical Dry Deciduous Forests.

The local sub-types found are as follows:-

A. TEAK FOREST WITH DENSE BAMBOOS:-

- (i) Plain sub-type
- (ii) Hill sub-type

B.TEAK FPREST WITH SCANTY OR NO BAMBOOS:

- (iii) Plain sub-type
- (iv) Hill sub-type

C. MIXED FOREST WITH DENSE BAMBOOS:

D. MIXED FOREST WITH SCANTY OR NO BAMBOOS:

Teak forest 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 forest commonly found important species are ain, bija, harra, behada, semal, haldu, dhawada, bhirra, tendu, salai, mowai, lendia, khair etc. Bamboo is found almost every where. Out of that Kurkheda and Korchi tahsil has got dense bamboo clumps. 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 sampling and poles develop hollowness. Fire prevents formation of human by burning the grass and leaf litter. Illicit cutting is common especially in the vicinity of human habitation. However organized illicit cutting is not observed. Encroachments are noticed in the protected forest, specially near the

cultivated areas, and where the boundaries are not properly demarcated. Grazing by the 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 NEEDS OF THE POPULATION:-The total population of the Gadchiroli District as per 2001 census is 9.70 lacs. Average population is 1406 per Sq.Km. The rate of increase of population is 21.76% in rural areas. As per the census of 2001, the total cattle in the district is 10.72 lac. The density of the cattle is 69.46 per sq km. Agriculturists dominate the population but they are mostly small or marginal farmers. Malguzari tanks are main potential sources of irrigation. People depend upon forests for timber, firewood, bamboo grass and others MFPS.

MARKET :- These forests are worked commercially for timber, firewood, and certain NWFPs. 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 NWFPs are collected by T.D.C. through local tribals. Wadsa is well connected by roads.

METHODS OF HARVESTING AND TRANSPORT :- Annual coupes are worked either by the FLCS or departmentally. 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 4 A.C.F's, 13 RFOs, 52 Foresters, 160 Forest Guards, 3 Drivers, 1 Surveyor, 1 Chief Accountant, 9 Accountant, 20 Clerks, 1 Daftari, 2 Watchman, 3 Peon, 1 Choukidar and 1 Cleaner.

PAST HISTORY

A. RESERVED FORESTS :-

The forest areas forming old reserves account for 25.44 % of the total forest area of division where as the new reserve forests account for 79.64 % of the total area of the division. The old reserve areas were reserved in 1897 under IFA, 1878. These are distributed in Wadsa, Porla, Purada, Malewada, Bedgaon, Delanwad, Armori and Kurkheda Ranges of Wadsa Forest 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 felling 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 Wadsa & 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 Silvicultural 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 for removal of dead & dying trees for 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 in 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 Wadsa, 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). 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, 2) C.W.R. , 3) improvement felling 4) Kuran, 5) Misc. Working Circle .The results of these plan were not in tune with the objective. The conversion system was not very successful because of failure of teak to come in many patches . Teak was never dominant spp. In the tract. The result of CWR were also not very satisfactory, because of failure of many spp. To coppice and lack of post harvesting care of CWR worked coupes due to host of factors like fire. These areas were degraded and were liable to erosion. This plan was replaced by the first independent consolidated working plan of Wadsa Forest Division by Shri T.K.Choubey, R.K.Pole, and D.R.Parihar.

B.PROTECTED FORESTS:-- The working scheme by Mr. V.K.Prabhu, was the first of its kind to bring the Ex. Proprietary forests declared as Protected Forests under any Scientific Management. The period of the working scheme was from 1965-66 to 1974-75.The object of the management was to improve the degraded irregular crop into normal productive forest at the same time taking into account the needs of the local villagers who were totally dependent on them. Following Working Circles were formed. 1) S.C.I. 2) C.W.R. 3) Minor Forest WC. 4) Bamboo Overlapping WC. The division of forests into tree forests ,

minor forests was ocular. There was no demarcation on ground around the protected forests. The coppicing of 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 was not achieved. Analysis of maps prepared at that time, reveals large scale cartographic errors. No soil conservation measures were carried out though prescribed during the plan period, soil erosion has accelerated. No light was thrown on the scientific management and improvement of NTFP. Age old tussar cultivation practice was ignored. Normalcy of forests could not be achieved.

In the Working plan of Shri.Parihar, Shri. Pole, Shri.T.K. Choube, consolidated managements for both P.F. and R.F. was given.

As per this plan following working circles have been constituted.

- (i) Selection cum Improvement Working Circle
- ii) Afforestation Working Circle
- (iii) Wildlife (Overlapping) Working Circle,
- (iv) Bamboo (Overlapping) Working Circle,
- (v) Joint Forest Management Working Circle
- (vi) Non-Timber forest Produce Working Circle.

The prescriptions of this plan could not be implemented properly due to various administrative and local reasons such as the Naxalite activities going on in the division and paucity of the funds. Only 43 % of SCI coupes and 26 % of IWC coupes could be worked due to Naxalite activities. This has resulted into heavy congestion in forest crop. In afforestation coupes the no. of stems per hectare was found to be 316.69 per Ha. as compared to 495.06 per Ha. in the SCI working Circle. In SCI there is a definite improvement in the growing stock. The no. of stems per was 261.95 in 1995/96 at the time of preparation of this plan(Shri. Choube).The growing stock of SCI allotted areas is suitable to continue them in the same Working Circle. In case of areas allotted to Improvement Working Circle the afforestation could not be taken up in desired level but Natural Regeneration is good due to fire protection and joint forest management. Hence depending upon the extent of matured crop the areas under AWC have been allotted to either Improvement Working Circle or Selection cum Improvement working circle. If the stock lacks in mature crops they had been proposed in Improvement Working Circle. The regeneration bamboos is good hence no change in Bamboo Working Circle is proposed. Similarly very good results of joint forest managements are visible in the recent past with samitis bagging state level prizes for best performance. Non wood forest produce Working Circle and Wildlife management working Circle are also proposed.

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 Wadsa 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 nala 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) Improvement Working Circle.
- iii) Old Teak Plantation Working Circle
- iv) Bamboo (Overlapping) Working Circle.
- v) Non Wood Forest Produce (Overlapping) Working Circle,
- vi) Joint Forest Management Working Circle,
- vii) Wild life (Overlapping) Working Circle
- viii) Eco-tourism

I. SELECTION-CUM-IMPROVEMENT WORKING CIRCLE :-

Total Area : 83143.08 ha.

Felling cycle : 20 years

Felling series : Will be Constituted in the draft plan.

Selection girth :

- 1) Teak, ain, bija, shisham kalam haldu tiwas: 135 cm
- 2) All other timber spp(dhawda,bhirra, ... 120 cm
kateain,salai,semal.
- 3) Khair 75 cm
- 4) Garari,lendia:- 45 cm

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

Demarcation :- Main felling coupes will be demarcated in the same year 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/Plantation

Type D :- Well stocked areas..

MARKING TECHNIQUE :-

Type A Areas. :- In protection areas no felling will be done.

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

Type C Areas. :- 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 D 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 silviculturally 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 10th year, 15th 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 thinning will be silvicultural, aiming at the spacing in congested crop equivalent to 1/3 of the average height of the stems.

II. IMPROVEMENT WORKING CIRCLE:

Total area	: 74183.25 ha.
Felling Series	: Felling Series will be constituted in the draft plan.
Choice of Species	: Teak bija, shisham, ain, semal, neem, bamboo and fodder grasses.
Regulation of yield	: No appreciable yield is available.
Demarcation	: coupes will be demarcated in the same year of felling.

SPECIAL OBJECTS OF MANAGERMENTS:-

Special objects of management are as follows:-

- i) To maintain and improve the existing crop.
- ii) To remove congestion and to help natural regeneration of various species that are coming up naturally.
- iii) To ensure growth of timber of commercial value.
- iv) To meet the local demand of nistar

SILVICULTURAL SYSTEM:

Silvicultural system prescribed is improvement of the crop through hygienic felling by removing dead dying deceased and malformed trees. Removal of congestion by carrying out singling operations will also be carried out to facilitate the young regeneration,

Treatment map:- Treatment map will be prepared by showing the following areas on map.

A protection areas:- all nala bank and steep slope vulnerable for erosion

B. Understocked areas: all blank areas which may or may not have natural regeneration

C. Advance Growth and young poles: this also include old plantations.

D. Well stocked areas: these are dense stock and have matured or old trees.

METHOD OF TREATMENT :- The basic aim to constitute this working circle is to improve the quality of the growing stock. The felling in these areas will be purely of hygienic in nature. The following operations will be carried out.

- i) Removal of dead, dying, diseased and malformed trees.
- ii) Thinning in congested patches.
- iii) Removal of mature crop which are not likely to survive till next felling cycle.
- iv) In areas where density is below 0.4 only climbers, malformed and crooked trees will be removed.
- v) Raising of plantations of teak and other suitable species.

III. OLD TEAK PLANTATION WORKING CIRCLE:

Total Area : 1004.00 ha.

Felling Cycle : 10 years.

Only one felling series and 10 annual coupes are proposed for working.

Objects of the Management:-The main object of the management is to improve the crop by carrying out regular cleaning and thinning as per the thinning schedule and site quality, growth etc. are properly studied before actual thinning operation. This will help in getting maximum yield and proper conversion as well as utilize the production capacity of the forest.

CUT-BACK OPERATIONS :-

These operations will be carried out departmentally in the year following the year of first mechanical thinning, which will consist of climber cutting, badly damaged and broken trees at the time of main felling cut back of all malformed advance growth of trees etc.

CLEANING:-

Cleaning operations will be carried out in the 10th year commencing from the year of formation of the teak plantation in which all the climbers, shrubs and bushes, bamboo and other unwanted plants species interfering with the growth of the teak will be systematically removed. This is mandatory in all the teak plantations to improve the growth of teak plantations uninterruptedly.

THINNING :-

Thinning in all the teak plantation areas will be carried out at 10th year and 15th year and thereafter in 10 years cycle. The first thinning will be mechanical during which alternate diagonal lines will be removed. The subsequent thinning will be silvicultural aiming at the spacing in congested crop equivalent to 1/3 of the average height of the crop. While carrying out thinning operations care should be taken to remove all the non-teak trees which are dominating and interfering with the growth of the teak. All the climbers, thorny Bushes, unwanted shrubs and bamboo clumps which are interfering with the teak shall also be removed to facilitate the growth of the teak.

IV. BAMBOO (OVERLAPPING) WORKING CIRCLE

Total Area : 69624. 10 ha.

Bamboo Covered Area : 41518.43 ha.

Felling series : Felling Series will be Constituted in the plan.

Rotation : 3 Years

Demarcation : Main bamboo coupes will be demarcated one year in advance .

This working circle includes all the areas where bamboo, natural or planted, is present in workable quantity. Workable means that there are sufficient bamboo clumps which require independent working. Areas with scattered bamboo have not been included in this working circle. All the compartments of bamboo, which were not included in the previous working plan have been included in this plan. The total area of the working circle is 69624.10 ha and is spread over eight Ranges of the Division containing bamboo area 41518.43 ha. The general character of the vegetation in the area included in this working circle have been described in the respective non overlapping working circles. Here only the condition of bamboo in this tract has been described in this chapter. The common variety of bamboo occurring in this tract is *Dedendrocalamus strictus*. This generally forms an under story in the better quality forest and occurs extensively. Difference in quality and growth are manifest as expected, in the large areas with varying drainage, soil sand and past maltreatment. Bamboo mostly occupies hill slopes and are dense particularly along nalas and moist sheltered slopes. There is a considerable

V. NON WOOD FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE :-

Total area :-157326.33 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 dhawda and salai trees produce gum. Tapping rules are given in detail in the Working circle

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

VI. JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE:

Total area covered : 44512.80 ha.

Since 1992 a total of 195 Forest Protection Committees are formed in Wadsa Division, and about 44512.80 ha. of forest area has been handed over to them for the protection and management of the area. under the provisions of Government Resolution No.SSL/1091/C.N.119/D-11 dated 16.3.1992.

SPECIAL OBJECTS OF MANAGEMENT:

The main objectives of management are as follows:

- 1) To rehabilitate and regenerate the degraded forest areas through JFM.
- 2) To check soil erosion and to conserve water through JFM
- 3) To maintain an optimum level of carrying capacity in the forests for the purpose of grazing.
- 4) To Protect the forests from illicit felling, and
- 5) To utilize the degraded forest area for productive purposes in order to meet the demand for fuel, fodder and timber and ultimately achieving the integrated development of adjoining villages with the help of other development agencies of the government.

VII. WILDLIFE (OVERLAPPING) WORKING CIRCLE :-

Total area : 157326.33 ha.

Provisions for conservation of wildlife have been prescribed.

VIII. ECOTOURISM IN THE TRACT:-

Nature tourism (ecotourism) is distinguished from mass tourism or resort tourism by having a lower impact on the environment and by requiring less infrastructure development. The ecotourism will be practiced as per policy issued by Maharashtra State Govt. in 2010.

Principles of Eco-tourism:---

- 1." Small is beautiful". It should be small.
2. Appropriate from environmental, social and cultural as well as financially proper.
3. Already tested and worth adopting
4. participation of locals.
5. It should not be degrading
6. As per tourist demand but with restriction

IX. MISCELLANEOUS REGULATIONS :-**DEMARCATON 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 1/5th 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.

COMPARTMENT HISTORIES :- Compartment history Forms Nos. from 1 to 5 will be maintained in the division and range offices.

PLANTATION AND NURSERY REGISTERS :- These will be maintained in the standard formats and will be kept in the Division as well as in the Range Office.

DIVISIONAL NOTE BOOK :- These will be maintained in the standard formats and will be kept in the Division as well as in the Range Office.

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 Increment
Cft.	Cubic feet
CM.	Centimeter
Cm ³	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
M ³ /m ³	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

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	Black cotton soil.
Rith	A deserted village site
Satkatha	Miscellaneous tree species
Seri-culture	Rearing silk/tussar worms.

**LOCAL AND BOTANICAL NAMES OF PLANTS
OCCURRING IN WADSA FOREST DIVISION**

A . TREES

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

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

B. SHRUBS AND HERBS

LOCAL NAME	BOTANICAL NAME	FAMILY
Aal	<i>Moringa citrifolia</i> (Lin)	Celastraceae
Aghada	<i>Achyranthus aspera</i> (Linn)	Amartaceae
Akola	<i>Alangium salvifolium</i> (Thwaites)	Cornaceae
Ban rahar	<i>Flemingia semialata</i> (Roxb)	Fabaceae
Baibirang	<i>Embelia ribes</i>	Myrsinaceae
Bankapas/Rankapas	<i>Thespesia lamps</i>	Malvaceae
Bharati	<i>Maytenus emarginata</i> (Benth)	Celastraceae
Chind/Sindhi	<i>Phoenix sylvestris</i> Roxb	Palmae
Chipti	<i>Desmodium pulchellum</i> Benth	Fabaceae
Dhawai/Jilbili	<i>Woodfordia fruticosa</i> Kurz	Lythraceae
Dikamali	<i>Gardenia resinifera</i> Roth	Rubiaceae

Gurmukhi/Gursukri/ Gaturli	<i>Grewia hirsuta</i>	Tiliaceae
Gokhru	<i>Trubulus terrestris</i> , Linn	Zygoiphylaceae
Harsingar/Kharsui	<i>Nyctanthus arbortristis</i>	Oleaceae
Jine	<i>Leea crispa</i>	Leeaceae
Ranbhendi	<i>Dodonea viscosa</i>	Spindaceae
Koril	<i>Petalidium barlerioides nees</i>	Acanthaceae
Kasterua	<i>Hygrophila auriculata k. Schum</i>	Acanthaceae
Kharoti	<i>Grewia hirsuta vahl.</i>	Tilianaceae
Kudursi	<i>Bridelia hamiltoniana wall</i>	Euphorbiaceae
Kudmudi	<i>Gardenia gummifera Linn</i>	Rubiaceae
Kuda	<i>Holarrhena pubescens</i> (Buch, Ham)	Apocynaceae
Kala kuda	<i>Wrightia tinctoria</i>	do
Kuchala	<i>Strychnos nuxvomica</i>	Strychnaceae
Lokhandi	<i>Ixora arborea Roxb</i>	Rubiaceae
Morarphal	<i>Helicteres isora Linn</i>	Steculiaceae
Maruadona	<i>Carvia callosa Ness</i>	Acanthaceae
Nirmali	<i>Strychnos potatorum</i>	strychnaceae
Neel	<i>Indigofera tinctoria</i>	Papilionaceae
Phetra-safed	<i>Gardenia turgida Roxb</i>	Rubiaceas
Phetra-kala	<i>Tamilnadia uliginosa</i> (Retz)	do
Tarwad	<i>Cassia auriculata</i>	Caesalipiniaceae
Tarota	<i>Cassia tora Linn</i>	do
Thuar	<i>Euphorbia tirucalli Linn</i>	Euphorbiaceae
Warangal	<i>Celastrus paniculata Willd</i>	Celastraceae

C. GRASSES AND BAMBOOS

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

Ukari	<i>Iseilema prostratum</i> Anderss	do
Chir	<i>Imperata Officinalis</i>	do

D. CLIMBERS

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

E . PARASITES

Amaraval	<i>Cuscuta refferxa</i> (Roxb)	Cuscutaceae

F . EPIPHYTES

Vanda	<i>Vanda cesellata</i> (Roxb)	Orchidaceae

G . ENDEMIC/THREATENED PLANT SPECIES

Alichettu	<i>Eonymus godaverensis</i>	Celastraceae

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

A . ANIMALS

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

B . BIRDS.

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

C . ENDANGERED WILDLIFE

Animals		Birds	
1	Bison	1	Pea Fowl
2	Wolf		
3	Panther		
4	Sloth Bear		
5	Tiger		

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List of Medicinal Plants in Wadsa Forest Division

SN.	Species / MPCA Code No.	Species/MPCA Code	Family	Med. Sysm. **	Marathi Name
1	2	Acacia catechu	Mimosaceae	AFTUS	Kaderi, khair, khaderi, khaira, lal khair.
2	5	Acacia leucophloea	Mimosaceae	AFS	Hewar, Hiwar, pandhri babul, pan hariya
3	9	Acacia torta	Mimosaceae	F	
4	19	Aegle marmelos	Rutaceae	AFHVTUS	Bael, Billi, Vel.
5	31	Albizia odoratissima	Mimosaceae	AFVUS	Chichwa, RamSaras.
6	42	Alysicarpus tetragonolobus	Fabaceae	F	
7	47	Ampelocissus latifolia	Vitaceae	AFV	Nadena
8	50	Andrographis paniculata	Acanthaceae	AFHVUSM	Olenkirayat
9	53	Anogeissus latifolia	Combrataceae	AFTUS	Daura, Dawnra, Dhamora, Dhaora, Dhauda, Dhavda
10	60	Asparagus racemosus	Liliaceae	AFVTUS	Asvel, Sahannsarmoli, Salvani, Satavarimull, Satavarimul, Shatavar, Shatamuli, Zatar.
11	63	Atylosia platycarpa	Fabaceae	F	
12	64	Atylosia scarabeoides	Fabaceae	F	
13	74	Bauhinia racemose	Caesalpiniaceae	AUS	Apata, Apta, Karanja, Seyara, Shiara, Sonan, Vanraja.
14	76	Biophytum candolleianum	Oxalidaceae	AV	
15	77	Biophytum reinwardtii	Oxalidaceae	AU	
16	81	Bombax ceiba	Bombacaceae	AVUSF	KantaSair, Kanterisamar, Kantesavar, Samar, Saur, Savar, Savari, Sayar, Semal, Shevari, Simlo, Tamari.
17	83	Borreria articularis	Rubiaceae	F	
18	84	Boswellia serrata	Burseraceae	AFTUS	
19	87	Bridelia retusa	Euphorbiaceae	A FU	Asan, Asana, Asana-kutgi, Ssna, Gunjan, Kantakauchi, Katiain, Kutki, Palapasana.
20	89	Buchanania lanzan	Anacardiaceae	ATUSF	Char, Charoli, Chirauli, Chironji, Pyalchar
21	90	Butea monosperma	Fabaceae	AFTUS	Kakracha, Palas, Paras, Phalas, Phulas
22	91	Butea superba	Fabaceae	AFS	Beltivas, Palasavela, Palasvel, Yelparas
23	98	Calycotris floricunda	Combrataceae	AFU	Baguli, Boguli, Ukshi, Wukshi
24	100	Canscora diffusa	Gentianaceae	A	Titavi, Yavotchi.
25	119	Cassia fistula	Caesalpiniaceae	AFVTUS	Bahava, Bawa, Bhawabaya, Bhawan, Boya, Chimkani, Garmala, Girimala, Gurmala Sarmal
26	121	Cassia pumila	Caesalpiniaceae	F	
27	126	Celastrus paniculatus	Celastraceae	AFTUS	
28	129	Ceriscoides turgida	Rubiaceae	A	
29	141	Cleistanthus collinus	Euphorbiaceae	AS	Garari
30	160	Costus speciosus	Costaceae	AFVUS	Penva, Pinnga, Pushkarmula
31	171	Curculigo orchoides	Hypoxidaceae	AFTUS	Bhuyimaddia, Kalimusli.
32	182	Dendrocalamus strictus	Poaceae	AFS	
33	184	Desmodium gangeticum	Fabaceae	AFHT , US	Darh, Ranbhal, Salvan , Sawan, Salpami.
34	187	Desmodium triflorum	Fabaceae	AFUIS	Chipti, Ranmethi, Ranmeti.
35	188	Desmodium velutinum	Fabaceae	AS	
36	193	Dioscorea bulbifera	Dioscoreaceae	AFVTUS	Dukaraknda, Gathalu, Konfagoradu
37	199	Diospyros ebenum	Ebenaceae	FSU	Abnus, Tai, Tendu.
38	205	Dolichandrone falcata	Bignoniaceae	AFTS	Bhersing, Medasingi, Med.shing, Mersunghi, Mersingi
39	215	Elephantopus scaber	Astraceae	AFVUS	Pathari.
40	218	Emblia officinalis	Euphorbiaceae	AFTUS	Aouli, Avalkti, Avla, Awla.
41	219	Emilia sonchifolia	Asteraceae	AFVUS	
42	230	Evolvulus alsinoides	Convolvulaceae	AFTUS	Shankavall, Shankhavalli, Vishnukanta, Vishnukrantha.
43	235	Ficus amplissima	Moraceae	AV	
44	242	Ficus religiosa	Moraceae	AFHVTUS	Ashvath, Ashvatha, Pimpala, Pipal.
45	244	Flacourtia indica	Flacourtiaceae	ATUSF	Bhekal, Binka, Kaker, Kuki, Paker, Tambat.
46	250	Gardenia latifolia	Rubiaceae	AS	Ghogar, Papura
47	251	Gardenia resinifera	Rubiaceae	AUS	Dikamali,

48	255	Gloriosa superba	Liliaceae	ATUSF	Bachnag, indai, Kllavi, Krianag, Khadyanag, Nagakria
49	265	Grewia salvifolia	Tiliaceae	S	
50	266	Grewia tiliifolia	Tiliaceae	AFS	Daman, Damni, Dhaman, Karavarani, Karkarani
51	276	Hemidesmus Indicus	Asclepiadaceae	AFVTU	Anantanmul, Anantvel, Dudhasali, Lahankavali, Makur, Upalasari, Uparasal, Upersari.
52	284	Holarrhena antidysenteric	Apocynaceae	AFHT , US	Bedaki, Kodaga, Kuda, Kurra, Pandharkuda, Pandharkura
53	289	Hybanthus enneaspermus	Violaceae	AFVS	
54	294	Hyptis suaveolens	Lamiaceae	AF	
55	305	Ixora arborea	Rubiaceae	AF	Kura, Kurat, Lokhandi
56	321	Lagerstroemia Parviflora	Lythraceae	AS	Bondara, Bondga, Lende
57	322	Lannea coromandelica	Anacardiaceae	AFVU	Magir, Moya, Shemat, Shinti.
58	329	Lepidagathis cristata	Acanthaceae	FS	Bhuyaterada
59	335	Lindemia ciliata	Scophulariaceae	V	
60	346	Maytenus emarginata	Clastraceae	FV	
61	358	Mitragyna parvifolia	Rubiaceae	A FUS	Kadamb, Kalam, Kalan
62	367	Murdannia nudiflora	Commelinaceae	V	
63	387	Phoenix sylvestris	Arecaceae	AFVT, US	Boichand, Sendri, Sindi, Sindikajuri.
64	393	Phyllanthus virgatus	Euphorbiaceae	V	
65	394	Physalis minima	Solanaceae	AFTUS	Chirboti, Dhanmori, Kapparpodi, Lahanpopti, Phopeti, Tanmori
66	418	Randia spinosa	Rubiaceae	AF	Gehela, Gel, Ger, Mainhpur.
67	419	Randia uliginosa	Rubiaceae	AFUS	Cindra, Klaphendra, Pandhri, Pendhara, Pendrey, Pendru, Pindra, Penedra, Phetra, Telphetru, Tupkela.
68	422	Rhynchosyilis retusa	Orchidaceae	V	
69	435	Schleichera oleosa	Schizandraceae	AFS	
70	436	Schrebera swietenoides	Oleaceae	AFTS	Moka, Mokadi, Nakti.
71	439	Semecarpus anacardium	Anacardiaceae	AFH TUS	Bibba, Bibha, Bibu, Bibua, Bibwa.
72	442	Sida acuta	Malvaceae	AFVUS	Bala, Chikana, Pata, Tukati, Tupkaria
73	444	Sida cordifolia	Malvaceae	AFVTUS	Bala, Chikana, Khiranti, Tupkaria
74	445	Sida rhombifolia	Malvaceae	AFVTUS	
75	451	Swietenia febrifuga	Meliaceae	A	
76	456	Stereospermum personatum	Bignoniaceae	FS	
77	457	Stereospermum suaveolens	Bignoniaceae	AFTUS	Kalagori, Kalgari, Kalgori-padri, Padal, Padialu, Pahad, Parul, Patala, Patalo.
78	475	Terminalia crenulata	Combretaceae	AF	
79	484	Tridax procumbens	Asteraceae	AFS	
80	488	Urena lobata	Malvaceae	AFVS	Rantupkada, Rantupkuda, Vana-Bhenda, Vanabendha, Vanbhendi, Wagdau Bhendi.
81	490	Vanda tessellata	Orchidaceae	AFUS	Rasna
83	496	Vigna unguiculata	Papilionaceae	A FS	
84	504	Woodfordia fruticosa	Lythraceae	AFTUS	Dalyatti, Dhaiphal, Dhaiti, Dhauri, Dhayati, Dhazatichi, Phulsati, Phusati, Pulsathi.
85	509	Xylia xylocarpa	Mimosaceae	AF	
86	515	Zizyphus oenoplia	Rhamnaceae	AFS	Kanerbali.

** **Medi**- Medicinal System:- A-Ayurveda, F- Folk, H-Homeopathic, M-Medicinal, S-Siddha, T-Tibetan, U-Unani, V-Van Rheede, **Forest Types**:- Th-Thorn, Dr- Dry Deciduous, Mo-Moist deciduous, Se- Semi Evergreen, Hi- Broadleaved Hill. All these are tropical forests, except the last being subtropical.

PART -I

SUMMARY OF THE FACTS ON WHICH THE PROPOSALS ARE BASED

CHAPTER – I

THE TRACT DEALT WITH

SECTION – 1.1 : NAME AND SITUATION:

This working plan deals with the entire forest areas of Wadsa Forest Division, which was the part of the erstwhile East Chanda Forest Division. On reorganization of the Forest Department, the Wadsa Forest Division was carved out from erstwhile East Chanda Division in 1983 vide Government of Maharashtra Resolution No. FDM/1880-F-2 dated 29.08.1983. This is the second independent consolidated working plan of Wadsa Forest Division. This Working Plan replaces the working plan of Shri T.K.Choubey, R.K.Pole, and D.R.Parihar.

1.1.1 Total forest area included in this working plan is 157326.33 Ha. which comes to 63.23% of the total geographical area of the division. Out of the total forests areas 383.76 Sq.km. is A class Reserved Forests, 34.01 Sq.km. is B class Reserved Forest, 835.11 Sq.km. is newly created Reserved Forests, 313.89 Sq.km. is Protected Forests, Zudpi Jangle 5.85 and Big tree forest 0.625 sq.km. The total areas covered by this plan include Zudpi Jungle and Big tree(un-class forests).

1.1.2 The forest areas of the tract dealt with lie between parallels of latitudes 20° 12' and 20° 50' North and the meridians of longitudes 79° 56' and 80° 38' East. The forest areas are more or less in compact block and situated in the Northern part of Gadchiroli district covering, total geographical area of about 2480 Sq.Km. These areas are situated within the civil (administrative) territories of Wadsa (Desaiganj), Kurkheda, Korchi(P), Armori (P), Gadchiroli (P) and Dhanora (P) Tahsils of Gadchiroli district.

1.1.3 The boundaries of the tract dealt with are as follows:

North	:	Morgao Arjani tahsil of Gondia District
East	:	Rajnandgao District, Chhattisgarh State.
South	:	Gadchiroli Forest Division
West	:	Wainganga river and Chandrapur District

SECTION- 1.2 : CONFIGURATION OF THE GROUND:

The tract lies at elevation varying from 201.47 m. (661 feet) to 588.57 m (1931 feet) above mean sea level. Most of area of the tract in general is flat or undulating broken by solitary hillocks and ranges of low hills. The slopes are moderate to steep and ground below is cut up by numerous nallas. Forest of the tract is situated on the triangle of high lands forming a table land which runs the entire length of the western portion of the division. Numerous hills rise in these table lands mainly on the North Eastern, Eastern and South Eastern sides. There are three main ranges or group of hills in the tract viz. Satnala in the North-East, Khobra mendha and Tipagarh in the South-East.

FOREST WEALTH:

1.2.1. Satnala hills range lies in Palasgarh and Gewardha ex-Jamindari. Satti River rises there and flows in to the Khobragarhi and eventually in to the Wainganga River. The highest portion of the Satnala hills is known as Kalapani and is 473 MSL. Khobramendha hills lie in between Satnala and Tipagarh ranges and are situated to the South East of Satnala range. An elevation of 588.57 m. near Betkathi in Khobramendha hills range forms the highest portion of tract dealt with. Towards the South East of the Satnala and Khobramendha hills in the part of Kotgul ex-jamindari, there is Tipagarh range rising to elevation of 660 MSL and forms the highest portion of a mountain region. The highest point of Tipagarh range falls in Gadchiroli Forest Division, but the Northern and North-Eastern part of this hills range lies in Wadsa Forest Division.

1.2.2. DRAINAGE:

The Wainganga River, which forms the Western boundary of the division, is the main recipient of numerous tributaries. Area of the tract dealt with falls on the left bank of the river and the chief effluents on this bank are from North to South, the Garhvi the Khobragarhi and the Kathani rivers. The Kathani River forms the little part of Southern boundary of the division.

1.2.3. The Khobragarhi is the largest tributary of the Wainganga River. It rises in the Khobramendha hills around Khobramendha, Bamkari Kohka and Betkathi. Flowing South-West it is joined by the Tipagarhi River which originates from the Tipagarh hills range. The united stream flows South West and near Wairagarh it receives the Satti River Stream from the North. Finally it drains in to the Wanganga River at about one and half Km. below the drainage point of the Garhvi River.

1.2.4. The Garhvi River takes mainly southerly course and flows across Wadsa and Armori ranges and finally drains in to the Wainganga.

1.2.5. Within the tract, the Satti River is the largest tributary of the Khobragarhi and it rises in the Satnala hills in Palasgarh and Gewardha ex-jamindaries in Kurkheda and Bedgaon ranges. It originates from the hills between Bonde and Aswal hurki. Flowing South West at the start and then, after changing its direction to West near Lendhari. It receives the Tirkhuri nala coming from North. Then it takes South West course and again changes its direction to South near Waghera in Kurkheda range. Dashkharka and Deorighat nalas join each other and the united stream then drains into South-West flowing Satti River which finally drains in to the Khobragarhi River near Wairagarh.

1.2.6. Taking westernly course, the Kathani River mainly flows across Gadchiroli Foret division and only the last part of it forms the Southern boundary of Armori range of Wadsa Division. It drains in to the Wainganga at about 3 Kms. North-West of Gadchiroli.

1.2.7. Above the Kathani River, the Pal nala flows South-West and drains in to the Wainganga, about 3 Kms. above the drainage point of the Kathani.

1.2.8. The general drainage of Wadsa Forest Division is towards South-West. The details of the drainage of the tract dealt with is shown in the map given in Appendix-

SECTION- 1.3: GEOLOGY, ROCK AND SOIL:

GEOLOGY AND ROCKS:

The tract dealt with is on the eastern 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 spatite occur as accessories. These rocks give rise to arenaceous loamy soil. Most of the area under soil cover has granite or gneiss as bed rock.

1.3.1. Basic dykes cut the granite at several places and general trend is North-West to South-East. 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 uralitisation of pyroxene and sanssuritisation of plagioclase giving rise to zoisite, opidote etc. are also observed in some thin sections.

1.3.2. Within the area covered by toposheets number 64 D/2, the country rock is fine grained granite. Hornblende-schist exists about 0.4 Km. wide striking NE-SW extending 0.5 Km. East of Dewanghata in the North to the bank of the River Satti in the South. Some lateritic capping are found East of Sadhutola near Jambulkhera and near Talegaon. Hornblende-schist with minor basic intrusive is exposed and seen at a few places. In the area covered by toposheet numbers 64 D/5, 64 D/6, 64 D/9 and 64 D/10 the country rock is prophyritic granite. There is a quartz-pegmatite vein running NW-SW from North West of Bedgaon to North-East of Patan Warwi.

1.3.3. Trap rocks (Andesites) are exposed in the North-Eastern boundary portions of the Bedgaon range. Trap rocks are also found near the villages Nawatola, Salge, North of Padikasa, Bogatola, Hutetitila and between Ghughuwa and Boteha. Quartz veins and pegmatite's striking nearly NW-SE extend for a length of about 4 Kms through Markakasa. Another vein of pogmatite is exposed North of Markakasa, slaty shale occurs near Jhandepar flanked on the South by trap walls.

1.3.4. 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 limonitic 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.

1.3.5. The soil mantle covering all the rock units varies in thickness from 2 to 6 meters except in some areas, where there is greater thickness of the soil mantle.

SECTION-1.4: CLIMATE

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.

1.4.1. TEMPERATURE:

The statistics of temperature are given in [Appendix -III](#) . 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 while in May it goes up to 42.45 C. During the summer, the mean max. temp. is about 42.45 C.g. and the mean min. temp. is about 27.19 C.g. during the winter the mean max. temp is about 28.08 C.g. and the mean min. temp. 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. In forest clad hills more equitable conditions favourable to plant growth are present.

1.4.2. RAINFALL:

The average annual rainfall over the area is 1479.44 mm. The total annual rainfall varies from 1213.88 mm to 1745 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.

1.4.3. The Statement showing average distribution of rainfall at different stations will be given in [Appendix .II](#)

1.4.4. FLOOD/FROST:

Though the occurrence of flood is not common, in 1994 and recently in 2010 monsoon season there were floods which affected both natural regeneration and plantations very badly.

1.4.5. HUMIDITY:

The air is generally dry except during South West monsoon season when the humidity exceeds 70%. The summer month is the driest when the relative humidity in the afternoon is between 20 to 25%. The average monthly relative humidity percentage data will be given in Appendix . 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.

1.4.6. CLOUDINESS:

The skies are heavily clouded to overcast during the South West monsoon season. In the rest of the year the skies are lightly clouded or mostly clear. Frost is almost unknown in this tract.

1.4.7. 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 South-West and North-West. In the period from October to February, the winds are mainly northerly to north-easterly in the morning and north-easterly to easterly in the afternoon. By March, winds begin to blow from directions between South West and North East and with the advance of the season they become predominant. Occasional storms in pre-monsoon or monsoon periods are also experienced which result in uprooting of isolated trees.

1.4.8.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. Un established 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.

1.4.9. 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 on formation of Gadchiroli district with new tahsil headquarters. Even though 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 during 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 – 1.5: WATER SUPPLIES

A number of tanks and wells form the major source of water supply. Water from Itiyadoh irrigation dam is received by

many villages for irrigation. Wainganga is the only perennial river which flows along the western boundary of the tract dealt with. Rain water drains off quickly. Most of inland nalas go dry from December onwards and water is confined to ponds only.

1.5.1. In the interior areas there are 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 ponds of permanent water, which form the most important sources of water supply for grazing cattle during the hot season.

1.5.2. During summer especially in the month of April, May and June, water table recedes and the 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 small 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.

1.5.3. In summer wildlife suffers because it has to depend on few limited water sources like natural springs, small stagnant ponds 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 labors for their drinking water during tendu season. Due to frequent, exhaustive use of almost all water sources in the interior areas for drinking purposes by tendu labors, 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.

SECTION – 1.6: DISTRIBUTION OF AREAS:

RANGE WISE DISTRIBUTION OF FOREST AREAS: Following is the distribution of forest areas of Wadsa Forest Division.

TABLE -1

Sr.No.	Name of Range	Reserved Forest	Protected Forest	Zudpi Jungle	Big Tree forest	Total
1	Porla	14462.450	2562.70	0.00	62.59	17087.74
2	Wadsa	13144.87	5094.49	37.31	0.00	18276.67
3	Purada	18550.15	2093.47	0.00	0.00	20643.62
4	Armori	11454.15	3403.48	102.62	0.00	14960.25
5	Bedgaon	22132.97	6398.12	194.63	0.00	28725.72
6	Malewada	23441.89	3575.30	224.65	0.00	27241.84
7	Kurkheda	10979.70	5096.98	12.84	0.00	16089.52
8	Delanwadi	11123.17	3166.10	12.70	0.00	14300.97
	Total	125289.35	31389.64	584.75	62.59	157326.33

1.6.1. The total forest area admeasuring, 157326.33 ha of the Wadsa Forest Division has been covered under this working plan. The statement showing Range, Round and Beats will be given in the **Appendix -IV**

SECTION-1.7: STATE OF BOUNDARIES:

1.7.1. RESERVED FORESTS:

The Reserved Forest account for 125289.35 hectares or 77.81 % area of the forest tract covered under this working plan. The length of external boundaries of forest is 2682 km. Out of which 320 km. is natural features. The range wise break up of external boundaries is as under:

TABLE-2

Sr. No.	Name of Range	External Boundaries in Km.		
		Natural	Artificial	Total
1	Porla	23	102	125
2	Wadsa	43	255	298
3	Purada	31	212	243
4	Armori	30	239	269
5	Bedgaon	22	653	675
6	Malewada	92	229	321
7	Kurkheda	30	351	381
8	Delanwadi	49	321	370

Total	320	2362	2682

1.7.2. Artificial boundaries consist of a cleared 13 meter 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 meters, of which about one meter projects above the cairn. They are numbered serially anticlockwise, 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. The experience of using RCC pillars was not satisfactory because of their transport, erection and curing in the remote forest areas. Besides damage by vandals in remote areas were also very frequently observed. Hence in recent past use of locally available surface boulders was done to erect boundary pillars as per the BFM guidelines.

1.7.3 PROTECTED FORESTS:

The ex-proprietary forests form the major portion of the division. These forests were first brought under scientific management in 1965-66 with the commencement of the working scheme by Shri.V.K.Prabhu. These forests were mostly undemarcated and were interspersed with villages either demarcated or undemarcated. These forests were distributed in all four ranges of the division. The external boundaries were well demarcated either by natural features or artificially cut lines identifying Zamindaris. Zamindari lines were supposed to be cleared annually under the direction of Patwaris which was seldom done resulting into poor state of affairs of the boundary lines.

1.7.4. After abolition of Proprietary Rights, the ex-proprietary forests suitable for management were identified and were transferred by the Revenue Department to the Forest Department. Forest Department completed the outer demarcation of these forests between 1958-1962. But afterwards no efforts were made to maintain the boundary lines and pillars. This led to large scale encroachments. Village boundaries of surveyed villages were not maintained and un-surveyed villages were without boundaries, which resulted into dispute of ownership of land between the Forest Department and the Revenue Department which enhanced encroachments. On the basis of clear cut record, Forest Department took demarcation programme by taking trench-cum-mound fencing in the later half of 1987. This was mostly carried out through Employment Guarantee Scheme during 1990s. RCC pillars were also erected under EGS scheme. The Protected forest is

admeasuring an area of 31389.64Ha. which include 71 compartments of zudpi jungle/big tree.

1.7.5 UNCLASSIFIED FORESTS:

Zudpi extends over an area of 584.75 Ha. and Big tree forest extend over an area of 62.59 ha. both totaling an area 647.34 ha comprising 72 compartments of Wadsa Division .

ADMINISTRATIVE UNITS:

For administrative convenience the ranges, rounds and beats were reorganized in Wadsa Division into 8 ranges, 34 rounds and 135 beats.

SECTION – 1.8: LEGAL POSITION

1.8.1. 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 Deptt. Notification No. FLD/3685/9316/C-R-42/F-3, dt.5/5/1992.

1.8.2 : PROTECTED FORESTS:

Under the provisions of Section 3 of Madhya Pradesh Abolition of Proprietary Rights (Estate, Mahals, Alienated lands) Act 1950 (I of 1951), areas formerly belonging to Malgujaris vested in the State Government and were taken over by the Revenue Deptt. These forests were transferred from time to time to forest deptt. as per the instructions contained in Madhya Pradesh Govt. Revenue Deptt. NO.2249/286-XII, dt. 6th April, 1951 and No.7177/CR- 617-XII of 4th Dec, 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 and 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 Section 4 of I.F.A., 1927 vide Bombay Govt. Gazette Notification No.FLD/1258/11-3314-E, dt.30th May, 1959 which was published 20th August, 1959.

1.8.3. For the purpose of completion of enquiries for settlement of rights and concessions over these forests, the Forest Settlement Officer was appointed in Gadchiroli and Sironcha tahsils 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, dt.13th September, 1975. The Govt. of Maharashtra has approved the recommendations of the F.S.O. and the forests have been declared as reserved forests under Section 20 of the I.F.A., 1927, vide Govt. of Maharashtra, Revenue and Forest Deptt. Notification No.FLD-3685/9316/CR-42/F-3, dt.5th May,1992. Vide this Notification the Govt. has declared 83532.23 ha. forest area as the Reserved Forest in the tract dealt with. These forests are commonly called as New Reserved Forests.

SECTION -1.9. RIGHTS AND CONCESSIONS

1.9.1: RESERVED FOREST:

The Reserved Forest areas coming under Wadsa 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 Govt. Resolution No. MFP-1371/237035-Z, dt.3rd November, 1973. Agriculturists are allowed at concessional rates for certain items of forest produce also.

1.9.2 PROTECTED FORESTS:

Prior to abolition of proprietary rights in 1951, all lands belonged 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, 1950 (I of 1951), coming in to 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 UNCLASSIFIED ZUDPI/BIG TREE FOREST:

The nistar enquiry was conducted in old Gadchiroli tahsil during the period 1951-53 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.

Agricultural cattle can either graze free of cost in the protected forest land indicated by Khasra numbers in case of surveyed villages and within the village boundaries in case of unsurveyed villages 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).

1.9.10. 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.

1.9.11. OCCUPATIONAL NISTAR:

In nistar patrahs, 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.

1.9.12 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, bamboo, thatching and fodder grasses, fencing material, bark, fibre, minor minerals and paidawar i.e. edible fruits, flowers and roots, honey, wax etc. The rights and concessions are governed as per the provisions made in the nistar patrak for each village, according to which, agriculturists and agricultural labors 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.

1.9.13. 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.

**DISTRIBUTION OF FOREST PRODUCE FOR NISTAR SYSTEM:
B. TIMBER:**

AGRICULTURAL 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 satkhatha (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 : 50 bamboo
(for repairs)

NON AGRICULTURISTS : 25 bamboo (subject to availability)

D. GROSS FOR THATCHING:

AGRICULTURISTS : Four cartloads

NON AGRICULTURISTS : Two cartloads.

E. MISCELLANEOUS:

(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 head load

(vi) FRUITS AND FLOWERS : No limit

(vii) KARAI AND KARKA BAMBOO:

(A) AGRICULTURISTS : Two Cartloads

(B) NON AGRICULTURISTS : One cartloads

1.9.14. In nistar patrak of each village khasra numbers 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.

1.9.15 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.

CHAPTER - II

THE FOREST

SECTION - 2.1 COMPOSITION AND CONDITION OF THE CROP

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.

2.1.1 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.

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 are 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 fires. These 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 gullies. 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.

2.1.2 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, although evergreens and sub-evergreens are present, they are inconspicuous and mainly confined to the moisture 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 species of bamboo is *Dendrocalamus strictus*. Epiphytes and ferns are quite inconspicuous.

2.1.3. The successional relationship in Southern Dry Tropical Forests is according to Champion and Seth classification.

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-3

Champion & Seth's Classification

Group	Tropical Dry Deciduous Forests
Sub Group 5A Forests	Southern Tropical Dry Deciduous

I. CLIMAX TYPES:

(1) 5A/C1	Dry Teak Bearing Forests
(2) 51A/C3	Southern Dry Deciduous Forests

II. DEGRADATION STAGES:

5/DS1	Dry Deciduous Scrub

III GENERAL SERAL TYPES:

5/1S1	Dry Tropical Riverain Forests

SECTION-2.2: GENERAL DESCRIPTION:

DRY TEAK FORESTS OR DRY TEAK BEARING FORESTS -

2.2.1. 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 no where it forms a pure crop. *Tectona grandis*, *Anogeissus latifolia* and *Diospyrous melanoxylon* spp. are the particularly 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 Kurkheda Range near Dongargaon in between Chandagarh and Sonsari and on the north-eastern portion of the Range, near Palasgaon in Wadsa Range and near Marhegaon on the eastern portion of Armori Range adjoining to Dhanora Range of Gadchiroli 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.

2.2.2. 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 some what 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.

FLORISTICS :

2.2.3. 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(*Syzigium cumini*), Padar (*Stereospermum suaveolens*).

2.2.4. 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 anacardium*), Amaltas (*Cassia fistula*).

2.2.5. II a. BAMBOOS:

Bamboo (*Dendrocalamus strictus*)

2.2.6. 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*).

2.2.7. V a. HERBS:

Tarota (*Cassia tora*), Divali (*Tephrosia hamiltonii*).

2.2.8. IV b. GRASSES :

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

2.2.9. CLIMBERS:

Adhanipari (*Oxalis scandens*), Chilati (*Mimosa hamata*), Yeroni (*Zizyphus oenoplia*), Kukutranji (*Calycopteris floribunda*), Mahulbel (*Bauhinia vahli*), Palasbel (*Butea superba*), Dudhi (*Cryptolepis buchanani*), Gunj (*Abrus precatorius*).

2.2.10. DRY DECIDUOUS SCRUB:

These forests found on low broken soil cover and are characterised by the stunted growth of tree spp. 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 degradation and heavy erosion. Such forests are the result of long continued maltreatment, grazing, fuel wood or pole felling, frequent fire etc. *Woodfordia fruticosa*, *Maytenus emarginata* and *Gardenia resinifera* spp. are the particular characteristic of the type.

FLORISTICS :**2.2.11. I/II. TOP CANOPY/SECOND STOREY:**

Hiwar (*Acacia leucophloea*), Ain (*Terminalia alata*), Khair (*Acacia catechu*), Mowai (*Lannea coromandelica*), Achar (*Buchanania lanzan*), Rohan (*Soymida febrifuga*), Palas

(*Butea monosperma*), bhirra (*Chloroxylon swietenia*), *Zyziphus* Spp., *Gardenia* Spp.

2.2.12 III. SHRUBS:

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

2.2.13. a. HERBS :

Tarota (*Cassia tora*), Divali (*Tephrosia hamiltonii*)

2.2.14 IV b. GRASSES :

Kusal (*Heteropogon contortus*), Bhurbhusi (*Eragrostic tenella*), Phulkia (*Apluda mutica*).

2.2.15. V. CLIMBERS:

Chilati (*Mimosa hamata*), Yeroni (*Zizyphus oenoplia*).

DRY TROPICAL RIVERAIN FORET

2.2.16. This type of forest 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.

FLORISTICS:

2.2.17. TOP CANOPY :

Arjun (*Terminalia arjuna*), Ain (*Terminalia alata*), Kalam (*Mitragyna parviflora*), Jambhul (*Syzigium cumini*), Umar (*Ficus glomerata*).

2.2.18 II. SECOND STOREY:

Karanj (*Pongamia pinnata*), Tendu (*Diospyros melanoxylon*), Palas (*Butea monosperma*), Amta (*Bauhinia malabarica*).

2.2.19. III. SHRUBS:

Mararphal (*Helicteres isora*), Katumber (*Ficus hispida*), nirgudi (*Vitex negundo*)

- IVa. HERBS** : Very little herbs.
IVb. GRASSES : Very little grass.
V. CLIMBERS : Very little climbers.

SECTION – 2.3: INJURIES TO WHICH THE CROP IS LIABLE

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

A. HUMAN AGENCIES

2.3.1.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 matter. 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 are 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 has 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.

2.3.2. The fire affected saplings and poles develop hollowness 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.

2.3.3. 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.

2.3.4. The occurrence of fires can be attributed to the negligence of way-farers, grazers and fruit and flower collectors. Willful incendiaries are common. 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 in to 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 escapes in to 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.

2.3.5. 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.

2.3.6. The accurate and up to date data about fire incidences 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-IX](#)

2.3.7. 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, 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 fire wood. 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 fire wood, 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 fire wood 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 will be given in [Appendix-IX](#)

2.3.8 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.

2.3.9 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. Now under Forest Rights Act 2005, the process of regulation of encroachments on forest land is already started in Wadsa Forest Division. Total claims of 8787 have been received. The procedure for allotting titles have already been started.

B. ATMOSPHERIC AGENCIES

2.3.10 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.

2.3.11. 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.

2.3.12 FROST:

Frost is unknown in this tract.

C. OTHER AGENCIES:

2.3.13. GRAZING:

There is steep rise in the population of animal live-stock. Further more, due to mass encroachment and disforestation of

the forest areas, forests have deteriorated and thus the grazing pressure has been increased in multifold.

2.3.14. 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 forests, which are surrounded by thickly populated villages. In the interior tribal belt, the tribal, however, believe in having large number of cattle such as bullocks, cows, calves, and buffaloes but strangely the tribal 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 cattle require large grazing area in the forests and depend only on forest areas for grazing. The state forest has 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-IX](#)

2.3.15. INSECTS AND FUNGI:

The insect damage is negligible in this area although the teak skeletonizers (*Hapalia 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.

2.3.16. PLANT PARASITES:

Panda (*Dendrophthoe falcata*) occurs occasionally on Mahua (*Madhuca latifolia*), Achar (*Buchanania lazan*), and ain (*Terminalia alata*). However, the damage done by these parasites is not of very serious nature.

2.3.17. 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 oenopia*), 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 climbers, regeneration fails to establish. The seasonal herbaceous annual climbers do some damage to the young seedlings. The weed growth is scanty.

2.3.18. 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 an alarming pace in all marginal areas of the division. The forest crop is degenerated into under stocked and scrub type in these areas. Gully formation is noticed in undulating portion of the forests especially adjoining to well populate tracts. Ravines formation has taken places where some xerophytes shrubs and inferior grasses are found in undulating forests especially in Bedgaon Range areas. Gully formation is prominent in the areas where the areas subjected to repeated burning for cultivation, excessive grazing and illicit felling. North east hilly and mountainous portion of Bedgaon and Kurkheda Ranges form major catchments of the Sati Rivers and the Khobragarhi River. Soil profile of northeastern 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 Bedgaon 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 into value less blanks would be only a matter of time.

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

CHAPTER – III **UTILIZATION OF FOREST PRODUCE**

SECTION 3. 1: AGRICULTURAL CUSTOMS AND REQUIREMENTS OF THE POPULATION:

The tract dealt with is spread over civil territories of Kurkheda, Korchi, Wadsa (Desaiganj), Armori (part), Gadchiroli (part) and Dhanora (part) talukas out of total 12 talukas in Gadchiroli district. The tract dealt with encompasses forest areas presently coming under the administrative control of Wadsa Forest Division. The Headquarter of this division, which was created in 1983, is situated at Wadsa (Desaiganj) which is the sub-Division Headquarter also.

3.1.1 New Gadchiroli district was carved out from old Chandrapur District and came in existence on 26th August, 1982. Before division of the old Chandrapur district, Gadchiroli and Sironcha two talukas and Gadchiroli and Aheri, two Revenue sub-Divisions were in existence. After the division, the New Gadchiroli district was divided in to 8 talukas; Gadchiroli, Chamorshi, Dhanora, Kurkheda, Armori, Sironcha, Aheri and Etapalli. On 7th August, 1992 on reorganization of Revenue Department, Wadsa (Desaiganj) new Sub-Division was created and four new talukas, Wadsa, Korchi, Mulchera and Bhamragarh were created. Municipal Council is in existence at Wadsa (Desaiganj) since long Back

3.1.2 POPULATION:

Total population of Gadchiroli District as per 2001 census is 970294, out of which 491101 are males and 479193 are females. The total geographical area of the district is 15,433 Sq.km. Average density of population is 117 per sq.km. as compared to 314 per sq.km. for the Maharashtra state. As per 2001 census the district has 12 towns and 1679 villages

3.1.3. Taluka wise break up of population as per 2001 census is as under.

Table-3

Taluka	Area in sq.km	Population per sq. km.	No. of villages		Town	Fig. in thousand		Population In thousand		
			Inhabited	Deserted		No of houses	No. of Families	M	F	T
1	2	3	4	5	6	7	8	9	10	11
Gadchiroli	773.4	163	109	13	1	21	22	63	62	125
Armori	1278.42	71	88	12	--	16	16	45	46	91
Kurkheda	1495.97	52	109	8	--	12	13	39	39	78
Dhanora	1950.33	40	216	11	--	12	12	38	39	126
Etapalli.	3954.7	18	109	7	--	10	10	35	36	71
Sironcha	872.3	80	114	34	--	11	13	34	36	70
Aheri	2723.74	38	149	26	2	16	17	52	52	104
Chamorshi	1023.31	162	175	22	--	23	28	83	83	166
DesaiGanj	192.48	396	30	6	1	13	13	38	38	76
Korchi	555.99	73	140	7	--	6	6	20	20	40
Bhamragarh	449.77	70	111	17	--	4	5	16	16	32
Mulchera	163.39	242	66	2	--	7	7	20	20	40
Total	15433.70	1406	1516	163	4	151	162	483	487	970

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

3.1.4. The major area of the District is under forest. The percentage of forest area is 86 % of the total geographical area of the District.

3.1.5. As per census, the population break up of the district on the basis of religion is as under,

Table-4

Religion	Population	Percentage of the total population
1	2	3
Buddhist	78058	8.04
Christian	3423	0.35
Hindu	818640	84.37
Jain	369	0.04
Muslim	17341	1.79
Sikh	603	0.06
Others	51860	5.35
Total -	970294	100.00

3.1.6. As per 2001 census, the percentages of population of Schedule Castes and Schedule Tribes in Gadchiroli district and talukas the tract dealt with is as under.

Table –5

Taluka	Population (in thousands)								
	SC (including New Buddhist)			S.T.			Total		
	M	F	T	M	F	T	M	F	T*
Gadchiroli	7	7	14	24	24	48	31	31	62
Armori	5	5	10	17	18	35	22	23	45
Kurkheda	4	5	9	15	15	30	19	20	39
Dhanora	4	5	9	15	15	30	19	20	39
Etapalli.	4	4	8	14	14	28	18	18	36
Sironcha	4	4	8	13	14	27	17	18	35
Aheri	6	5	11	20	20	40	26	25	51
Chamorshi	9	9	18	32	32	64	41	41	82
DesaiGanj	4	5	9	15	15	30	19	20	39
Korchi	2	3	5	8	8	16	10	11	21
Bhamragarh	2	2	4	6	6	12	8	8	16
Mulchera	2	2	4	8	8	16	10	10	20
Total Gadchiroli District	53	56	109	186	187	373	240	245	485

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

3.1.7. As per 2001 census, the percentage of population of S.C. & S.T. in the district are 11.20 and 38.49 respectively.

3.1.8. The percentage of SC and ST in talukas covering tract dealt with are as under as per 1991 census.

Table-6

Name of Tahsil	Population percentage	
	S.C.	ST.
Gadchiroli	1.46	5.00
Armori	1.05	3.61

Kurkheda	0.90	3.08
Dhanora	0.89	3.08
Etapalli.	0.82	2.80
Sironcha	0.88	2.79
Aheri	1.20	4.10
Chamorshi	1.91	6.54
DesaiGanj	0.88	3.01
Korchi	0.47	1.62
Bhamragarh	0.37	1.24
Mulchera	0.45	1.56

3.1.9 LIFE STYLE PATTERN:

The distribution of the workers as per livelihood pattern in the tract dealt with, based on 2001 census is given below -

Table-7

District	No. of persons (in hundreds)					
	Agricul- turists	Agricu- ltural Labourers	Live stock, Fisheries,	Other Services	Marginal Workers	Non workers
Gadchiroli	177806	86273	8187	67173	160145	373190

3.1.10. As per 2001 census, in the district out of total population, 272266 are main workers, 160145 are marginal workers and remaining 373190 are non-workers.

LAND HOLDING:

As per the reports of Agriculture Directorate, Maharashtra State, Pune for the year 1985-86 and 1990-91 the major portion of the cultivated areas the district belongs to small and marginal farmers. The details of land holding and percentage of land holders is as given below.

Table-8

Land holding In ha.	% of Land holders 1985- 86	% of Land	% of Land holders 1990-91	% of Land
Up to 02	57.98	23.98	63.97	29.81

02 to 05	31.90	40.40	28.32	40.25
05 to 10	08.04	22.86	06.33	20.27
10 to 20	01.85	10.00	01.28	07.82
Above 20	00.23	02.76	00.13	01.85
Total	100.00	100.00	100.00	100.00

3.1.11. 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. In 2000-01 areas covered by rice, jawari and pulses were 71.60 %, 5.00 % and 7.62% respectively of the total cultivated lands in the tract dealt with.

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.

3.1.12. 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. Itiya Doh, the major irrigation project (Dist. Bhandara is the main source of irrigation water in Wadsa and Armori Talukas. The area is irrigated through canals and people take two crops 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. Instead of going for big irrigation projects, the potential Malguzari tanks should be deepened and repaired to fulfill the irrigation demand. It is always admissible to deepen the existing malguzari tanks to increase the storage capacity of the tanks to make them perennial source of water for all purposes.

3.1.13. CATTLE:

As per the cattle census of 2003, the total cattle in the district were 10.72 lakhs. Out of these, 59.12 % were cows and bullocks, 10.18 % were he and she buffaloes, 25.29 % were sheep and goats and 665989 nos. were other cattle. The density of the cattle is 69.46 per sq. km. 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 Farm Yard Manure (FYM)

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

3.1.14 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. Teak is mainly used for bullock 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.

3.1.15 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.

Due to the increase in population and there is keen demand for fire wood all over the tract except the most interior hilly portion. It is the only source of cooking energy in this 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.

3.1.16. 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.

3.1.17 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 government forests for grazing their cattle. Stall feeding of cattle still remains largely unknown practice in this tract. Grasses used for grazing are paonia, shedra, 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 pressure 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.

3.1.18 BAMBOO:

Bamboo (*Dendrocalamus strictus*) is available in approximately 65 % forest areas of the division. It is mainly found in interior and hilly tract of Bedgaon and Kurkheda Ranges. Popularly known as poor man's timber, bamboo 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 bamboo locally known as Karkas are used for fencing. This bulk is harvested from all Commercial and some of the Nistar Bamboo felling Series. Every year few coupes from Nistar Bamboo Felling Series are worked departmentally and bamboo is brought to established depots for supply of the same to nistaries. The local people purchase it at concessional rate. After meeting the local demand, the surplus bamboo is sold in open auction. Though there is provision of nistar, the local people, particularly in the interior hilly areas does not avail 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 household articles from it and sale them locally or out side. They need bamboo, particularly green bamboo throughout the year. Though small market is there in Kurkheda, Wadsa is the main market within the tract. Gadchiroli is one of the main markets out side the tract.

3.1.19 TENDU LEAVES:

As per G.R. No.MFP-21/04/Case No.67/F-1 dated 28.02.2006 in the revised lump sum method from 2006-07 tendu season. The expenditure incurred in the collection of leaves is to be deducted from the revenue and the net profit should be distributed among the labour according to the proportionate collection of tendu leaves. Tendu collection is highly labour intensive activity during the peak summer season. However, this activity also has a fall out in the form of forest fires which occur at the beginning of the season, caused by human agency with the intention 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 'Kafila labourers' get employments by tendu leaves plucking, bulk of which is exported out of the district for manufacture of bidis.

3.1.20 OTHER FOREST PRODUCE:

The other 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 sometimes 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.

SECTION – 3.2 MARKETS AND MARKETABLE PRODUCE

MARKET:

Desaiganj has been one of the important centers of marketing of forest produce since long back. The name ganj itself indicates that this was an important marketing place of forest produce, as earlier the area had beautiful forests all around and main activities were related to forestry only. Historically Desaiganj has been an important market of timber, charcoal, tendu patta and others forest produce. Old meter gauge Railway line and large number of old godowns witness the extensive marketing of these produce in the past.

3.2.1 Now a days also the forests of Wadsa 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 Wadsa 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.

3.2.2 Fuel beats are either brought to the sale depot for auction sale or are sold in jungle depots. The major part of fuelwood is exported out side after its conversion to charcoal. Wadsa, on Chandrapur Gondia Railway Line on the Eastern Railways served earlier with narrow gauge, now converted in to broad gauge, 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 deptt. 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.

3.2.3. Timber, poles and fire wood material is brought to Wadsa depot and sold in open auction. Fire wood is supplied to locals on concessional rate at Wadsa Depot. Bullock carts and tractors are used for local transport while trucks and trains are used for long distance transport.

3.2.4 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 Bidi 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.

3.2.5 Barring few coupes of Nistar Bamboo Felling Series, which are worked departmentally, every year the major bulk of bamboo from all Commercial and remaining Nistar Bamboo Felling Series, is harvested and consumed by the Ballarpur Paper Mill. Trucks are used for transportation of bamboo bundles directly from jungle depots to the Paper Mill at Ballarshah. On departmental working of remaining Nistar coupes, the bamboo is brought to Wadsa, Kurkheda and Armori Depots for supply of the same to locals, particularly the burads, agriculturists etc. on concessional rate. The surplus bamboo is sold in open auction at Wadsa depot and the purchasers from different parts of state attend the sale.

3.2.6. Other minor forest produce like moha flowers, charoli, gum 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 centers, 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.

MARKETABLE PRODUCE:

A. MAJOR FOREST PRODUCE:

3.2.7. TIMBER AND POLES:

There is a great demand for teak timber and poles above 15 cm. girth. Production of teak in Wadsa 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 are also readily sold. Salai, mowai and semal logs above 45 cms. girth are preferred for packing cases. Salai has limited market during orange season at Nagpur. Semal logs 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.

3.2.8. FIRE WOOD:

There is a heavy demand of fire wood in plains. Wood pieces of any species and size are used as firewood. 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, they are separated and taken out by the purchasers and are sold as timber pieces for carpentry works. In order to obtain better sale results, the fuel stacks should be sold as early as possible.

B. MINOR FOREST PRODUCE

3.2.9. BAMBOO:

Bamboo is in great demand in this tract. The major part is consumed by Ballarpur Paper Mill and the secondary demand is of the local people for its various uses. Paper Mill removes bamboo in the form of bamboo bundles. Each bundle has 20 pieces of bamboo and length of each piece is 2 meters. These are called full bundles while in half bundles there are 20 pieces of length 1 m each piece. Burads use better quality green bamboos. Other locals use long bamboo for different purposes. There is demand of long bamboo and also of bamboo bundles from orange and grape cultivators and the purchasers come from these areas also to attend the sale. The bamboo bundles harvested departmentally are generally purchased by Ballarpur Paper Mill directly or indirectly through its agents.

3.2.10 TENDU:

It was one of the most important revenue earning forest produce of the division. It is sold by tender. The lumpsum 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 licensees and there after transported to bidi manufacturing centers

within or outside the state. On demand, some packed leaves are directly transported to consumption centers.

3.2.11. GRASS:

The broom grass is sold in open auction. Other grasses are consumed by locals.

C. OTHER FOREST PRODUCE

3.2.12. 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 – 3.3 : LINES OF EXPORT

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 Deptt. and Z.P. ad 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. Paper Mill also prepares and maintains some roads in the remote forests for transportation of bamboo bundles. Inaccessibility of innermost reaches of the division has been reduced considerably after the formation of Gadchiroli district.

3.3.1. Wadsa-Armori-Bramhapuri, Gadchiroli-Armori-Wadsa, Nagbhir-Bramhapuri-Wadsa (across Wainganga river), Wadsa-Kurkheda-Bedgaon-Korchi to State Border, Malewada-Purada, Korchi-District Border, Kurkheda-Wairagarh, Wadsa-Lakhandur-Nagpur etc. are the main lines of road transport to which many feeder roads are linked.

3.3.2. 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 tributaries in the recent past 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.

3.3.3. Some of the forest roads being maintained by the

forest department are as under.

3.3.4 The list of existing roads in the tract is given in **Appendix- X**

3.3.5 RAILWAYS:

Wadsa on Chandrapur-Gondia railway line on the South Eastern Railways serves as the main line of transport of firewood, 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 -3. 4 : METHODS OF HARVESTING AND THEIR COST

AGENCY FOR HARVESTING:

Till 1980 forest coupes for timber and fire wood were worked through three agencies viz; (i) Departmental agency, (ii) Forest laborer's co-operative society and (iii) Contractors. However, as per the policy decision taken by Govt. of Maharashtra vide its Revenue and Forest Department No. FCT/1581/93544/F-1, dt. 04/04/1981, harvesting by contractor system was totally stopped, with few exceptions, with effect from July/81. Now main felling & thinning coupes are either worked departmentally or through F.L.C.S. Thereafter during the implementation of T.K.Choubey and R.K. Pole's Working plan all the silvicultural operations were carried out either departmentally or through FLCS.

3.4.1. 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 licensees appointed by the government. The tendu units are sold in open auction by inviting tenders and the licensees are appointed to collect the leaves through the labourers. The area of Wadsa Division is divided into 22 tendu units. 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, processed and then packed in gunny bags. The quantity of tendu leaves is measured in Standard bag. In the 2010 season, the collection of tendu leaves in Wadsa division was 41611.342 Standard bags against the target, the notified yield of 41100 Standard bags. In 2009 tendu season 22 units in Wadsa Dn. were offered to licensee.

3.4.2. 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.

3.4.3. METHOD OF FELLING AND EXTRACTION:

Boundary demarcation and 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 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.

3.4.4. 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.

3.4.5. 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.

3.4.6. After arrival of the log in the sale depot it is given a serial number & remeasured. The differences in measurements at the jungle depot and at the sale depot are reconciled.

3.4.7. 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.S. Most of the items of work are done on fixed job rates.

3.4.8. 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.

3.4.9. Tendu leaves are plucked, tied into 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 is called 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-9

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

3.4.11 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, 2000 to 31st July 2001 was Rs.37.90. 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 2009-2010 in the Chandrapur and Gadchiroli Circles are reproduced in **Appendix-XI**

3.4.12 The rate of collection for tendu leaves of the 2010 season was Rs. 1050/- per Standard bag. One standard bag contains 1000 bundles of 70 leaves each.

SECTION -3. 5 : PAST AND CURRENT PRICES:

As a combined result of explosion in population, increase in various developmental activities, rise in the living standard, increase in per capita consumption, big gap in demand and supply position and due to inflation etc. timber as well as prices of other forest produce are increasing at an enormous rate. The Trade wise market rates of teak and other important miscellaneous species at Wadsa Depot will be given in **Appendix-XII**

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CHAPTER - IV

STAFF AND LABOUR SUPPLY

SECTION -4.1 STAFF:

The forests of the tract being dealt with are in the administrative control of Wadsa Forest Division which was carved out of the East Chanda Division in 1983 as a sequel to the reorganization of the Forest Department. The area 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.Deptt.No.FDM/18807F-2,dated the 29th August, 1983, the East Chanda Division was again split up into Wadsa, Brahmapuri and Gadchiroli Divisions. As per Govt. of Maharashtra, Revenue and Forest Department, Resolution No.FDM/2010/CNo.2/F-2 dated 3rd March 2010, the Wadsa division is included in Gadchiroli Forest Circle,.

4.1.1. The area of Wadsa division is divided in to 8 ranges, 34 rounds and 135 beats for administrative purposes. The charge of the division is held by the Deputy Conservator of Forests.

4.1.2. A list of officers who held the charge of the division from 1983 on wards is given in **Appendix-XIV**

4.1.3. The following statement shows the permanent and temporary staff as on 1st January, 1996.

TABLE-10

Sr. No.	Category & Designation	No. of posts		
		Permtt.	Temp.	Total
	I. Gazetted (Class - I)			
1	Dy. Conservator of	-	1	1
2	Asst.Conservator of	-	4	4
	Class – II			
3	Range Forest Officer	12	1	13
	II. Non Gazetted			
	Class – III			
4	Chief Accountant	0	1	1
5	Forester	44	8	52
6	Accountant	8	1	9
7	Junior Statistical Assistant	1	0	1

8	Surveyor	1	0.	1
9	Clerk	14	6	20
10	Driver	3	0	3
11	Forest Guard	107	53	160
12	Class - IV			
13	Naik	1	0	1
14	Daftari	0	1	1
15	Peon	3	0	3
16	Choukidar	2	0	2
17	Dak-runner	1	0	1
18	Mali	2	0	2
19	Sweeper	1	0	1
	Forest Labourers	0	88	88
Total -		200	164	364

4.1.4. 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/CN252/F-9, Mantralaya, Mumbai-400032, dated 31st January 1996. These posts will stand abolished automatically on the superannuation.

4.1.5 The list of Divisional Forest Officer/Deputy Conservator of Forests who have held the Charge since 1992-93 of Wadsa Division is as follows.

TABLE-11

Sr.No.	Name of Officer	Period during which the charge held	
		From	To
1	Shri M.B.Mankare	1.9.83	30.10.83
2	Shri A.K.Saxena	31.10.83	20.10.84
3	Shri P.P.Ghule	21.10.84	25.11.84
4	Shri A.K.Saxena	26.11.84	19.5.85
5	Shri S.P.Kelkar	20.9.85	13.10.87
6	Shri C.R.Gajbhiye	14.10.87	10.1.88
7	Shri F.S.Jafry	11.1.88	3.6.92
8	Shri Jeet Singh	4.6.92	6.6.92

9	Shri M.Karunakaran	7.6.92	22.4.96
10	Shri G.R.K.Rao	23.4.96	25.11.96
11	Shri K.R.Khadse	26.11.96	21.11.98
12	Shri B.P.Singh	22.11.98	4.5.99
13	Shri S.S.Mahajan	5.5.99	15.1.2003
14	Shri S.V.Ramarao	16.1.2003	17.5.2007
15	Shri B.V.Selukar	18.5.2007	24.5.2007
16	Shri P,Kalyankumar	25.5.2007	31.7.2010
17	Shri Ramanujam	1.8.2010	--

SECTION ■ 4.2 LABOUR SUPPLY

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. area, other upliftment and developmental schemes and programs are also being carried out by other departments. The villagers are not willing to work on many occasions in a year. The tribals perform festival named "Polo" and on that day the entire population would simply enjoy. They would not do any work even if the work is very important or even if more money is offered for the same. With the introduction of developmental activities and in course of time, there are changes observed in their attitude. It is only in course of time things will improve. Because of these factors, labourers are becoming 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. Considerable number of labourers comes even from Andhra Pradesh and Madhya Pradesh. During summers large number of labourers comes from Chandrapur and Bhandara districts for plucking of tendu leaves. These labourers stay in camps and are commonly called as "Kafla Labourers".

4.2.1. 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.

CHAPTER – V

PAST SYSTEMS OF MANAGEMENT

SECTION -5.1: PAST HISTORY OF THE FORESTS

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. The Zudpi jungle in possession of the division was transferred from Revenue deptt. in the recent past. The major categories of forest areas are RF and PF which have undergone several changes of management as discussed below.

RESERVED FORESTS

5.1.1. 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), dtd. 24th February, 1879. These old reserved Forest Areas form a very small percentage, i.e. 25.65 percent of Wadsa 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 illicit felling 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.

5.1.2. Commutation system introduced after reservation was in force up to 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 licenses. The license 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.

5.1.3. Originally, administratively, the old Reserved Forests covered under the present plan were part of Wairagarh Range of Chanda Forest Division in the dusk of 19th century. Later in 1901, after reorganization, Wairagarh Range came under the control of North Chanda Division. North Chanda division was reorganized in to East and West Chanda Division in 1959 and after this reorganization these forest areas came under the control

of Armori, Wadsa, Dhanora and Kurkheda ranges of East Chanda Division. On further reorganization in 1983 the East Chanda Forest Division was divided into Wadsa, Gadchiroli and Brahmapuri divisions and these areas came under Wadsa forest division under North Chandrapur forest circle. In the latest reorganization in March 2010 the Wadsa Forest Division came under Gadchiroli Circle.

B. PROTECTED FORESTS

5.1.4. 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 Mr. Prabhu's working scheme. The traditions of the ruling families were 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.

5.1.5. When the Chanda District came under British rule, it was held that, the Jamindar's had no absolute right in the soil. It vested with Government to confer that right, attaching such conditions to its exercise as that tenure should be indivisible and non transferable except, to the nearest male heir, and then only subject to the approval of the Chief Commissioner that the estate should be held by one person, the Jamindar for the time being & subject to the conditions of loyalty, good police administration and the improvement and cultivation of the estate.

5.1.6 Under the provisions of Madhya Pradesh Abolition of Proprietary Rights (Estate, Mahals, Alienated Lands Act, 1950 (1 of 1951), Jamindari's 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 deptt. as per the instructions contained in Madhya Pradesh, government. Revenue Deptt. No. 2249/ 286-XII, dated 6th April, 1951 and No. 7177/CR-617-12 of 4 th Dec, 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 intention to constitute these forests as

reserved forests under section 4 of I.F.A.1927 vide Bombay Government Gazette Notification No.FLD/1258/11-3314-E, dt. 30th May, 1959 which was published 20th August, 1959.

5.1.7. For the purpose of completion of enquiries in to the rights over these forests, the Forest Settlement Officer was appointed in Gadchiroli and Sironcha tahsils on 12th Feb. 960. 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,dtd. 13th September 1975. The Government 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,dtd.5th May,1992. Vide this Notification the Government has declared 83532.23 ha. forest areas as the Reserved Forest in the tract dealt with.

SECTION 5.2: PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS

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

A. RESERVED FOREST

5.2.1. Past systems of management of the Reserved Forests: 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

I. PRE RESERVATION PERIOD FROM 1853 TO 1878:

5.2.2. Prior to reservation of these forests in 1879, the tract was in a very undeveloped state. There was no regulation or control over the felling in the forests. The accessible areas adjoining to the villages were excessively harvested in a very irregular way.

II. EARLY RESERVATION PERIOD FROM 1879 TO 1898:

5.2.3. The forests of this division were declared as Reserved Forests in 1879. After reservation of these forests, some protection measures were undertaken. Certain species such as teak, bija, shisham, kusum, haldu and kowah could not be removed without a license. 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 license system. From 1893, these indiscriminate

felling were put to stop and localized felling of timber, green fuel and bamboo were permitted, while other produce could still be obtained from any part of the forests. However, there was no scheme to regulate the felling 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.

III. PERIOD OF REGULAR WORKING UNDER DIFFERENT WORKING PLANS FROM 1899 ON WARDS:

5.2.4. The Reserved Forests areas of the tract dealt with originally belonged to the Wairagarh Range of Chanda Forest Division. The following working plans were in operation since beginning:

THE WORKING PLAN OF MR.A.F.LAWRIE:

5.2.5. The first working plans were introduced between 1900-1926 and were prepared by ranges. A. F. Lawrie's Working Plan was the first Working Plan for Wairagarh Range. This first plan covered Reserved Forests of the then Wairagarh, Ghot and Dhaba Ranges in Chanda Division. Hence present Wadsa, Armori and Kurkheda Ranges in Wadsa division were covered by this first plan. 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.

5.2.6. A.F.Lawrie's plan described that no good forests existed in Wairagarh Range. The hills in Kondhala and Khairee blocks contained some small teak scattered here and there. Natural regeneration was generally poor owing to unregulated felling, 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, afterward restricted only to B1 Class forests called excised areas.

5.2.7. 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 favoring them at the expense of less valuable one.

5.2.8. The plan was quite simple in its prescriptions and prescribed Improvement felling 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.

5.2.9. RESULTS:

Coupes were opened to the purchasers who could remove any trees not marked as reserved. 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 felling 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 stock. Subsequently intensive cultural operations, thinning, cleanings and climber cutting were carried out with great benefit to the forests. Fire protection work was started in 1897. It was found to be too elaborate and several fire lines were subsequently abandoned. The system of rigid fire protection was followed till 1913-14 when early burning was introduced.

WORKING PLAN OF MR. VAHID (1927-1935):

This plan was one of the first plan 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 Wairagarh Range only. However, to have an idea about past treatment in and around the area dealt with in the present plan, the plan of Mr. Vahid is being discussed.

5.2.10. This plan prescribed 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.

5.2.11. 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 midst of a populous agricultural tract, great importance was given to satisfy the domestic requirements of local populations for timber, fuel, minor forest 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.

5.2.12. 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 in the interests of the war supply.
- (iv) To aim at creation of normal forests with a normal series of age classes and 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.

5.2.13. 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.

5.2.14. 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.

5.2.15 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.

1. HIGH FOREST WORKING CIRCLE

5.2.16. 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.

2. COPPICE WITH STANDARD WORKING CIRCLE

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

3. LOW FOREST WORKING CIRCLE

5.2.18. 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 and was covered by 6 Felling Series in the then Wairagarh Range. Comptt. Nos. 220-224, 235-253 and 262-271 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.

5.2.19. 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 felling in climber infested areas and mid rotation thinning in all the felling series were prescribed.

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.

5.2.20 In the A class forest areas included in the present plan, main felling were carried out fairly completely except that in nearly all the felling series one coupe remained unworked owing to the disorganization caused by civil disobedience movement in 1930 and the slump in the fuel trade of 1931-32. Thinning were not carried out partly because of insufficient demand and partly because many coupes did not need thinning.

4. LOW FOREST UNWORKED CIRCLE

5.2.21. 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, Comptt. No. 203, 219, 225-234, 254-261, 272 and 273 were kept under Low Forests Unworked Circle.

5.2.22. Management of B Class forests was not taken up. The plan described that the condition was unsatisfactory and it was suggested that forest deptt. be given power to restrict irregular felling 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.

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

5.2.24 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.

5.2.25 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.

5.2.26 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.

5.2.27. 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 over wood and the failure to recognize 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 of these W.Cs. on completion of this working plan are not described anywhere.

THE WORKING PLAN OF MR. HEWETSON (1936 to 1948):

5.2.28. 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 Dn. consisting of the then Warora, Moharli, Mul, Chanda, Brahampuri, Sindewahi and Wairagarh Ranges. Though the area covered by the present plan belongs to Wairagarh Range only, the plan as a whole with specific attention to Wairagarh Range, is being described for general idea of past management.

5.2.29 After careful observation of the results obtained during the 8 years, since Mr. Vahid's plan was in force, Mr. Hewetson analyzed the causes for the failure of certain prescriptions. He concluded that clear felling was unsatisfactory for the areas having bamboo 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 coppicer. He therefore, changed 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.

5.2.30 Under this plan the better quality forests continued to be managed for production of large timber. The silvicultural prescriptions recognized 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 wood. In such forests, regeneration was expected to be chiefly by coppice. All inferior and open forests and those too distant from the market were excluded.

The following working circles were formed:

1. HIGH FOREST WORKING CIRCLE WITH 80 YEARS ROTATION

5.2.31. 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, areas of tract dealt with in the present plan were not covered by this Working Circle. 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 bamboo some years in advance of main felling and also postponement of overwood felling until sufficient advance growth had established itself. It was also prescribed to supplement natural regeneration by planting of teak and other useful species.

2. COPPICE WITH STANDARDS WORKING CIRCLE WITH 40 YEARS ROTATION.

5.2.32. 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 to all areas taken out of High Forest Working Circle of previous plan as well as to 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 Wairagarh Range. The area of the tract dealt with Comptt. Nos. 242-246, 254-271 were allotted to this circle.

5.2.33.. 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 are deficient in dense bamboo and large proportion of over mature trees existed in such areas. When the bamboos were not clear felled within tree forest, they had

responded vigorously to the extra light and had heavily suppressed whatever coppice reproduction survived. Even when bamboos were clear felled with the tree forest, they recovered more vigorously than 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 bamboo must be clear felled 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.

5.2.34. 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 thinning were to be done at the age of 15 years.

5.2.35. Poor and understocked 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 their fruit was collected by the local villagers.

3. MISCELLANEOUS WORKING CIRCLE

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

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

5.2.38. Comptt. Nos. 220-241, 247-253 and 273 of the present tract dealt with were allotted to this working circle.

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

4. BAMBOO WORKING CIRCLE (OVERLAPPING)

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.

5.2.40 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.

5.2.41 B Class Reserved Forests covering the large area of the present tract remained in blocks and were not covered by the plan.

5.2.42 Under Miscellaneous regulations prescription for grazing, fire protection etc. were given.

5.2.43 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 felling. 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.

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

5.2.45 In case of High Forest Working Circle, the felling operation of bamboo before the main felling 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 bamboo to free the existing re-growth led to serious failures in some areas.

5.2.46 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 xerophytic 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 depleted. The increased demand for fire wood and charcoal was also responsible for heavy felling.

5.2.47 In case of Coppice with Standard Working Circle, the results of the treatment were said to be satisfactory in non bamboo forests. But in some places, larger trees failed to coppice satisfactorily. In bamboo bearing forests heavy felling 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.

5.2.48. In Miscellaneous Working Circle, as irregular working including the removal of dead and dying trees and improvement or selection felling 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.

5.2.49. Bamboo were exploited regularly on four year cycle by the local villagers as well as purchasers from Wardha and Yavatmal districts. Owing to the large size of the coupes, supervision was difficult and felling rules were often violated.

5.2.50. 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.

WORKING PLAN OF MR.SINGH AND MAJUMDAR (1949-50 TO 1963-64)

This was a more systematic plan which 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 Wairagarh Ranges. The area of present plan belongs to the then Wairagarh Range. Though, only the part of objects of management, some of the Working Circles and hence some of the prescriptions 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 below.

5.2.51 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, fire wood and other minor forest produce and conserve as far as possible those tree species which produce edible fruits and lowers.
- (iii) To provide grazing to the maximum possible extent consistent with the silvicultural requirements for maintaining the forests perpetually productive and to maintain and improve 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.

5.2.52 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.

5.2.53 . The forests of the tract dealt within 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.

5.2.54 TREE FORESTS: All the better quality forests were put in to this class. These were principally managed for the supply of timber and fire wood and other forest produce and to realize 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.

5.2.55 The treatments prescribed were Conversion operations with artificial regeneration in case of better quality area and Selection-cum- Improvement felling 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 belongs to this class.

5.2.56 MINOR FORESTS: The entire R.F., A -class forest 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.

5.2.57 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, fire wood 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. 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.

5.2.58 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.

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

5.2.60 The lands were to be managed as grazing grounds to provide grazing to the maximum possible extent consistent with the maintenance of pasture. No felling were prescribed, but tree growth could be sacrificed in the interest of pasture. Monsoon closures were prescribed to maintain and improve the pasture.

5.2.61 No area of the tract covered by the present plan was classed as pasture.

5.2.62 MISCELLANEOUS FORESTS: This class comprised grass 'birs' of the then Warora Range and forest village areas.

5.2.63 No working was prescribed in these areas, though valuable forest growth in forest village area could be exploited under proper authority.

5.2.64 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 Wadsa 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.

5.2.65 Keeping in view the above classification of forests, the following Working Circles were formed.

i. PLANTATION WORKING CIRCLE

5.2.66 This included better quality tree forests. No area of the tract being dealt with covered this Working Circle.

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

ii. SELECTION - CUM - IMPROVEMENT FELLING WORKING CIRCLE :

5.2.68. No area of the tract dealt with in the present plan was allotted to this Working Circle.

5.2.69. 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.

iii. **COPPICE WITH RESERVE WORKING CIRCLE :-**

5.2.70 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.

5.2.71 Apart from other areas of other ranges, it included the more accessible workable forests of the then Wairagarh Range. 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 Wairagarh Range which were not worked so far, were also allotted to this Working Circle and new felling series were formed.

5.2.72 The forests belonging to the present Wadsa Division covered eight felling series. Compartment No. 225, 232 to 246, 250 A, 251, 252, 254 to 271, 282 to 284 and 287 of present Wadsa Division were allotted to this Working Circle.

5.2.73. The chief object of management was to supply on sustained basis small size timber, poles, fire wood 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.

5.2.74. Special treatment was prescribed for forests having dense under growth of bamboo. Keeping in view the past experience, felling of bamboo 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 bamboo weeds and grass until new recruitment.

5.2.75. In the forests containing few or no bamboo, 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. Fruit bearing trees were reserved. *Gardenia 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.

5.2.76. The rotation was fixed at 40 years and the regulation of yield was by areas.

5.2.77. C.B.O. in the year following the main felling, 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 felling were prescribed.

5.2.78. All coupes were closed to grazing for a period of 7 years from the year of working. Further, in moderately graze areas three year closure was prescribed. Besides, monsoon closures were prescribed.

iv. **MISCELLANEOUS WORKING CIRCLE :**

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

5.2.80. As far as forests of the Wadsa Division are concerned, compartment No. 220 to 224, 226 to 231, 247 to 249, 250 B, 253, 273, 274, 285, 286, 288 to 290 were allotted to this Working Circle.

5.2.81. These forests were not kept under the regular working but dead and dying trees could be removed and Selection- cum-Improvement felling 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 Manual. The area of Wadsa Division did not have any forest villages.

v. **PASTURE WORKING CIRCLE:**

5.2.82. No area of the present Wadsa division was covered by this working circle.

vi. **BAMBOO (OVERLAPPING) WORKING CIRCLE:**

5.2.83. No area of Wadsa division belongs to this. The plan described local demand and prospects of paper industry at Ballarshah. Commercial and Nistar Bamboo Felling series were formed.

5.2.84. In order to safe guard the demand of some of the local

population, about 1/10th of the total C.B.F.S. acres were even set a part in some areas cases.

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

vii. SEMAL (OVERLAPPING) WORKING CIRCLE:

5.2.86. No area of Wadsa 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.

5.2.87.. B Class Reserved Forests:

B Class RFs. were not allotted to any working circle. These forests were subjected to unrestricted grazing by bovine animals and to browsing by goats and sheep. Due to this and due to fires, illicit felling 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.

5.2.88. KOSA CULTIVATION:

Kosa cultivation areas were to be made available from B-class forests.

5.2.89. FIRE PROTECTION: The forests were classified into three classes as prescribed in paragraphs 86 to 89 of the Central Provinces and Berar Forest Manual Vol.1.

5.2.90. All regenerated areas under C.W.R. working circle, all plantations, experimental plots, sample plots and grass birds 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.

5.2.91 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.

5.2.92 The Reserved Forests A-class area of Wadsa division was allotted to Coppice with Reserve and Miscellaneous Working Circles. As no regular working was prescribed in Miscellaneous W.C., the results of working in these areas are not described.

5.2.93. The results of Coppice with Reserves W.C. were as under:-

(a) Areas subjected to light to moderate grazing regenerated well but in the areas subjected to heavy grazing,

especially 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 affect the misc. 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 thinning were noticed to be usually heavy, amounting to felling of reserves. The trees reserved at the time of main felling were found to be removed against the working plan prescription.

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

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 the 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 in 1972.

5.2.94. Mr. Kartar Singh set his objects according to the National Forest Policy guide lines. The govt of Maharashtra in Revenue and Forest Deptt., vide Resolution No. MFP/1365/ 13221 /-YS, dated 6th December, 1969 had classified the forests in to functional basis as Protection Forests, Tree Forests, Minor Forests, Pasture lands and Grass Reserves.

5.2.95. 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) not under systematic management.

5.2.96. OBJECTS OF MANAGEMENT: 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 (birs) in heavily populated areas where the demand of fodder grass is heavy and improves 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 under stocked patches and thus enriches 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.

5.2.97. METHOD OF TREATMENT: The method of treatment adopted by him was based on the functional classes of forests as given below.

5.2.98. TREE FORESTS : These included well stocked mixed forests which, according to him were capable of producing good quality teak and semal. An assumption was in time with the general view that the only answer for intensification was conversion and the only valuable species was teak. In these forests natural reproduction of teak and other important species like bija, sisham, semal etc. was deficient. These forests inhabited mostly the gently undulating tracts. He found these areas suitable for taking up concentrated felling and therefore decided to prescribe 'Uniform System' for these forests to be converted by clear felling and planting mostly. A grazing closure of eight years from the year of plantation and an average incidence of grazing 5 acres per cow unit was prescribed.

5.2.99. Reserved Forests of Armori and Wadsa Ranges were classed as teak forests.

5.2.100.. MINOR FORESTS: These included all areas containing inferior tree growth which were capable of producing mainly firewood and poles. In these forests grazing was decided to be provided to the maximum possible extent consistent with the management of these forests on the basis of sustained yield of firewood, poles and fodder. The incidence of grazing was fixed at 1.5 to 2 acres per cow unit on the average area open to grazing. These forests were further divided in to three categories for systematic management.

(a) The marginal areas were subjected to adverse biotic influences which had resulted in the failure of regeneration and where erosion had set in or which were liable to erosion. He prescribed these areas to be worked under Improvement Felling supplemented with soil conservation operations and compensatory plantations to enrich the growing stock. The

grazing closure prescribed was for seven years after the main felling. The felling cycle was to be of 20 years.

(b) The Reserved Forests, which had been transferred from B to A-class during the run of the last plan, contained preponderance of malformed tree growth and had been subjected to unrestricted grazing. These forests were also prescribed to be worked under Improvement Felling as in (a) above.

(c) The better stocked forests which had regenerated well under the Coppice with Reserve system in the last plan were to be continued under the same system with a rotation of 40 years. These areas were to be closed for grazing for 6 years.

5.2.101. GRASS BIRS :- These were to be formed in 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' were to remain permanently closed to grazing and were to meet the demand for the supply of fodder grass to stall feed the cattle. In such areas rank growth was to be removed and better varieties were introduced.

5.2.102. REMAINING FORESTS:

These were either under the process of disforestation, or were classified as B-class forests to be given out for cultivation or transferred to other departments. Hence these areas were allotted to the Miscellaneous Working Circle.

5.2.103. In accordance with considerations mentioned above Mr. Kartar Singh's plan prescribed the following working circles.

- (i) Conversion Working Circle.
- (ii) Coppice with Reserve Working Circle,
- (iii) Improvement Fellings Working Circle,
- (iv) Kuran Working Circle,
- (v) Miscellaneous Working Circle.

5.2.104. The Reserved Forests of Wadsa Division were covered by all above five Working Circles.

1. CONVERSION WORKING CIRCLE:

5.2.105. Comptt.Nos. 251, 252, 289-A and 289-C, in Armori Range and comptt. Nos. 262, 263 and 265 in Wadsa Range were allotted to this Working Circle. Out of these, comptt. Nos. 259 and 289-A were allotted to P.B.-1 and remaining to P.B. unallotted.

5.2.106. 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 laterite.

5.2.107. The crop consisted of mainly ain, dhaora, bija, endu, mahuwa, lendia and garari. Teak occurred in small patches. Density of over wood varied from 0.5 to 0.7. Reproduction 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.

5.2.108. 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.

5.2.109. 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.

OBJECTS OF MANAGEMENT:

5.2.110. 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 possible without impairing the productive capacity of forests.
- (iv) Consistent with the above, to derive the maximum financial benefit.

5.2.111. 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.

5.2.112. 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, was 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 misc. forests which could not be

conveniently separated from management point of view and plantable under stocked areas. P.B. un allotted areas consisted of mainly young to middle aged misc. forests having varying quality and density and capable of sustaining teak forests.

TREATMENT IN P.B.I AREAS

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

(A) Unworkable areas: These comprised areas with steep slopes of 25 % or more, seriously 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.

(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.

(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 teak and shisham with 2m x 2 m. 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.

(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 mahuwa.

TREATMENT IN PB UN ALLOTTED AREAS

5.2.114. The areas included and treatment to be given in P.B. un allotted areas was as under :

(A) Unworkable area

(B) Patches containing advanced growth of teak and plantation.

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

5.2.115. 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.

5.2.116. Subsidiary silvicultural operations like weeding and replacement of casualties in plantations, cleaning in the 6 th year

and thinning in the 12th year, climber cutting, removal of miscellaneous species interfering with teak etc. were prescribed in P.B.I areas.

2 . COPPICE WITH RESERVE WORKING CIRCLE

Compartment Nos. 225, 234, 242 to 246, 249,250,253,259 to 261, 286 and 312 to 314 of Armori Range, comptt. Nos. 254 to 258, 284 and 321 to 326 of Wadsa Range and comptt. Nos.235 to 241 and 287 of Kurkheda Range were allotted to this working circle.

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

5.2.118. 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 0.4 to 0.7 and occasionally below 0.4 and above 0.7. Coppice regeneration was found to be satisfactory.

OBJECTS OF MANAGEMENT

The main objects of constitution of this Working Circle were as under.

5.2.119. (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.

5.2.120. 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 coppices, a flexible Coppice with Reserve system was applied to these forests.

5.2.121. Teak, bija, shisham, semal, ain, tinsa, haldu and 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.

5.2.122. TREATMENT :- The treatments prescribed were as under:

(A) Unworkable areas: These included precipitous and steep slopes, understocked areas of density below 0.4, 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.

(B) Areas fit for clear felling with some reservations: These were well stock forests having density 0.7 above and capable of restocking the areas after clear felling from the resultant coppice and the advance growth already present.

5.2.149. 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 up to 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.

(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.

(D) Remaining areas with density 0.4 to below 0.7:-

Marking for Improvement felling consisting of following operations was prescribed :-

- (i) Cutting of all climbers and high stools, dead, dying, unsound, malformed, heavily burnt or otherwise vary badly damaged trees.
- (ii) Thinning 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 weedings and casualty replacements in plantations, C.B.O., cleanings in the 6th year and thinning in the 21st year were prescribed.

3. IMPROVEMENT WORKING CIRCLE

Compartment Nos. 220 to 224, 226 to 230, 232, 233, 247, 248 274, 283-A, 285, 290, 308 to 311. 315, 318 and 320 of Armori Range, Comptt. Nos. 264, 266 to 271, 319 of Wadsa Range and Comptt. Nos. 273, 288, 316 and 317 of Kurkheda Range were allotted to this Working Circle.

5.2.123. 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 nalas. Density was generally 0.5 and below.

OBJECTS OF MANAGEMENT

The main objects of management in the constitution of this Working Circle were:

- (i) To maintain and improve adequate soil cover.
- (ii) To improve existing malformed crop by tending operations.
- (iii) To help the regeneration of various species to establish and supplement the same by taking up afforestation of under stocked areas.
- (iv) To take anti-soil erosion measures for raising the productive capacity of the soil and maintaining the same.

5.2.124. As these forests were highly degraded due to heavygrazing, fires and illicit felling, 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 fewer trees, tending of regeneration and planting of understocked areas with suitable species. Teak as the principal species got the preferential treatment followed by bija, shisham, tinsa, haldu, ain and semal.

No rotation was fixed. Felling cycle of 20years was fixed. Regulation of yield was by area.

5.2.125. TREATMENT :- The treatment included are following :-

(A) Under stocked 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 3 m spacing in 30 cm x 30 cm x 30 cm pits. Nala and gully plugging with brush wood and boulders

(B) Remaining areas :-The prescriptions were:

- (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.

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

KURAN WORKING CIRCLE

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.

5.2.126. OBJECTS OF MANAGEMENT :- The main objects of raising the plantations for receiving the different types of improved grass varieties, to increase the yield of fodder grass and to protect the areas vulnerable to soil erosion by maintaining adequate soil cover.

5.2.127. TREATMENT:- 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 mtr. 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) (i) Areas which needed heavy openings of trees : 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 brush wood or boulders.

5. MISCELLANEOUS WORKING CIRCLE

Comptt. Nos. 231, 283-B and B-class Reserved Forests of Pathargota, Chamorshi, Porla, Sirsee.Churmura and Hirapur in Armori Range, comptt. Nos.282 and Pathargota B-class R.F. in Wadsa Range and Nagarwahi B-class Reserved Forests in Kurkheda Range were allotted to this Working Circle.

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. **5.2.128.** method of treatment was prescribed for this Working Circle.

B. EX-PROPRIETARY PROTECTED FORESTS

5.2.129. (1) These forests were placed under scientific management first time through the Working Scheme of Mr.V.K. Prabhu since 1965-66. Prior to that year 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 of Proprietary Rights (Estate, 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 Deptt. and later on were transferred from time to time to the Forest Deptt. for their scientific management. These forests were declared as Protected Forests in 1955 and 1957 and major parts of these forests have been 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 dwindling finances.

(3) Up to 1951 and even beyond, Jamindari 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 1965.
- (v) The period of regular working under the scheme of Mr.V.KPrabhu from 1965-66 to 1991-92.

PERIOD OF PRACTICALLY NO CONTROL, UP TO 1888.

5.2.130. There was only general provision 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 valuable timber species like teak, ain, bija, shisham etc. Contracts for extraction of timber was under the general control of the Deputy Commissioner, 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.

5.2.131. 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 from 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.

PERIOD OF WILD CONTROL; FROM 1889 TO 1917

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 specially 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.

5.2.132. 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. Dunbar Brander was deputed to inquire in to the conditions prevailing in the jamindaris. According to him, the main difficulties in managing the jamindari 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.

5.2.133. 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.

THE PERIOD OF SOME CONTROL: FROM 1918 TO 1951

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

5.2.134. 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 as under.

- (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, date 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 subject 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 bamboo less than two years old should be cut;
 - (d) No cutting should be done within 20 yard 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 Deputy Commissioner;
 - (v) The Deputy Commissioner might, at any time, suspend cutting, to investigate whether the operations were in accordance with the rules or not.

5.2.135. 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.

5.2.136.. 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.

5.2.137. 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.

4. THE PERIOD AFTER ABOLITION OF PROPRIETARY RIGHTS, FROM 1951 TO 1965.

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.

5.2.138 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. PERIOD OF REGULAR WORKING UNDER THE SCHEME OF MR. V.K.PRABHU : FROM 1965- 66 TO 1991-92

5.2.139 The forests dealt with under the scheme of Mr.V.K. Prabhu were part of Madhya Pradesh state till 31 st October, 1956.

5.2.140. It was decided by the then Government of Madhyam 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.

5.2.141. 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. The working scheme was submitted to the Government of Maharashtra in March 1964. After the reorganization of East Chanda Division in 1983, this scheme covered Protected Forest areas of Wadsa and Gadchiroli Divisions. Major parts of these Ex-proprietary P.Fs. have been declared as R.Fs. in 1992.

5.2.142. The Working Scheme which was to expire in 1974-75 has been accorded extension thereafter. The reason for the delay in the revision of this Scheme may be outlined as under.

5.2.143.(i) 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 not issued.

Therefore a considerable uncertainty, as to the legal status of these areas prevailed till 1992 when finally 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

(ii) 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.

(iii) There after two Working Plans for the Central Chanda Forest Division were revised. This work went on till mid 1987.

5.2.144. The ex-proprietary forest areas of Wadsa Division, now spread over all the four Ranges viz, Wadsa, Armori, Kurkheda and Bedgaon, belong to Gadchiroli, Dhanora and Kurkheda Ranges of ex-East Chanda Division covered by the Working Scheme of Mr.V.K.Prabhu. .

5.2.145. OBJECTS OF MANAGEMENT: The main objects of management of Mr. Prabhu's Scheme were as under:

(i) To bring as much area as possible of the ex-proprietary forests under systematic management.

(ii) To improve the condition of the growing stock and increase the proportion of valuable species in these forests by the preferential treatment and by plantations within as short period as possible.

(iii) To satisfy the local demand for small timber, firewood, bamboo and other minor forest produce from the area specially set apart to meet the bonafide nistar requirements and conserve as far as possible those tree species which produce edible flowers and fruits, wherever flowers and fruits collected.

(iv) To combat the ill effects of soil erosion wherever it has started and to prescribe preventive measures against further soil erosion.

(v) To aim at progressively increasing yield as under the present conditions, all these forests are poorly stocked with large number of inferior species.

5.2.146. METHOD OF TREATMENT : The method of treatment adopted for the scheme by Mr. Prabhu was basically influenced by the guidelines of National Forest Policy, 1952 and the subsequent decision of the then Madhya Pradesh Government vide their Resolution No. 3952-2624-XI, dated 12th December, 1952 regarding its implementation in the state. Vide this Resolution, the then Madhya Pradesh Government decided that the forests of the state should be managed as follows:

5.2.147. I. PROTECTION FORESTS: This included those forests which occurred on very steep slopes (25 and over) or along river banks, and forests that had become depleted through maltreatment, and further exploitation of which would accelerate soil erosion and adversely affect the productivity of agricultural lands in the lower regions. The management aimed at rapidly conserving these forests so that they might once again exert their beneficial influence on the soil, the water regime and the physical and climatic factors of the locality.

. II. TREE FORESTS: Those forests situated in remote tracts on which there was little or no agricultural demand and which were prominently suited for growing large sized timber and other products of commercial value.

. III. MINOR FORESTS: This included forests which were interspersed with cultivated lands and were capable of producing small timber and firewood and providing grazing, which were the indispensable needs of the adjoining agricultural population.

IV. PASTURE LANDS: Those openly stocked forests or scrub lands that had ceased to yield even small timber but which were conveniently situated for providing grazing to the cattle used on agricultural works.

V. REMAINING FORESTS: (a) Grass reserves which were small blocks of forests situated amidst intensively cultivated

tracts carrying scrubby growth and capable of producing good fodder grasses which were in short supply, (b) Recreation reserves which were needed for bio aesthetic purposes i.e. as holiday makers resorts and for the study of wildlife, (c) Forest Villages etc.

5.2.148. TREATMENT: Mr. Prabhu observed that all above mentioned categories except iv and v existed in the areas covered under his Scheme. Keeping in view of the principles laid down in National Forest Policy and the functions of the forests as per the State government's order on the report of of State Forest Policy Committee, Mr.Prabhu prescribed the method of treatment as under-

5.2.149. I. TREATMENT FOR PROTECTION FORESTS: Most of the steep slopes liable to erosion, under stocked areas with density below 0.4, blanks to a width of one chain were either excluded from working or very light felling was prescribed with due regard to the necessity of preserving sufficient forest cover for site protection.

II. TREATMENT FOR THE TREE FORESTS: The better quality forests mostly on hilly and having sufficiently dense under story of bamboo were to be worked on Selection Cum-Improvement System. In addition, some of the inferior quality tree forests were also to be worked under this system due to the following reasons, (a) remoteness of these areas from human settlements (b) a concentrated system like the Coppice with Reserves was thought not to be an economically viable proposition for these interior areas and (c) the main object of management of these areas was basically improvement of the crop.

However, "Tree Forests" of inferior quality situated mostly near human habitations in the plain having little or no bamboo were to be worked under Coppice with Reserves System.

III. TREATMENT FOR THE MINOR FORESTS: Forest around about villages where nistar zones had been formed, were to be worked under Coppice with Reserves System albeit on a reduced rotation, i.e., 20 years. The main object of the Minor Forest Working Circle was to meet the nistar demand of small timber and fuel of the villagers.

IV. MISCELLANEOUS: An overlapping Working Circle was formed for bamboo working in which the felling cycle was four years. Suitable areas were set apart for the Ballarpur Paper Mills Ltd.

5.2.150. Based on the above methods, the following working circles were formed.

- (i) Selection-cum- Improvement Working Circle,
- (ii) Coppice with Reserve Working Circle,
- (iii) Minor Forest Working Circle and

(iv) Bamboo Overlapping Working Circle.

(I) SELECTION-CUM-IMPROVEMENT WORKING CIRCLE:

5.2.151. The Selection-cum-Improvement Working Circle contained the good quality miscellaneous forests, forests with dense bamboo and forests which were situated mostly on hills. The forests mainly belong to Madhya Pradesh quality III often found intermingled with lower quality classes. The main object of management was the production of large sized timber of valuable species.

5.2.152. The area included in this working circle was subjected to extravagant selective harvesting, uncontrolled fires and lack of operations for regeneration and tending during the zamindari regime. Hence the prescriptions for the working of forests under this working circle, which had mainly sound to middle aged crop with a few mature and over mature trees, were designated for the production of large sized timber, improvement of growing stock and increase in the proportion of economically valuable species by preferential treatment and by planting in a short period. The silvicultural system prescribed was, Selection-cum-Improvement System.

A rotation of 100 years was prescribed on the basis of growth data for teak in North Chanda Division (old). Harvestable girths for the main species were prescribed as follows:

5.2.153. Teak (121.92cm) Bija (137.16 cm) Ain (137.16 cm), Shisham(137.16 cm) Bhirra(121.92cm) Haldu (137.16), Garari(42.72cm). Based on the objects of management a felling cycle of 20 years was prescribed. The yield was regulated by area. Teak was chosen as the most favoured species due to its commercial value. Other favored species in order of importance were bija, ain , shisham, dhaora , haldu , tendu , and bhirra .

5.2.154. Areas unfit for working included precipitous and very steep slopes 25 degree and over, under stocked area with density below 0.4 including half chain wide strips of forest surrounding them, areas liable to serious erosion and eroded areas, one chain wide strips along side main water courses and five chain wide strips around tanks.

Suitable areas not less than 25 acres or 10.11 hectares of plantable area in extent at one place bearing predominantly miscellaneous crop and having deep well drained soil with gentle slopes were to be selected for teak plantations.

5.2.155. The marking rules prescribed climber cutting over the whole coupe at the time of marking, preservation of trees for protection purposes, preservation of trees for seed production, and lastly preservation of healthy fruit, kulu gum and khair trees. Trees of all the marketable species were to be enumerated in 30 centimeters girth classes.

5.2.156. In the selection felling, one in every two of mature trees of and above the prescribed size were to be marked for felling provided their retention was not necessary on the silvicultural grounds and for the soil conservation. Best trees were to be selected for retention. Trees in the pre selection girth class were not to be marked for felling unless their removal was essential for improvement of the crop. Formation of permanent gaps was to be avoided.

5.2.157. As regards the improvement felling, these were to be guided purely by silvicultural considerations. In this, dead, definitely dying, or seriously deteriorating trees putting on negative increment, trees whose removal was necessary for the growth of underlying sufficient regeneration, trees whose removal did not endanger the soil or the economic value of the ground, were considered available for harvesting. Thinnings were prescribed, for the remaining large areas having irregular crop, to be carried out in favour of teak, bija, ain shisham, bhirra, dhaora and tendu in order of importance as stated above. The canopy was to be kept sufficiently dense in order to keep the bamboo under check. All the weak and malformed advance growth of valuable species was to be cut back throughout the coupe at the time of marking. Trees of inferior species and bamboos interfering with the resultant coppice were to be removed, provided such an action did not encourage the growth of grasses.

5.2.158. Every year at least 100 acres or 40.47 hectares of teak plantations per range were to be taken up on suitable sites, with no plantation site admeasuring less than 25 acres or 10.11 hectares of actual area planted.

5.2.159. Subsidiary silvicultural operations like cutting back operations, cleanings and thinning in plantations were also prescribed.

5.2.160. Miscellaneous regulations included fire protection, closure to grazing of coupes and plantation areas for 7 years after main felling and planting respectively. Areas to be worked under this working circle were to be closed under section 30 of Indian Forest Act, 1927 and thereby prohibiting villagers from exercising their nistar rights for small timber and firewood etc.

(II) THE COPPICE WITH RESERVE WORKING CIRCLE

5.2.161. This working circle included all the harvestable forests situated near the human settlements, in which the forest growth was considered sufficiently dense and valuable to make their harvesting possible. Most of the areas included had inferior growth with scanty or no bamboo, and were considered suitable for the supply of small timber and fuel wood. The general quality of forests included in this working circle was Madhya Pradesh quality class IVa. Teak was scanty in occurrence and malformed

in growth. The crop was characterized by the presence of a great variety of species, most important of which were ain (*Terminalia alata*), bija (*Pterocarpus marsupium*), and dhaora (*anogeissus latifolia*). The main object of management of these forests was commercial production of small timber, poles and firewood on sustained basis to the maximum possible extent. This object was considered to be the best achieved by working these forests under Coppice with Reserve System. A rotation of 40 years was prescribed for forest under this system with the rider that the trees reserved for the production of big sized timber would be retained for two or more rotations. The yield was prescribed to be regulated by area.

5.2.162. Teak was again chosen to be the most favoured species. The other valuable species to be favoured included bija , semal , ain , Shisham , dhaora and bhirra .These species were to receive preferential treatment in order of their importance in the selection of trees to be reserved, in subsidiary silvicultural operations and in thinnings. Trees bearing edible fruits and flowers were also to be reserved.

5.2.163. Marking of areas unfit for working was to follow the prescriptions given in the Selection-cum-Improvement Working Circle.

5.2.164. As regards marking in the areas unfit for marking, only dead and over mature trees were to be marked departmentally if not needed to be retained for silvicultural reasons. In all other areas, the following trees were to be reserved.

- [1] Healthy trees bearing edible fruits and flowers used by the local population,
- [2] Semal trees below 4'-6" in girth at breast height over bark,
- [3] All good advance growth, excepting garari up to 9" in girth at breast height over bark,
- [4] All healthy trees of economic importance such as teak, ain, shisham, tendu, aonla, siwan, tinsa and bhirra up to 24 inches in girth at breast height over bark. The number of trees to be reserved would depend upon the number of suitable trees available and was not to fall below 30 trees per acre as far as possible. In areas of medium to low stocking all healthy trees except garari were to be reserved at the rate of 40 to 50 trees per acre. In addition to this, thinning was prescribed for the patches containing pole crop, all climbers were to be cut and garari was to be clear felled.

5.2.165. The subsidiary silvicultural operations included cutting back operations and cleaning.

5.2.166 The general miscellaneous regulations prescribed in the Selection-cum-Improvement Working Circle were to be applied to the forest areas of this working circle as well.

(III) MINOR FOREST WORKING CIRCLE

5.2.167. This working circle comprised of forests round about cultivation and occupied areas. All such forests were included in this working circle to be managed chiefly for meeting the nistar requirements of the village population. These areas had earlier been constituted into nistar Zones in accordance with the guidelines given by the then Madhya Pradesh Government in June, 1953. According to these guidelines if the tree clad area in a village was half of the total occupied area of that village, the village was to be considered self sufficient in nistar supply. V.K.Prabhu, however, did not consider it possible to stick up this proportion in all cases and therefore, other factors like the relative spread of the forest areas and cultivation, continuity of the area to be worked under Selection-cum-improvement and Coppice With Reserve Working Circle, natural features, blanks etc. were taken into account while laying lines separating the area under Minor Forest Working Circles, from the other working circles. The general composition of the forest was the same as in the selection-cum-improvement and Coppice With Reserve Working Circles. These forests had suffered considerable damage in the past due to indiscriminate felling due to unregulated and unscientific harvesting for nistar by the local villagers. The main objects of management of forest coming under this working circle were (1) to provide nistar material to the local villages (2) to prevent indiscriminate felling by regulating felling through simple felling rules for the removal of small timber and fuel for nistar.

5.2.168. The main object of management of forests included in this working circle is to meet the bonafide nistar requirements of local population which were for small timber and fuel. The silvicultural system prescribed was Coppice with Reserve. The rotation was kept at 20 years. No coupes were laid out. The agency for harvesting after marking by the Department, was to be Gram Panchayat, Gram Sabhas or Nistar Panchayats or as decided by the Conservator of Forests, Chanda Circle.

5.2.169. The method of executing felling was essentially the same as prescribed for the Coppice With Reserve Working Circle. The same set of rules for subsidiary silvicultural operations in Coppice with Reserve Working Circle were to be applied to this Working Circle as well.

5.2.170. Miscellaneous regulations included those for fire protection, grazing, exercise of rights and concessions etc. it was provided that all areas except for those under working would be closed under Section 30 of the Indian Forest Act, 1927. Nistar was to be made available only from the current year's working areas for this working circle, which if, found insufficient, could be made good from other working circle by the Divisional Forest Officer.

(IV) BAMBOO (OVERLAPPING) WORKING CIRCLE

5.2.171. This working circle which overlapped areas of all the three earlier working circles included areas carrying bamboos in harvestable proportion. The only common species of bamboos occurring in these forests is *Dendrocalamus strictus* with very few scattered patches of Katang bamboos (*Bambusa arundinacea*) on nala banks.

5.2.172. There was sufficient growing stock of bamboo in these areas. Working of bamboo for nistar on commercial purposes was, however, totally unregulated and unscientific. Whereas bamboo areas in the interior suffered from the absence of management rather than harvesting, those in the vicinity of human habitations were subjected to irregular harvesting. The growing stock of bamboo in these areas was on the point of marked deterioration which could have deleterious effects on sustained yield in future.

5.2.173. The local demand for bamboo was very limited as compared to the quantum available. In order to utilize the potential fully, therefore, the bamboo areas were grouped into nistar and commercial felling series with the former meeting the local need and the latter catering to the commercial requirements of Ballarpur Paper Mills. The commercial felling series were leased out to Ballarpur Paper Mills for a period of 30 years. The object of management of forest areas allotted to this working circle was scientific harvesting of bamboo for meeting the local needs as well as for commercial purposes. The felling cycle was of four years.

5.2.174. Felling rules governing the bamboo harvesting provided as follows:

A clump having less than 10 culms was to be considered undeveloped and therefore, unfit for working.

- 1.No felling would be carried out during monsoons,
- 2.No culm below two years of age would be felled,
- 3.No dead, malformed, twisted or crooked culms would be left in the clumps,
- 4.No culm would be cut lower than 6 inches and higher than 18" from the ground,
- 5.At least 8 mature well grown culms would be maintained in the clump,
- 6.No rhizome would be dug out or damaged and
- 7.The retained culms would be spaced out in clump.

SECTION – 5.3 ANALYSIS OF PRESCRIPTIONS AND OTHER TECHNICAL AND ADMINISTRATIVE PARAMETERS

5.3.1. (1) 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 division was at best ocular. 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 short coming. It was perhaps over- looked because of the conditions prevailing then.

5.3.2. (2) 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.

5.3.3. (3) 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 , ain , mocha , beheda ,harra, bhirra , khair, semal 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 coppice 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.

5.3.4. (4) 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.

5.3.5 (5) Forest areas belonging to the Wadsa 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 nowhere 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 will lead to monoculture. The fact is that teak has increasingly become out of the reach of local population which can not afford to buy it, therefore, large increase in area under teak would adversely affect people in supply of locally useful non teak timber. Thus large scale teak is neither technically feasible nor socially acceptable.

5.3.6 (6) 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.

5.3.7. (7) 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 regarding the acts prohibited in the Protected Forests and the regulation of the Acts permitted in these forests respectively.

5.3.8. In the notification under section 30 of the Indian Forest Act, 1927 there are three clauses. Section 30(a) lists out the class of trees which are reserved; 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 and lastly 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. Out of these three clauses only the clause (b) had a time limit of 30 years which expired on 25th January, 1988.

4. WORKING PLAN FOR SHRI D.R.PARIHAR, SHRI R.K.POLE, AND SHRI T.K.CHOUBEY FOR THE PERIOD 2002-03 TO 2011-12.

5.3.9. After the end of working plan of Mr.Kartar Singh (1977-78 to 1991-92) and Mr.Prabhu's Scheme for Ex-proprietary Forest (1965-66 to 1974-75) no plan was in existence till 2001-02. The plan of Shri Choubey, covered the period from 2002-03 to 2011-12 and still in progress.

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

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

CLASSIFICATION OF FOREST:

5.3.11. The functional classification of the forest has been made by taking into consideration a new forest policy as well as resolution no.MEP-1365/132211-Y Dated 6 December1968 issued by the Govt. of Maharashtra, Revenue and Forest Department. The following classes of forest have been identified for management.

1. Protection Forest :-This includes forest which occur on very steep slopes (25 degree and above) or along river banks and forest that have become depleted through maltreatment and further harvesting of which will accelerate soil erosion and adversely affect the productivity of agricultural land in the lower regions. The management should aim at rapidly conserving these forest so that they may once again exert their beneficial influence on the soil. The water regime and physical and climatic factors of the locality.

2.TREE FOREST; This includes forest which are situated in remote tract that are prominently suited for growing large sized timber and other products of commercial value.

3.MINOR FOREST: This includes forest that are interspersed with cultivated lands and are capable of reducing small timber and fire wood and providing grazing which are the indispensable needs of the adjoining agricultural population

4.PASTURE LAND:- These are openly stocked forest or shrubs land that have ceased to yield small timber but which are conveniently situated for providing grazing to cattle used on agricultural works.

5. MISCELLANEOUS FOREST:

- a) Grass Reserve:-Which are small blocks of forest situated amidst intensively cultivated tracts carrying scrubby growth and capable of producing good fodder grasses which are in short supply.
- b) Remaining areas which are need for other purpose.

METHOD OF TREATMENT: The method of treatment was based on the functional classification.

5.3.12. The emphasis was on conservation of biodiversity and the meeting the demands of local people. Hence for the conservation of biodiversity and site, soil and moisture conservation works based on water shed were proposed. To meet the local demand of people, involvement of local people in plantation and other activity has been provided in a separate Joint Forest Management (overlapping) Working Circle. The various types of forest were treated as follows.

1- Protection Forest: These areas were excluded from commercial felling, degraded and erosion from the areas like steep slopes and nala banks were adequately protected by providing suitable safeguards in marking rules. Forest areas having density less than 0.4 were allotted to the afforestation working circle.

2-Tree forest:- This type of forest included the better quality of forest capable of reducing large of timber, which were comparatively away from villages and biotic pressure on them. These areas were proposed under SCI system they were managed to produce large size timber. The natural regeneration in most of the areas was adequate in areas where natural regeneration inadequate, artificial regeneration was proposed to enhance the productivity of the area, gap planting of teak to increase the overall percentage of teak to the extent of 10 to 15 percentage was proposed.

3-MINOR FOREST:- This type of forest included forest areas mainly near the human habitation. They were to be managed primarily to meet the local needs of small timber, poles and fuel wood. The growing stock in mainly of low quality mixed with patches of better quality. The density in most of the areas was below 0.4 having low natural regeneration and open eroded areas.. These forests were proposed to be managed under afforestation working circle. Soil and moisture conservation works were proposed to be taken up. Tending of natural regeneration planting of suitable indigenous species, specially for small timber poles, fodder and fuelwood was proposed. The pasture land grass reserves of previous working circles were not treated in separate working circle but mostly under afforestation working circle.

Zudpi jungle which has been transferred from revenue Department to Forest has been included in this category.

5.3.13. WORKING CIRCLE

Following working circle were proposed in the plan.

1. Selection-cum-improvement working circle
2. Afforestation Working Circle
3. Bamboo (Overlapping) Working Circle
4. Non-timber (Overlapping) Working Circle
5. J.F.M.(Overlapping) Working Circle
6. Wildlife (Overlapping) Working Circle.

1. Selection-Cum-Improvement Working Circle:

i) General constitution of the working circle.

5.3.14. Some of the felling series, consisting of quality III and IVa areas, of Coppice With Reserve Working Circle of Prabhu's Scheme as well as the areas of conversion working circle of Kartar Singh's plan. Also the areas which were managed under Improvement Working Circle of kartar's plan as well as PB unallotted areas of that plan have been included in this working circle.

These forests occur in all four ranges. The total area included in this working circle is 132553.60.

5.3.15. 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 0.4 to 0.6 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. Most of the forest included in this working circle have a dense under storey of bamboo. There is a considerable degree of congestion in the clumps. The overall status of natural regeneration of almost all miscellaneous species was satisfactory. The advantage of this regeneration was taken to restock the area. Though the forest consist mainly of miscellaneous species yet it is capable of growing teak. Therefore, to increase the value of the crop and productivity of the area teak was to be introduced by way of gap planting so that the overall percentage of teak becomes 10 to 15% in the resultant crop.

ii Special objects of management.

5.3.16. The forests allotted to this working circle belonged to the category of Tree forest. The special objects of management of these forests was: -

- 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 was not sufficient.
- iii) To plant bamboo where possible to increase the productivity of bamboo.
- iv) To manage and improve the soil cover by way of soil and water conservation measure particularly on the basis of watershed management.

iii) Harvestable girths.

5.3.17. Since the growth conditions were usually vigorous most of the areas included in this working circle were capable of growing trees of 120 to 150 cms. girths at breast height (O.B.) The growth study for major tree species was carried out by stem and 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 was follows.

1.	Teak, ain(saja),bija,shisham,haldu	135 cms.
2.	Garari,lendia	45 cms.
3.	All other timber species.	120 cms.

iv) Regulation of yield.

Exploitable girths (gbh) were taken as follows:-

a)	Ain,bija,shisham,teak and haldu	135 cms.
b)	Lendia & garari.	45 cms.
c)	All other timber spceis.	120 cms.

PREPARATION OF TREATMENT MAP:-

Type A: Protection areas: This included,

- i) Areas on slopes above 25 degree.
- ii) Area eroded or liable for erosion.

Type B: Under stocked areas:

These will include all areas with crop density less than 0.4.

Type C: Old plantations and group of young poles. It included patches of well grown pole crop of teak and miscellaneous species suitable for more than five ha. and retain as future crop.

Type D: Well stocked areas Areas:-With crop density above 0.4 included in this category.

5.3.18. To facilitate the preparation of treatment map each coupe, in general, was divided into 4 sections. Each type of area was to be marked only if its extent at one place was more than 5 ha except the nalla banks, which was marked irrespective of its area. The treatment map would have to be submitted to Dy.C.F.Wadsa who, after careful scrutiny, would approve the treatment map.

MARKING TECHNIQUE:-

5.3.19. Marking was to be done in the same year in which demarcation was done. Soon after the receipt of approved treatment map marking was done. The marking technique has been described in details in the miscellaneous regulations. The bamboo clumps were to be harvested as per the marking rules for bamboo working. The marking rule for each type of area besides climber cutting and cleaning of bamboo clumps were as follows.

Type A : (Protection areas): No marking will be done in such areas.

Type B : (Under stocked areas): Marking will not be carried out except in the following cases.

- 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.

Type C : Pole crop and old plantations area. In old plantation thinning will be done as per the quality classes and year of plantation. In case of natural pole crop if they occur in patches more than 5 ha thinning will be done on the basis of weighted average of diameters of the crop and quality classes so as to make the average spacement equal to $1/3^{\text{rd}}$ of the average height of the crop.

Type D: Well stocked 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 2m 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 isles will be retained.

v) No sound tree will be removed unless its removal benefits two other trees of the same girth class.

SOIL AND MOISTURE CONSERVATION WORKS

5.3.20. Soon after the receipt of approved treatment map, soil and moisture conservation works were to be taken along with marking and were to be completed before the onset of monsoon in the next year. The details of these works are given in the Miscellaneous Regulations.

1. METHOD OF REGENERATION

5.3.21. Both Natural Regeneration and Artificial Regeneration methods were to be used depending on the extent of regeneration. If the natural regeneration is adequate it is the best source for getting growing stock provided the available natural regeneration is well protected from its worst enemies mainly fires, grazing and weeds. Weeds in natural regeneration areas will cause inter-specific competition which will result in improper growth of desirable species. In the next year of main felling the naturally regenerated seedlings will be cleared of all undergrowth and will be spaced out uniformly. The miscellaneous species to be favored in order of priorities are bija, shisham, haldu, ain, calam, saja, tiwas, dhawada, bhirra, rohan, garadi and lendia.

5.3.22. These operations will be repeated in the next two years also except that the weeding and soil working will be reduced to two in place of three. The young recruit coming during these two years will be removed if they are around the weeded plants. Natural regeneration will be rigidly protected from fire incidences.

INADEQUATE NATURAL REGENERATION:- In such area planting will be started in the following year of the main felling. In plantations 10 to 15% teak in teak suitable areas and rest other locally suitable miscellaneous species as mentioned above.

BAMBOO PLANTING:- In the fourth year from the year of planting under planting of bamboo will be done at all suitable sites..

5.3.23. SUBSIDIARY SILVICULTURAL OPERATIONSS: The following works will be carried out in the following of the main felling and in the subsequent years.

A) CUTTING BACK OPERATIONS:- These will be done in the following year of the main felling. They will involve in the 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 recovered will be felled.
- iii) All climbers will be cut.
- iv) All coppice shoots where natural regeneration is adequate will be cut.
- v) All malformed regeneration up to 15 cms g.b.h. will be cut.

B) CLEANING:- In the sixth year from the year of main felling the following operations will be carried out.

- i) Climber cutting.
- 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)

C) THINNING:- Thinning will be carried out in the 11th year from the year of main felling provided anticipated growth has been achieved. In thinning following operations will be carried.

- i) Climber cutting.
- ii) Removal of dead, badly damaged trees or trees uprooted by wind or storm after leaving 2 dead trees/ha.
- iii) Thinning of young crop so that the average spacement of thinned crop is 1/3 of the height of the trees excluding the trees above selection girth. No trees above selection girth or approach class will be marked for felling.
- iv) Removal of inferior growth interfering with the growth of naturally regenerated seedling after the cleaning operation.

5.3.24. CLOSURE OF GRAZING:-The main felling coupes will remain closed to grazing for a period of 5 years from the year of main felling. The close coupes will specifically be maintained in the grazing license and the villagers will be made aware about them by regular drum beating in the villages

2. Afforestation Working Circle:

GENERAL CONSTITUTION OF THE WORKING CIRCLE:-

5.3.25. The following types of areas have been included in this working circles.

- i) Compartments which are devoid of tree growth of SCI Working Circle of Prabhu's Scheme.
- ii) The compartments which are devoid of tree growth of CWR Working Circle of Prabhu's Scheme.
- iii) All the compartments with blank areas of improvement working circle of Kartarsingh's Plan.
- iv) All the areas with less than 0.20 density and areas under encroachments have been included in this working circle.

Forest area mentioned under (IV) have been brought under systematic management in this plan for the first time.

The total areas included in this working circles are 24125.38 ha.

GENERAL CHARACTER OF THE VEGETATION

5.3.26. Most of 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 shrublike 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.

5.3.27. The areas which are in the immediate vicinity of human habitation are under tremendous biotic pressure. Some areas have been encroached upon for cultivation. Due to heavy biotic interference like grazing and illicit cutting for fire wood. The crop has been reduced to scrubby growth. The status of natural regeneration is very poor. The heavy pressure of grazing has resulted in compaction 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 0.2 to 0.4 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.

SPECIAL OBJECTS OF MANAGEMENT:

5.3.28. These area 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 of area through artificial regeneration containing mainly the indigenous species of small timber, fire wood, fodder value to meet the local demand.
- ii) To meet the demand of local people for small timber, fire wood and fodder to the maximum possible extent.
- iii) Maintaining 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.

A. RESTORATIVE PHASE:-It shall be of 3 years duration. The area of the coupe shall be protected completely from biotic interference by digging T.C.M. During this phase various works shall be taken up as under.

- 1) Preparation of T.C.M.around the coupe.
- 2) Nala bunding and gully plugging limited to 10 M3 /ha.
- 3) Digging of effective Live Cattle Trenches of size 30m long x 0.60m wide x 0.30 deep at 6m vertical intervals and WATs wherever necessary.
- 4) Sowing of seeds of Glyricedia, Maharukh, Khair and other local species on the mound of the Live Cattle Trenches and TCM.
- 5) Singling and cutting back of the rooted stock.
- 6) The most important work of motivating the people for J.F.M. shall be done during this period. And if the people are motivated, the micro plan for the village shall be prepared.
- 7) The villagers shall be allowed to cut the grasses in the coupe areas.

B. PRODUCTIVE PHASE:- In the fourth year the same coupe shall be inspected thoroughly by the A.C.F. and if he finds favorable improvement in the area as well as in the social climate, he shall select suitable areas for plantation. The treatment map and selection of species shall be done in consultation with the local villagers.

Following works shall be done during the productive phase. This phase shall be of 7 years duration.

1. Preparation of treatment map in the 4th year.

2. Repairs to T.C.M. as per treatment map in the 4th year.
3. Repairs to Nala bunding and gully plugging in the 4th year.
4. PPO/PYO operations as per the treatment map in the 4th year.
5. Singling and cutting back of the rooted stock.
6. Plantation in the 5th year.
7. Maintenance and protection of the from 5th to 10th year.

YIELD REGULATION:

5.3.29. Since most of the area is degraded, no appreciable yield will be available. However, the small timber and firewood removed during the working will be distributed to members of Forest Protection Committee on concession rate. After fulfillment of their demand the material will be sold out in auction. The coupes have been laid out in such a way that approximately equal area will be available for afforestation.

5.3.30. DEMARCATION OF COUPE, PREPARATION OF TREATMENT MAP AND MARKING TECHNIQUE.

1. TYPE A: PROTECTION AREA.

These will include :-

- i) steep slopes above 25 degree.
- ii) 20 mt. wide strip on the either side of nala banks and river courses.

In these areas no tree will be mark for felling.

2. TYPE B: UNDERSTOCKED AREA.

It includes the forest below 0.4 density including blank area.

- i) In these area all dead trees will be marked for felling after retaining 2 dead trees per ha.
- ii) All live stumps will be marked.

3. TYPE C: OLD PLANTATIONS AND GROUPS OF YOUNG POLE CROPS.

- i) In these areas thinning, marking will be done.
- ii) All dead and dying, deceased and malformed trees shall be marked for felling.

4. TYPE D: WELL STOCKED AREAS.

These areas include the forest having density 0.4 and such areas are found in small patches.

- i) In these areas all edible fruits and flower yielding trees of Moha, Char, Tendu, Aonla, Chinch, Sitafal, Harra, Bel and trees of Gum will be reserved from felling.
- ii) All dead trees shall be marked for felling after retaining two dead trees per hectare.

MARKING TECHNIQUE:-

5.3.31. Marking technique is described in detail in miscellaneous regulations. Marking rules for each type of area besides climbers cutting and tending of naturally regenerated seedlings will be as follows.

1. TYPE A: PROTECTED AREA.

No trees will be marked for felling in these areas.

2. TYPE B: UNDERSTOCKED AREA.

The areas under encroachment as well as all natural blanks will be covered. In some of the areas where the tree growth is sufficient edible fruits and flower yielding trees will be reserved. The dead trees will be marked for felling after retaining two trees per hectare for the purpose of wildlife. All live high stumps will be marked for felling. If the trees are available for marking the marking will be as per procedure described in SCI Working Circle. Under this category major area will be taken for afforestation works.

3. TYPE C: In these areas thinning and marking will be done as per the procedure described in selection-cum-improvement working circle.

4. TYPE D: WELL STOCKED AREA.

- i) All dead trees will be marked for felling after retaining two dead trees per hectare. The retention of two trees will be from inferior species as far as possible.
- ii) All live high stumps will be marked for felling.
- iii) All the marking shall be verified by the RFO before commencement of work.

If the trees are available for marking, the marking will be done as per procedure described in S.C.I. Working Circle.

SOIL AND MOISTURE CONSERVATION.

5.3.32. Soil and moisture conservation works will be taken up on all over the areas along with the marking and will be completed before the onset of monsoon in next year. The details of these works has been given in miscellaneous regulations.

REGENERATION

5.3.33. The artificial regeneration mainly will be resorted for regeneration of the area as major area is understocked and degraded. However, the N.R. through coppice and seedlings will be treated as supplementary to artificial regeneration and will be properly tended.

COPPICING:-After felling is over, the stools will be dressed at 10 to 15 cm. height above the ground with a sharp axe.

ARTIFICIAL REGENERATION:-Soon after the receipt of approved treatment map for marking, a detailed treatment map for planting will be prepared by the RFO under the guidance of an ACF.

PLANTING TECHNIQUE.

5.3.34. Planting of teak and miscellaneous species:-The planting will be taken in the next year of main felling. However, premonsoon works will be done during the year of main felling. The spacing will be 2m x 2m for both teak and miscellaneous species. Planting of teak with standard technique and that of miscellaneous species in pits of size 30 cm x 30 cm x 30 cm will be followed.

Planting of grass:-Planting of grass will be taken in the year of planting itself either through seed sowing or through tussock planting.

Bamboo Planting:-Bamboo planting in all suitable areas will be done in the 4th year from the year of felling at the spacing of 6m x 6m in pits of size 45 cm x 45 cm x 45 cm.

SUBSIDIARY SILVICULTURAL OPERATIONS:

5.3.35. The following works will be carried out in the next year of main felling and in the subsequent years.

Cutting back 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.

5.3.36. Cleaning:-In the sixth year from the year of main felling the following operations will be carried out.

- (i) Climbers will be cut all over the area.
- (ii) Inferior species, interfering or likely to interfere with natural growth as well as planted seedlings, will be cut.
- (iii) Seedlings or trees damaged by wildlife and illicit cutting will be cut.
- (iv) Coppice shoots on each stump will be reduced to not more than two well spaced out vigorous shoots.

5.3.37. Thinning:-Though the thinning is carried out in the eleventh year of main felling, it depends on the proper growth of seedlings and accordingly decision will be taken by the Dy. Conservator of Forest in consultation with Conservator of Forests. However in the 11th year from the year of main felling following works will be carried out.

- (i) Climbers will be cut all over the areas.
- (ii) All dead trees or badly damaged trees will be felled after retaining two dead trees per ha. for wildlife.
- (iii) Coppice shoots on each stump will be reduce tone vigorously growing shoot.

3. Working Plan for the Bamboo (Overlapping) Working Circle: General constitution of the working circle.

5.3.38. This working circle included all areas where bamboo natural or planted is present in workable quantity. Workable means that there are sufficient clumps which require independent working. Areas with scattered bamboo have not be included in this working circle. Some compartments of bamboo, which where not included in the previous scheme, have been included in this plan. The total area of working circle is now 53620.65 ha. And is spread over two ranges of the division containing bamboo area 38528.03 ha.

General character of the vegetation.

5.3.39. The general character of the vegetation in the area include din this working circle have been described in the respective non overlapping working circles. Here only the condition of the bamboo in this tract has been described. The common variety of the bamboo occurring in this tract is *Dendrocalamus strictus*. This generally forms an under story in the better quality forest and occurs extensively. Difference in the quality and grow3th are manifest as expected, in the large areas with varying drainage, soil and past maltreatment. Banboo mostly occupies hill slopes and are dense particularly along nalas and moist sheltered slopes. There is a considerable degree of congestion in the clumps.

Local and commercial demand:

5.3.40. Presently village communities exercise their rights over entire forest areas, but the bamboo production potential is in excess of village community requirement for bonafide use.

- A) Nistar bamboo felling series(N.B.F.S):-
Bhimanpalli, Banjari, Kumarpal, Laxipur, Padiyaljob,
Godri and Tutekanar.
- B) Commercial bamboo felling series (C.B.F.S.)
Khobramendha, Kohka, Zankargondi and Hadkikanar.

5.3.41. The nistar bamboo felling series were intended to meet the requirement of nistar and commercial requirement either free or at the concessional and commercial rates. The commercial bamboo felling series have leased out to the Ballarpur Paper Mill Ltd. The policy regarding lease to be decided by the Govt. from time to time and the coupes of this felling series will be worked according to the latest existing government policy. Considering the local demand for nistar occupational and commercial requirement etc. every year few N.B.F.S. coupes are being worked departmentally and rest coupes under N.B.F.S are allotted to the Paper Mill for working on payment of royalty.

Special objects of management.

5.3.42. The special objects of management of this working circle are as follows:-

- (i) To harvest from all bamboo areas scientifically to get the maximum sustain yield.
- (ii) To meet the nistar demand of the local population and commercial demand of village industries.
- (iii) To meet the commercial demand of paper and pulp industries.
- (iv) To improve the crop to increase the potential of the areas.

Cutting Cycle.

5.3.43. The harvesting of bamboo will be done on cutting cycle of three years. Each cutting series will be divided into three coupes. Viz. A.B.C. and one of the coupes will be worked annually.

Method of working.

5.3.44. The method of working are as follows :-

- (i) No harvesting works should be permitted between 15th June to 30th September

- (ii) No clump should be considered fit for harvesting unless it contains more than 12 mature culms
- (iii) No culms below the age of two years will be felled.
- (iv) Following culms shall be removed from all clumps :
 - a) All dead, decayed and dry bamboo.
 - b) Culms whose half or more top portion is broken or damaged.
 - c) Twisted or malformed culms.
- (v) In a mature clump the following type of culms (green and living) will be retained.
 - a) All current season's i.e. less than one year old culms.
 - b) From the rest culms equal in number to the current season's (i.e. less than one year old) culms or 8 whichever is more.

The remaining culms will be considered available for harvesting.
- (vi) The cutting height of culms from ground level will be between 15 cm to 45 cm above ground level i.e. above the first internode above the ground. The cut shall be slant with the sharp instrument.
- (vii) In case of any flowering, no culm from flowered clumps shall be felled in the year of flowering.
- (viii) Harvesting of bamboos shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two year old are retained on periphery for the purpose of support to the new culms.
- (ix) Following acts will be strictly prohibited.
 - a) Digging of rhizomes.
 - b) Lopping bamboo culms for fodder.
 - c) Use of tender bamboo culms for bundling.
- (x) Climber infesting with growth of bamboo clumps will be cut.

- (xi) After cutting, the debris will be removed away from the clumps and will be stacked at a distance not less than two meter away from the outer periphery of each clump.
- (xii) In order to facilitate working of congested clumps, wedge shaped opening will be created in the clump from outside to the center of the clump. The width of the wedge will not be more than 75 cms.
- (xiii) Felling will start from the center of the clump towards the periphery.
- (xiv) Clumps, which have been dealt badly by the local villagers, should be cleaned by the method mentioned in the item (iv) above. Such areas should strictly be closed to grazing for a period of two years. Besides this, to improve the condition of such clumps, digging half-circular trench to the uphill side of size 60 cm x 60 cm and 1 to 1.5 meter away from the center of the clumps is proposed to be taken. Besides, in the gaps, planting of rhizomes during rains should be taken.

The cutting should be supervise by a forest official knowing the rules of felling.

5.3.45. CROP OF AGE ABOVE 8 YEARS :- When the crop age is 8 years, the clump formation is normally completed and clumps are mature enough for harvesting. The treatment during this period will be of the nature of harvesting-cum-tending. The felling rules already described in the earlier paragraphs, will be applied here too.

4. Working plan for non timber forest produce(Overlapping) Working Circle.

Minor Forest Produce of the tract.

5.3.46. There are numerous minor forest produce available in this tract and are found in almost all Ranges with varying extent. This contributes to sizeable revenue to the State exchequer as well as generation of self-employment to tribal. These play an important role in rural economy.

5.3.47 The important minor forest produce, found in this tract, are Moha flowers 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.

SPECIAL OBJECTS OF MANAGEMENT

5.3.48. 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. b 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 employment and thereby to improve the economic status of the local people

Other regulation.

5.3.49. GUM :- 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 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, oilcloth 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.

5.3.50. TENDU:- This is one of the most important minor forest produce of the tract, which gives handsome revenue. This is used for manufacturing of bidis. Presently people are benefited from it only by way getting wages for collection of leave. But my setting a cottage industry for bidi manufacture will provide the maximum benefit from tendu to tribals. Bidi making is such as activity which can be started without any costly infrastructure. Beside bidi making can be done at any leisure time.

5.3.51. BAMBOO:- This is one of the important minor forest produce of this tract. This is popularly known as poor man's timber. The local people make use of it in a variety of ways. Tribal people eat tender rhizomes as vegetable during monsoon. Besides, it is used by Burads to prepare bamboo articles and local people in construction of huts, houses, cattle sheds and fencing. This is used by outsider in a number of industries such as Paper and Pulp, Ice cream etc.

MYRABOLONS, DIKAMALI AND NIRMALI FRUITS:

5.3.52. USE:- These forest produces are used in many ways. Hirda, Beheda and Aonla are most common amongst Myrobalons. These are of high medicinal value and are used in many Ayurvedic medicines. Hirda and Beheda are given to child in villages invariably for cold, cough and stomach disorder. Dikamali and Nirmali fruits are used in chemicals and in many other industrial uses.

BROOM GRASS:

5.3.53. USE: - This grass is used in the preparation of broom, which is usually used in houses. It is a seasonal crop and localized one.

SABAI GRASS (*Eulaliopsis binata*)

5.3.54. This is a very good soil binder and comes up well in wastelands as well. This is good for soil as well as quick yielding cashcrop. This is used in making ropes.

5. Working Plan for Joint Forest Management (Overlapping) Working Circle.

5.3.55. General constitution of the working circle.

The prescription of this chapter will be applicable to the entire division. It shall be an overlapping working circle. JFM works will be taken up in any village if the forest belong to the category as describe in the Govt. Resolution dated 16th March 1992 and local people are interested in participatory approach in forest protection and management.

5.3.56. Background of the Joint Forest Management.

The National Forest Policy envisages massive people movement for conservation of the forest resources and the Government of India advise State Government in June 1990 to involve local people in protection and development of forest in the participatory management called the Joint Forest Management. The State Government through the government resolution No. SLF/1091/199/F-11 dated 16th March 1992 adopted this participatory management approach for degraded forest areas. Villagers themselves voluntarily constitute the JFM committee to participate in the programme. The member of the committee will help in protection and development of forest and in turn receive a share in the usufruct and output from the forest. The JFM area will be manage according to the micro plan prepared jointly by the Dy. Conservator of Forest and members of the JFM committee. The micro plan should ideally have details of forest development and village development which are sustainable feasible and cater to the aspirations of local committee. Later the Govt. of India also advised the State Government to take up the JFM in good forest areas.

The JFM programme has already been taken up in 6 villages and the number is growing. Performance of the committee however varies widely in the enthusiasm output and impact on the forest protection.

General character of vegetation:

5.3.57. The areas of Armori, Wadsa, Kurkheda and Bedgaon range in general are understocked and mostly open with crop density usually less than 0.4 though rarely some patches to better stocked forest or old plantations are also met within some compartments. These areas are degraded to the extreme extent and without any significant tree crop. Due to heavy grazing the soil has become compact. Young recruit of ain, bija, garadi, dhawada, teak, palas etc. are found in any compartments but they die back or just manage to survive without any growth, these areas are therefore wastelands. Presently they are just being utilized for grazing of cattle because they are mostly adjoining the villages. Repeated attempts of afforesting these areas have totally failed mainly because of extreme biotic pressure and non involvement of the local people.

Special objects of management.

5.3.58. This working circle would endeavor to generate and sustain the participatory forest management through the JFM program. This approach has shown promising results in forest protection in many parts of the country and it is consistent with philosophy of the democratic governance. Instead of considering JFM programme as a scheme. It should be considered as the approach of forest administration. Its participatory approach should be widely applied even at places, where formal JFM committee have not been constituted. After analyzing the reasons for the present deteriorated conditions of these areas. It is found non involvement of the local people in our efforts to develop these areas is the main cases for our continuous failure. Naturally therefore, prime objects will be to involve local people in the development of the areas.

The other objects of management shall be as under.

- (i) To increase vegetal cover.
- (ii) To check soil erosion.
- (iii) To bring about soil and moisture conservation.
- (iv) To utilize the land for the productive purpose according to its capability.
- (v) And ultimately bring about the integrated development of the adjoining villages with the help of all other development agencies.

Method of treatment.

5.3.59. The areas shall be treated according to the JFM plan for the village to be prepared in consultation with the villagers as per guidelines issued by the Government vide G.R.No.SLP/1091/CN/119/F-11, Mantralaya Bombay, dated 16th March 1992. Similarly the guidelines issued by the Central Government in this connection vide its letter No.6-21/89/FP Dated 1-6-1990 shall also be considered.

6 Working plan for the Wildlife (Overlapping) Working Circle.

5.3.60. GENERAL CONSTITUTION OF THE WORKING CIRCLE

This is an Overlapping Working Circle covering the entire area of the division. Total area of this working circle is 156678.98 ha. This tract represents a great variety of wild animals, which were depleted owing to indiscriminate shooting in the regime of jamindari.

SPECIAL OBJECTS OF MANAGEMENT

5.3.61. Following are the special objectives of management.

- i) To preserve and develop of the existing wildlife in this tract.
- ii) To ensure the maintenance of viable population of wildlife.
- iii) To preserve biodiversity of the area.
- iv) To maintain and develop of infrastructure facilities of wildlife existing in this tract.

Section- 5.4: ANALYSIS OF THE PRESCRIPTION UNDER CURRENT WORKING PLAN OF SHRI D.R.PARIHAR,SHRI R.K.POLE, AND SHRI T.K.CHOUBEY.

1. Selection-cum-Improvement Working Circle:-

The objects of management of this working circle were to, (i) produce large sized trees to meet the requirement of timber 9ii) to increase the proportion of valuable trees species in the congestion of crop., (ii) to plant bamboos wherever possible to increase productivity and (iv) to manage and improve soil moisture consumption by treating area and watershed management basis.

The objective of the Selection Cum Improvement Working Circle are fulfilled partially because most of the areas (more than 50%) could not be worked owing to Naxalite problem, who do not allow forestry operation including plantation in the affected areas like Kurkheda, Malewada, Bedgaon ranges. The analysis of growing stock (Result of enumeration) shows that there is a good proportion of valuable tree species in the areas allotted to this working circle. The yield from the worked SCI coupes show good sized timber output. In fact most of the past un-worked area have become very much congested and there are large no. of mature trees and pole crop. The plantation of bamboos could not be done in these areas because of Naxal problems. No special efforts were taken up for soil moisture conservation like, management on watershed basis but strict maintenance of treatment of A type areas in the coupe have helped.

As most of the areas are having very good regeneration and recruitment in all age classes the area allotted to SCI need to be continued in the same circle. Hence the system is proposed for continuation and additional suitable areas from erstwhile Afforestation Working Circle are included it.

2. Afforestation Working Circle:- The compartments which were derived of tree growth in the SCI and CWR Working Circle of plan. Blank areas, areas under 0.2 density and area under encroachment have been proposed in Afforestation Working Circle, (i) The object of management was to reclaim the areas by intensive soil and moisture conservation works and afforestation works to enhance the productivity of areas through Artificial Regeneration by indigenous of small timber, firewood, fodder value to meet the local demand (ii) to meet the demand of local people small timber, firewood and fodder to the maximum possible extent (iii) maintaining the biodiversity of forests by introducing mixture and not the monoculture. (iv) to involve local people in afforestation through JFM.

To achieve this objective (A) Restorative Phase and (B) Productive Phase was proposed before going into plantation as in normal courses. But in practice this Restorative Phase was not practiced, because the target for plantation were given in time. Hence this was not actually practiced. The plantation were also not raised in Afforestation Working Circle areas, The grants are not received in advance to carry out restorative phase. Only 16% plantation were raised in Afforestation Working Circle areas and 35% plantation were raised in S.C.I. areas in last 10 years. In fact naturally blank areas were already planted in various District level schemes or JFM, EGS related activities. The blank or under encroachment areas near villages pose lot of problems, for protection after afforestation. In fact the areas under cultivation can not be tackled up because of drive of regulations of encroachment under Forest Right Act 2005. Under such circumstances also we find that most of the plantations have come up very successfully. The analysis

of crop allotted to Afforestation Working Circle (after enumeration data is analyzed) shows a very remarkable trend. The areas show a very profuse regeneration of mixed species as well as recruitment in almost all girth classes. Hence it is proposed to change the area from Afforestation working Circle to Improvement Working Circle. These areas having matured trees are put in Selection Cum Improvement Working Circle. But the areas having immature crop is put up in Improvement Working Circle. The natural regeneration can be treated by putting in B type areas of Improvement Working Circle, where it will be suitably tended like regular plantation in case of blanks plantation will be taken. The advance growth will be treated in "C" type areas and tended Hence the areas in Afforestation Working Circle, proposed to be shifted in either SCI or IWC depending on their regeneration and girth extent in various girth classes.

3. Bamboo (Overlapping) Working Circle:- This working circle is for the working of commonly occurring variety of bamboo (*Dendrocalamus strictus*). The crop occur as under-storey in most of the dense and hilly areas, on nala banks, slopes. The object of the management of this working circle are (i) to harvest from all bamboo areas to get maximum sustained yield, (ii) to meet the nistar demand of the local population and commercial demand of village industries (iii) to meet the commercial demand of paper and pulp industries (iv) to improve the crop to increase the potential of the area. The management objective in the proposed areas are getting achieved. The bamboo working is one of the most important source of employment for local population because of various agencies like Government, Ballarpur Paper Mill and sometimes private contractor. Naxalites also do not interfere in bamboo exploitation. Hence the management of bamboo has been proposed to be continued under Bamboo (Overlapping) Working Circle. Areas where workable patches of bamboo, whether natural or planted have been included in this working circle. Hence the area of working circle is more because of bamboo plantation area of 3663.95. ha.

4. Non Timber Forest Produce Working Circle:- The objection of the management was (i) to increase the growing stock of various non-timber forest produce species in the area (ii) to manage scientifically to utilize the existing potential optimally and thereby to enhance the production and productivity of the same (iii) to generate employment and there to improve the economic status of the local people. In the entire tract the Tribal Development Corporation is entrusted by the Govt. to collect and dispose of the minor forest produce. The tract record of T.D. is not very good in catering all the areas of division because of their weak infrastructure. The entire Gadchiroli District is declared as 'Schedule Area. Hence the villagers through Gramsabha are empowered to collect and dispose off Minor Forest Produce in their area. But as the gramsabhas are not enough empowered the State Govt. has to declare T.D.C. are the sole agency

for collection and disposal of minor forest produce. On this back background the proposed management need to be continued.

5. Joint Forest Management(Overlapping) Working Circle:-

this is an overlapping Working Circle with mostly degraded forest areas given to Joint Forest villagers. The object of the management was (i) to increase vegetal cover,(ii) check soil erosion(iii) bring about soil and moisture conservation (iv) utilize the land for productive purpose (v) bring about integrated development of villages. The no. of villages have been increased to more than 195 and the area allotted to them is about 44512.80 ha. which is quite vast. As this working circle is in consonance with the forest policy and after best solution for today's complex management of scarce measures. It needs to be continued by streamlining the new schemes, by Government of India like Forest Department Agency. The funds from Tribal Department and DRDA should also be pooled in to carry out overall development. This Working Circle needs to be continued.

6. Wildlife Management (Overlapping) Working Circle:- This is overlapping Working Circle with objective of (i) preservation and development of existing wildlife in the tract (ii) ensure the maintenance of viable population of wildlife (iii) preserve biodiversity of the area (iv) maintain and develop infrastructure facilities of wildlife in the area.

The preservation for regular monitoring and erection of database was not given in the plan. Hence regular monitoring, periodic census by traditional pugmark and new transect method has been proposed. This help in better formulation of strategy to tackle issues like waterhole management, poaching etc. Wadsa also fall in corridors of Tadoba Andhari Tiger Project. That fact also need to be taken into account.

CHAPTER – VI
STATISTICS OF GROWTH AND YIELD

**SECTION: 6.1 STATISTICS OF RATE OF GROWTH OF TEAK AND
 MISCELLANEOUS SPECIES**

6.1.1. Study has been conducted with regard to the growth of teak in Wadsa Forest division and the statistics pertaining to the growth and development of teak is reproduced hereunder.

GROWTH OF TEAK: -

6.1.2. STEM ANALYSIS: - Stem analysis of teak trees selected from Bedgaon Range has been carried out during the Revision of Plan for Wadsa Forest Division. The results of stem analysis are reproduced below: -

TABLE –12
 Table showing the results of stem analysis : Teak site quality II

Age in year	Height in mt.	D.B.H. (O.B.) in cm.	G.B.H. (O.B.) in cm.	Stem timber volume in cum.
3	1.37	3.80	11.93	0.010
13	4.24	5.71	17.93	0.047
23	7.24	10.71	33.63	0.168
33	10.24	14.68	46.10	0.344
43	13.24	18.80	59.03	0.571
53	16.24	22.73	71.37	0.825
63	19.24	28.43	89.27	1.100
73	22.24	31.71	99.57	1.400
83	25.24	37.03	116.27	1.629
93	25.65	40.34	126.67	1.956
103	25.65	46.50	146.01	1.988
107	25.65	52.07	163.50	1.988

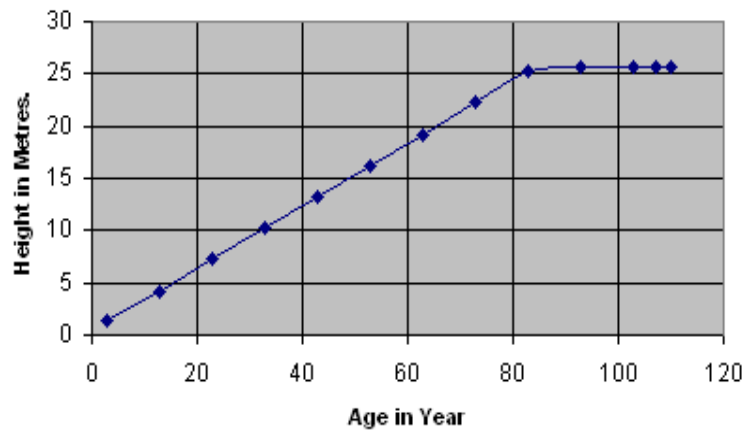
From the above tables following conclusions can be drawn.

- i) The areas are capable of growing sound trees up to 25.65 mts.in height and 52.07 cmt. DBH (OB) in 107 years.

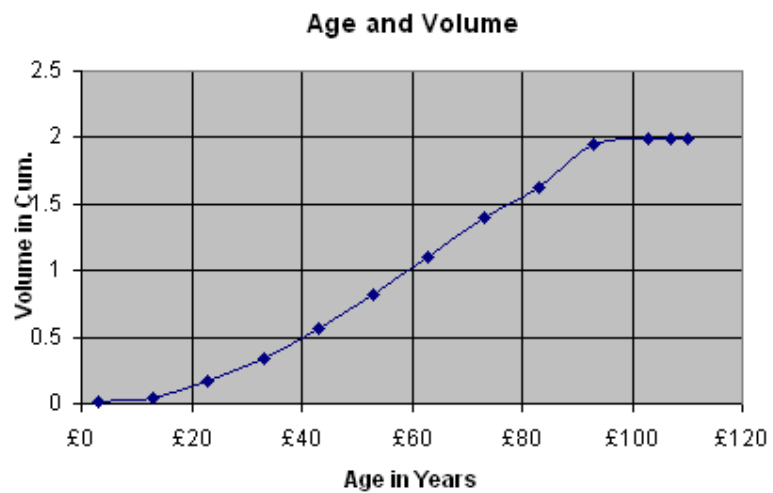
GROWTH STUDIES OF TEAK IN WADSA DIVISION: -

Growth studies of teak for different site qualities has been conducted by selecting trees in Bedgaon Range through stem analysys. The results are given in the form of data and graphs, which are self-explanatory.

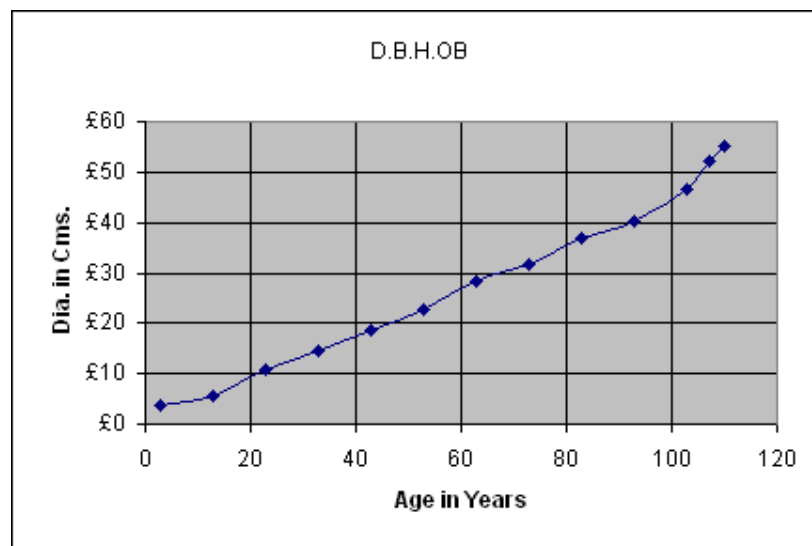
Age	Height (Mt.)
3	1.37
13	4.24
23	7.24
33	10.24
43	13.24
53	16.24
63	19.24
73	22.24
83	25.24
93	25.65
103	25.65
107	25.65
110	25.65



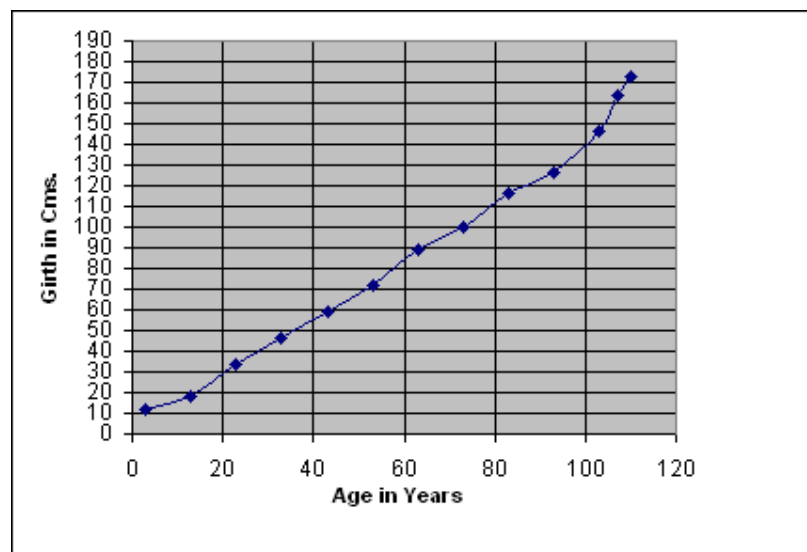
Age	Volume in Cum.
3	0.01
13	0.047
23	0.168
33	0.344
43	0.571
53	0.825
63	1.1
73	1.4
83	1.629
93	1.956
103	1.988
107	1.988
110	1.988



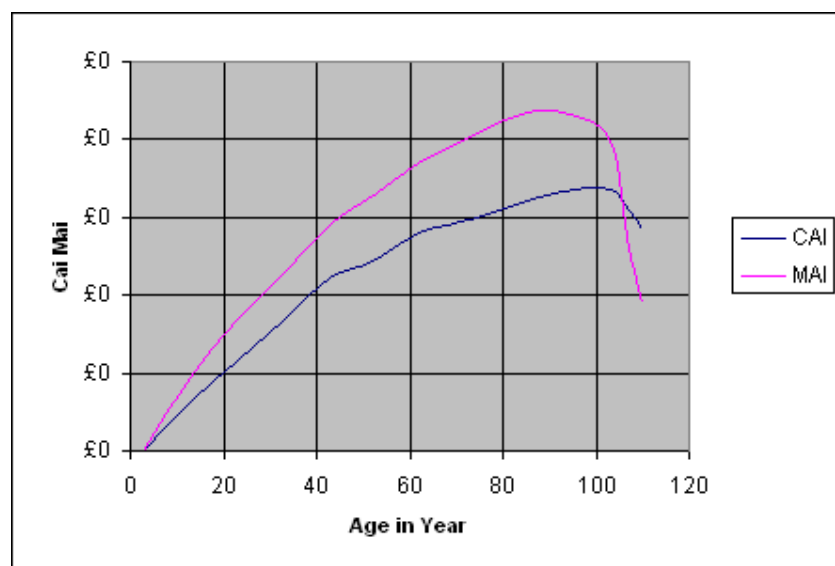
Age	D.B.H.OB
3	3.8
13	5.77
23	10.71
33	14.68
43	18.8
53	22.73
63	28.43
73	31.71
83	37.03
93	40.34
103	46.5
107	52.07
110	55.03



Age	G.B.H.OB
3	11.93
13	18.12
23	33.63
33	46.10
43	59.03
53	71.37
63	89.27
73	99.57
83	116.27
93	126.67
103	146.01
107	163.50
110	172.79



Age	CAI	MAI
3	0	0
13	0.0031	0.0047
23	0.0058	0.0084
33	0.0085	0.0115
43	0.01115	0.01447
53	0.01233	0.0165
63	0.01419	0.01873
73	0.0149	0.02011
83	0.01588	0.02145
93	0.01661	0.0217
103	0.01678	0.0199
107	0.01548	0.0131
110	0.0142	0.0095



C.A.I.M.A.I. Curve intersect each other at the age of 107 years which corresponding to G.B.H. (O.B.) 163.50 Cms.

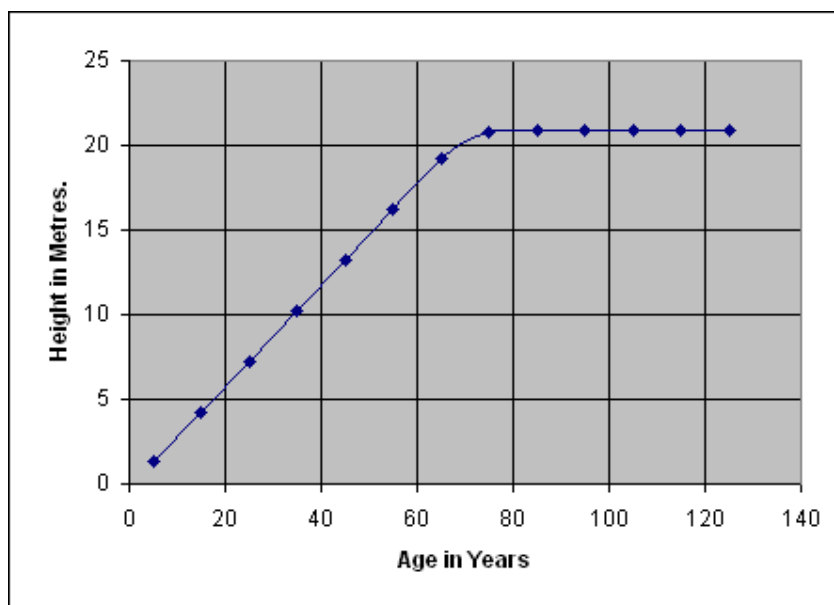
Table showing the results of stem analysis : Teak site quality III

Age in year	Height in mt.	D.B.H. (O.B.) in cm.	G.B.H. (O.B.) in cm.	Stem timber volume in cum.
5	1.37	6.03	18.93	0.01
15	4.24	10.09	31.68	0.05
25	7.24	12.99	40.79	0.27
35	10.24	17.36	54.51	0.42
45	13.24	19.97	62.71	0.57
55	16.24	25.15	78.97	0.74
65	19.24	28.00	87.92	0.95
75	20.74	33.59	105.47	1.09
85	20.86	36.45	114.45	1.32
95	20.86	38.79	121.80	1.49
105	20.86	45.58	143.12	1.49
115	20.86	47.88	150.34	1.49
125	20.86	47.88	150.34	1.49

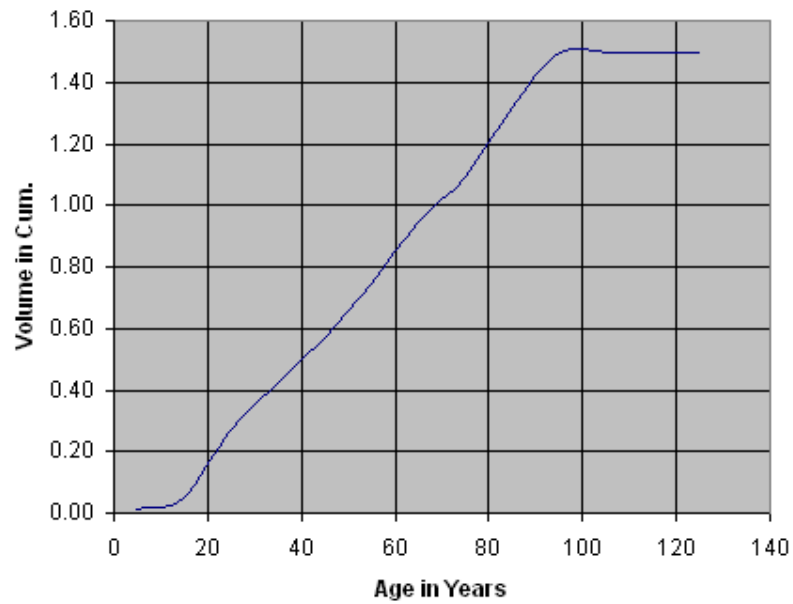
From the above tables following conclusions can be drawn.

- i) The areas is capable of growing sound trees up to 20.86 mts.in height and 47.88 cmt. DBH (OB) in 115 years.

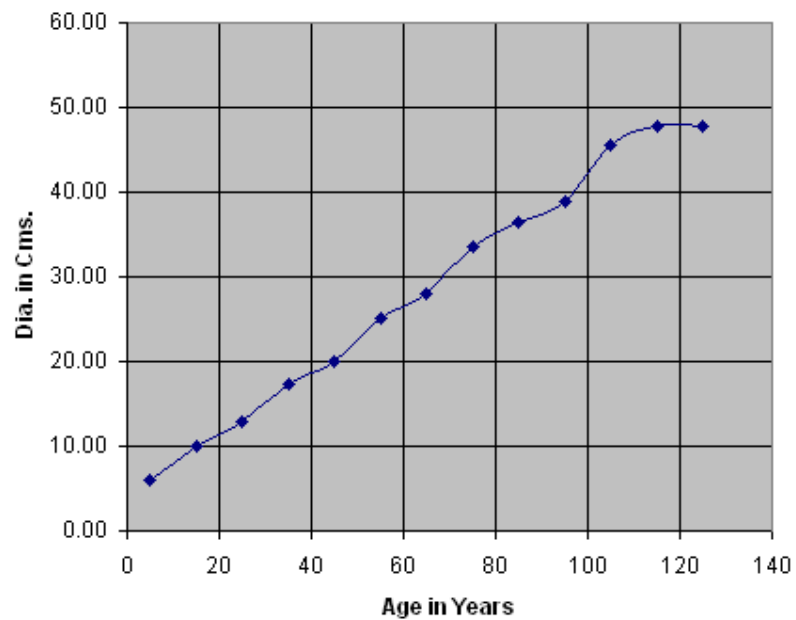
Age	Height (Mt.)
5	1.37
15	4.24
25	7.24
35	10.24
45	13.24
55	16.24
65	19.24
75	20.74
85	20.86
95	20.86
105	20.86
115	20.86
125	20.86



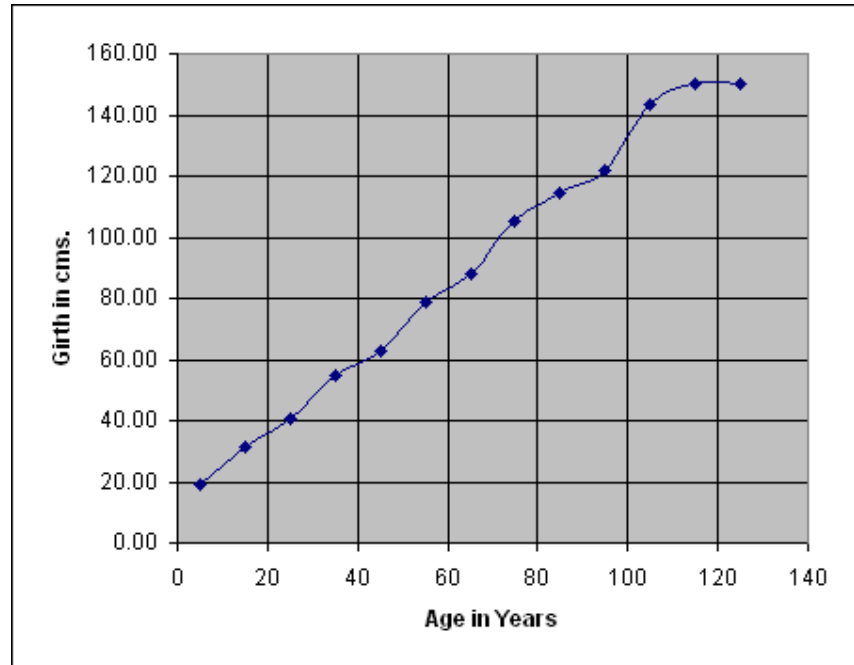
Age	Volume in Cum.
5	0.01
15	0.05
25	0.27
35	0.42
45	0.57
55	0.74
65	0.95
75	1.09
85	1.32
95	1.49
105	1.49
115	1.49
125	1.49



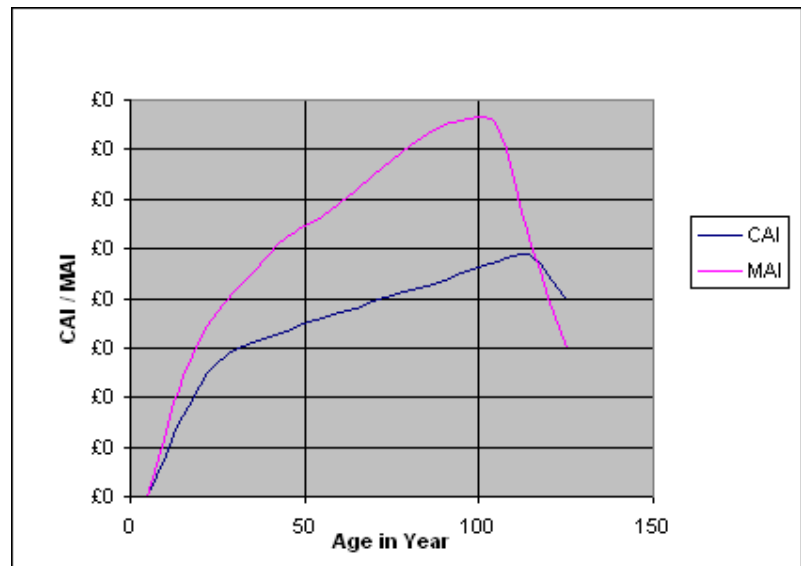
Age	D.B.H.OB
5	6.03
15	10.09
25	12.99
35	17.36
45	19.97
55	25.15
65	28.00
75	33.59
85	36.45
95	38.79
105	45.58
115	47.88
125	47.88



Age	G.B.H.OB
5	18.93
15	31.68
25	40.79
35	54.51
45	62.71
55	78.97
65	87.92
75	105.47
85	114.45
95	121.80
105	143.12
115	150.34
125	150.34



Age	CAI	MAI
5	0	0
15	0.0032	0.0049
25	0.0054	0.0074
35	0.0062	0.009
45	0.0067	0.0105
55	0.0072	0.0113
65	0.0076	0.0124
75	0.0082	0.0135
85	0.0085	0.0146
95	0.0090	0.0152
105	0.0095	0.0149
115	0.0097	0.0101
125	0.0080	0.006



C.A.I.M.A.I. Curve intersect each other at the age of 115 years which corresponding to G.B.H. (O.B.) 150.34 Cms.

GROWTH OF MISSCELLANEOUS SPECIES:

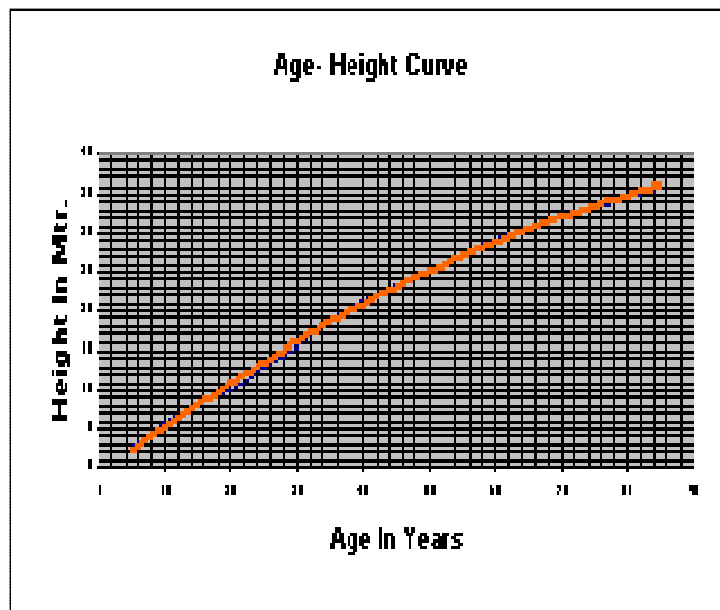
Growth studies for the important miscellaneous species such as Shisam, Khair, Dhawda, Tendu is not conducted. For the purpose of reference data from earlier plans of Nagpur Division is reproduced for ready reference and guidance.

6.1.3 (I) GROWTH OF SHISAM:

Analysis of Growth of Shisam (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.

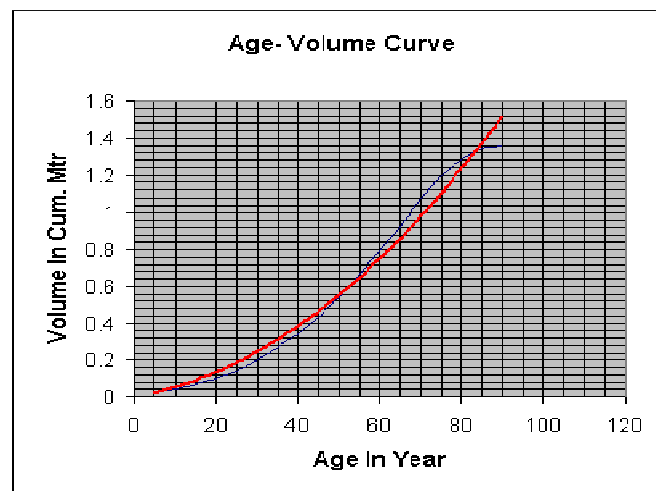
A. Age- Height Curve.

Age (yrs)	Height mt.
5	2.7
10	5.7
15	8.2
20	10.2
25	13
30	15.5
35	18.6
40	21.2
45	23.4
50	25
55	27.6
60	29.1
65	30.8
70	32.3
75	33.4
80	34.5
85	36



B. Age-Volume Curve

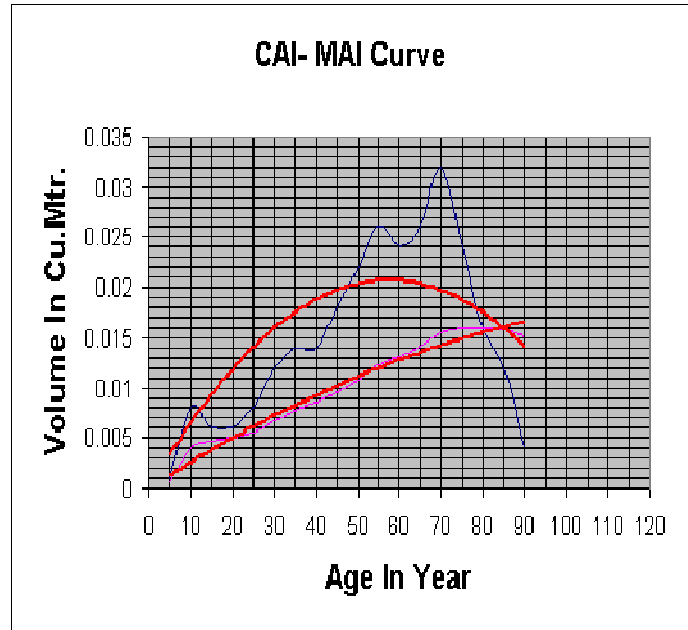
Age (yrs)	Volume m3
5	0.018
10	0.04
15	0.07
20	0.1
25	0.14
30	0.2
35	0.27
40	0.34
45	0.43
50	0.54



55	0.67
60	0.79
65	0.92
70	1.08
75	1.2
80	1.28
85	1.34
90	1.36

B. CAI – MAI Chart.

Age (yrs)	Cai m3	Mai m3
5	0.001	0.0007
10	0.008	0.004
15	0.006	0.0047
20	0.006	0.005
25	0.008	0.0056
30	0.012	0.0067
35	0.014	0.0077
40	0.014	0.0085
45	0.018	0.0096
50	0.022	0.0108
55	0.026	0.0122
60	0.024	0.0132
65	0.026	0.0142
70	0.032	0.0154
75	0.024	0.016
80	0.016	0.016
85	0.012	0.0158
90	0.004	0.0151



D. Age Diameter Curve

Age (yrs)	D.B.H(O.B) m3
5	3.2
10	7.5
15	10.4
20	14.8
25	18.3
30	22.4
35	25.5
40	28.8
45	31.8
50	34.3
55	36.1
60	38.7
65	40.2
70	42.8
75	44.8
80	46.8
85	48.8
90	50.5
95	52.1
100	53.7



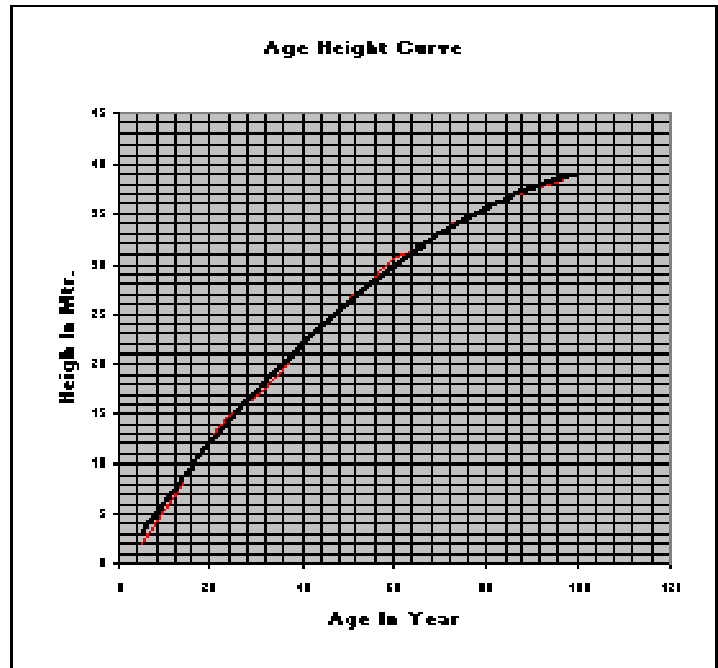
E. Statement Showing the diameter increment & volume increment.

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
	10	5.7	7.5	0.04	0.008	0.004	16.07477	15.1724138
	15	8.2	10.4	0.07	0.006	0.0047	6.480447	10.9090909
	20	10.2	14.8	0.1	0.006	0.005	6.984127	7.05882353
	25	13	18.3	0.14	0.008	0.0056	4.229607	6.66666667
	30	15.5	22.4	0.2	0.012	0.0067	4.029484	7.05882353
	35	18.6	25.5	0.27	0.014	0.0077	2.588727	5.95744681
	40	21.2	28.8	0.34	0.014	0.0085	2.430939	4.59016393
	45	23.4	31.8	0.43	0.018	0.0096	1.980198	4.67532468
	50	25	34.3	0.54	0.022	0.0108	1.512859	4.53608247
	55	27.6	36.1	0.67	0.026	0.0122	1.022727	4.29752066
	60	29.1	38.7	0.79	0.024	0.0132	1.390374	3.28767123
	65	30.8	40.2	0.92	0.026	0.0142	0.760456	3.04093567
	70	32.3	42.8	1.08	0.032	0.0154	1.253012	3.2
	75	33.4	44.8	1.2	0.024	0.016	0.913242	2.10526316
	80	34.5	46.8	1.28	0.016	0.016	0.873362	1.29032258
	85	36	48.8	1.34	0.012	0.0158	0.83682	0.91603053

6.1.4 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.

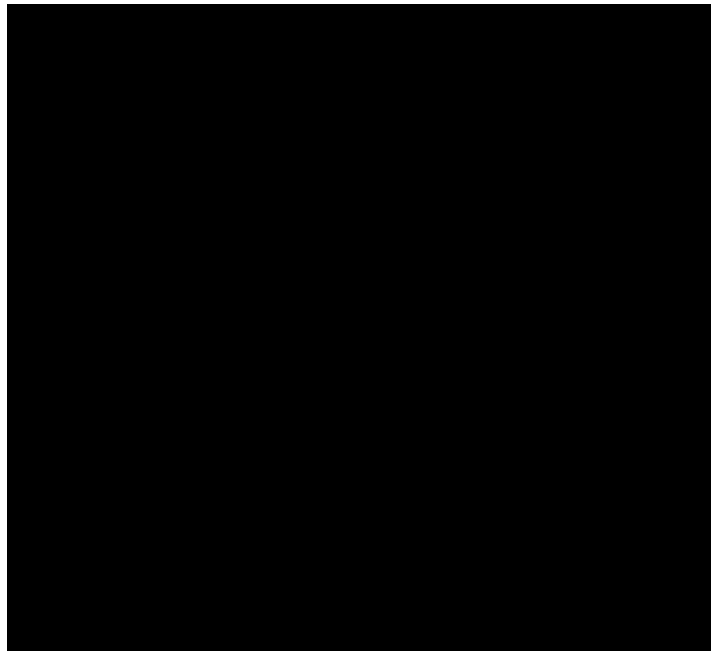
A. Age Height Curve.

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



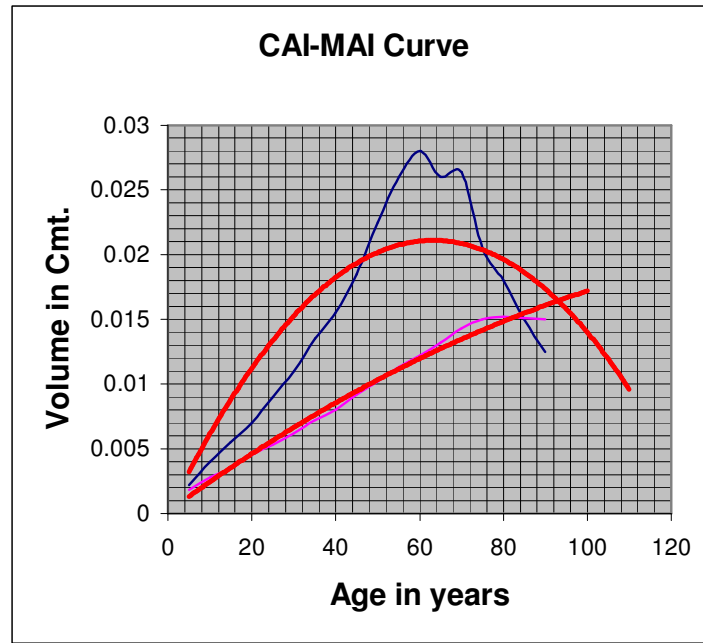
B Age Volume Curve

Age (yrs)	Volume m3
5	0.02
10	0.045
15	0.075
20	0.1
25	0.16
30	0.195
35	0.25
40	0.34
45	0.4
50	0.55
55	0.69
60	0.78
65	0.93
70	1.04
75	1.14
80	1.22
85	1.29
90	1.34



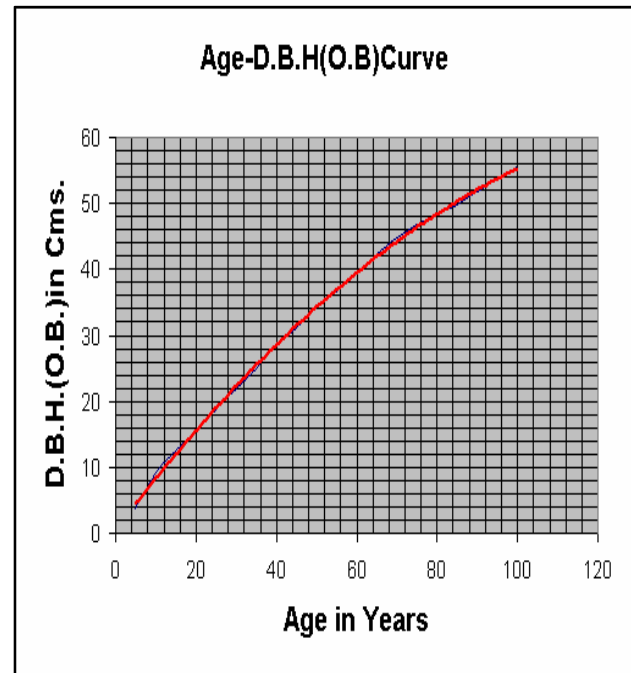
C CAI - MAI Curve

Age (yrs)	Cai m3	Mai m3
5	0.0022	0.0018
10	0.004	0.0028
15	0.0055	0.0035
20	0.007	0.0045
25	0.009	0.0053
30	0.011	0.0062
35	0.0135	0.0072
40	0.0155	0.008
45	0.0185	0.0092
50	0.0225	0.0102
55	0.026	0.0113
60	0.028	0.0122
65	0.026	0.0132
70	0.02635	0.0143
75	0.0205	0.015
80	0.018	0.0152
85	0.015	0.0151
90	0.0125	0.015



B. Age Diameter Curve.

Age (yrs)	D.B.H(O.B) m3
5	3.8
10	9.2
15	12.5
20	15.6
25	18.7
30	22
35	24.9
40	28.7
45	31.2
50	34.5
55	36.7
60	39.7
65	42.2
70	44.7
75	46.7
80	48.3
85	49.9
90	51.9
95	53.7
100	55.5



E. Statement Showing the diameter increment & volume increment.

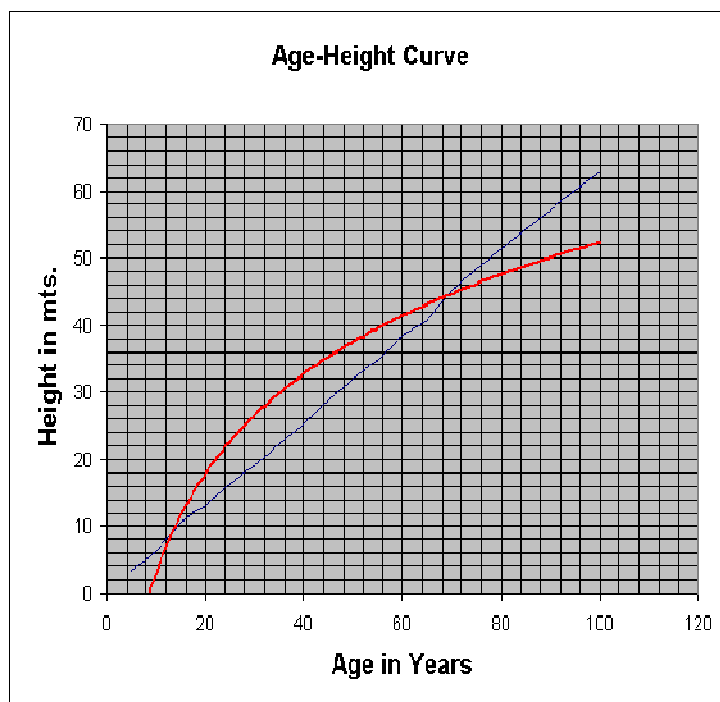
Age in yrs.	Ht. In mtrs.	Dbh.ob. (cms)	Volume (cumt)	Cai (cumt)	Mai (cumt)	Diam. Incr.	Volume Incr.
5	2	3.8	0.02	0.0022	0.0018	0	0
10	5.5	9.2	0.045	0.004	0.0028	16.61538	15.38462
15	8.8	12.5	0.075	0.0055	0.0035	6.082949	10
20	12	15.6	0.1	0.007	0.0045	4.412811	5.714286
25	15	18.7	0.16	0.009	0.0053	3.61516	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

6.1.5 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.

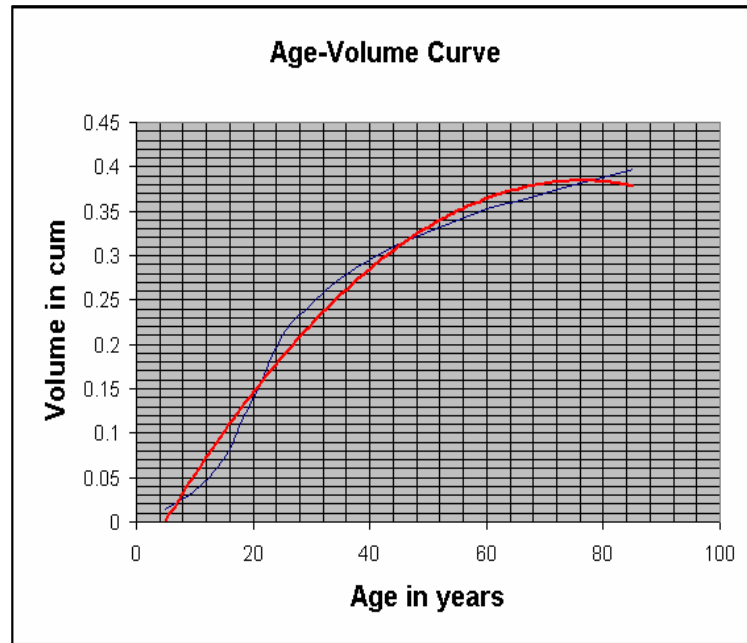
Age (yrs)	Height mt.
5	3.5
10	6.4
15	10.4
20	13.2
25	16.4
30	19.2
35	22.4
40	25.2
45	28.8
50	32
55	35
60	38.6
65	40.8
70	45.2
75	48.4
80	51.4



85	54.2
90	57
95	60.2
100	63

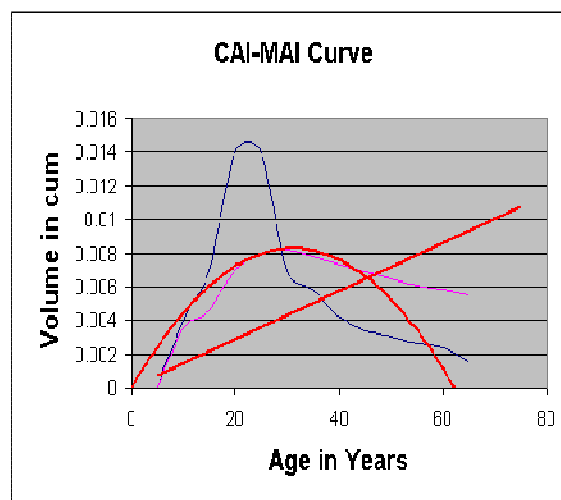
B. Age Volume Curve.

Age(yrs)	Volume m3
5	0.015
10	0.035
15	0.07
20	0.14
25	0.21
30	0.245
35	0.274
40	0.295
45	0.312
50	0.327
55	0.34
60	0.352
65	0.36
70	0.37
75	0.38
80	0.388
85	0.397
90	0.41



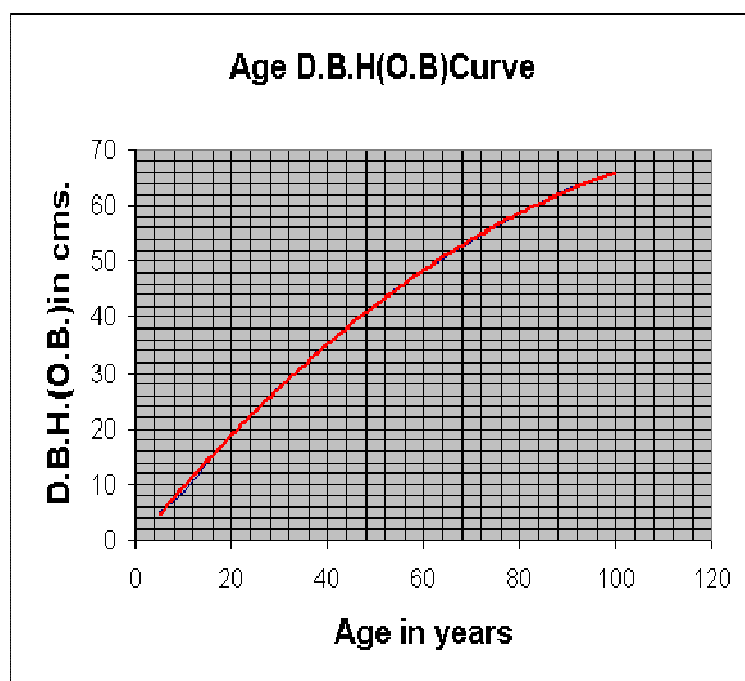
C. CAI - MAI Curve

Age(yrs)	Cai m3	Mai m3
5	0	0
10	0.004	0.0035
15	0.007	0.0046
20	0.014	0.007
25	0.014	0.008
30	0.007	0.0082
35	0.0058	0.0078
40	0.0042	0.0073
45	0.0034	0.0069
50	0.003	0.0065
55	0.0026	0.0061
60	0.0024	0.0058
65	0.0016	0.0055



D. Age Diameter Curve.

AGE (yrs)	D.B.H(O.B) m3
5	5.2
10	8.8
15	13.9
20	18.7
25	23.6
30	27.8
35	31.5
40	35.2
45	39
50	42.2
55	45.6
60	48.2
65	51
70	53.8
75	56.2
80	58.6
85	60.8
90	63
95	64.6
100	65.8



E. Statement Showing the diameter increment & volume increment.

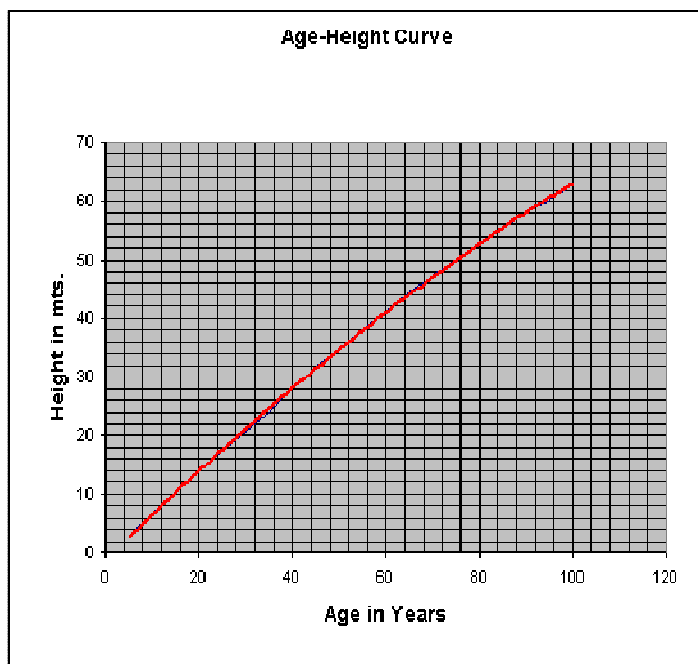
Age in yrs.	Ht. In mtrs.	Dbh.o b. (cms)	Volume (cumt)	Cai (cumt)	Ma i(cumt)	Diam. Incr.	Volume Incr.
5	3.5	5.2	0.015	0	0	0	0
10	6.4	8.8	0.035	0.004	0.0035	10.28571	16
15	10.4	13.9	0.07	0.007	0.0046	8.986784	13.33333
20	13.2	18.7	0.14	0.014	0.007	5.889571	13.33333
25	16.4	23.6	0.21	0.014	0.008	4.63357	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

6.1.6 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.

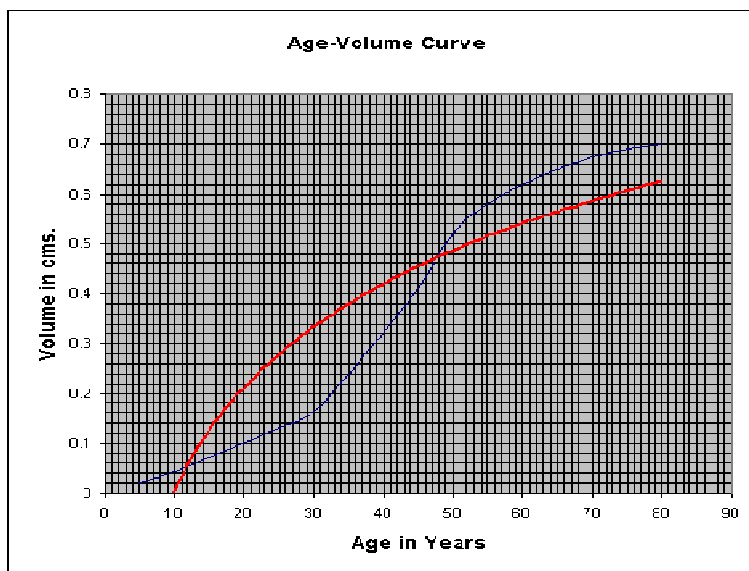
A. Age Height Curve.

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



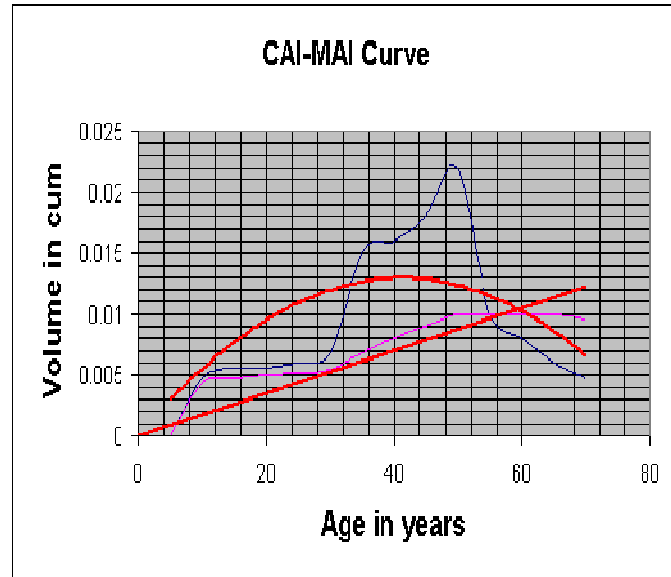
B. Age Volume Curve

Age(yrs)	Volume M3
5	0.02
10	0.044
	0.072
	0.1
25	0.13
30	0.164
35	0.24
40	0.32
45	0.41
50	0.52
55	0.58
60	0.62
65	0.65
70	0.674
75	0.69
80	0.7



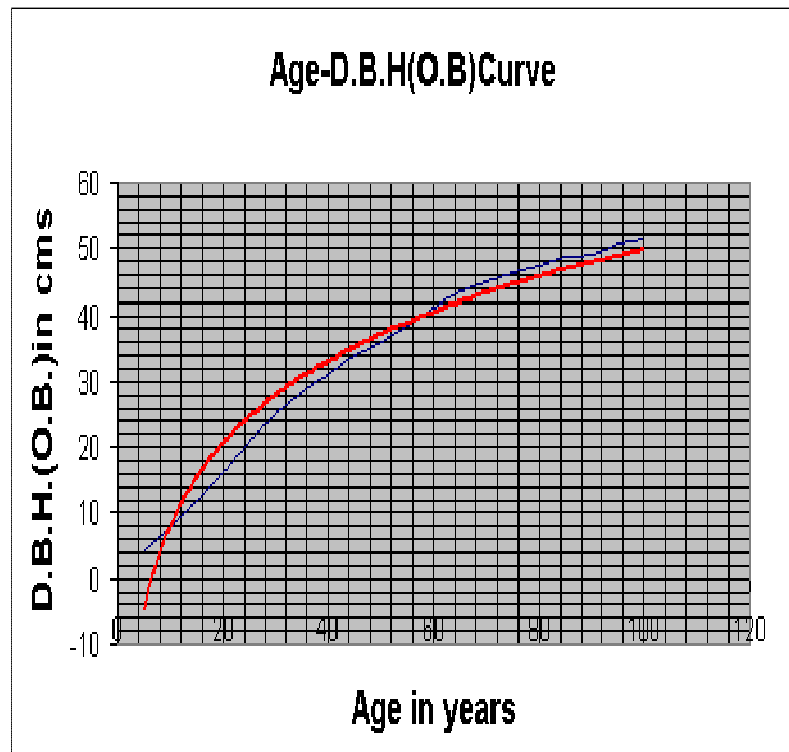
Age (yrs)	Cai m3	Mai m3
5	0	0
10	0.0048	0.0044
15	0.0056	0.0048
20	0.0056	0.005
25	0.006	0.0052
30	0.0068	0.0054
35	0.0152	0.0068
40	0.016	0.008
45	0.018	0.009
50	0.022	0.01
55	0.01	0.01
60	0.008	0.01
65	0.006	0.01
70	0.0048	0.0096

CAI – MAI Curve



D. Age D.B.H.O. Curve.

Age (yrs)	D.B.H(O.B) M3
5	4.5
10	7.9
15	11.8
20	16.4
25	20.8
30	25.1
35	28.7
40	31.1
45	34.1
50	36.1
55	38.5
60	41.1
65	43.5
70	45.1
75	46.5
80	47.5
85	48.7
90	49
95	50.7
100	51.5



E. Statement Showing the diameter increment & 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 – 6.2 ESTIMATION OF GROWING STOCK

6.2.1. (I) GENERAL VOLUME TABLE: -

Forest Survey of India has conducted the Forest Resources Survey of Ballarshah catchments 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) $V/D^2 H = a + b/D^2 H$
- iii) $V = a + b D^2 H + c (D^2 H)^2$
- iv) $\text{Loge } V = a + b \text{ Loge } D + c \text{ Loge } H$
- v) $V/D^2 = a + b/D^2 + c H^2$

Where V = Volume (in cum under bark) up to 5 cm top over bark diameter.

D = Diameter (in m) at breast height (1.37 m from ground)

H = Height in meters.

6.2.2. Since the tract dealt with comes within the Gadchiroli 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 coefficients, applicability of the equation and meaningful interpretation of the equation for different species:

TABLE – 13

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 will be given in the [Appendix-XVII](#)

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:-

$$V = a + bD^2$$

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

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

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

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

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

$$V/ D^2 = a + b/ D^2$$

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

$$V/ D^2 = a+b/ D^2+c/D + dD \quad \text{Loge } V = a + b \log e D$$

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 – 14

S.N.	Species	Local Volume Equations
1	<i>Tectona grandis</i> (30)	$\sqrt{V} = - 0.106720 + 2.562418 D$
2	<i>Terminalia alata</i> (266)	$V/D = - 0.397340 + 0.011283/D + 4.704700D + 2.369640 D^2$
3	<i>Pterocarpus marsupium</i> (59)	$V = 0.107059 - 1.010240D + 7.685670 D^2$
4	<i>Diospyros melanoxylon</i> (140)	$V/D = - 0.975148 + 0.033867/D + 8.255412D$
5	<i>Anogiessus latifolia</i> (112)	$V/D = - 0.36762 - 0.006854/D + 4.5577D + 5.25567D^2$
6	<i>Phyllanthus emblica</i> (49)	$V/ D^2 = 5.000428 - 0.013485/ D^2$
7	<i>Lagerstroemia parviflora</i> (39)	$\sqrt{V} = - 0.130340 + 2.824203 D$
8	<i>Boswellia serrata</i> (38)	$V/D = - 2.641645 + 0.153684/D + 15.056400D - 6.2061 D^2$
9	<i>Lanea Coromandelica</i> (44)	$\sqrt{V} = - 0.138286 + 2.729368D$
10	<i>Madhuca latifolia</i> (78)	$V = 0.074069 - 1.23002D + 7.726902D^2$
11	<i>Buchanania lanzan</i> (67)	$V = - 0.00767 + 0.2654D + 1.0385 D^2 + 7.527 D^3$
12	<i>Cleistanthus collinus</i> (320)	$V = - 0.019404 + 3.80207 D^2$
	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 will be given in the **Appendix-XVIII**

6.2.10. (III) TREE ENUMERATION: -

1% strip sampling method has been adopted for tree enumeration. The enumeration works have been started by the SOFR unit Chandrapur in the year 2003-04 under the supervision of Dy. Conservator of Forest, Working Plan Division No.1, Chandrapur. The statement showing the number of stems per ha with distribution of stems among different species and girth classes will be given in the Appendices of the Draft Plan. 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 is being followed for enumeration. The intensity of sampling the Reserve Forest as well as P.F. has been taken as 1 % of the growing stock.

6.2.12. (IV) EXISTING GROWING STOCK (CUBICAL CONTENTS) :-

Working circle wise and Range wise growing stock per ha will be given in the **Appendix-XIX**

SECTION - 6.3 :- 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 – 15

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 -7.1 DISTRIBUTION OF WILDLIFE

7.1.1. The wildlife in the tract dealt with is seriously depleted due to the indiscriminately shooting during the zamindari 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 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 following numbers of tigers were recorded in the division during the last census conducted in 2005.

Adult		Cubs	Total
Male	Female		
1	1	0	2

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. Four Panthers was recorded during the census of the year 2005. .

7.1.4. HERBIVORA :- The herbivorous animals that are found in these forests are; Sambar (*Corvus unicolor*), Cheetal (*Axis axis*), Nilgai (*Boselaphus tragocamelus*), Wild boar (*Sus cristatus*), Sloth bear (*Melursus ursinus*), Barking deer (*Muntiacus muntjak*), Langur (*Prebyitis entellus*).

7.1.5. RODENTS: The smaller animals that are common in tract, are Jungle striped squirrel (*Funambulus sublineatus*), Thee striped palm squirrel (*Funambulus pennanti*), Porcupine (*Hystrix indica*), Hare (*Lepus ruficaudatus*).

7.1.6.AVIFAUNA: The commonly seen birds are Pea fowls (*Pavo cristatus*), Jungle fowls (*Gallus sonneratai*), Quails (*Coturnix coromandelica*), Partridges (*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 – 7.2 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 North Wairagarh and South Wairagarh shooting block. These areas cover some compartments of Armori, Wadsa and Kurkheda Ranges. 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. Prabhu's Scheme mentions some shooting blocks, which were closed to shooting ever since the formation of shooting blocks because wildlife in these shooting blocks was already depleted. 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 net work, better means of transport and higher range weapons have proved to be a considerable threat to the existing wildlife. Commercial trade in wildlife products and poaching are no exception. There was no specific management as such for the conservation and development of wildlife.

SECTION – 7.3 LEGAL POSITIONS:

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(l) and 76(d) by Ex-Madhya Pradesh Government as given in Appendix - VIM of M.P.Forest Manual, 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 these 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 936 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 zamindari 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 18* 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 Manual, 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 & practical measures and sponsoring the setting up of National Park 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-FRYM/LP, 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, (became 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 because of poaching wildlife has 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. The Wildlife (Protection) Amendment Act, 1991 is a good piece of comprehensive legislation, which provides for effective protection and preservation of wildlife.

SECTION-7.4 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 possess in the district he resides any specified plant or part or derivative thereof for his bonafide personal use. However, permits can be granted by the Chief Wildlife Warden, with prior approval of the State Government, for the special purposes of education, scientific research and collection of specimens for recognized Zoos, Museums and similar Institutions.

SECTION- 7.5 INJURIES TO WHICH THE WILDLIFE IS LIABLE:

I. HUMAN AGENCIES:

7.5.1. A. POACHING:

Poaching is a great menace in this area. The hunting habit of local population is deep rooted since Jamindari regime. 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 tribal 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 Wadsa Division since 2000 to 2010 :

TABLE-16

Year	Species of wild animals and their number								
	Tiger	Panther	Sam-bhar	Chital	Nilgai	Hyena	Wild bore	Bhedki	Total
1	2	3	4	5	6	7	8	98	10
2000-01	--	--	--	--	--	--	--	--	--
2001-02	--	--	--	--	--	--	--	--	--
2002-03	--	--	--	--	--	--	--	--	--
2003-04	--	--	--	--	--	--	1	--	1
2004-05	--	--	--	--	--	--	--	--	--
2005-06	--	--	--	--	--	--	--	--	1
2006-07	--	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--	1
2008-09	--	--	--	--	--	--	--	--	--
2009-10	--	1	--	--	--	--	--	--	1

7.5.3.B FIRE: Forest fires 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 Moha flower collection and by negligence is also common. In general, the area is so badly affected by repeated fires that by the end of summer hardly any part is left intact without having very seriously suffered from fire. Recurring 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 fires 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.C 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.

II. 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 disease 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 prey to cattle killing.

7.5.6. B. GRAZING:

There is steep rise in the cattle population. Further, due to mass encroachment and the disforestation, forest have been deteriorated and thus grazing pressure has been increased in multifold, 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 nallas 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, temporary jhiras is 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 disturbs the normal course of life and affects the wildlife very adversely.

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CHAPTER - VIII

ESTIMATE OF CAPITAL VALUE OF FORESTS

SECTION-8.1: IN TERMS OF 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:

a)Exhales oxygen worth	Rs. 2.50 lakh
b)Inhales CO ₂ and thus purifies air worth	Rs. 5.00 lakh
c)Prevents soil erosion worth	Rs. 2.50 lakh
d)Regulates water supply worth	Rs. 3.00 lakh
e)Provides shelter to wildlife worth	Rs. 2.50 lakh
f) Causes synthesis of proteins worth	<u>Rs. 0.20 lakh</u>
	Rs 15.70 lakh
	=====

8.1.3. Thus from a middle aged tree we get intangible benefits worth about Rs. 15.7 lakhs. It is also estimated that well stocked wood land on one hectare area absorb 3.7 tonnes of CO₂ 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 dereservation of forest land under Forest Conservation Act, 1980, they have given a thumb rule as follows :--

ONE HA. OF FULLY STOCKED FORESTS (DENSITY = 1.00):

- (i) Avoids soil erosion,
- (ii) Affects hydrological cycle,
- (iii) Provides wildlife habitat,
- iv) Improves micro climate, and
- (v) Maintains ecological balance

Worth Rs. 126.74 lakhs to accrue over a period of 50 years. This shows the tremendous value of the forests.

PART II

PART - II

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

CHAPTER - IX

BASIS OF PROPOSALS

SECTION – 9.1 :- NATIONAL FOREST POLICY

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.

9.1.1. FOREST POLICY 1894 FOR INDIA :- This policy came in to existence Government of India's 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.
- c) The realization of revenue to the greatest possible extent.

9.1.2. 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 defense on forests. The reconstruction schemes, such as river valley projects, development of industries and communications, were dependent heavily on forest.

9.1.3. 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 complimentary 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 apace 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 realization of the maximum annual revenue in perpetuity, consistent with the fulfillment of the needs enumerated above.

9.1.4. 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 utilizing 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.

9.1.5. 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 fuel-wood, 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 utilization, restoration and enhancement of the natural environment, was enunciated in December 1988.

9.1.6. 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 programs, especially on all denuded, degraded and productive lands.
- (v) Meeting the requirements of fuel wood, 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 utilization of forest produce and maximizing substitution of wood.
- (viii) Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimize pressure on existing forests.

9.1.7. 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 those 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 tribal should be protected. Their domestic requirements of fuel-wood, 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 regularize 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 information.

SECTION :- 9.2 FACTORS INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT

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 become 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.

SECTION – 9.3 :- GENERAL OBJECTS OF MANAGEMENT

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.

SECTION - 9.4 : ANALYSIS AND VALUATION OF THE CROP:

1% strip sampling method have been adopted for tree enumeration in this division and it has been done by SOFR unit Chandrapur under the supervision of Conservator of Forest, Working Plan Division No.2, Chandrapur. The statement showing the number of stems per ha with distribution of stems among different species and girth classes will be given in the **Appendix - XIX**

9.4.1 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 recognized for the purpose of stock mapping of the growing stock.

TABLE – 17

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.

9.4.2. A. TEAK TYPE :- The forests in which the percentage of teak is more than 20 of the growing stock are classified as teak forest.

9.4.3. 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.

9.4.4. The bamboo quality is locally decided as follows:-

TABLE – 18

Quality Class	Height in m.	Girth at 1st internode
1st	10 m. & above	12.5 cm. & above
2nd	Below 10 m.	Below 12.5 cm.

9.4.5. The Stock maps will be prepared in the GIS lab at Chandrapur on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Dn., Chandrapur. Area statement of compartments by type, quality classes and other features will be prepared from the data received from the office of the SOFR Units and Territorial Division.

**RESULT OF SAMPLE TREE ENUMERATION OF WADSA FOREST
DIVISION**

Wadsa Forest division is one of the Forest divisions in Gadchiroli Circle. Its civil district is Gadchiroli. The area of Reserved Forest and Protected Forest is situated between latitude 20°12' and 20°50' North and Longitude 79°56' and 80°38' East.

The boundaries at the tract are as below.

North : Arjuni Morgaon and Lakhandur Tahsil under Gondia District

East : Rajnandgaon District of Chhatisgarh State..

South : Gadchiroli Forest Division

West : Wainganga River and Chandrapur District.

The forest areas are more or less compact and situated in the northern part of Gadchiroli district covering total geographical area of about 2480 sq.km.

The area of the tract in general is flat or undulating broken by solitary hillocks and ranges of low hills. The slopes are moderate to steep and ground below is cut by numerous nalas. Forest of the tract are situated on the triangle of high lands forming a table lands which runs the entire length of the western portion of the division. The tract lies at an elevation varying from 201.47m to 588.57m above sea level.

According to legal status the following are the Forest Area figures as on 2007-08.

Table No.19
Forest Area in sq.km.

Sr. No.	Item	Reserved Forest	Protected Forest	Un-class Forest	Total Forest Area
1	2	3	4	5	6
1	In charge of Forest Department	1110.78	395.80	0.00	1506.58
2	In charge of FDCM	-	-	-	-
3	Zudpi Jangle	-	-	6.48	6.48
4	In charge of Revenue Department	-	-	-	-
	Total	1110.78	395.8	6.48	1513.06
	% to total Forest Area	73.41	26.16	0.43	100.00

The division consist of eight ranges namely

1. Wadsa 2. Armori 3. Kurkheda 4. Bedgaon 5. Malewada 6. Purada 7. Porla and 8. Delanwadi respectively.

The area under Scientific Management as recorded in the Shri T.K.Choubey, R.K.Pole and D.R.Parihar Dy. C.F. Working Plan Division No.1, Chandrapur for Wadsa Forest Division is recorded in statement below.

Table No.20
Working circle wise area in ha.

Sr. No.	Name of Working Circle	Total Area in (ha)
1	2	3
1	Selection-cum-Improvement Working Circle	132553.60
2	Afforestation Working Circle	24125.38
	Total	156678.98

The Dy. C.F. Working Plan Division, Chandrapur-2 has projected the Forest Area as described below for sample tree enumeration.

Table No.21
Working circle wise area proposed for tree enumeration (ha.)

Sr. No.	Name of Working Circle	Total Area in (ha)
1	2	3
1	Selection-cum-Improvement Working Circle	132553.60
2	Afforestation Working Circle	24125.38
	Total	156678.98

Sampling plan of tree enumeration

The “systematic line plot sampling with random start” was resorted to with square plot of 0.36 ha. spread roughly at 600 meters. The sampling intensity was roughly at below 1%. The trees enumeration work carried out by Forest Resources Survey unit, Chandrapur, under the supervision of Conservator of Forests. Working Plan, Gadchiroli.

The enumeration work was completed during the year 2008-09. Scrutiny of data and preparation of results of Stock per hectare was obtained from Chief Forest Statistician and Working plan office. The result were represented in the form of statement.

Statement I : Estimated growing stock- No. of sound trees

Statement II : Estimated growing stock- No. of sound trees per ha.

Statement III: Percentage distribution of total stock of species over all girth class.

Statement IV: Percentage of stock of species in a girth class to the total stock in that particular girth class.

Statement V : Estimated growing stock in volume in cu.m./ha.

Some noteworthy results on comparison of past and current enumeration described in below paragraph.

Table No.22
Statement showing detail of No. of tree per ha for previous and current tree enumeration

Sr. No.	Name of Working Circle	No. of Tree per ha.	
		Previous enumeration 1995-96	Current enumeration 2007-08
1	2	3	4
1	Selection cum-Improvement Working Circle	261.95	495.06
2	Afforestation Working Circle	--	316.69

Table No.23
No. of Sound trees per ha.

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	Selection cum-Improvement Working Circle	495.06	93.628	19.852	76.982	304.598
	% of stock to total stock	(100)	(18.91)	(4.01)	(15.55)	(61.53)
2	Afforestation Working Circle	316.69	72.67	11.81	73.04	159.17
	% of stock to total stock	100	(22.95)	(3.73)	(23.04)	(50.26)

1) Selection-Cum-Improvement Working Circle

It is observed that species of General Utility viz. Ain, Bija, Haldu, Shisam, Teak, Tiwas are 18.91% to the total growing stock. The Species of Special Utility viz. Behada, Hirda, Khair are 4.01% to the total growing stock. The species of minor forest produce viz. Aonla, Dhawda, Moha, Shivan, Tendu are 15.55%. While remaining all species are 61.53%.

2) Afforestation Working Circle

It is observed that species of General Utility viz. Ain, Bija, Haldu, Shisam, Teak, Tiwas are 22.95% to the total growing stock. The Species of Special Utility viz. Behada, Hirda, Khair are 3.73% to the total growing stock. Minor forest produce viz. Aonla, Dhawda, Moha, Shivan, Tendu are 23.06% to the total growing stock remaining all species are 50.26% to the total growing stock.

Table No.24

Teak/ha stock & its percentage to total stock

Sr. No.	Name of Working Circle	Total growing Stock per ha.	Teak/ha	% of stock of Teak trees to the total stock
1	2	3	4	5
1	Selection cum-Improvement Working Circle	495.06	8.497	1.72
2	Afforestation Working Circle	316.69	2.09	0.66

STATISTICAL ANALYSIS

The statistical personnel of the office of the Chief Forest Statistician, Maharashtra State, Nagpur have carried out the Statistical Analysis of the data. The calculated estimates lead to certain error and percentage of standard error is around 5% in the statistical analysis. The percentage of standard error calculated for each working circle and prescribed as below in Table

Table No.25

Sr. No.	Name of Working Circle	Population area in ha.	Sample area in ha.	Intensity of sampling %	% of standard error
1	2	3	4	5	6
1	Selection cum-Improvement Working Circle	132553.60	1259.28	0.95	1.04
2	Afforestation Working Circle	24125.38	241.2	1	6.02
	Total	15667.98	1500.48		--

SECTION – 9.5 CLASSIFICATION OF FORESTS

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:-

9.5.1 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.

9.5.2 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.

9.5.3 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.

9.5.4 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.

9.5.5 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.

9.5.6 Classification :- On the above functional basis forests of Wadsa Forest Division are classified as under.

TABLE – 26

S.N.	Class of Forest	Area in ha			Total Area	% of total
		RF	PF	Z.J.		
1	Tree Forest	103017.07	2398.30	0	105415.37	67
2	Minor Forest	22272.28	28991.34	647.34	51519.96	33
Total		125289.35	31389.64	647.34	157326.33	100

9.5.7 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 – 9.6 :- METHOD OF TREATMENT

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 JFM Working circle chapter 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.

9.6.1. 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 Improvement Working Circle.

9.6.2. 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 and under SCI working circle in the previous plan of Shri.Choube. 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. Denuded areas will be afforested. Thinning will be carried out in the teak plantation according to the schedule.

9.6.3. 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 Improvement Working Circle. Soil and moisture conservation works will be taken up. The natural regeneration will be tended and planting of suitable indigenous species, specially for small timber poles, fodder and fuelwood will be taken. The existing stock in such areas will provide the present need of small timber, poles and fuelwood for the local people and the understocked areas will be treated to obtain future requirement. In afforestation program, Forest Protection committee will be involved.

9.6.4. MISCELLANEOUS FORESTS :- This will include those areas which were not included in aforesaid classes. This will include 3899.48 ha Zudpi Jungle which has been transferred to the Forest Department and in the possession of Forest Department. These areas being proposed to be transferred in to Reserve Forests and required proposal for the notification under section 4 should be sent to the government. The statement showing Range, village and survey number wise area will be given in the **Appendix- XXI**

SECTION – 9.7:- FORMATION OF WORKING CIRCLES

Based on the above consideration and objects of management & on the basis of results of past system of management of these forest following working circles have been proposed.

TABLE – 27

S.N.	Name of the Working Circles.	Area in ha
1	Selection Cum Improvement Working Circle	83143.08
2	Improvement Working Circle	74183.25
3	Teak Plantation(Overlapping) Working Circle	1004.00
4	Bamboo (Overlapping) Working Circle	69624.10
5	Wildlife (Overlapping) Working Circle	157326.33
6	Non -Timber(Overlapping) Working Circle	157326.33
7	Joint Forest Management (Overlapping) W.C.	157326.33

The details of the compartments that are allotted to the above working circles will be given in the **Appendix- XXII**

SECTION – 9.8 :- BLOCKS AND COMPARTMENTS

The total area of the Wadsa Forest Division will be divided into various working circle, felling series, coupes and compartments and will be given in the Appendices of the Draft Plan. The Statement of the Reserved Forests and Protected Forests by Compartments, and Range will be given in the **Appendix- XXIII**

SECTION – 9.9 PERIOD OF THE PLAN

The period of the plan is fixed at 10 years with effect from 2012-2013 to 2021-2022 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 – X

WORKING PLAN FOR THE SELECTION-CUM-IMPROVEMENT WORKING CIRCLE

SECTION-10.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

The following types of areas have been included in this working circle: -

- (i) Part areas under SCI working circle of the previous plan.
- (ii) Better-stocked areas of Afforestation Working circle in the previous plan

10.1.1. These forests occur in Eight Ranges of Wadsa Forest Division. The total area included in this working circle is **71891.41 ha**. The Range-wise break up of the areas covered under this working circle is given as follows: -

TABLE – 28

S.N.	Name of The Range	Area of Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Porla	17087.74	0	0	0
2	Armori	14960.25	3743.51	25.02	2.38
3	Wadsa	18276.67	5581.88	30.54	3.55
4	Kurkheda	16089.52	1079.28	6.71	0.69
5	Malewada	27241.84	19804.75	72.70	12.59
6	Delanwadi	14300.97	7233.52	50.58	4.60
7	Bedgaon	28725.72	21865.30	76.12	13.90
8	Purada	20643.62	12583.17	60.95	7.99
	Total	157326.33	71891.41		

(The area allotted to SCI working circle in each range may change as per the density slicing of satellite data maps to be processed.)

The statement showing exact areas of the compartments allotted to this working circle will be given in the **Appendix-XXIV**

SECTION- 10.2: GENERAL CHARACTER OF THE VEGETATION

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, teak, 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 0.60 and above with patches of lesser density areas too. The site quality of the crop is III to IVa with some open patches of IVb. The overall status of natural regeneration is satisfactory.

SECTION-10.3: BLOCKS AND COMPARTMENTS

The details of blocks and compartments allotted to this working circle will be given in the [Appendix-XXIV](#)

SECTION: 10.4 SPECIAL OBJECTS OF MANAGEMENT

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.

SECTION- 10.5: ANALYSIS AND VALUATION OF THE CROP:

STOCK MAPPING:

The Stock Maps will be updated through field visits by taking the help of stock maps of the earlier plan.

10.5.1 ENUMERATION:

1% strip sampling method has been done for tree enumeration. The enumeration works have been started by the SOFR unit Chandrapur in the year 2008-09 under the supervision of Working Plan Division No.2, Chandrapur. The statement showing the number of stems per ha with distribution of stems among different species and girth classes is given in the [Appendix-XIX](#)

10.5.2. DENSITY AND AGE CLASSES:

The crop is mostly middle aged to mature trees with scattered over mature trees. Density generally varies from 0.6 and above.

10.5.3. REGENERATION:

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- 10.6: SILVICULTURAL SYSTEM

The areas having good quality miscellaneous forests with middle age to over mature crop with assured natural regeneration will be worked under selection-cum-improvement working circle to achieve the objectives of producing large sized timber. Under this silvicultural system, the matured trees with selection girth class and above will be enumerated and 50% of such silviculturally available trees will be marked for felling. While marking trees with higher girth classes will be preferred. The gaps of more than 20-25 ha. Patches will be identified and the same will be planted with teak so as to improve the percentage of the teak.

SECTION- 10.7: CHOICE OF SPECIES

Since teak is the most economically important species it shall be given top priority. The miscellaneous species to be favored in the existing crop in order of their priorities are bija, shisham, haldu, ain, kalam, tiwas, dhaora, bhirra, rohan, garari and lendia. However, in inferior areas with degraded soil rohan, bhirra, khair, garari and lendia will be preferred.

10.7.1. In the artificial regeneration teak will be planted in areas with well-drained soil and khair will be planted in inferior areas. Besides, edible fruits and flower yielding plants such as aola, hirda, behada, moha and semal will be reserved from felling.

SECTIONS- 10.8: HARVESTABLE GIRTHS

Since the growth conditions are usually favourable, most of the areas included in this working circle are capable of growing up to 120 to 150 cms. in girth at breast height (O.B.). The growth study of teak is carried out by stem analysis. And the stump analysis for miscellaneous superior timber trees was conducted by Shri Kartar Singh at the time of preparation of the working plan for East Chanda Division. Based on the above growth studies, the harvestable girth of various species will be as follows:

1) Teak, ain, Kalam, bija, shisham, haldu, Tiwas	135 cms.
2) All other timber species;(Dhaoda, , bhirra, kateain, salai, semal)	120 cms
3) Khair	75 cms
4) Garari, lendia	45 cms.

The yield calculation will be carried out for the girth class 135 cm, 120 cm, 75 cm & 45 cm gbh and the same will be given in the chapter V.

SECTION-10.9: FELLING CYCLE

The felling cycle of 20 years has been adopted.

SECTION-10.10: FORMATION OF FELLING SERIES AND COUPES

The total area allotted to this working circle is 83143.08 ha which will be divided into various felling series and coupes, the details of which will be given in the Appendices of the Draft Plan. The sequence of felling in SCI Working Circle will be given in the Appendix-XXV

SECTION-10.11 : REGULATION OF YIELD

The annual yield will be regulated by area by making coupes as far as possible equi-productive in each felling series. The coupes of 100 to 125 ha size will be laid down.

10.11.1. Mathematical analysis for K.P. Sagreiya's modification of Brandis' Method of determining the sustainable and exploitable size of trees from all-aged forest is given as below;
If-

- (i) The number of trees in Class I (Exploitable Girth Class) is S_1 ;
- (ii) The number of trees in classes II, III ... are $s_2, s_3, \dots$;
- (iii) The fraction of the trees of classes II, III, ... that survive and are eventually available for harvesting as class trees are $x_2, x_3, \dots$, so that $x_2 s_2 = S_2$; $x_3 s_3 = S_3$; ...
- (iv) The trees take $Y_2, Y_3, \dots$ years in classes II, III, ..., so that the average annual recruitments in the class periods are-
 $S_2 / Y_2 = R_2$
 $S_3 / Y_3 = R_3, \dots$
- (v) The overall average annual recruitment for the entire enumeration period, i.e.,
 $(S_2 + S_3 + \dots) / (Y_2 + Y_3 + \dots) = S / Y$ is say R .
- (vi) The felling cycle adopted is f years and
- (vii) The accruing average annual recruitment during the 1st, 2nd, ..., Cycles is $R', R'', \dots$, so that the recruitments, accruing in successive cycles, i.e. $f R', f R'', \dots$ are given by as follows:

$$f R' = a R_x + (f - a) R_{x+1}$$

$$f R'' = b R_y + (f - b) R_{y+1}, \dots$$



Then the realizable recruitments $R_{r1}, R_{r2}, \dots$ in cycles I, II, ... Will be.....

$$R_{r1} = \frac{1}{2} [f R' - a (R' - R_x)],$$

$$R_{r1} = \frac{1}{2} [f R'' - a (f R'' - R_y)], \dots$$

Therefore, the prescribed yield should be -

$$I/f [S_1 + f R'/2 - a (R' - R_x)/2],$$

$$I/2f [S_2 + f (R' + R'')/2 - b (R'' - R_y)/2], \dots$$

According as the stock in hand has to be liquidated in 1, 2, ... cycles, to obtain the maximum sustained yield, while the actual recruitment is still less than R .

From this it follows that if the overall annual recruitment R is to be realized on a sustained basis even while the realizable recruitment in a cycle is less than R , there must be a stock in hand of -

$$S_I = f [R - R'/2] + a (R' - R_x)/2,$$

$$S_{II} = f [2R - (R' + R'')/2] + b (R'' - R_y)/2, \dots$$

According as the deficiency continues for 1, 2, 3, ... felling cycles.

GROUP A (Ain, Bija, Haldu, Shisham, Teak)

For the tract dealt with, in Selection Cum Improvement Working Circle consisting of all aged forests, we have girth wise distribution of trees, years to cross the class according to stem analysis of teak tree of Site Quality - III and selection girth fixed is 135 cm.

Table No-1
Enumeration data

Species	16-30	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	151&up	Total
Ain	20.16	9.78	5.69	4.42	4.06	3.90	3.47	2.48	1.96	2.00	57.93
Bija	2.07	1.61	1.78	1.90	2.49	2.88	2.65	2.37	1.87	2.01	21.63
Haldu	0.31	0.31	0.32	0.34	0.36	0.38	0.31	0.16	0.09	0.23	2.79
Shisham	0.34	0.68	0.58	0.64	0.47	0.41	0.13	0.07	0.01	0.02	3.35
Teak	16.32	7.03	3.56	2.04	1.02	0.53	0.32	0.29	0.21	0.29	31.61
Tiwas	0.32	0.90	0.87	0.86	0.80	0.48	0.34	0.29	0.11	0.07	5.03
Total	39.5	20.3	12.7	10.2	9.1	8.5	7.21	5.65	4.25	4.62	122.3

	2	0	9	0	9	9					3

Table No-2

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
I	Over 135		
II	120-135	9	Y_2
III	106-120	10	Y_3
IV	91-105	10	Y_4
V	76-90	10	Y_5
VI	61-75	10	Y_6
VII	46-60	9	Y_7
VIII	31-45	10	Y_8
IX	15-30	14	Y_9
Total enumeration period		82	Y

Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

Table No- 3

TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	150 & up	4.62					
I	135-150	4.25		100%			
II	120-135	5.65	s_2	75%	X_2	4.25	S_2
III	106-120	7.21	s_3	59%	X_3	4.25	S_3
IV	91-105	8.59	s_4	49%	X_4	4.25	S_4
V	76-90	9.19	s_5	46%	X_5	4.25	S_5
VI	61-75	10.2	s_6	42%	X_6	4.25	S_6
VII	46-60	12.79	s_7	33%	X_7	4.25	S_7
VIII	31-45	20.3	s_8	21%	X_8	4.25	S_8
IX	15-30	39.52	s_9	11%	X_9	4.25	S_9
	Total	122.32				34.00	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is $34.00 / 82 = 0.414$ per ha. The average annual recruitment during the size class period namely, $S_2 / Y_2 = R_2$, $S_3 / Y_3 = R_3$, ... will be as following table:



Table No- 4

TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP A

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
I	Over 135	8.87*				
II	120-135	4.25	9	Y_2	0.472	R_2
III	106-120	4.25	10	Y_3	0.425	R_3
IV	91-105	4.25	10	Y_4	0.425	R_4
V	76-90	4.25	10	Y_5	0.425	R_5
VI	61-75	4.25	10	Y_6	0.425	R_6
VII	46-60	4.25	9	Y_7	0.472	R_7
VIII	31-45	4.25	10	Y_8	0.425	R_8
IX	15-30	4.25	14	Y_9	0.304	R_9
		34.00	82	Y	0.422	R

It is obvious that although there is stock in hand of 8.87 class I trees/ha and there will be a recruitment of 34.00 trees/ha in the 82 years and thus theoretically annual yield of $(34.00 + 8.87) / 82 = 0.52$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$. Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2 / 2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2 / 2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2 / 2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2 / 2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No-5

**TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF
STEMS: GROUP A SPECIES**

(For Proposed Plan Felling Cycle of 20 years; n th year of operation; No of trees per ha)

SrNo	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S ₁	Realizable Recruitment =	Accruing Recruitment=
1	I	1	1	8.87	$\frac{1}{2}R_2 = 0.236$	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 8.993$
2	II	1	2	8.87	$R_2 + \frac{1}{2} R_2 = 0.708$	$15R_2 + 3 R_3 + \frac{1}{2} R_3 = 8.568$
3	III	1	3	8.87	$2R_2 + \frac{1}{2} R_2 = 1.180$	$15R_2 + 2 R_3 + \frac{1}{2} R_3 = 8.143$
4	IV	1	4	8.87	$3R_2 + \frac{1}{2} R_2 = 1.652$	$15R_2 + R_3 + \frac{1}{2} R_3 = 7.718$
5	V	1	5	8.87	$4R_2 + \frac{1}{2} R_2 = 2.214$	$15R_2 + \frac{1}{2} R_3 = 7.293$
6	VI	1	6	8.87	$5R_2 + \frac{1}{2} R_2 = 2.596$	$14R_2 + \frac{1}{2} R_2 = 6.844$
7	VII	1	7	8.87	$6R_2 + \frac{1}{2} R_2 = 3.068$	$13R_2 + \frac{1}{2} R_2 = 6.372$
8	VIII	1	8	8.87	$7R_2 + \frac{1}{2} R_2 = 3.54$	$12R_2 + \frac{1}{2} R_2 = 5.90$
9	IX	1	9	8.87	$8R_2 + \frac{1}{2} R_2 = 4.012$	$11R_2 + \frac{1}{2} R_2 = 5.428$
10	X	1	10	8.87	$9R_2 + \frac{1}{2} R_2 = 4.484$	$10R_2 + \frac{1}{2} R_2 = 4.956$
11	XI	1	11	8.87	$10R_2 + \frac{1}{2} R_2 = 4.956$	$9R_2 + \frac{1}{2} R_2 = 4.484$
12	XII	1	12	8.87	$11R_2 + \frac{1}{2} R_2 = 5.428$	$8R_2 + \frac{1}{2} R_2 = 4.012$
13	VIII	1	13	8.87	$12R_2 + \frac{1}{2} R_2 = 5.90$	$7R_2 + \frac{1}{2} R_2 = 3.54$
14	XIV	1	14	8.87	$13R_2 + \frac{1}{2} R_2 = 6.372$	$6R_2 + \frac{1}{2} R_2 = 3.068$
15	XV	1	15	8.87	$14R_2 + \frac{1}{2} R_2 = 6.844$	$5R_2 + \frac{1}{2} R_2 = 2.596$
16	XVI	1	16	8.87	$15R_2 + \frac{1}{2} R_3 = 7.293$	$4R_2 + \frac{1}{2} R_2 = 2.214$
17	XVII	1	17	8.87	$15R_2 + R_3 + \frac{1}{2} R_3 = 7.718$	$3R_2 + \frac{1}{2} R_2 = 1.652$
18	XVIII	1	18	8.87	$15R_2 + 2 R_3 + \frac{1}{2} R_3 = 8.143$	$2R_2 + \frac{1}{2} R_2 = 1.180$
19	XIX	1	19	8.87	$15R_2 + 3 R_3 + \frac{1}{2} R_3 = 8.568$	$R_2 + \frac{1}{2} R_2 = 0.708$
20	XX	1	20	8.87	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 8.993$	$\frac{1}{2}R_2 = 0.236$
	Total	20	20		93.91	93.91
			Average	8.87	4.69	4.69



Thus overall average number trees per ha will be $8.87+4.69+4.69 = 18.25$. Out of which available for selection felling would be $8.87+4.69 = 13.56$. Percentage removal would be $13.56/18.25 \% = 74.30 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 %. For sake of simplicity say 50% of silviculturally available tree i.e. on average 50% of $18.25 = 9.13$ say 9 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 135-150 as timber = 0.485 cubic meter We will have average yield = $9 \times 0.485/20 = 0.21$ cubic meter per hectare per annum of timber. For fuel wood average yield will be $= 9 \times 0.330/20 = 0.15$ fuel wood per ha per annum.

Group B (Other species: Selection Girth =120 cms)

Table No-6

TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS IN GIRTH CLASS

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
	>135		
I	120-135		
II	106-120	13	Y_2
III	91-105	14	Y_3
IV	76-90	14	Y_4
V	61-75	12	Y_5
VI	46-60	12	Y_6
VII	31-45	12	Y_7
VIII	15-30	16	Y_8
Total enumeration period		93	Y

Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in tables

GROUP- B SPECIES

Table No-7

TABLE SHOWING THE PERCENTAGE OF DIFFERENT GIRTH CLASS TREES REACHING TO HARVESTABLE GIRTH CLASS

Class	Girth Class in cm	No of Trees/ ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	>135	9.66					
I	120-135	6.52		100%			
II	106-120	8.6	s_2	76%	x_2	6.52	S_2
III	91-105	16.18	s_3	40%	x_3	6.52	S_3



IV	76-90	21.59	s_4	30%	x_4	6.52	S_4
V	61-75	26.46	s_5	25%	x_5	6.52	S_5
VI	46-60	35.7	s_6	18%	x_6	6.52	S_6
VII	31-45	48.31	s_7	13%	x_7	6.52	S_7
VIII	15-30	64.48	s_8	10%	x_8	6.52	S_8
	Total	237.5				45.64	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is $45.64 / 93 = 0.49$ per ha. The average annual recruitment during the size class period namely, $S_2 / Y_2 = R_2$, $S_3 / Y_3 = R_3$, ... will be as following table:

Table No- 8
TABLE SHOWING ANNUAL RECRUITMENT OF STEMS TO DIFFERENT GIRTH CLASSES : GROUP B

Class	Girth Class in cm	No of trees / ha reaching to Class I	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
I	>120	16.18				
II	106-120	6.52	13	Y_2	0.50	R_2
III	91-105	6.52	14	Y_3	0.47	R_3
IV	76-90	6.52	14	Y_4	0.47	R_4
V	61-75	6.52	12	Y_5	0.54	R_5
VI	46-60	6.52	12	Y_6	0.54	R_6
VII	31-45	6.52	12	Y_7	0.54	R_7
VIII	15-30	6.52	16	Y_8	0.41	R_8
	Total	45.64	93	Y	0.50	R

It is obvious that although there is stock in hand of $(9.66+6.52)=16.18$ class I trees/ha and there will be a recruitment of 45.64 trees/ha in the 93 years and thus theoretically annual yield of $(45.64 + 16.18) / 93 = 0.66$ trees/ha is obtainable. In practice, as the existing stock is assumed to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$. Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2 / 2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the 1st year's coupe will be only $\{S_1 + R_2 / 2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the recruitment of that year $R_2 / 2$ will also be



available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2/2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as following table:

Table No- 9

TABLE SHOWING ANNUAL REALIZATION AND ACCUMULATION OF STEMS: GROUP B SPECIES

(For Proposed Plan Felling Cycle of 20 years; n th year of operation; No of trees per ha)

Sr.No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_1	Realizable Recruitment =	Accruing Recruitment=
1	I	0.25	1	16.18	$\frac{1}{2}R_2$ 0.25	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 9.61$
2	II	0.75	2	16.18	$R_2 + \frac{1}{2} R_2$ 0.75	$15R_2 + 3 R_3 + \frac{1}{2} R_3 = 9.14$
3	III	1.25	3	16.18	$2R_2 + \frac{1}{2} R_2$ 1.25	$15R_2 + R_3 + \frac{1}{2} R_3 = 8.20$
4	IV	1.75	4	16.18	$3R_2 + \frac{1}{2} R_2$ =1.75	$15R_2 + 2 R_3 + \frac{1}{2} R_3 = 8.67$
5	V	2.25	5	16.18	$4R_2 + \frac{1}{2} R_2$ =2.25	$15R_2 + \frac{1}{2} R_3 = 7.73$
6	VI	2.75	6	16.18	$5R_2 + \frac{1}{2} R_2$ =2.75	$14R_2 + \frac{1}{2} R_2 = 7.25$
7	VII	3.25	7	16.18	$6R_2 + \frac{1}{2} R_2$ =3.25	$13R_2 + \frac{1}{2} R_2 = 6.75$
8	VIII	3.75	8	16.18	$7R_2 + \frac{1}{2} R_2$ =3.75	$12R_2 + \frac{1}{2} R_2 = 6.25$
9	IX	4.25	9	16.18	$8R_2 + \frac{1}{2} R_2$ =4.25	$11R_2 + \frac{1}{2} R_2 = 5.75$
10	X	4.75	10	16.18	$9R_2 + \frac{1}{2} R_2$ =4.75	$10R_2 + \frac{1}{2} R_2 = 5.25$
11	XI	5.25	11	16.18	$10R_2 + \frac{1}{2} R_2$ =5.25	$9R_2 + \frac{1}{2} R_2 = 4.75$
12	XII	5.75	12	16.18	$11R_2 + \frac{1}{2} R_2$ =5.75	$8R_2 + \frac{1}{2} R_2 = 4.25$
13	VIII	6.25	13	16.18	$12R_2 + \frac{1}{2} R_2$ =6.25	$7R_2 + \frac{1}{2} R_2 = 3.75$
14	XIV	6.75	14	16.18	$13R_2 + \frac{1}{2} R_2$ =6.75	$6R_2 + \frac{1}{2} R_2 = 3.25$
15	XV	7.25	15	16.18	$14R_2 + \frac{1}{2} R_2$ =7.25	$5R_2 + \frac{1}{2} R_2 = 2.75$
16	XVI	7.73	16	16.18	$15R_2 + \frac{1}{2} R_3$ =7.73	$4R_2 + \frac{1}{2} R_2 = 2.25$
17	XVII	8.20	17	16.18	$15R_2 + R_3 + \frac{1}{2} R_3 = 8.20$	$3R_2 + \frac{1}{2} R_2 = 1.75$
18	XVIII	8.67	18	16.18	$15R_2 + 2 R_3 + \frac{1}{2} R_3 = 8.67$	$2R_2 + \frac{1}{2} R_2 = 1.25$

19	XIX	9.14	19	16.18	$15R_2 + 3 R_3 + \frac{1}{2} R_3 = 9.14$	$R_2 + \frac{1}{2} R_2 = 0.75$
20	XX	9.61	20	16.18	$15R_2 + 4 R_3 + \frac{1}{2} R_3 = 9.61$	$\frac{1}{2} R_2 = 0.25$
	Total	20	20		99.60	99.60
			Average	16.18	4.98	4.98

Thus overall average number trees per ha will be $16.18 + 4.98 + 4.98 = 26.14$. Out of which available for selection felling would be $16.18 + 4.98 = 21.16$. Percentage removal would be $21.16/26.14 \% = 80.94 \%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 50 % of $26.14 = 13.07$ say 13 trees per ha. In terms of number, 50 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 120 as timber = 0.400 cubic metre, we will have average yield = $13 \times 0.400/20 = 0.26$ cubic meter per hectare per annum of timber. For fuel wood average yield will be $= 13 \times 0.230/20 = 0.14$ fuel wood per ha per annum.

SECTION-10.12 : AGENCY FOR HARVESTING

The main felling of coupes, after marking, will either be worked departmentally or through JFM Committees or FLCS. However, subsidiary silvicultural operations, thinning, soil and moisture conservation works, planting and fire protection works will be carried out departmentally. Besides this in the areas where the Forest Protection Committees have been constituted, the soil & moisture conservation as well as plantation works will be carried out through these committees as per Government Instructions issued from time to time under FDA. The protection works will be entrusted to the Forest Protection Committees as per memorandum of understanding.

SECTION- 10.13: DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAPS AND MARKING TECHNIQUE.

DEMARCATION:

Main felling coupes will be demarcated in the same year as per procedure laid down under miscellaneous regulations. The details of the same will be given in Appendix- XXVI

10.13.1. PREPARATION OF TREATMENT MAP:

Soon after the demarcation a treatment map will be prepared by RFO after thorough joint inspection with the ACF in charge of the area and the same will be submitted to the Dy. Conservator of Forest. The treatment map will show the following areas distinctly:

10.13.2. Type A: - Protection areas:

These will include,

- I. Areas with slopes of 25 degree and above,
- II. Areas eroded or liable for erosion.
- III. 30-meter wide strip on either side of Nala banks and river courses.

10.13.3 Type B: These are under stocked areas. These will include all areas with crop density less than 0.4. They can be further divided into B1 and B2 depending upon extent of natural regeneration.

10.13.4 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. Old plantations if available in the coupe area they should be included in C type area.

10.13.5 Type D Areas: Well Stocked Area: Areas with crop density above 0.6 are included in this category. All edible fruit and flower yielding trees of moha, char, tendu, aola, chinch, sitafal, hirda, 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.

10.13.6 To facilitate the preparation of treatment map, each coupe, in general, will be divided into 4 sections. Each type of area will be marked only if its extent at one place is more than 5 ha except the nala banks, which will be marked irrespective of its area. The treatment map will be submitted to Dy. Conservator Forest, Wadsa who will approve after careful scrutiny. A broad treatment map will be provided by the GIS lab at Chandrapur in the office of Conservator of Forests, Working Plan, Chandrapur and all the above-mentioned areas will be shown on the map.

10.13.7 MARKING TECHNIQUE & TREATMENT:

Marking will be carried out soon after the receipt of approved treatment map. The marking technique has been described

in detail under miscellaneous regulations. The bamboo clumps, if present in SCI coupes, will be harvested as per the silvicultural rule 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.

10.13.8 Type A Areas: (Protection areas): No marking will be done. However, seed sowing of Neem, Maharukh and indigenous species will be carried out. Soil and moisture conservation works with planting of soil binding species such as agaves/bamboo are suggested.

10.13.9 Type B Areas: (Under stocked areas): Marking of dead dying and diseased trees will be carried out after retaining two dead trees per ha. The B type areas can be further divided into two categories, viz. B1 and B2. The areas without adequate regeneration will be put into B1 category and if such patches are more than 5 ha in extent they will be planted with suitable species. The areas with adequate natural regeneration will be put into B2 category and only suitable tending operation as in the case of plantations will be carried out.

10.13.10 Type C Areas: The advance growth up to the extent of 5 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.

10.13.11 Type D Areas: All edible fruit and flower yielding trees of moha, char, tendu, aonla, chinch, sitafal, hirda, behada, 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.
- (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 clear bole up to 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 silviculturally available.

SECTION:-10.14 SUBSIDIARY SILVICULTURAL OPERATIONS

The following works will be carried out in the following year of the main felling and in the subsequent years.

10.14.1 A. CUT-BACK OPERATIONS:

The following works will be carried out in the following year of the main felling.

- (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 up to 15 cm gbh. will be cut.

10.14.2 B. CLEANING:

The cleaning operations will be carried out in the sixth year from the year of main felling by removing all climbers (except endangered species) and unwanted bushes and undergrowth interfering with the natural regeneration/planted seedlings.

The sequence of subsidiary silvicultural operations and thinning will be given in the Appendix-XXIII

SECTION – 10.15 OTHER REGULATIONS

10.15.1 PROTECTION:

The success of regeneration will depend upon the protection of all areas from fire, grazing and illicit felling.

10.15.2 FIRE PROTECTION:

Special attention is needed to control the fire of all coupes worked annually. After working coupes are to be protected from fire for a period of 5 years so as to prevent the damage for the

young regeneration. The details of fire protection schemes are given in miscellaneous regulations. It will be worthwhile to involve JFM Committees in protection of these areas by paying them the money earmarked for fire protection.

10.15.3 CLOSURE TO GRAZING:

The main felling coupes will remain closed for grazing for a period of five years after felling. And the details of the same shall be mentioned in grazing passes to be issued every year. 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 detailed instructions are given to all the field staff to ensure the protection of worked coupes from grazing and fire.

10.15.4. 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, Lucerne, bur-seem may be taken in the suitable patches near villages. These areas will be closed to grazing from July to November, during which the seeding of grasses will be over.

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CHAPTER XI

WORKING PLAN FOR IMPROVEMENT WORKING CIRCL

SECTION:- 11.1 GENERAL CONSITITUION OF WORKING CIRCLE:

The following types of areas are proposed to be included in the Improvement Working Circle, which is newly proposed based on the existing crop condition of the Wadsa Forest Division.

- i) The Forest Compartments allotted to SCI, in the previous plan period,
- ii) The Compartments allotted to Afforestation working circle, in the previous plan
- iii) The areas where profuse natural regeneration of miscellaneous species has come up and have good stocking but lack in mature trees.

11.1.1 The areas allotted to this Working Circle are having the density of 0.4 to 0.6 with young to middle age tree growth of mostly miscellaneous species. Some percentage of matured to over matured trees of miscellaneous species which are either malformed, damaged, hollow etc. spread all over the compartments can also be seen. The areas allotted to this Working Circle are either surrounded by villages or situated in the interior areas. These areas are subjected to heavy biotic pressure and illicit felling to meet the local demands of the people. This has resulted in crop having coppice growth with more than one pole to clusters of poles. The forests are highly congested due to unwanted climbers, which are damaging the trees of different species. The total area of the Working Circle is 85434.92 ha. (54.30% of the total areas of the division). The range wise distribution of the area is as follows:

TABLE - 29

S.N.	Name of The Range	Area of Range	Area of the W.C. in ha	% of the area of the Range	% of the are of the Division
1	Porla	17087.74	17087.74	100.00	10.86
2	Armori	14960.25	11216.74	74.98	7.12
3	Wadsa	18276.67	12694.79	69.46	8.07
4	Kurkheda	16089.52	15010.24	93.29	9.54
5	Malewada	27241.84	7437.09	27.30	4.73
6	Delanwadi	14300.97	7067.45	49.42	4.49
7	Bedgaon	28725.72	6860.42	23.88	4.36
8	Purada	20643.62	8060.45	39.04	5.12
	Total	157326.33	85434.92		

The statement showing the allotment of compartments to this working circle in each range will be given in the [Appendix-XXVII](#)

SECTION:- 11.2 GENERAL CHARACTER OF VEGETATION:

Most of these areas are having miscellaneous tree growth, mostly of garadi, ain, dhawada, bija, salai, movai, tendu, char, khair, aola, moha, bel, lendia, bharati, ghoti, etc. The common climbers of chilati, eroni, kukudranzi, bel-palas etc. The density of crop varies from below 0.4 to 0.6 with site quality of IV to IV (B). The status of regeneration is poor in some areas although at many places it is very good. But there is a severe problem of congestion and over growth of climbers and other inferior species. There is abundance of tree growth in most of the lower girth classes. In higher girth classes, towards maturity the no. of trees is less. Many of the allotted areas are open and are subjected to soil erosion due to heavy biotic pressure and illicit felling. The crop is subjected to un-controlled grazing by the local villagers for their cattle and goats. The branches and pole crop of the palatable species is cut to feed the goats, which results in loss of growing stock. This type of hacking results in crop having number of coppice shoots.

SECTION:- 11.3 SPECIAL OBJECTS OF MANAGEMENT:

Special objects of management are as follows:

- i) To maintain and improve the existing crop.
- ii) To remove congestion and to help natural regeneration of various species that are coming up naturally.
- iii) To ensure growth of timber of commercial value.
- iv) To meet the local demand of nistar.

SECTION-11.4: STOCK MAPPING:

The stock maps are updated through field visits, satellite maps and the help of stock maps of the previous plan, as well as enumeration data.

SECTION-11.5: ENUMERATION:

One percent sampling is being carried out for tree enumeration through S.O.F.R. unit of Chandrapur. The statement shows the No. of stems per ha. with distribution among different species and girth classes will be given in [Appendices-XIX](#)

SECTION-11.6: SILVICULTURAL SYSTEM:

Silvicultural system prescribed is improvement of the crop through hygienic felling by removing dead, dying, deceased and malformed trees. Removal of congestion by carrying out singling operations will also be carried out to facilitate the young regeneration.

SECTION-11.7: METHOD OF TREATMENT

The basic aim to constitute this working circle is to improve the quality of the growing stock. The felling in these areas will be purely of hygienic in nature. The following operations will be carried out.

- i) Removal of dead, dying, diseased and malformed trees.
- ii) Thinning in congested patches.
- iii) Removal of mature crop which are not likely to survive till next felling cycle.
- iv) In areas where density is below 0.4 only climbers, malformed and crooked trees will be removed.
- v) Raising of plantations of teak and other suitable species.

SECTION-11.8: CHOICE OF SPECIES:

The choice of species shall be as per the site-specific requirement. However, teak shall be principal species if the soils are deep, fertile and well drained. The other major species shall be preferably bija, sisam, haldoo, semal, sehana, shivan, khair, aola, char, moha, hirda, behada and important medicinal plants.

SECTION-11.9: ALLOTMENT OF COMPARTMENTS:

The details of compartments allotted to this Working Circle will be given in the [Appendix-XXVII](#)

SECTION-11.10 : FORMATION OF FELLING SERIES AND COUPES:

The entire area will be divided into felling series and each felling series will be divided into annual coupes. The details of felling series and coupes will be given in the [Appendix-XXVIII](#)

11.10.1 FELLING CYCLE:

The felling cycle will be of 20 years.

11.10.2 ROTATION:

No rotation is fixed as the basic object of management is to improve the existing crop by providing hygienic treatment through removal of dead, dying, diseased, malformed trees and climbers. Singling and thinning operations will also be taken up in all the plantations that are existing in the coupe area.

11.10.3 REGULATION OF YIELD:

Yield will be regulated by area. However, annual yields may vary due to irregular nature of the crop. Hence no yield regulation is prescribed.

11.10.4 IMPLEMENTING AGENCY:

All silvicultural works such as cleaning, thinning, soil and moisture conservation works, planting operations, weeding and fire protection works will be carried departmentally or through JFM Committees or through FLCS.

SECTION-11.11: DEMARCATION & MARKING OF COUPES:

Main felling coupes will be demarcated in the same year as per procedure laid down under miscellaneous regulations. The details of the same will be given in [Appendix- XXIX](#)

SECTION-11.12: PREPARATION OF TREATMENT MAPS:

Treatment map will be prepared by the Range Forest Officer, under the supervision of A.C.F. I/c of the area. Treatment maps will include the following type of area.

A) Type-A: Protection Areas

- i) Areas having more than 25 degree slope
- ii) Areas susceptible for soil erosion
- iii) 30 mt. wide buffer on both sides of water courses.
- iv) Riparian zones and sacred groves

In these area no trees will be marked for felling.

B) Type B- Under stocked Areas:

The forests having less than 0.4 density are included in this category. They can be further classified into B1 and B2 categories, depending upon extent of natural regeneration. If natural regeneration is inadequate they will be put into B1 category and if the patch is more than 5 ha. in extent it should be properly demarcated on ground as well as on the treatment map as suitable for Artificial regeneration. All patches with adequate natural regeneration will be put into B2 category and shown as such on the treatment map.

C) Type-C areas-Advance growth and Young poles:

All patches in the coupe area having well established advance growth and natural pole crop should be demarcated and put in this category. If old plantations are existing they should be shown in type C area.

D) Type D Areas:

Well stocked area- Areas with crop density above 0.4 and tree growth in timber classes will be included in this category and will be marked accordingly.

11.12.1 MARKING RULES:

Marking will be done in the same year of main felling in which demarcation is done. Marking technique will be described in detail under the chapter of miscellaneous regulations. The important marking rules are as follows.

- i) All climbers which are not of medicinal value will be cut.
- ii) All pollarded trees will be marked for felling.
- iii) All live stumps of illicitly cut trees will be cut back close to the ground and dressing will be done.
- iv) All dead, dying, diseased and malformed trees will be marked for felling.

The marking rules for each type of area are as follows.

TYPE-A – PROTECTION AREA:

Only dead trees will be marked for felling unless they are required for site protection.

TYPE-B- UNDERSTOCKED AREA:

All edible fruit and flower yielding species shall be reserved from felling. The following trees will be marked for felling.

- i) All dead, dying and deceased trees will be marked.
- ii) All live and dead stumps
- iii) All but one vigorously growing coppice shoot per stool will be cut and will be marked for felling.

TYPE-C- (a) GROUPS OF POLES:

Tending of advance growth and thinning will be carried out upto the extent of the one third of the top height of the dominant pole intended to be retained. If old plantations are available suitable thinning regime for that age will be followed. Singling operations will also be carried out to retain one pole or coppice shoot per stool.

(b) TEAK PLANTATION:

Thinning operations will be carried out as per the thinning schedule.

TYPE-D-WELL STOCKED AREA:

All edible fruit and flower yielding trees will be reserved from felling. The following trees will be marked for felling.

- i) All dead, dying and malformed trees after retaining two dead trees per ha.
- ii) All live and dead high stumps
- iii) All but one vigorously growing coppice shoot per stool where the stem density is less and natural regeneration through seedling is inadequate. Otherwise coppice shoots should be marked for felling.
- iv) The over matured trees of gbh more than 120 cm. shall be removed if they are not likely to last upto the next felling cycle and silviculturally available.

SECTION-11.13: REGENERATION:

NATURAL REGENERATION:

Area containing good natural regeneration will be identified in the coupe and the same will be marked on the treatment map. The necessary silvicultural operations will be carried out to promote the regeneration.

11.13.1 ARTIFICIAL REGENERATION:

In the areas where there is inadequate regeneration artificial regeneration works will be carried out through plantations to fill the gap of inadequacy. A minimum of 625 established seedlings are required per ha to treat the area to be adequate in regeneration. A patch of minimum 5 ha. will be treated as adequate for plantation.

11.13.2 CHOICE OF SPECIES:

The choice of species will be mainly as per the suitability of the site. However, species like teak 50% in deep fertile and well drained soils shall be planted. The remaining 50% of the area may be planted with ain, bija, shisham, haldu, lendia, movai, char, aola, chinch, hirda, behada, bamboo etc.

SECTION-11.14: SUBSIDIARY SILVICULTURAL OPERATIONS:

A) *Subsidiary silvicultural operations* such as cut-back operations which includes, (i) removal of all badly damaged trees (ii) high stumps marked for felling but not felled (iii) all climbers except endangered species (iv) cutting back of coppice shoots where natural regeneration is sufficient and (v) cutting back of all malformed regeneration upto 15 cm. girth etc. will be carried out in the next year of main felling to improve the crop.

B) *Cleaning operations* which includes, (i) cutting back of all climber except endangered species, (ii) singling of coppice shoots by retaining one or two per stool, (iii) removal of all inferior species which interfere with the growth of teak and other important species (iv) removal of all damaged and malformed trees etc. will also be carried out in the next year of main felling to improve the crop.

C) *Thinning-* First thinning operations will be carried out in the 10th year of plantation, which will be mechanical thinning. Thinning schedule shall be prescribed to all the old teak plantations so as to achieve the main objectives.

SECTION-11.15: OTHER REGULATIONS:

11.15.1 Fire Protection:

Main felling coupes shall be protected from fires by providing strict protection measures through cutting and burning of the fire lines for a period of 5 years for all the plantations taken up. It will be worthwhile to involve JFM Committees in protection of this area by paying them the money earmarked for fire protection.

11.15.2 Closure to Grazing:

All the main felling coupes shall be strictly closed for grazing up to a period of 5 years from the year of main felling so as to allow the young regeneration to establish.

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CHAPTER – XII

WORKING PLAN FOR THE OLD TEAK PLANTATION (OVERLAPPING) WORKING CIRCLE.

SECTION – 12.1 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE

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 during the implementation of previous working plans. The total area allotted to this working circle is 1004.00 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. These forests occur in eight Ranges of Wadsa Forest Division. The total area included in this working circle is 1004.00ha. The Range-wise distribution of the area allotted to this working circle is given in following table.

TABLE -30

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	Porla	203.00	1.19	0.13
2	Armor	166.00	1.11	0.10
3	Wadsa	245.00	1.34	0.15
4	Kurkheda	219.00	1.36	0.14
5	Delanwadi	25.00	0.17	0.02
6	Malewada	25.00	0.09	0.02
7	Bedgaon	121.00	0.42	0.07
8	Purada	0.00	0.00	0.00
	Total	1004.00		

12.1.1 The statement showing the allotment of compartments to this working circle will be given in the **Appendix-XXX**

SECTION – 12.2:- GENERAL CHARACTER OF THE VEGETATION :-

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. 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 – 12.3 :- BLOCKS AND COMPARTMENTS :-

The details of blocks and compartments allotted to this working circle will be given in the [Appendix.XXX](#)

SECTION – 12.4 :- SPECIAL OBJECTS OF MANAGEMENT

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 – 12.5 :- SILVICULTURAL SYSTEM.

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 – 12.6 :- FELLING CYCLE :-

Thinning in the plantation will depend upon the age of plantation.

SECTION – 12.7 :- IMPLEMENTING AGENCY :-

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 – 12.8 :- TEAK PLANTATION CLEANING AND THINNING PROGRAMME:-

*Teak plantation taken during previous plans will be included in this category and treatment will be as per the prescription for old teak plantation i.e. cleaning and thinning will be done in the year as per sequence for that given existing old teak plantation. The sequence of cleaning and thinning is given in **Appendix No.XXXI***

SECTION – 12.9 :- REGULATION OF YIELD :-

Yield shall be regulated on the basis of area, though the annual coupes will be equal in extent, the annual yield is bound to vary because of variation in success of plantation. No regular yield is prescribed due to this nature of working circle.

SECTION – 12.10 :- ANALYSIS AND VALUATION OF THE CROP:-

12.10.1 STOCK MAPS :- The Stock Maps will be prepared in GIS cell in this office on the basis of Satellite maps under the Administrative control of Conservator of Forest, Working Plan Dn.1, Chandrapur

12.10.2 DENSITY :- Generally the crop is fully stocked.

12.10.3 AGE AND QUALITY :- Age of Plantation is taken from the plantation journal and other available record. The prescription of previous working plan will be included in this working circle. The site quality varies from III to IVa.

SECTION – 12.11 SILVICULTURE OF TEAK :-

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.

12.11.1 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-shoots. 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.

12.11.2 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 - 12.12 DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAPS AND MARKING TECHNIQUES

(i) Demarcation :-

12.12.1 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 :-

12.12.2 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.

12.12.3 Marking Techniques :-

12.12.4 The standard marking techniques which have been prescribed in the Chapter on Miscellaneous regulations shall be followed and adopted.

SECTION – 12.13 SUBSIDIARY SILVICULTURAL OPERATIONS :-

These operations shall be carried out departmentally and shall include the following.

12.13.1Cutting 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 and 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.

12.13.2Cleaning :- 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 and 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.

12.13.3 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.

12.13.4 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.

12.13.5 Mechanical Thinning :- Teak is traditionally planted at a spacing of 2m x 2m i.e. 2500 seedlings per hectare.

Year	No./ha. (for site quality –III)	Spacement
1 st Year	2500	2m x 2m
10 th year	1250(after 1 st thinning of removing alternate diagonal)	2√2 x 2√2 m

12.13.6 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.

12.13.7 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 . 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. A thinning cycle of 10 years have been prescribed to provide a clean bole of the plant.

12.13.8

Silvicultural Thinning :- This low grade thinning shall be done after 1st mechanical thinning carried out in 10th year of its formation. It will require the removal of all diseased, dead and moribund 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. This is needed to promote a mixed undergrowth beneath the crown, so that the soil is protected. When thinning is completed, all crowns should have as far as possible, a clear space all around them. The first silvicultural thinning will be at the age of 15 years and then after every ten years. However in poor site quality, it may be deferred if it is not corresponding a required basal area at that age with the yield table.

12.13.9 Removal :- The average diameter of the crop should be calculated, by taking all trees in plot (100 Mt x 40 Mt.). All suppressed, dominated and coppice should be removed first, if they are silviculturally available. While removing, following sequence may be followed:

- 1) non-teak coppice irrespective of species will be marked
- 2) coppice teak
- 3) non teak species of seed origin

4) Teak trees of seed origin

At the time of removal, the no. of stems to be retained in a girth class shall be increased by the no. it is falling short in higher girth class. The fruit trees will not be marked. 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-12.14METHOD OF EXECUTING THINNING.

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. At the same time basal area should be measured with the help of a wedge prism of BAF -0.5.
- III. Corresponding to age and site quality the number of stems per ha and their distribution girth/diameter classes will be obtained from the stand table. Comparing the actual data with this stand table , the number of stems to be retained in each diameter class will be obtained.
- IV. To carry out the thinning in field, the procedure given by Letter no. PLN/05/F-III-2874 Dt.2/9/1999, of Managing Director FDCM Ltd. Nagpur should be followed. The detail enumeration and marking list will be prepared and the same will be kept in record.
- V. At an interval of 5 years, the measurement of diameter and height will be recorded. Yield from thinning should also be recorded.
- VI. Coppice shoots will be cut unless they do not create permanent gap. Climbers will be cut except the endangered & threatened species. Dead and badly damaged trees will be removed.

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CHAPTER -XIII

WORKING PLAN FOR THE BAMBOO (OVERLAPPING)

WORKING CIRCLE

SECTION – 13.1 GENERAL CONSTITUTION OF THE WORKING CIRCLE

This working circle includes all the areas where bamboo, natural or planted, is present in workable quantity. Workable means that there are sufficient bamboo clumps which require independent working. Areas with scattered bamboo have not been included in this working circle. All the compartments of bamboo, which were not included in the previous working plan have been included in this plan. The total area of the working circle is 69624.10 ha and is spread over eight Ranges of the Division containing bamboo area 42088.38 ha. This includes 3663.95 ha. area old bamboo plantation is raised in various ranges of the division.

13.1.1 The territorial division should consider introduction of edible bamboo while undertaking bamboo plantations on experimental basis and various other native species of bamboo too should be tried.

13.1.2. The Range wise distribution of areas in this working circle is as follows :-

TABLE-31

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	Area of plantation
1	Porla	2679.82	15.68	1.70	315.00
2	Armori	2243.89	14.99	1.43	570.00
3	Wadsa	4500.53	24.62	2.86	719.00
4	Purada	12467.66	60.39	7.92	00
5	Kurkheda	5060.14	31.44	3.21	785.00
6	Delanwadi	5101.52	35.67	3.24	610.00
7	Malewada	18421.37	67.62	11.70	00
8	Bedgaon	20436.98	71.14	12.99	00
	Total	70911.91			2999.00

13.1.3 The statement showing the allotment of compartments to this working circle will be given in the **Appendix-XXXIII**

SECTION – 13.2 :-GENERAL CHARACTER OF THE VEGETATION

The general character of the vegetation in the area included in this working circle have been described in the respective non overlapping working circles. Here only the condition of bamboo in this

tract has been described in this chapter. The common variety of bamboo occurring in this tract is *Dedendrocalamus strictus*. This generally forms an under story in the better quality forest and occurs extensively. Difference in quality and growth are manifest as expected, in the large areas with varying drainage, soil sand and past maltreatment. Bamboo mostly occupies hill slopes and are dense particularly along nalas and moist sheltered slopes. There is a considerable degree of congestion in the clumps. Very few scattered clumps of katang bamboo (*Bambusa Arundinacea*) occur on the banks of Nalas. The regeneration is scanty in adjacent to the these areas due to its gigantic size. There is formation of a mat of rootlets around its clumps which prevents any arboreal shrubby or herbaceous growth in the vicinity of one to two meters. The bamboo raised by way of plantations or congested due to non attendance. The clump on the poorer soil are congested or culms tend to grow inside the clump due to hard soil outside.

SECTION – 13.3 LOCAL AND COMMERCIAL DEMAND

Bamboo is used for making tattas, baskets, temporary walls and great variety of other purposes by the local population and burads. The bamboo of the tract is in the vicinity of about 30 to 60 Kms. from Wadsa and Wadsa which are marketing places for bamboo. Apart from local consumption, Nagpur, Yeotmal and Nashik are the main consuming centers for bamboo of the tract. The local demand for bamboo is very limited. Hence there is a vast surplus of bamboo potential available in this tract. Presently, village communities exercise their right over entire forest areas, but the bamboo production potential is in excess of village community requirements for bonafide use. With a view to utilize the optimum potential of bamboo forest, its systematic working is of prime importance. There is no need of separating bamboo areas into nistar and commercial bamboo felling series. There should be only one type of felling series. To regulate rights of the villagers and make them enjoy their rights properly, a provision will be made in the terms of lease that lessee will make available bamboos for bonafide domestic and village industries requirements at a place and given period of time, as certified by the local range forest officer. The department is required to do the exhaustive exercise to assess the village and familywise bonafide requirement of the local people and the period during which it is required. Accordingly, the Nistar will be distributed by the forest department well in time to the local people either free or at the nominal rate so that they should not feel necessity of going into the forest and cut bamboo in the manner they like. Presently, people hardly take bamboo at the present Nistar rate. They bring them from the forest illicitly and damage the crop. On the fulfillment of the above condition, the departmental harvesting of coupes for Nistar should be stopped and all felling series should be worked by one agency, decided by the Government. The department will control as has been controlling in case of commercial felling series.

13.3.1 Bamboo harvesting will be carried as per the government guidelines and policy.

SECTION – 13.4 :- BLOCKS AND COMPARTMENTS

The details of allotment of compartment to cutting/felling series and sequence of cutting will be given in the [Appendix-XXXIV](#)

SECTION – 13.5 :- SPECIAL OBJECTS OF MANAGEMENT

The special objects of management of this working circle are as follows.

- (i) To harvest from all bamboo areas scientifically to get the maximum sustain yield.
- (ii) To meet the nistar demand of the local population and commercial demand of village industries.
- (iii) To meet the commercial demand of paper and pulp industries.
- (iv) To improve the crop to increase the potential of the areas.

SECTION – 13.6 :- METHOD OF TREATMENT

The crop will be treated on clump basis i.e. each clump will be treated independently as per the requirement. The bamboos are in great demand and it will be harvested under periodic thinning in the clumps. A cutting cycle of 3 years has been fixed as it has been found that the yield reduces considerably at a short rotation of 2 years 1st and 2nd year bamboo culms provide food and nourishment to the rhizomes under soil and should not be cut. They are also deficient in lignifications and are brittle and highly vulnerable to fungal attack. Only 3rd year culms are fit for harvesting.

SECTION – 13.7 :- CUTTING CYCLE

The harvesting of bamboo will be done on cutting cycle of 3 years. Each cutting series will be divided into 3 coupes viz. A,B,C and each one of the coupes will be worked annually.

SECTION – 13.8 :- ANALYSIS AND VALUATION OF THE CROP

13.8.1 STOCK MAPPING :- The bamboo areas in the compartment will be separately stock mapped and the extent of bamboo bearing areas will be shown in the stock map.

13.8.2 ENUMERATION :- 1% strip sampling method have been adopted for tree enumeration. The enumeration works have been started by the SOFR unit Chandrapur in the year 2008-09 under the supervision of Conservator of Forest, Working Plan Division No.1,

Chandrapur. The statement showing the number of stems per ha with distribution of stems among different species and girth classes.

SECTION – 13.9 :- REGULATION OF YIELD

It is regulated by area.

SECTION – 13.10 :- IDENTIFICATION OF AGE OF BAMBOO

Since the marking of bamboo is highly selective, it is necessary to distinguish, current year's previous year's and mature culms from one another.

13.10.1 CURRENT YEAR :- Culm sheath is present on lower half of the culm, branches are present throughout the length of the culm and bloom (white powdery dust) is present abundantly and comes off easily when touched.

13.10.2 SECOND YEAR :- Culm sheath absent, branches are present practically at all nodes, Bloom is patchy and comes off easily.

13.10.3 THIRD YEAR :- Culm sheath absent, branches are present practically at all nodes, white bloom is absent and it change in to blackish gray.

SECTION – 13.11 :- METHOD OF EXECUTING THE TREATMENT

The coupe due for working will be demarcated in April/May (before onset of monsoon) in the year in which they become due for harvesting by giving three geru bands at 15 cm intervals on the trees selected at intervals or by erecting poles. On the trees selected/poles, compartment number, coupe no. and name of cutting series will be written.

13.11.1 Soon after the demarcation, the entire coupe due for working will be thoroughly inspected by the R.F.O. and 10 percent checking will be done by an A.C.F. The inspection will be carried out by compartment and the area containing bamboo will be shown on the map. In this area 5 % enumeration of bamboo will be done and on this basis estimate of bamboo clumps will be made. As per the enumeration the estimates of various works and yield of bamboo will be made.

SECTION – 13.12 :- METHOD OF TREATMENT

The method of working are as follows :-

- (i) No harvesting works should be permitted between 15th June to 30th September i.e. no bamboo exploitation will be permitted during the monsoon season as this is a period of formation of new culms. As far as possible the cutting of bamboo should end by March when the culms are almost devoid of starch and therefore attract less insects borer.

- (ii) No clump should be considered fit for harvesting unless it contains more than 12 mature culms (one year as well as two year included).
- (iii) No culms below the age of two years will be felled.
- (iv) Following culms shall be removed from all clumps :
 - a) All dead, decayed and dry bamboo.
 - b) Culms whose half or more top part is broken or damaged.
 - c) Twisted or malformed culms.
- (v) In a mature clump the following type of culms (green and living) will be retained.
 - a) All current season's i.e. less than one year old culms.
 - b) From the rest culms equal in number to the current season's (i.e. less than one year old) culms or 8 whichever is more.

The remaining culms will be considered available for harvesting.
- (vi) The cutting height of culms will be between 15 cm to 45 cm above ground level i.e. above the first internode above the ground. The cut shall be slant with the sharp instrument.
- (vii) In case of any flowering, no culm from flowered clumps shall be felled in the year of flowering.
- (viii) Harvesting of bamboos shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two year old are retained on periphery for the purpose of support to the new culms.
- (ix) Following acts will be strictly prohibited.
 - a) Digging of rhizomes.
 - b) Lopping bamboo culms for fodder.
 - c) Use of tender bamboo culms for bundling.
- (x) Climber infesting with growth of bamboo clumps will be cut.
- (xi) After cutting, the debris will be removed away from the clumps and will be stacked at a distance not less than two meter away from the outer periphery of each clump.

- (xii) In order to facilitate working of congested clumps, wedge shaped opening will be created in the clump from outside to the center of the clump. The width of the wedge will not be more than 75 cms.
- (xiii) Felling will start from the center of the clump towards the periphery.
- (xiv) Clumps which have been dealt badly by the local villagers should be cleaned by the method mentioned in the item (iv) above. Such areas should strictly be closed to grazing for a period of two years. Besides this, to improve the condition of such clumps, digging half circular trench to the uphill side of size 60 cm x 60 cm and 1 to 1.5 meter away from the centre of the clumps is proposed to be taken. Besides, in the gaps, planting of rhizomes during rains should be taken.

13.12.1 Cutting should be supervised by a forest official knowing the rules of felling. Climbers infesting with growth of bamboo clump shall be cut. After cutting, the debris will be removed away from the clumps and will be stacked at a distance not less than 2 meter away from the outer periphery of each clump

SECTION -13.13 :- BAMBOO FLOWERING AND TREATMENT OF GREGARIOUSLY FLOWERED AREAS

It is hoped that during the operation of this working plan gregarious flowering of bamboo in this division may occur. Since in this process, bamboo dry simultaneously and as dry bamboo is the fire hazards, its quick removal is essential. Removal involves voluminous work and therefore, to carry out this operation advance planning and preparation is essential. As soon as the gregarious flowering occurs in any locality its extent should be found out and recorded in the compartment history form and also in "Divisional Note Book". The same should immediately be reported to the Conservator of Forest, Silviculturist and Dy. Conservator of Forests, Working Plan No.1. As soon as bamboo starts flowering gregariously, the entire area will be effectively closed to grazing and will be strictly fire protected for a period of 8 to 10 years from the year following the year of flowering. The dry culms, after seeding, should be cut and disposed of as soon as possible. After seeding a profuse regeneration of bamboo comes up in the following monsoon. It takes nearly 8 years for new generation to reach the harvestable size, but often it takes considerable more time.

13.13.1 After the gregarious flowering and subsequent death of old bamboos, the profuse regeneration of bamboo comes up. Many a times fallen seeds are attacked by fungus which destroys the seeds and in order to avoid fungus attack, a mild solution of fungicide may be sprayed over the seeds. The viability of the bamboo seeds is for one year and the seeds should be collected and spread manually in the deficient areas. It takes nearly eight years for new regeneration to reach the exploitable size, but often it takes considerably more time.

13.13.2 COLLECTION OF SEEDS AND DISPOSAL :- The fresh seeds of bamboo will be collected from the clumps. The seeds will either be sent to the silviculturist for storage and further distribution among various divisions or will be sown, if needed locally, in raised beds of standard size in the last week of May or first week of June. After the rains set in the bamboo seeds will germinate and in the months of October-November, these seedlings will be transplanted in the polythene bags. The seedlings so raised will be utilised for afforestation works and also for raising bamboo plantations.

13.13.3 Immediately after completion of seeding it will be necessary to remove all culms as they get dried. The removal may be done either departmentally or through the agency of Forest Labourers Cooperative Societies or else the standing coupes may be auctioned. The conservator of Forests, will take a decision in this regard.

13.13.4 TENDING OPERATIONS :- After completion of seeding it is essential to properly look after the young regenerated crop till clump formation. The following operations will be carried out in the natural regeneration of bamboo :-

13.13.5 (I) CROP OF AGE BETWEEN 1 TO 3 YEARS :- During this period the area will normally contain thick seedling crop and the clump formation does not start. For timely formation of clumps the following tending operations will be carried out.

- (i) The area will be thoroughly inspected and 0.8 meter diameter focii, at the rate of 300 per ha and distributed evenly over the whole area, will be formed.
- (ii) All the rank growth of grasses, weeds and even bamboo seedlings upto a distance of 1.5 meter all around the focii formed as above, will be cleared so that the growth of the bamboo seedling in the selected focii is not hampered.
- (iii) All climbers within and around the focal upto 1.5 meter distance will be completely removed.
- (iv) The whole area will be strictly protected from fire and grazing.

13.13.6 (II) CROP OF AGE 3 TO 8 YEARS :- During this period clump formation starts but the crop is yet immature for harvesting. During this period following operation will be carried out .

- i) All badly grown, twisted and damaged culms from the selected focii will be removed.
- ii) All weeds, grasses and climbers, within and around the focii upto a distance of 1.5 m will be completely removed.

- iii) Tree growth of species, other than teak, ain, shisham, bija, tinsa/tiwas, dhaora, haldu, karam, semal, mowai, and bhirra over topping the clumps, will be removed.
- iv) The whole area will be strictly protected from fire and grazing.

13.13.7 (III) CROP OF AGE ABOVE 8 YEARS :- When the crop age is 8 years, the clump formation is normally completed and clumps are mature enough for harvesting. The treatment during this period will be of the nature of harvesting-cum-tending. The felling rules already described in the earlier paragraphs, will be applied here too.

SECTION-13.14:- CYCLE OF TENDING OPERATION

The operation, as prescribed under Section-13 above, will be carried out annually. When it is not possible due to administrative reasons, these operations, except fire protection, will be carried out on alternate years or at the most in cycle of 3 years. This will be decided by the Conservator of Forests. The fire protection will be carried out every year and grazing will remain close till the completion of the clump formation.

SECTION-13.15:-Bamboo Plantation

This will be carried out in the 4th year as under planting in planted patches of main coupe.

13.15.1 Pre-monsoon Works :-

Demarcation of the patches suitable for existing bamboo plantations will be done in the year of demarcation of the bamboo coupe. Plantable patches not less than 5 ha. in extent of plantable area will bear separate demarcation. Pits will be dug at 6m x 6m and of size 45 cm x 45 cm negotiating the overwood and bamboo clumps etc. to bring up the bamboo population to sufficient extent. Pre-planting operations will be carried out in the year of harvesting the bamboo in the coupe. Planting operations will be carried out in the rains subsequent to bamboo harvesting. In case of under-planting the bamboo, it will be done in the 4th year of main planting. Rhizome planting can also be done from the rhizomes grown in nurseries.

13.15.2 The coupe will be demarcated soon after the rains in the year in which the pre-monsoon works are to be undertaken by erecting posts at suitable intervals. This demarcation will exclude the working coupes of the main working circle to which this working circle overlaps to avoid confusion. On the posts, compartments number, coupe number and name of the planting series should be written with black paint.

SECTION-13.16:- METHOD OF EXECUTING THE WORKS.

(a) Collection of seeds :

13.16.1 The seeds as far as possible should be collected directly from the forest or obtained from Silviculturist. The collected seeds after cleaning can be stored in dry sealed tins or in gunny bags. Normaly viability of bamboo seed is one year. There are about 55,000 seeds in a kg. Before seed sowing, the viability of the seeds should be tested by carrying out tetrazolium test which includes the putting of cotyledons in solutions for 24 hours. The viable seeds become red coloured. .

(b) Nursery technique :

13.16.2 The nursery operations will start two years in advance of the planting operations. The following operations are involved.

i) **Preparation of mother beds :-** After thorough cross ploughing the area upto a depth of 30 cm. raised beds of size 12.20 m x 1.20m will be prepared in the month of March-April after allowing the ploughed soil to weather for about a month. All clouds on beds should be broken properly before sowing. The height of the beds may vary from 20 cm to 30 cm. The space to be left in between two beds should facilitate sowing watering, weeding ad later on pricking out of the seedlings.

ii) **Sowing :-** As soon as the seed is available May-June, it should be sown in lines in the bed, lines being 10 cm apart. About 1 kg. seed will be required for a bed.

iii) **Germination :-** After the rains set in, the germination starts within 6 to 7 days and is completed within 3 weeks. Germination is about 60 to 80 %.

iv) **Transplantation :-** As soon as the seedlings are 3 to 5 cm tall, they should be pricked out from the mother beds and transplanted in polythene bags filled with mixture of soil, sand and cow dung manure in the ratio of 1:2:1. At least two to three seedlings should be transplanted together in a bag as it helps the early formation of clumps. A minimum of 10,000 polythene bags can be prepared in this way from one bed. The mixture in the polypots should invariably from soil adjacent to bamboo clumps which contains VAM i.e. Vesicular Arbiscular Mycorrhiza which helps in the healthy growth of rhizome.

v) **Watering and shifting:-** The seedlings so transplanted together in a bag as it helps in the early formation of clumps. A minimum of 10,000 polythene bags can be prepared in this way from one bed.

(c) Pre-monsoon works :

13.16.3 Immediately after demarcation of the areas at the close of rains a treatment map will be prepared indicating the areas suitable for

bamboo under planting. The premonsoon works will then be taken up in such areas. The include the following works :-

- 1) Clearing of lines :- One meter wide straight lines should be cleared by cutting all brush wood and under growth at intervals of 6 meters over the area. The established regeneration of important tree species such as teak, ain, bija, shisham, haldu, dhaora, bhirra, tinsa and tiwas falling on these lines should not be removed.
- 2) Digging pits : The pits of size 45 cm x 45 cm x 45cm should be dug on these cleared lines at a spacing of 6 m x 6 m.
- 3) Soil conservation works :- All gullies should be plug using the cut brush wood.
- 4) Refilling of pits :- After the soil gets sufficiently weathered the pits should be refilled with the excavated soil in the month of April. To avoid possible attack of seedlings by white ants a small quantity of 10% B.H.C. powder (about 5 gm.) should be mixed thoroughly in the soil before refilling the pits. About 15 cm.pit should be left unfilled to avoid attack by wild animals like wild bore.

d) Planting operations :-

13.16.4 After the first good monsoon showers are received and the soil gets properly soaked upto a depth of 30 cm the nursery raised bamboo seedlings in polythene bags should be planted in these pits after removing the polythene bags. Care must be taken to see that the buds or rhizomes do not get hurt while transporting and planting the seedlings. The rhizome portion should only go completely below the ground level. The soil should be packed thoroughly round the plants and sloped so as to avoid water logging, care must be taken while planting in pits.

e) Weeding operations :-

13.16.5 Weedings are necessary to save the plants from suppression for first 3 years. In the first year 3 weedings are prescribed. The first weeding should be carried out by the mid of July. Along with this weeding replacement of casualties should also be done. The second weeding should be carried out by the mid of August and the third weeding should be completed by the end of October. The plant should be clean weeded to a distance of 45 cm all round by uprooting, Along with the third weeding it is necessary to do mulching. It is generally seen that mulching work is neglected with the result that moisture conservation in the soil is adversely affected. The soil should be heaped around the plant at the centre. Saucer helps in accumulating the late rain water which is very useful for the growth of shallow rooted bamboo. These saucers should be broken in the beginning of rain next year and remade at the last weeding.

13.16.6 In the second year two weeding should be carried out. The first weeding should be carried in the month of July and along with this weeding casualty replacement should also be done. The second weeding should be carried out in the month of October.

In the third year only one weeding should be carried out in the month of August.

f) Tending Operations:

13.16.7 All climbers within or around the plants up to a distance of 1.5 meter will be completely removed in the sixth year.

SECTION -13.17 :- GROWTH OF SEEDLINGS AND DEVELOPMENT OF CULMS AND CLUMPS.

In the first year the seedlings develop in to thin, wiry stem, bearing single foliage leaves arising alternately at the nodes. The stem is sheathed by the bases of the leaves. Meanwhile fibrous adventitious, roots develop from the base of young shoot. Successive pointed buds are produced in the rhizomes. From these are, developed branch rhizomes which curve first downwards and then upwards and thus successive shoots arise deeper down. Successive shoots as also buds and rhizomes from which they arise become larger and larger. The earlier shoots are thin, wiry and grass like but subsequently a stage is reached when woody culms are produced. The transition is gradual.

13.17.1 The time taken to form normal culms depends on conditions of growth. Under artificially raised conditions and with regular weeding the stages are -

3rd Season : Whippy culms

4th Season : Fair sized culms

8th season : Large enough bamboos to permit cutting of 1 or 2 culms per clump.

The normal season at which new culms are produced appears to be July to September.

13.17.2 Maturity :- A clump is said to have attained maturity when it commences by formation of new branches to the rhizomes and more new culms are produced every year. This increase goes up to a point. Investigation of F.R.I. on all India basis have shown that the life of a culm is about 9 years. (varying from 4 to 14 years).

SECTION-13.18:- INJURIES DUE TO INSECTS AND THEIR CONTROL

13.18.1 The insects known to attack the bamboo culms are *Estigmina chinensis* (Chrysomelidae colioptera), which attack new clumps and make galleries inside the internodes and *Cryptotrachelus*

longipes which is responsible for destroying the growing terminal bud causing branchy growth. The damage caused by insects are not reported so far in this tract.

13.18.2 The attack of these insects can be controlled by taking up the following measures

- i) All the affected culm should be cut and burnt during winter when the insect hibernates,
- ii) To cause light ground fire to run through the infested areas in winter as the insects hide in the debris and
- iii) Taking advantage of the insectivorous birds.

SECTION – 13.19 :- OTHER REGULATIONS

13.19.1 FIRE PROTECTION :- The new shoots of bamboo are badly affected by fire and therefore, bamboo areas will be protected completely from fire. Fires cause extensive damage to the new shoots of bamboos and, therefore, these areas will be completely protected from fire.

13.19.2 GRAZING :- These areas should be protected from grazing specially after flowering and in the rainy seasons in which the recruitment of new culms will take place.

13.19.3 Scattered Bamboo Area Management :- The successful bamboo plantations will be specially treated to improve the quality, composition & condition of bamboo. The list of such bamboo plantations will be given in the draft working plan. The list of such bamboo plantation area will also include the scattered bamboo areas in which bamboo clumps are less than five hectare. The main objective is to improve the quality, quantity and yield of bamboo. Interfering trees in the bamboo clumps will be removed whereas the independent sound trees to be retained. Such bamboo plantation areas will be ploughed in between bamboo lines along the contour. And seeds of neem, gliricidia, sitafal, moha, karanj & other fruit trees to be planted on the ridges of these contours. The entire area will be rigidly be protected from fire.

13.19.4 The area included in this group will be divided into three sections and each section will be harvested every year & the yield of bamboo from these areas will be reserved for distribution as nistar. The details of these areas and sequence of working will be given in the [Appendices-XXXIV](#)

CHAPTER XIV

WORKING PLAN FOR NON-WOOD FOREST PRODUCE

(OVERLAPPING) WORKING CIRCLE

SECTION – 14.1 GENERAL CONSTITUTION OF THE WORKING CIRCLE

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 157326.33 ha. The non-wood forest produce includes both non - wood forest produce (NWFP) and also the medicinal plants found in this tract.

SECTION – 14.2 MINOR FOREST PRODUCE OF THE TRACT

A. MINOR FOREST PRODUCE

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.

14.2.1 The important minor forest produce, found in this tract, are Moha flower and fruits, Tendu, Myrabolans, Gum, Broom grass etc. The statement showing stems per ha and their distribution in different girth classes of important species will be given in the [Appendix.XIX](#)

The recorded yield of NWFP from the tract is shown below:-

TABLE-32

Minor Forest Produce	2003-04	2004-05	2005-06	2006-07	2007-08
Moha flower	232.92	311.33	633.3	9087.57	3780.70
Hirda	69.83	-	-	1627.74	455.83
Behada	-	-	-	90.22	-
Aonla	-	-	-	4.52	-
Amaltas	-	-	-	0.15	-
Biba	--	-	-	0.05	-
Rohan flower	-	467.23	308.40	-	85.00
Tendu leaves	42468.80 S.B	37735.31 S.B	38634.71 S.B	37728.52 S.B	42180.28 S.B

B. MEDICINAL PLANTS :-

14.2.2 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.

14.2.3 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 Organization (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.

14.2.4 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.

14.2.5 For sustainable and equitable development of medicinal plants it has been realized 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 an 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 Program for benefit sharing to alleviate poverty of local people/tribals.

14.2.6 The important medicinal plants available in this tract which are being identified during the process of enumeration will be given in **volume-I page No.XXIX**

14.2.7 Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain invariably the list of the following in the division.

- a) A list of Red data plants of Maharashtra vis-vis that of the district in which the said forest division fall.
- b) A list of endemic plants of Maharashtra vis-à-vis that of the district in which the said forest division fall.
- c) A list of flora (Published by BSI) of the district in which the said division fall, highlighting the flora of the division, most traded medicinal plants, and traditionally used medicinal plants along with their trade name, Marathi name and Local names.

14.2.8 For better scientific management of the existing NWFPs in the division Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should strictly follow the following guidelines.

- a) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain the record of NWFP harvested legally/illegally from the forest along with the quantities and the collection charges paid to the labourer from 10 year before and after, the starting of working plan.
- b) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should select the representative area, in each beat comprising of around one ha and continuous efforts be made by the territorial forest officers to visit this plot every month and to identify and record the occurrence of flora along with flowering and fruiting periods.
- c) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should get the prescribed in working plan regarding selection of Plus Trees/stand/seed plot of trees, climbers, shrubs, herbs as well as rhizome and tuber species of NWFP/ medicinal plant/commonly used by the local people for their livelihood and food vegetable, and commercially traded in Maharashtra.
- d) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should collect the information regarding all types of forest produce, their

quantities and the sell price during the weekly bazar days throughout the year during the working plan period in the division. The help of local schools situated at bazaar places be taken to collect the said information and prescribe a system of recording, reporting, collecting, documenting information at weekly bazaar places, at Beat, Round, Range and Division level.

- e) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should collect and document the traditional knowledge about the use of Wild plants/Animal product by the locals/Tribal as traditional medicine/food/fruit/vegetable etc. etc.
- f) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should engage all the Vanmajurs and Forest Guards to collect minimum 100 Kgs of seed in a year of most traded and economical important medicinal plants and use the same for bush sowing/sowing in vacant areas in the beat, without involving any cost and arranging SHRAMDAN at least once in a day as prescribed by 25th April, 2003 G.R. regarding JFM.
- g) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain a register at every Beat, Round, Range and Division level noting the present unscientific and destructive harvesting practices and to collect the information regarding correct scientific harvesting of NWFP for sustainable production from various journals, institutes within and outside Maharashtra State (Like IIFM Bhopal, CIMAP Lucknow, ICFRE, Dehradun etc.)
- h) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain a register at every village level regarding the domestic consumption of NWFP family wise and computerized programmed be prepared at state level so that the consumption of NWFP can be accurately assessed and corrective measures to streamline the production as a action point under Bio-diversity Act 2003.
- i) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain a register at Beat, Round, Range and Division level regarding names of barefoot botanists and field taxonomists, traditional and educated vaidyas along with their names, address, phone numbers, E-mail addresses etc. etc.
- j) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should maintain a register of all the vendors, purchasers, manufacturers, stockiest of NWFP including medicinal plants by prescribing fees and format as being followed in Thane Circle.
- k) Dy. Conservator of Forests, Wadsa Forest Division, Wadsa should prescribe a register to be maintained by the purchaser at every collection center having following information, viz. serial number, the full name of the collector of forest produce, approximate place of collection, village, name of forest produce, quantity, rate at

which F.P. sold to vendor/purchaser, name of purchaser, and all other forward linkages.

SECTION-14.3 :- SPECIAL OBJECTS OF MANAGEMENT

As per the National Forest Policy, 1988 the proper utilization of Non Wood Forest produce (NWFP) 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 NWFP 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 NWFP.
- 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 NWFP and medicinal plants.

SECTION- 14.4 :- METHOD OF TREATMENT

(1) MOHA

(i) MOHA FLOWER :- USE AND NUTRITIVE VALUE

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.

14.4.1 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.

14.4.2 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.

14.4.3 Besides this, moha trees have an important place in tribal folk lore and religious belief. For example, moha flowers are used to forecast rain and moha tree is worshiped in the form of deity called "Mahugorla" in parts of Bastar District of Madhya Pradesh.

14.4.4 The madias prefer to bury or cremate their dead bodies under a Moha tree.

ii) MOHA FRUIT :

14.4.5 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.

14.4.6 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.

14.4.7 Crude oil has deep color, 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.

14.4.8 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.

14.4.9 ISI standards prescribed for Moha oil are as follows :-

TABLE – 33

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

14.4.10 YIELD :- Moha tree starts bearing flowers and fruits between 10th to 15th 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.

14.4.11 Result obtained are as given below.

TABLE - 34

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

14.4.12 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.

14.4.13 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.

14.4.14 MARKET :- The collection of moha flower and seed is done by the tribals and purchase of the same is done by the TDC.

14.4.15 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

14.4.16 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.

14.4.17 YIELD :- The distribution of such trees in different girth class will be given in the [Appendice-XXXV](#) 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.

14.4.18. TAPPING RULES :- The rules for gum tapping prescribed by the FRI, Dehradun 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 tapped 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 fiber. The lower surface of the blaze should be slightly slopping outwards to avoid logging of gugal in the blazed pocket in case initial blazing is done by adze.
- f) The gugal 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 freshening may be done fortnightly intervals up to May. Thus 12 freshening 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 freshening. 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 – 35

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 7th 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.

14.4.19. 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.

14.4.20. AGENCY :- All operations will be carried out either through FLCS or the agency decided by the Government.

14.4.21. 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.

14.4.22. 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.

14.4.23. TENDU

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.

14.4.24. YIELD :- The Revenue realized during the last ten years will be given in the [Appendix-XXXV](#)

14.4.25. 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.

14.4.26. FORMATION OF UNITS :- The Wadsa Divn. is divided into 22 units/groups, which is having a target of 41611 Standard Bags.

14.4.27. 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 lump sum system was adopted. In the new system there is reduction in illicit cutting of tendu trees. 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.

14.4.28. 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.

14.4.29. 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

14.4.30. 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 disorder. Dikamali and Nirmali fruits are used in chemicals and other industrial uses.

14.4.31. YIELD :- So far no study has been conducted to know the yield trees of such species.

14.4.32. 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.

14.4.33. 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.

14.4.34. MARKET :- Market should be surveyed and recorded so that in case of departmental working the same could be used.

14.4.35. OTHER REGULATIONS :- The details list of such species should be prepared and maintained at beat, round and division level.

V. BROOM GRASS

14.4.36. USE :- This grass is used in preparation of broom which is usually used in houses. It is a seasonal crop and localized one.

14.4.37. YIELD :- So far no study has been conducted to assess the yield of this grass.

14.4.38 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.

14.4.39 AGENCY :- The unit will be sold by calling tenders.

14.4.40 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.

V. SABAI GRASS (*Eulaliopsis binata*) :

14.4.41 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.

14.4.42 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.

14.4.43 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 :

14.4.44 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.

14.4.45 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.

14.4.46 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.

14.4.47 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.

14.4.48 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.

14.4.49 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 – 14.5 :- RESEARCH WORKS

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 Wadsa and Chandrapur Districts. Over 150 such plants have been identified so far.

A list of such medicinal plants will be given in the **Volume-I page No.XXIX**

SECTION – 14.6 OTHER IMPORTANT RULES

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 Minor Forest Produce shall be approved by the Conservator of Forests.
- (c) The Range Forest Officer of the respective Range shall issue the passes for collection of M.F.P. to the leasee and keep records of the collection etc.
- (d) The minor forest produce lease units shall have distinct boundaries.
- (e) M.F.P. 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 minor forest produce.

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CHAPTER-XV

WORKING PLAN FOR JOINT FOREST MANAGEMENT **(OVERLAPPING) WORKING CIRCLE**

SECTION-15.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE

Joint Forest Management (Overlapping) Working Circle covers entire area of 157326.33 ha. of the Wadsa forest division. The area is over burdened with heavy cattle and human population and is subjected to biotic pressure to meet the requirement of fodder, fuel, small timber and timber. Illicit felling and grazing is more common. Cutting of young pole crop for the purpose of firewood and poles and selling the same in the semi-urban areas is common feature to earn the daily wage by the local poor and unemployed people. Control of these illegal activities and protection of forest and wildlife is become a difficult task in the recent past. The staff available for the purpose of protection of forest and wildlife is very meager when compared to the extent of area. Encroachments in forest area are also a common feature and from 1972-78 about 4606.93 ha. and from 1978-2009 about 1696.33 ha. area was encroached. In totality about 6303 .26 ha forest area was encroached as per available records of the Division. Due to presence of Naxal activities the staff and officers of this division had difficult in control over these activities. Under these circumstances, for the better protection and management of forest resources the joint forest management is one of the best options left with the forest department.

15.1.1 PRESENT STATUS OF J.F.M. IN WADSA DIVISION:

Since 1992 a total of 195 Forest Protection Committees are formed in Wadsa Division, and about 44497.34 ha. of forest area has been handed over to them for the protection and management of the area. under the provisions of Government Resolution No.SSL/1091/C.N.119/D-11 dated 16.3.1992. During the implementation of World Bank funded Maharashtra Forestry Project, the JFM scheme got an impetus and from 1993 onwards monetary support was provided to the villages under entry point developmental works such as construction of samaj mandir, gobar gas plants, drainage and sanitary works, etc. to win over the people. In addition to this soil and moisture conservation works, construction of forest tanks etc. were also taken up to provide employment opportunities. People are very conscious about their rights and concessions and also earning employment .It is very important to establish close working relationship with the local people so as to achieve the goals of JFM.

15.1.2 Wadsa Forest Division is geographically situated in northern part of Gadchiroli Forest Circle. The forest area of Wadsa division is 1566 sq. km. comprises of Teak, Bija, Ain and other valuable species. Over the years the tribal of these areas have protected these valuable forest species. By intensive patrolling, regular beat inspection naka bandhi programme and by taking the help of J.F.M. Committee valuable forest well protected from encroachment, illicit felling, fires and etc.,

In the year 1988 new forest policy was declared by Govt. of India and this new forest policy was given stressed on a community forest management. In Wadsa Division there are 195 JFM committees adjacent to forest area. The committees were allotted to 44497.34 ha forest area for protection and development activities. The committees' are coming forward to protect and develop forest allotted area. Some of the forest committees received award under Sant Tukaram Scheme at District and State Level during the period of 2006-07 to 2010-11

Result of Implementation of JFM Committee:-

- 1) Soil & moisture conservation: - Nala Bunds, Stone Bunds., Soil Bunds, Cement Bunds and other soil and moisture conservation activities carried out by various forest protection committee in there allotted forest areas. The material required for various activities carried by forest protection committee are to be collected by following rules and regulation prescribed by State Govt.
- 2) Forest Protection :- There are various formation of groupe / batches for protection of allotted forest area by JFM committees. The groupe includes male and women members. There is a patrolling records maintain by is committee. If there is any illegal activities found in a patrolling then the action would be taken against accused persons with the help of forest staff. The programme of the patrolling was published on public placed and it is strictly followed by committee members. decided the batches and batches of members are prepared for protection work. A quarter patrollis programme is prepared and displayed the public places. Many committees have seized material, vehicles and confiscated to government.
- 3) Fire and forest protection :- As per working plan norms, there are various types of fires lines (Class-I, II, & III). The special fire lines scheme prepared at range and division level it is submitted to C.C.F. Office, and permission granted by same office. As per fire lines scheme, the work of cutting and burning of lines was given to concern forest protection committees and committees members are carried out fire cutting and burning work in there allotted forest areas. The committee members are taking every care to protect the forest from

fires. Incidentally if there is incidence of forest fires then that is to be extinguish is by committee members. At the time of collection of Moha flowers and other NTFP, the every care is taken to clear the land by fire and it should not be spread to other place.

- 4) Forest Encroachment banned: - The Committees members are taking every care to banned encroachments on forest land and if there is any incidence of encroachment then that to be evicted by taking help of forest officers. No encroachments were noticed after the formation of JFM committee
- 5) Illegal grazing banned: - The villagers were appraised with ill-effects and losses due to heavy grazing by domestic animal. The grazing is totally banned in closed areas. The cattles were allowed to graze in reserved areas. Some times the agricultural fields are used for grazing purpose. Stall feeding is also necessary to protected the forest from illegal grazing.
- 6) Wildlife protection :- The committee members have effectively controlled the illegal hunting. The hunters are not allowed to camp in the village area. The committee member protected various type of birds verities, bio-diversity and various type of wild life species in schedule-I to Schedule-VI list. The area is well protected by forest committees members. There is citation of many endanger wild life and wild animals species like as Panther, nilgai, sambar, chital wild sloth hare.
- 7) Water holes for wild life and birds :- Vantalao's and water tank are constructed in the JFM area which supplies water to wild animals and birds. The JFM committee has constructed water hole through people's participation, at the free of cost.
- 8) People participation :- All the committee members are highly enthusiastic in all development and protection activities. The member are taking active part in protection and development of forest. All the members are present on going works.
- 9) Women participation :- As per Govt. policy the participation of women is essential in forest protection and other development activities carried out in allotted areas. There are many Women Saving Grope which are taking activities part in Gramsabhas and other other development activities.
- 10) Fuel consumption (other than from forests) :- Many committee members have gobar gas, LPG Gas and no smoke chulhas. Women members use the dried cakes prepared from cow-dungs. The people used

fuel wood from babul trees from the agricultural fields and some times they are taking fuel wood as nistar from Govt. The committees members are persuaded to use non conventional energies and solar energies to minimize use of fuel wood.

- 11) Record keeping :- Up to date record is kept by committee members e.g. meeting register village fund (member fee) register, visit book, nistar supply register, fuel wood supply register, katipet supply register, and cash book, Saving account monthly quarterly reports, eco- socio, status report, MOU registration etc.
- 12) Innovation Ideas :- committee believes in development of village through JFM. A schemes planned to prepare wormy compost fertilizer etc. The committee are coming forward to take agarbatti preparation from bamboo, lac production from palas and other trees, the collection and disposal of NTFP through saving groups. The use of natural resources are taken for forest and village development.
- 13) Awareness :- JFM committee organizes different programmes like work forestry day, environment day and plans with officers and dignitaries and thereby creates awareness among villagers. These programmes are given publicity through news papers. It creates awareness among committee members. JFM committee organized essay competition and speeches on 'forest and wild life protection and conservation'.

15.1.3 Information regarding J.F.M. Committee received award

Year	Name of J.F.M. Committee	Sant Tukaram Award	Award Price
१	२	३	४
2006-07	Dongargaon (Armori Range)	District Level Third Prize.	7500/-
2007-08	Kondhal (Wadsa Range)	District Level First Prize.	25,000/-
	Kondhal (Wadsa Range)	State Level Third Prize.	3,00,000/-
2008-09	Kondhal (Wadsa Range)	District Level First Prize.	25,500/-
	Naroti Chak Porla Range	District Level Third Prize.	31,500/-
2009-10	Kondhal (Wadsa Range)	District Level First Prize.	56,000/-
		State Level Third	

		Prize.	
	Naroti Chak Porla Range	District Level Second Prize.	36,000/-
2010-11	Kondhal (Wadsa Range)	District Level First Prize.	District Level First Prize.
	Naroti Chak Porla Range	District Level Second Prize.	31,000/-
	Shioni (Delanwadi Range)	District Level Third Prize.	11,000/-

15.1.4Details of lac cultivation and attempts made in this area, present status as well as future proposals:-

In the jurisdiction of Wadsa Forest Division, the lac production and management training were given to 40 J.F.M. Committee during the year 2009-10 to 2010-11. Details are as under:-

Sr.No.	Range	Name of J.F.M. Committee	No.of Trainees
1	Kurkheda	Bijapur	39
		Dhamditola	28
		Joshitola	37
		Gongoli	29
		Palasgaon	40
		Khairi	36
		Jambhulkheda	36
		Khedegaon	55
		Yerandi	50
		Gewardha	50
		Chandagad	50
		Bamhni	50
2	Wadsa	Sirpur	110
		Kharmattola	68
		Boldha	19
		Kasari	23
3	Armori	Wadegaon	55
		Thothebodi	31
		Pettukum	25
		Ravi	50
		Koregaon	50
4	Porla	Mohtola	48

		Lohara Kosbi Churmura Belgaon Naroti Mal	60 175 49 50 36
5	Delanwadi	Nagarwahi Wasi Palasgaon Uradi Mendha Dongargaon Kosi Sonsari	75 125 53 125 50 37 54 56
6	Purada	Dalli Kumbhitola Sonsari Katangtola Lawari Dongargaon Kotaldoh Chikaldhokda Lendhari Yedapur Khedegon	20 35 16 25 58 50 17 55 49 50 50
7	Malewada	Khobramendha Updalli Jaisingtola Sindewahi Deosara Murmadi Ranwahi	65 22 40 31 50 51 51
8	Bedgaon	Bogatola Zagadwahi Betkathi Dawandi Tutekannar Kale Bharritola Ghugwa Kaimul	39 30 41 51 16 36 43 50 35

15.1.5 SPECIAL OBJECTS OF MANAGEMENT:

The main objectives of management are as follows:

- 1) To rehabilitate and regenerate the degraded forest areas through JFM.
- 2) To check soil erosion and to conserve water through JFM
- 3) To maintain an optimum level of carrying capacity in the forests for the purpose of grazing.
- 4) To Protect the forests from illicit felling, and
- 5) To utilize the degraded forest area for productive purposes in order to meet the demand for fuel, fodder and timber and ultimately achieving the integrated development of adjoining villages with the help of other development agencies of the government.

15.1.6 BASIS OF THE JFM & ROLE OF FOREST DEPARTMENT:

The Government of India through Ministry of Environment and Forest has issued detailed guidelines for the implementation of JFM program in all the states vide its circulars No.22-8/98-FPD-88 dated 11.02.2000 & No.22-8/2000 (FPD) dated 21.02.2000. In continuation to these guidelines the Government of Maharashtra has also issued Resolutions through Revenue and Forest Department vide G.R.No.SLF-1091/C.N.119/F-11, dated,16.03.1992 and G.R.No. MSC/2000/ C.N. 143/F-1 dated 25.04.2003 for the effective implementation of JFM program. The Government of Maharashtra has realized that, it is not possible to protect the valuable forests from illicit felling and illegal trade without active participation of the local people living in and around the forest areas.

In areas where the villagers are willing to participate in JFM plan, the Dy. Conservator of Forests shall prepare a micro plan for all such areas to be tackled as per the government instructions issued vide G.R. dated 16.03.1992. The micro plan prepared for the particular village shall match with the prescriptions of the working plan so far as the village is concerned. In no case Forest (Conservation) Act, 1980 shall be violated while working. The micro plan shall be sanctioned by a committee headed by the Conservator of Forests.

The execution of works and control shall be exercised strictly in accordance with the guidelines issued by Government of India through Ministry of Environment and Forests vide letter No.6-21/89-FP dated 01-06-1990 and the Government of Maharashtra

G.R.No.SLF-1091/C.N.119/F-11 dated 16.03.1992 and also other guidelines, circulars issued from time to time.

The guidelines issued by the Government of Maharashtra emphasizes on the following aspects,

- i) The degraded forests in and around the villages and hamlets shall be selected for the regeneration, protection and management purposes. All the families in these villages will be the members of the JFM committee.
- ii) The JFM committee members shall be responsible for the plantations taken up by the department and their protection in and around their villages.
- iii) JFM committee shall appoint a executive committee who will prepare a plan of operations to be taken up and implementation of the same. However all the policy decisions will be vested with the JFM committee.
- iv) Distribution of benefits from the regenerated areas among all the member families as decided by the committee.

However the details circulars and G.R.s issued state and central Government given in the Appendix-XXXVII

The micro plan and JFM scheme shall be implemented through forest department are any other agency approved by the Government of Maharashtra.

15.1.7 ROLE OF WOMEN IN JFM:

The Government of India in its G.R. dated 21.02.2000 has stated that at least 50% of the members of the JFM general body should be women, and the presence of 50% women members is a prerequisite for holding general body meeting. Besides this, 33% of executive committee members should be women. These instructions shall be strictly complied with while implementing the JFM.

15.1.8 AREA OF OPERATION:

Initially the area of operations of JFM was restricted to poor and degraded areas of the forests. However, afterwards it was extended to good quality forest areas.

15.1.9 REGENERATION OF FORESTS IN JFM AREAS:

As per the objects of management, the degraded forest areas near the villages are to be regenerated through participatory involvement of villagers .At the same time their needs of fuel, small

timber and fodder for cattle also should be solved through their own cooperation . The regeneration operations in such areas shall be highly selective and site specific in nature. For successful management of such areas both the i) natural and ii) artificial regeneration methods can be adopted.

i) Natural Regeneration: In areas wherever the good rooted stock is available, the aided natural regeneration activity is to be taken up to take the advantage of existing rooted stock by carrying out the following operations:

- a) Demarcation of the area is to be taken up by digging a TCM around the whole area selected for JFM.
- b) All the live stumps/pollarded stems shall be thoroughly cut back to ground level and stump dressing is to be done with axe.
- c) Climbers such as Kukud ranji (*Calycopteris floribunda*), Eroni (*Zizyphus oenoplia*), Chilar (*Ceasalpinia ecapetala*), chilati (*Mimosa hamata*), Chilati badi (*Acacia torta*) shall be removed to facilitate the growth and development of existing trees.
- d) Carry out singling operations of all the coppices by reserving one leading shoot per stump.
- e) Close the area for grazing and other biotic interference at least for a period of five years.
- f) Provide fire protection of the areas for better regeneration of grasses through natural dispersal of existing grasses.
- g) Provide complete protection of the area manually to prevent any kind of illicit felling for poles, firewood and grazing
- h) If badly damaged/congested bamboo clumps are available in the selected JFM areas, the same are to be cleaned by removing malformed, twisted and dried bamboo to promote the growth of new culms.

ii) Artificial Regeneration:

In case of the areas selected for JFM are blank, eroded and poor in rooted stock the artificial regeneration activities shall be taken up to provide the green cover to the area, to prevent the soil

erosion, to conserve the moisture, and to brought the area under sustainable management to meet the demands of firewood, small timber and fodder for cattle. The following operations are to be taken up for the successful regeneration through artificial plantation with people's participation.

- a) Demarcation of the area selected for JFM are to be carried out by providing TCM around the site.
- b) The treatment map is to be prepared by jointly inspecting the area by RFO/ACF and committee members.
- c) The treatment map shall be self-explanatory with all the details such as soil type, gradient, type of erosion, situation of existing gullies/nalas, the species of trees/plants, shrubs, grasses etc. that are naturally growing,
- d) Site-specific plan/micro plan is to be prepared showing the requirement of species, spacing to be adopted, and the type of SMC works to be taken up etc.
- e) In case of good soils 50% of timber species, 25% fruit & flower yielding species of NTFP (as per the choice of committee), 25% fuel and fodder yielding indigenous species are to be planted strictly.
- f) In open areas the spacing of 2 x 2 mt. is to be strictly followed to have more survival percentage of trees at the end of completion of the scheme.
- g) Care is to be taken to see that planting is not done under direct shade. This may result in poor growth and ultimate death of seedlings planted.

In case of shortage of departmental funds, these operations of both natural and artificial regeneration shall be taken up under the schemes available under various District level scheme like, employment guarantee Scheme, ITDP ,DRDA or other GOI schemes funded through FDA.

15.1.10 FOREST DEVELOPMENT AGENCY(FDA)

In order to boost the program of JFM and improve the participatory approach as well funding, GOI, adopted Two tier set up from 2001-02. viz.1) FDA at territorial or wild division level registered under society registration act and 2) JFMC at grass root level. The JFMCs will be registered with the territorial conservator of forests.

Each territorial division will have an independent FDA under Conservator of forests as its Chairman. The territorial DCF will be member secretary. The FDAs will sign an MOU with JFMCs indicating the mutual obligations, rights and role.

Microplanning : After the project is approved by GOI. Funds earmarked for microplanning would be released to enable the FDA to undertake the microplanning exercise and to develop the work program. For forest areas included in the project, FDAs would ensure that the microplans are not in conflict with the existing and operational working plans for those areas.

The FDAs are to be registered as Federation of all JFMCs, within a territorial division under the society registration act, with the following structure.

General Body	Executive Body
Chairperson-Conservator of Forests	Chairperson-Conservator of Forests
Members	Member Secretary cum Chief Executive Officer Divisional Forest officer.
Presidents of JFMC General Bodies, not more than 50 at any time, to be nominated by Chairperson on rotational basis for a period of one year, of which 20 would be women representative. In the event adequate number of women chairpersons are not available, the women representative will be drawn from the members of the General Bodies of JFMCs.	Members Ex-Officio Members (Without voting rights) District Development Officer, District level officers of Agriculture, Rural Development, Animal husbandry, Soil Conservation, Tribal Welfare, Industries, Public health & Engineering and Education Departments.
One non-official representative to be nominated by the apex institutional framework of Pancharats.	ADM/AC to be nominated by DC/DM2
Range Forest Officer, ACFs/SDFs.	One non-official representative to be nominated by the apex institution frame worked Pranchayats. Fifteen nominees from the JFMCs, to include minimum.

Activities of FDAs.

- (i) Implementation of centrally sponsored afforestation schemes.
- (ii) Other beneficiaries oriented activities like agro forestry, avenue plantations.
- (iii) Take steps for value addition and marketing of produce.
- (iv) Inventorisation of land other natural resources.
- (v) Environmental education.
- (vi) Awareness and active association in protection against poaching and illicit felling of timber.
- (vii) Establishment and management of decentralized nurseries with marketing arrangements.
- (viii) Assist in management of CPRs.
- (ix) Address socio-economic needs of people.
- (x) Management of existing captive water resources in the village.
- (xi) Active involvement in forest fire fighting operations.
- (xii) Monitoring of activities of local NGOs.

Functions of FDAs.

- (i) Approve plans for all afforestation related activities in forest fringe villages, including the micro plans.
- (ii) Provide support and assistance to JFMCs for micro planning.
- (iii) Organize training and awareness programmes.
- (iv) Implementation of water harvesting and soil conservation measures with appropriate approvals.
- (v) *Inter se* prioritization for scheme and activity-wise financial outlays.
- (vi) Decide entry point activities.
- (vii) Formulate guidelines for utilization sharing of usufruct.
- (viii) Evolve rules for use of funds created.
- (ix) Improvise technological improvements.
- (x) Develop Guidelines for employment generation opportunities.
- (xi) Establish and maintain decentralized nurseries.
- (xii) Coordinate and Monitor activities of their constituent JFMCs.
- (xiii) Conceptualize innovative schemes, viz establishment of botanical gardens, sacred groves etc.
- (xiv) Deal with contingencies such as drought, flood and forest fires.
- (xv) Coordinate with DRDAs and other relevant government departments to dovetail their schemes and programmes with afforestation schemes so that watersheds can be developed in a holistic manner.

15.1.11 SHARING OF BENEFITS:

Sharing of benefits among the members of the JFM committee will be as per the standard instructions given in the governments and guidelines. In case of JFM activity in good forest areas the benefit sharing is restricted to NTFP only. Sharing of profit from timber will be only when the JFM committee protects the area for at least 10 years and sharing percentage not to exceed 20% of final harvest.

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CHAPTER XVI

WILDLIFE (OVERLAPPING) WORKING CIRCLE

SECTION – 16.1 GENERAL CONSTITUTION OF THE WORKING CIRCLE

This is an overlapping Working Circle covering the entire area of the division. Total area of this Working Circle is 157326.33 ha. This tract represents a great variety of wild animals which were depleted owing to indiscriminate shooting in the regime of *Jamindari*.

The wildlife Population figures as per 2005 census are depicted below-

TABLE-36

Sr.No.	Name of Wild animals	No.of animals.
1	Tiger	2
2	Leopard	4
3	Hyaena	2
4	Wolf	58
5	Wild bore	44
6	Bear	10
7	Cheetal	34
8	Barking deer	91
9	Nilgai	62
10	Chousingha	13
11	Monkey	1497
12	Mongoose	2
13	Peacock	3

SECTION – 16.2 SPECIAL OBJECTS OF MANAGEMENT

Following are the special objectives of management.

- a) To educate and sensitize people about wildlife conservation
- b) To protect, preserve and improve the existing wildlife stock in this tract.
- c) To ensure the maintenance of viable population of wildlife.
- d) To conserve & preserve biodiversity of the area.
- e) To improve the habitat of wildlife existing in this tract.

SECTION – 16.3 DESCRIPTION OF THE HABITAT

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.

16.3.1. The forests of Wadsa Forest division has a variety of grasses such as Themada, Sheda, Tikhadi, Marvel (Large and small), Mushan, Kusal, Kunda, Bamboo karka, Bamboo katang etc. to meet the requirement of fodder for herbivores. The important fruit and flower species includes Aola, Hirda, Behada, Moha, Char, Tendu, Bel, Bor, Yeroni etc. which are also eaten by wild animals.

16.3.2. The forest of this area contains plenty of riparian zones which support variety of wildlife.

16.3.3. In recent past, incidences of man animal conflict have been reported especially in western part of division adjoining to Brahmapuri forest division.

SECTION 16.4 :- METHODS OF TREATMENT

Identification & documentation of resource base

- a) It is prescribed that the division will undertake compilation of floral & faunal resources, ecologically sensitive sites and create a comprehensive database for the division
- b) The division will carry out the survey of floral species of wildlife significance such as browse, fodder resources, wildlife cover, etc and map and record them for purpose of habitat management.
- c) The division will also carry out survey of riparian zones, mesic sites, perennial water holes, saltlicks, natural wallows, breeding and nesting sites, etc. and map them for purpose of their protection and management.
- d) The division will also maintain a meticulous record of these sites in a register. This "Register of the Special Wildlife Habitat" will be filled regularly and updated, fortnightly by an officer not below the rank of Range Forest Officer.
- e) The Division will undertake traditional annual census survey for estimation of the wildlife population as well as by transect method given by Wildlife Institute Of India.

16.4.1. General habitat & population management

The specific objective of this working circle is to ensure wildlife protection and conservation in the managed forests of the division. Following prescriptions are being made for achieving above objects.

- a) While preparing the treatment map of a coupe for felling in any of the working circles, potential habitat of wild animals and existing waterholes will also be identified and will be shown on the treatment map.
- b) In the plantations, few trees of local fruit species like Ber, Bel etc will also be planted to provide food to the wild animals.
- c) The waterholes, which are frequently visited by wild animals, will be excluded from grazing by making a special mention of such areas in the grazing permit/license.
- d) The existing waterholes will be maintained and at suitable sites new waterholes will be created to make the waterholes distributed evenly throughout the tract as far as possible. Strict vigilance and monitoring will be done on such waterholes.
- e) Suitable locations will be identified where forest tank will be constructed to provide water to the wild animals. These tanks / waterholes should be near good JFM village or Forest Guard naka who can monitor them.
- f) Signages on the importance of wildlife and its protection and also about minimizing man animal conflict will be exhibited at strategic locations.
- g) The labour camps and transit depots will be established away from the areas having high density of wild animals.
- h) Monitoring will be done fortnightly to know the status and movement of wild animals. The proforma for monitoring will be given in the Appendices.
- i) Annual consolidation of all fortnight report and monitoring should be done and shown on the suitable maps of the division.
- j) It has been observed that tigers from Ekara- Bhuj forest areas of Bramhapuri Forest Division, cross the Wainganga river and enters into the Porla Range of Wadsa Division, because of rich herbivore population. These tiger then move eastward to Delanwadi of Wadsa Forest Division and Chatgaon range of Gadchiroli Forest Division In order to provide effective corridor

for free movement of wildlife from the Tadoba Tiger Reserve corridors will be identified and special habitat management treatment will be given.

- k) The division shows exceptionally high population of wolf. Special monitoring will be carried out to confirm their presence and dynamics. Hunting of small herbivores will be discouraged to make available prey base for this carnivore.

16.4.2 General management

1) The field staff should be trained in anti-poaching activities and dealing with offence cases related to wildlife. Forest check posts should be made sensitive to the wildlife offences to check its illicit transport.

2) The Wadsa Division has a record of visits by Bahelias who are notorious in poaching of Tigers, in the past. Because of Narrow Gauge Railway the division was their conduit point. Hence regular watch on Railway station is suggested. Besides meticulous checking of Musafiri registers maintained by police patils needs to be checked by the field staff for tracking the movement of such people.

3) The areas near sensitive water holes frequented by the wildlife may be excluded from grazing, and specially mention in the grazing license.

4) Every person residing in or within 10 km. of these forests and possessing a fire arm will register his name with the Deputy Conservator of Forests.

5) Adequate provisions should be made in the budget for payment of compensation to the villagers on account of killing of, or injury to any person or his livestock and the Deputy Conservator of Forests concerned shall not make any delay in payment of compensation to the affected people.

6) The village forest protection committees under Joint Forest Management Program shall be made accountable for detection of offences related to the wildlife.

7) The forest produce harvesting and collection will be discouraged in potential wildlife and conflict sites.

16.4.3 Measures suggested to be taken to avoid wildlife attacks on human being and domestic cattle.

In wadsa division, most of the incidences of man-animal conflict takes place in Porla and Armori ranges. Hence, more importance was given to these ranges in terms of preventive measures to reduce man-animal conflict. The prevention measures taken by the forest department to avoid attack by wild life on human beings and domestic animals are as under:

- i) Through Joint Forest Management Committees, awareness was created among the people not to enter forest area alone in the areas prone to man-animal conflict.
- ii) Many boards indicating the presence of carnivores in the particular area were displayed in forests.
- iii) Awareness is created among the students of schools & colleges by showing video films
- iv) Whenever the incidence of attack by wild animals comes into notice, the frontline staff will caution the villagers by distributing pamphlets, announcement through kotwal to prevent the people from entering forest for a few days
- v) People were advised to make use of toilets in their houses, instead of attending nature calls in the forest area. In this regard, a letter has been written to Chief Executive Officer, Zilla Parishad to instruct the field staff and members of local bodies to create awareness among the people.
- vi) Whenever the wild animals attack human beings, serious attention is paid to see that the compensation is paid within a month.
- vii) To create adequate prey base for the carnivores, water holes have been taken on a large scale through EGS scheme.

16.4.4 Compartments for corridor of Tiger:

The compartment no. of corridors for tiger and other wild animals as under:-

1. As per wildlife estimation in the year 2010, no tiger was reported. But, leopard has been sighted in few compartments and report of attack on human being and domestic animals by leopard has been reported in those compartments.

The list of Compartment in which leopard was sighted is as follow.

Sr. No.	Range	Round	Beat	Comptt. No.
1	Wadsa	Wadsa	Ekalpur	97
2	Wadsa	Wadsa	Kondhala	58, 59
3	Wadsa	Vihirgaon	Vihirgaon	80, 81, 82
4	Wadsa	Vihirgaon	Dongargaon	84
5	Kurkheda	Palasgad	Palasgad	188, 170
6	Bedgaon	Bedgaon	Bedgaon	485, 483, 484
7	Bedgaon	Korchi	Laxmipur	463, 464, 465
8	Bedgaon	Bedgaon	Temli	453, 480, 481, 482
9	Bedgaon	Maseli	Bodena	536, 537
10	Porla	Churchura	Nawargaon (South)	8
11	Porla	Maregaon	Deloda	10
12	Porla	Maregaon	Moushikhamb	20
13	Porla	Maregaon	Maregaon	18
14	Porla	Sirshi	Sirshi	62, 48
15	Porla	Porla	Sakhara	5
16	Armori	Palasgaon	Palasgaon	88,85
17	Armori	Palasgaon	Manjewada	32,34,33
18	Armori	Palasgaon	Salmara	36,39,
19	Armori	Armori	Ramala	40

2. Various species of animals are found in the division. The presence/absence of the important animals like leopard, Nilgai, Bison, Sloth bear in eight range is given in the following table.

Sr. No.	Range	Presence of wildlife							
		Tiger (Yes/No)	Leopard (Yes/No)	Nilgai (Yes/No)	Sambhar (Yes/No)	Bison (Yes/No)	Wild boar (Yes/No)	Sloth bear (Yes/No)	Common langur (Yes/No)
1	2	3	4	5	6	7	8	9	10
1	Wadsa	N	Y	Y	Y	N	Y	N	Y
2	Armori	N	Y	N	Y	N	Y	Y	Y

3	Porla	N	Y	Y	Y	N	Y	N	Y
4	Kurkheda	N	Y	Y	Y	N	Y	Y	Y
5	Delanwadi	N	Y	Y	Y	N	Y	Y	Y
6	Bedgaon	N	Y	N	Y	Y	Y	Y	N
7	Purada	N	Y	Y	Y	N	Y	Y	Y
8	Malewada	N	Y	Y	Y	N	Y	Y	Y

(B) Reason for disappearance of tiger:

Having discussion with the local people and senior field staff, it was brought to notice, once tigers were roaming in Porla, Armori and Wadsa ranges of the Division. In 1950s and 60s, wild animals were killed by the hunters. From the discussion, it is learnt that a tendu contractor named Shri.Mohammad Khaji Rafi, who was residing in wadsa used to visit jungle area upto Kondhala, which is just 10 km. away from wadsa for hunting wild animals. It was the situation in 1950s and 60s. People were of opinion, that the chances of sighting of tiger reduced drastically from mid-70s. Moreover, because of biotic pressure on the forest land for agriculture and habitations, the forest cover lost gradually and the density also reduced to a greater extent. The habitat for the herbivores, the main prey base for the tiger also got disturbed. May be because of change in the habitat and inadequate prey base, tiger would have shifted its habitat to the nearby divisions and leopard would have occupied the territory left by the tigers.

With respect to man-animal conflict, more incidences of injury to and killing of human beings by leopard were reported in Porla and Armori ranges only. Two children were killed and few persons were injured by leopard. There are incidence of crop damage and domestic animals killed by wild animals. The compensation was paid to the affected persons as per Govt. resolution. The no. of wild life compensation cases from the year 2002-03 to 2010-11 is as follows.

Sr.No.	Year	No.of persons injured	Compensation paid for injury (Rs.)	No.of persons killed	Compensation paid regarding human death cases (Rs.)
1	2002-03	1	175	-	-
2	2003-04	5	103176	4	800000
3	2004-05	4	11339	-	-
4	2005-06	7	121624	-	-
5	2006-07	6	17500	1	200000
6	2007-08	12	104101	-	-
7	2008-09	15	464315		
8	2009-10	11	216727	1	200000
9	2010-11	-	-	1	200000

(C) Site for heronry, vultures, bats, wetlands:

The field staff was instructed to identify the sites of heronry, vultures, bats and wetlands. Bats were reported in Bedgaon range. It was located in C.No. 486, bedgaon beat and were found hanging on the branches of banyan trees. In forest and non forest area more number of man-made wetlands (Village Irrigation Tank, Mati nala bunds and cement plugs) are there. It attracts both animals and birds. The construction of water holes was carried out in forest areas to supply water for wild animals. The soil & water conservation works were carried out in forest areas to increase the water level.

Information regarding water holes range-wise is as follows.

Range	No. of water hole	Seasonal/ perenial
Wadsa	20	Seasonal
Armor	12	
Porla	15	
Kurkheda	05	
Purada	18	
Bedgaon	15	
Malewada	18	

Delanwadi	07	

The list of cement plugs, loose boulder structures, nala bund, water storage tank and mati nala bunds constructed under MREGS is as follows.

Name of item	Nos
Loses bolder structure	55
Nala bund	79
Cement plugs	59
Wildlife storage Tank	13
Mati Nala bunds(Van talaos)	296

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CHAPTER XVII

ECOTOURISM IN THE TRACT

SECTION-17.1: WHAT IS ECOTOURISM?

According to World Tourism Organization (WTO), “Tourism that involves traveling to relatively undisturbed natural areas with specified object of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects (both of the past or the present) found in these areas” is defined as ecotourism. Nature tourism (ecotourism) is distinguished from mass tourism or resort tourism by having a lower impact on the environment and by requiring less infrastructure development.

ECO-TOURISM POLICY OF MAHARASHTRA GOVERNMENT

The Maharashtra Govt. has issued its Eco-tourism policy vide R & F D. G.R. no. WLP 1002/pr.kr.53/F-1 dt.20/02/2008 In this policy also the main objective is to conserve the Protected Areas, like National Parks, Wildlife Sanctuaries and Tiger projects as they are the repositories of biodiversity is accepted. At the same time, it is important to improve the financial condition of the people who are depending on these forest areas for their livelihood and who care for the conservation of these areas. These people can provide for the daily needs of such tourists and get benefited from it. Hence cardinal principle of conservation of local peoples culture without degrading the environment and promote Eco-tourism, to benefit both tourist and local has been adopted under this policy.

Ecotourism has been defined as, expression of local culture, study of fauna and flora in unpolluted natural areas, introduction of nature and moving in nature for enjoyment.

Principles of Eco-tourism:---

- 1.” Small is beautiful”. It should be small.
2. Appropriate from environmental, social and cultural as well as financially proper.
3. Already tested and worth adopting
4. participation of locals.
5. It should not be degrading
6. As per tourist demand but with restriction

Role of Stake Holders:-- Role of stake holders and forest Department has been identified in this policy. The Forest deptt. has

been entrusted with preparation of management plans without affecting the provisions of Forest Conservation Act 1980, Indian Forest Act 1927 and Wildlife Protection Act 1972. Every visiting tourist should go back as messenger of forest and wildlife conservation.

MAHARASHTRA ECO TOURISM PROMOTION BOARD:-- This has been solely created to promote eco tourism in the State. The board has to coordinate with all concerned Deptts and enter into MOU with Forest deptt. The board should obtain necessary permissions and shall create necessary infrastructure outside Protected areas by itself or on BOT (build, operate, transfer) principles. The Board should coordinate with MTDC (Maharashtra Tourism Development Corporation), Private tour operators, State Govt. in creation of proper facilities for tourist in consultation with the needs of local population.

Procedural Guidelines For Ecotourism:

Detailed guidelines have been given in the policy regarding identification and development of tourist places, identification of various types of tourist, accommodation arrangement, capacity buildings of local people to get employment etc. In case of accommodation new concepts like Home stays with construction of western toilets or stay in tents has been suggested. Tribal Development Department has been entrusted with imparting Hospitality Management Training to tribal youth, to enable them in getting employment.

It is evident that the policy of state govt. is pro eco tourism and in favour of conservation of forest, wildlife, environment and local culture.

17.1.1 The tract dealt with has potential for eco-tourism and at present an ideal environment having distinct vegetation cover, enchanting mountain ranges and bewitching river flows and above all unique tribal population and their distinct cultural and social life.

Wadsa forests have distinct floral variation. The beautiful lofty trees, dense *bamboo* forests and unlimited herbs and shrubs, spiraling climbers embracing and curling the trees, chirping of jungle fowl, peacock and other birds with serene voices of animals which any body with passion to watch the nature will love to visit.

17.1.2. FOLK DANCE AND FOLK-LORE OF TRIBALS:

Tribals of this area have unique Madia dance and folklore to present before the visiting guests.

SECTION-17.2: ECOTOURISM CENTERS:

Many places have been identified as eco-tourism centers in Wadsa Division, they are as follows:

- (1) **Wadsa:** Wadsa is the Headquarter of Wadsa Forest Division. It is the tahasil place of Gadchiroli District . It is situated on the bank of Wainganga River. It is a seat of Tribal art and culture. Near to it one can find Tussar Cultivation (Sericulture).
- (2) **Arat tondi Mahadeo Temple:**It is in Kurkheda Tahsil and about 25 km from Wadsa. It is a Lord Shiva temple situated on a hillock where annual fair is held at the Mahashivaratri.Large no. of tourists and devotees visit during that period .There isa scope to develop proper facilities for tourists for their comfortable stay.
- (3) **Khobramendha Hanuman Temple :** This is also in Kurkheda Tahsil and 65 km from Wadsa. It is a Lord Hanuman Temple situated on a hill where fair is held during Hanuman Jayanti.
- (4) **Dongarmendha Mahadeo Temple:-** It is a Lord Shiva temple situated on a hill, 15 kms away from Wadsa.Fair is held at Mahashivratri
- (5) **Tipparah:** This is a scenic place, actually remnant of a old fort of Gond period with a beautiful lake and forest on it. The place lies in Gadchiroli Forest Division but adjoining the Wadsa divn. boundary.Annual fair is held. The tank, serves as origin of river Tipparahi.

SECTION-17.3: ROLE OF FOREST DEPARTMENT:

Each Eco-center is proposed to have the following components as its integral part of the programme.

- (i) Nature interpretation and awareness centers which tell about the importance of the area, people and their culture.
- (ii) Audio-visual Aids and equipments, including films and documentary related to the conservation of environment, forest, wildlife and local customs of people.
- (iii) Eco-tourism camps to provide recreation, and education through organization of tracking programme, botanical tours to students of local schools and colleges.
- (iv) Watch towers with binoculars, wireless handsets shall be provided.
- (v) Water sports facilities on eco-centers at water bodies

17.3.1. The villages adjoining to these centers are proposed to be taken up under eco-development program for their overall development.

17.3.2 It is also prescribed to improve the worship sites of the local people as a part of people's participation in the eco-development and allied activities.

17.3.3 Archeologically important sites identified by the Archaeological Survey of India or the State Department of Culture shall be delineated and marked on the divisional/range maps to serve as focal sites for eco-tourism.

17.3.4 Awareness generation campaign shall be taken up to involve local villagers and JFM committees in the wildlife conservation programme.

17.3.5 Eco-tourism centers should have good approach roads, transportation facilities, interpretation centers, signs, observation towers, adequate but unpretentious lodging and dining facilities, garbage disposal facility and other utilities as per the requirement.

17.3.6. Teaching institutions viz. schools, colleges, nature and wildlife lovers shall be involved through nature interpretation camps, wildlife film shows, exhibitions, seminars competition etc.

17.3.7 The division will also provide information and interpretation services. It will be in the form of brochures, leaflets, specialized guides, and visitor information centers etc. The visitors are advised to abide by the guidelines prepared for them.

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CHAPTER – XVIII

FOREST PROTECTION IN THE TRACT

SECTION– 18.1: AREA AND DISTRIBUTION.

This chapter deals with the entire forest area of the Wadsa Forest Division i.e. 157326.33 ha. The whole area is divided into Eight ranges, 34 rounds and 135 beats. The average area of each range, round and beat is 19665.89 ha., 4627.24 ha. and 1165.38 ha respectively. There are 425 villages with large number of cattle and human population situated in and around the forest areas and causing heavy biotic pressure, which results in degradation of forests. The inhabitants of the area cause damage to the forests through fire, illicit felling, girdling of the trees, encroachments and grazing.

SECTION– 18.2: OBJECTS OF FOREST PROTECTION

The main objects of forest protection are to protect the area from fire, illicit felling, grazing, encroachments, illegal mining, poaching of wildlife, and illegal collection, transportation and trading of major and minor forest produce.

SECTION–18.3: VALUE AND SIGNIFICANCE OF THE FOREST IN THE

AREA.

The Wadsa Forest Division has got the most valuable forests with biological diversity of Flora and Fauna.

SECTION– 18.4: THREATS

The main threats to the forests are fire, illicit felling, poaching, encroachment and grazing.

18.4.1 FIRE:-

Forest fires occur during March to May in each year and causes loss to the productivity of forest through burning of invaluable

leaf litter and humus. Further it also causes loss to fruits and seeds of important species, micro flora and fauna existing in the area. Damage is also caused to young regeneration. Large number of wind fallen trees are also burnt in every summer during the fire season. Though major part of the area is burnt each year, only a fraction of about 1-2% is reported. The main reasons for forest fire are due to intentional burning of the area to collect the Moha flowers, and to stimulate the growth of tendu leaves during the season. Some times the honey collectors and also poachers cause the fire to drive away the honeybees and animals, which results into spreading of fire to the whole area.

18.4.2 ILLICIT FELLING:-

Illicit felling of forest takes place mainly to meet the demand of firewood, small timber and timber for agricultural implements, construction of houses and furniture by the local people. Though organized illicit felling is not reported, the losses due to illicit felling varies from 10 to 20 lakhs per year. Stray incidences of illegal transport of forest produce / timber are also reported, in which the vehicles used in the offence are confiscated under the appropriate sections of Indian Forest Act, 1927.

18.4.3 POACHING:-

Poaching of herbivore animals such as deer, sambar, neelgai, etc. by local people resulted in scarcity of prey to the important carnivore animals such as tiger, panther, etc.; their population has been showing alarming trend for the past 2 decades which resulted in disappearance of tiger from the Wadsa forest division. Illegal poaching and trading of tiger skins and hides has also been noticed since quite some time in the division.

18.4.4 ENCROACHMENT:-

Wadsa Forest Division has got mainly the population of small and marginal farmers distributed throughout 425 villages and

most of the cultivated areas are adjacent to the forest areas. The average size of holding is 0.5 to 2 ha. With growing population and size of the family and due to increasing demand for the food-grains and clothing and tendency of encroaching the adjacent forest areas by clearing, girdling of trees is a regular feature resulting in honeycombing of the area. A total area of 6303.26 ha. of forestland is encroached upon by 3064 local inhabitants mainly the tribal and non-tribal farmers between 1972-2009. However, this is not a final figure. Due to naxal infestation and increasing awareness of their rights, the local inhabitants defy the government regulations and thereby causing forest staff to loose control over the area day by day. This results in illicit felling and encroachments. Local self-rule through “Mavanate Mava Sarkar” is also adversely affecting the day to day functioning of the forest department. In case of encroachment the losses are enormous due to the loss of not only land but also the huge quantity of standing timber and non-timber forest produce. Except Moha trees, all other species of trees standing in the encroached areas are slowly girdled and burnt before starting actual cultivation of the area. Though the powers of eviction of the encroachments under Maharashtra Land Revenue Code, 1966 u/s 53, 54 and 54(a) are vested in the forest officers, it's use is practically very limited due to the fear of naxal activities in the district. Lack of proper demarcation is also one of the main reason for encroachment of the area. After the implementation of Forest Right Act 2005, the process of settlement of encroachment is on through village level samitis and Gramsabhas. The claims are settled through three tier process i.e. village level, Sub-Division level, and District level. The District Collector is the Chairmn of District Level Samitis. Dy.Conservator of Forests is the member. The measurement of the encroachments are done by taking GPS measurement by Revenue and Forest staff. The Wadsa Division so far, 15396 claims have been received at SDO(Revenue level) involving approx. 10322.11 ha. of forest land out of which 8787 claims have been recommended by the Wadsa Forest Division involving 6361.89

ha. forest land. The process of issuing Titles(patta) is already on. An undertaking about commitment for protection of forest is obtained from every encroacher before Title is issued to him.

18.4.5 GRAZING:-

Grazing is the main cause for the degradation of forests through continuous removal of grasses and soil cover and also through compaction of the soil, which results in run-off of rainwater and also erosion of topsoil. Along with topsoil, soil nutrients are also washed out during rainy season. Hence the protection of forests from grazing is very important. Though in all the coupes, plantation areas are closed for grazing for 5 years, illegal grazing takes place in the area.

SECTION- 18.5: STRATEGIES FOR FOREST PROTECTION

IDENTIFICATION OF SENSITIVES AREAS:-

Incidences of illicit felling, poaching and other illegal activities will be analyzed and based on that sensitive and hypersensitive areas will be identified every year before monsoon and existing resources and manpower will be suitably deployed to control the offences.

18.5.1 STRENGTHENING OF STAFF AND RELATED

INFRASTRUCTURE:-

At present there are 364 sanctioned posts including the Dy. Conservator of Forests, 4 A.C.F.s and 13 R.F.O.s, 52 Foresters, 160 Forest Guards and ministerial staff. The present number of RFOs, Foresters and Forest Guards needs to be doubled for the effective protection, management and conservation of the forests, from growing incidences of illicit felling, encroachment and poaching.

At present very few officers and staff has got the accommodation at their place of working. Many of the field staff resides at the nearby urban areas for the want of accommodation and other infrastructural facilities such as schools, hospital, etc. Hence, residential quarters at

beat, round and range level should be provided for better management of the forest.

At present the Dy. C.F., A.C.F., and R.F.O (Mobile squad) have got the vehicles. The remaining RFOs do not have vehicles. Territorial RFOs in sensitive areas should be provided with jeeps and Round Officers with two wheelers for effective protection of forest and Wildlife in the area. All the vehicles including two wheelers shall be provided with wireless network for effective communication in dealing with the forest offences and other related works.

18.5.2 STRENGTHENING OF COMMUNICATION, ROAD AND WIRELESS NETWORK:

For effective communication a good network of roads running through sensitive and hypersensitive areas shall be created and vehicles with wireless network should be provided. Patrolling of all such areas by special squads shall be done round the clock and regular reports will to be sent to the Dy. Conservator of Forests.

18.5.3 DEVELOPMENT OF INTELLIGENCE NETWORK:

A good network of intelligence shall be created by employing informers to provide the information in connection with illicit felling and poaching. Sincere and prompt informers shall be rewarded suitably as per the guidelines issued by the Government.

18.5.4 MONITORING OF OFFENCES INCLUDING WILDLIFE CRIMES:

Regular monitoring of offences related to illicit felling shall be done through beat inspections and analysis of reports at Dy.C.F./A.C.F level as per the standing orders issued by the P.C.C.F. and all the offences causing loss of Rs.2,000/- and above shall be tried in the court of law. As per the guidelines vide circular No.TRS 1087/102380/F-2, R.& F.D., dt.18th June, 1981 and Letter No. TRS 1082/36/F-6, dt.8.9.1982, inspection of the areas shall be carried out within 3 days by the RFOs, ACFs, Dy.C.Fs and seven days by CF in case of the loss due to illicit felling exceeding 25,000/-, 1 lakh, 5 lakhs and more than 5 lakhs, respectively and the report shall be

submitted to the P.C.C.F. and the government as the case may be. Any laxity on the part of staff in dealing with the offence cases and under reporting of illicit felling shall be punished.

18.5.5 EFFECTIVE APPREHENSION AND PROSECUTION OF OFFENDERS:

A list of habitual offenders related to illicit felling and poaching shall be maintained at range and division level and habitual and hardened offenders shall be kept under regular watch. Prosecution of offenders shall be tried in the court of law and pursued effectively to ensure success.

18.5.6 FORMATION OF FOREST PROTECTION COMMITTEES AND DEVELOPMENT OF SOCIAL FENCING AROUND THE FORESTS:

Forest Protection Committees shall be formed in all the sensitive and hypersensitive areas so as to protect the forest from illicit felling, illegal grazing and poaching by involving the local people and NGOs living in and around the forest areas.

18.5.7 REWARDS AND PUNISHMENTS:

System for rewards and punishment shall be formulated and developed at division level to prevent the crimes against forest and wildlife.

18.5.8 CHECK POSTS:

At present there are 5 check posts, which are functioning in the division to inspect the vehicles passing through the main roads and border areas. Wireless network is provided to all the check posts. Three persons are working round the clock at each check post. Seasonal check posts may be created during the season of tendu leaves and NTFP collection season as per the necessity.

18.5.9 SURVEY AND DEMARCATION.

A special measure for survey and demarcation of the forest boundaries around villages shall be taken up to demarcate the disputed areas so as to prevent the areas from the encroachments and illegal mining.

18.5.10 EFFECTIVE FIRE PROTECTION MEASURES:

All the fire lines shall be regularly cleared from the vegetation so as to protect the area from fires. Fire fighting squads with suitable equipment should be deployed in the fire sensitive zones to ensure protection of areas from fire.

18.5.11 EFFECTIVE CONTROL OF GRAZING:

Grazing licenses will be issued only on the basis of carrying capacity of the area. All the illegal grazing cases shall be dealt with strictly.

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CHAPTER – XIX

MISCELLANEOUS REGULATIONS

SECTION – 19.1 DEMARCATION OF COUPES AND PREPARATION OF TREATMENT MAP.

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.....RFO,.....certify that I have personally inspected the demarcation of coupe No.....in Compartment No.....of.....FS.....WC on dated month year.....and have prepared the treatment map as per the prescription of the working plan Wadsa Forest Division. The area of the coupe is ha.

Place:-

Date:-

Signature
Range Forest Officer.....

Place:-

Date:-

Countersigned
Assistant Conservator of Forests.....

19.1.1 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 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.

S.N.	Species	Girth at B.H.	Remarks
1	2	3	4

No trees bearing coupe demarcation bands will be marked for felling.

19.1.2 DEMARCATION OF SECTIONS :-

i) To control harvesting, each coupe marked for felling in SCI and IWC will normally be divided into four approximately equal sections. Sections will be demarcated by 1.5m 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

19.1.3. 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.

S.N.	Species	Girth at B.H.	Remarks
1	2	3	4

19.1.4 DEMARCATION OF OTHER AREAS GIVEN IN THE TREATMENT MAP

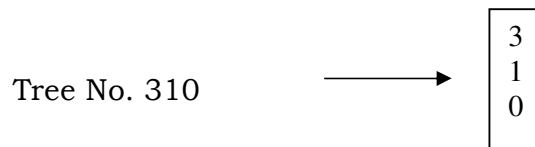
The other categories of areas will be marked by giving one geru band and one coaltar band. The geru band will be at b.h. and the coaltar band above this and at a height of 5 cms above this

19.1.5. 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. :-

S.N.		Species	Girth at B.H.	Remarks
Digit	Coaltar			
1	2	3	4	5

- v) Abstract of trees marked for felling will be made in 15 cms girth classes. Timber, poles and firewood trees will be shown separately.
- vi) The numbers on the trees will be put in the vertical direction as shown below.



SECTION – 19.2 :- THE SPECIAL OBJECTIVE OF MANAGEMENT

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 will be 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 possession 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 – 19.3 :- APPROACH TO THE FOREST DEMARCATION :-

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.

19.3.1 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.

19.3.2 Forest maps for the Protected and the unclassified forests in possession 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 possession 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.

19.3.3 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.

19.3.4. 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.

19.3.5. The Zudupi jungle areas have been 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 – 19.4 HARVESTING AND DISPOSAL OF FOREST PRODUCE

19.4.1. 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.

19.4.2. 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 22 tendu units/group of units have been formed in Wadsa Forest Division. Tendu leaves are auctioned by Chief Conservator of Forests, (Evaluation and Nationalization) M.S. Nagpur.

19.4.3. 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.

19.4.4. 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.

19.4.5. 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.

19.4.6. 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 tribal and local people.

SECTION – 19.5 :- IRREGULAR HARVESTING

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.Conservator of Forests, 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.Conservator of Forests 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.Conservator of Forests well in advance. Felling should be strictly as per the objective of the work.

SECTION – 19.6 :- MAINTENANCE OF BOUNDARIES

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 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.

19.6.1. 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. Conservator of Forests for the same as well by preparing a scheme. The work of boundary lines and repairing boundary pillars will be done departmentally.

19.6.2. The internal boundaries of the forest will be maintained according to the 1/5th boundary demarcation and verification scheme will be given the [Appendix -XLII](#)

19.6.3. 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 neighboring one. Trees on the boundary line will not be cut down so long as they do not obscure the view of the boundary marks one from the other. Except, where natural features form the boundary, demarcation will be done by cairns.

19.6.4. 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, the details of which will be given [Appendix -XLII](#)

19.6.5. The boundary marks (cairns) will be placed at visible distance one from the other, so that from any mark it's neighboring one on both sides can be seen clearly. The detail design of Boundary pillars prepared by the Forest Engineer will be given in the draft plan, the details of which will be given in the Appendix of the draft plan. 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.

19.6.6 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.

19.6.7 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\5th 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 will be given in Appendix of the working plan for the forests of Wadsa 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".

19.6.8. The Range Forest Officer will check at least 25% of the annual boundary line as per the 5 year programme and 5% verification will be carried out by the ACF.

19.6.9. MAINTENANCE OF COMPARTMENT BOUNDARIES:- All 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.

19.6.10. 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 – 19.7 FIRE PROTECTION :-

Fire is the dominant factor for non-establishment of natural regeneration and degradation of forest in Wadsa 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

19.7.1. 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.

19.7.2. All areas in this class will be isolated by means of fire lines and cut guidelines and will be patrolled by the fire watchers.

19.7.3. 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

19.7.4 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.

19.7.5 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

19.7.6. All other forests, not included in the above two classes, are included in this class.

19.7.7. In the forests of this class deliberate burning is prohibited, but no special measures for protection will be undertaken.

19.7.8. 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.

19.7.9. LEGAL PROVISION AVAILABLE :-

(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.

19.7.10. IN PROTECTED FORESTS PROVISIONS ARE AS FOLLOWS

(vi) 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.

19.7.11 ROVISIONS CONTAINED IN THE MAHARASHTRA FOREST (PROTECTION FORESTS FROM FIRE) RULES, 1982. :-

The Government of Maharashtra, vide Notification No.1074\252\359\F-6, dated 14-10-1982 under section 32(6) and

76(i) (d) of the I.F.A., 1927 made the rules for the protection of protected forests from fire called "The Maharashtra Forest (Protection of Forest From Fire) Rules, 1982". The various provisions made under rules 3 to 7 are given as under.

19.7.12. Rule 3 :- A ban is placed on kindling fire within a distance of one Km. from the boundary of the forests.

19.7.13. 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.

19.7.14. 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.

19.7.15. 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.

19.7.16. 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.

19.7.17. Rule 8 :- Rules 3 to 7 will be relaxed during the rainy season from 15th of June to 31st of October.

19.7.18 II) PROVISIONS CONTAINED IN THE BOMBAY FOREST MANNUAL VOL- II, PART- IV.

19.7.19. 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.

19.7.20. (III) PROVISION FOR FIRE PROTECTION CONTAINED IN THE WILDLIFE (PROTECTION) ACT, 1972.

19.7.21. 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,

19.7.22. (IV) PROVISIONS CONTAINED UNDER THE MAHARASHTRA MINOR FOREST PRODUCE (REGULATION OF TRADE) ACT, 1969

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.

19.7.23 (V) PROVISIONS CONTAINED IN "THE MAHARASHTRA FELLING OF TREE (REGULATION) ACT, 1964 .

As per section 2(e) of the above Act burning trees on private lands is included in the definition of "Felling of trees" and such act on the part of any person without obtaining felling permission from the competent authority 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.

19.7.24. STEPS FOR EFFECTIVE FIRE CONTROL

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. Conservator of Forests, 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.

19.7.25. B. DEPLOYMENT OF FIRE WATCHERS AND STAFF :-

(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 persuasion 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.

19.7.26. 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.

19.7.27. 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.

19.7.28. 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.

19.7.29. 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.

19.7.30. 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 Deputy Conservator of Forests. 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

19.7.31. The Dy. Conservator of Forest will be personally responsible for carrying out efficiently all protective (as envisaged under various Acts and rules and regulations made there under measures in the area of his Division.

19.7.32. The Dy. Conservator of 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.

19.7.33. FIRE REPORTS :- The Range Forest Officer will report the outbreak of fire in his area to the Dy. Conservator of Forests 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. Conservator of Forests.

19.7.34. 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. Conservator of Forests within 15 days after thorough inspection of the burnt area by himself.

19.7.35. The Dy. Conservator of Forests 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.

19.7.36. 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. Conservator of Forests

19.7.37. A fire record will be maintained in the office of the Dy. Conservator of Forests showing name and the length of fire lines burnt and areas specially protected will be indicated on the map. Incidence of fire in class I, II and III areas in each range will be serially numbered in chronological order and the details of areas burnt will be shown on the map.

19.7.38. 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. Conservator of Forests.

SECTION – 19.8 :- ARTIFICIAL REGENERATION

19.8.1. 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 through stump and miscellaneous species will be planted through polythene bag plants. The details of various works will be as follows:-

19.8.2. PREMONSOON WORKS:- They will be carried in the year of main felling, along with the felling. They will include following works:-

19.8.3. 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 agaves 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.

19.8.4. 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.

19.8.5. 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.

19.8.6. MISCELLANEOUS PLANTS :- The miscellaneous plants will be raised in the polythene 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 polybag 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.

19.8.7. 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 agaves 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.

19.8.8 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.

19.8.9. 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.

19.8.10. 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.

19.8.11. 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:

19.8.12. 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.

19.8.13. 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.

19.8.14. 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.

19.8.15. 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-19.9 :-SOIL AND MOISTURE CONSERVATION WORKS :-

With the increase in biotic interference in the forest areas, the forests of Wadsa division are becoming degraded. Adequate soil & moisture conservation works will be taken where required to check soil erosion.

19.9.1. 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.

19.9.2. 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.

19.9.3. 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 - 37

Slope in degree	Distance between consecutive trenches
Up to 15	8 m
15 to 25	5 m
Above 25	3 m

19.9.4. 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.

19.9.5. 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 will be given in the Appendix of the draft plan. 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 2/1 and 1/1 respectively.

19.9.6 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 – 19.10 :- GRAZING CONTROL :-

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.

19.10.1 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.

19.10.2 Keeping in view the above provisions the grazing in various working circles of this plan will be regulated as under.

19.10.3 I. SELECTION-CUM-IMPROVEMENT WORKING :-

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 this working circle will be 51964 cattle units.

19.10.4 II. IMPROVEMENT WORKING CIRCLE :- This working circle comprises of minor and degraded forest and the maximum incidence of grazing prescribed for it is 0.8 ha. per cattle unit. All main felling coupes will remain closed to grazing for 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 will be 69546 cattle units.

19.10.5 Thus as per the prescriptions of the working plan 121510 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 silage preparation should be conducted and through this stall feeding should be advocated. The preparation of silage will solve the problem completely. People should be motivated for rearing cattle in less number but of better breed to have better return and less problem.

19.10.6 Grazing rules made applicable vide Govt. of Maharashtra Revenue and Forest Department Resolution No.MFP-1371/237035-Z,dated 3rd November, 1973 will be strictly followed which will be given in the Appendix .

SECTION – 19.11 :- ILLICIT CUTTING

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.

19.11.1 The Government vide letter No. TRS 1087/102380/F-2 R & F.D., dated 18th June, 1981 has stated that all illicit cutting valueing 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.Conservator of Forests 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.

19.11.2 The following time schedule has been prescribed for inspection of illicit cutting by the respective officers:

TABLE- 38

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.

91.11.3 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 – 19.12 :- DEVIATIONS

(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 as per National Working Plan Code 2004.

The DFO will forward through the territorial Conservator type copies of this form in triplicate early with his copy of Control forms. No explanatory remarks are required on this form but these should be given in the forwarding letter. One copy of the statement will be returned to the DFO and another to the territorial Conservator after the deviations have been sanctioned by the PCCF. If the PCCF or the working plan Conservators sanctioned has been obtained in advance the sanctioned number and date should be quoted in the last column.

All deviations which permanently alter the basis of management laid down in the working plan will required prior sanction of the PCCF. All deviations which do not permanently alter the basis of management and with the necessity of which he agree, may be approved and sanctioned by the Working Plan Conservator on behalf of the PCCF. In case where there is difference of opinion between the working plan conservator and the territorial conservator the former will refer them to the PCCF for instructions. The PCCF / CF WP as the case may be will countersigned the deviation statement.

Minor deviations can be sanctioned at the level of the CF Working Plan or the PCCF as the case may be but the PCCF before sanctioning the major deviations of following nature will necessarily take prior approval of the regional CCF of the Ministry of Environment and Forest.

- (i) Change in Silvicultural System;
- (ii) Clear Felling of Natural Forest;
- (iii) formation of new Felling Series; and
- (iv) large scale felling due to natural calamities, which can not be adjusted against future yield.

SECTION – 19.13 :- ROADS, CART TRACKS AND CULVERTS

The forest area of Wadsa Forest Division is well connected by roads and cart tracks. Wadsa – Wadsa, Wadsa - Sindewahi, Wadsa - Chandrapur via Mul, Wadsa - Nagpur via Naghbhid are the main lines of road transport. Besides, there are feeder roads like Wadsa – Chatgaon, Wadsa – Potegaon, etc. 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 by the Territorial D.Y.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 Wadsa Forest Division will be given in the **Appendix-X**

19.13.1 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 – 19.14 :- BUILDINGS

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.

19.14.1 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 will be given in the [Appendix-XLIII](#)

SECTION – 19.15 :- WATER SUPPLY

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 – 19.16 :- PRIVILEGES AND CONCESSIONS FOR FOREST PRODUCE

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.

19.16.1 BAMBOO :- In Wadsa Diivision lot of burads are there who prepare bamboo mats and other articles to earn their livelihood. Bamboo are required by agriculturists also. Their entire requirements are fulfilled through departmental working of bamboo coupes.

19.16.2 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.

19.16.3 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 – 19.17 :- SURVEY AND MAPS

Reserved forests of Wadsa 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 will be prepared in GIS cell at the office of the Conservator of Forest, W.P.-1, Chandrapur on the basis of Satellite maps under the Administrative control of Chief Conservator of Forest, Working Plan, Nagpur & will be supplied by the office of Chief Conservator of Forest, Working Plan, Nagpur. As per the instructions contained in standing order No. 55 of Chief Conservator of Forests, Working Plans, Nagpur the following sets of maps will be prepared.

19.17.1. 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 :

19.17.2. A. FOR C.F. WORKING PLAN :- Two uncut and mounted sets called "Master sets" will be prepared having following details.

(i) One fair set indicating stocking details.

(ii) One management map showing compartments, coupes, felling series, working circles, range boundaries and other management details.

19.17.3. B. FOR THE DY.C.F., WADSA :- One uncut and mounted and two cut and mounted sets showing the management details will be supplied to the Dy. C.F., Wadsa. 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.

19.17.4. 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.

19.17.5. 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.

19.17.6. 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 office of DY. Conservator of Forests Working Plan office and the other set will be supplied to the DY. Conservator of Forests, Wadsa.

SECTION – 19.18 :- BEAT CHECKING

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.

19.18.1 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:-

19.18.2 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.

19.18.3 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. Conservator of Forests through his Range Forest Officer.

19.18.4 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 endeavor 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. Conservator of Forests punctually. In case of extensive illicit felling he will take prompt measures to inspect the beats thoroughly.

19.18.5 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 – 19.19 :- CHARCOAL KILNS

No permission to manufacture charcoal to the private persons will be given in the Reserved or Protected forests or in private areas upto 10 km. from the boundaries of the forests

SECTION -19.20 :- METEOROLOGICAL OBSERVATIONS

Since there is observatory at Wadsa & Wadsa, 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 – 19.21 :- PRESERVATION OF WILDLIFE

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 – 19.22 :- TUSSAR CULTIVATION

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 from July to August, that of Second crop is from 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 – 19.23 :- RULES FOR TRANSIT OF FOREST PRODUCE

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.

19.23.1. 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.

19.23.2. 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.

19.23.3. Regarding transit passes & renewal of licenses 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 – 19.24 :- APPLICATION OF JFM

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.

19.24.1 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.

19.24.2 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.

19.24.3 In areas where the villagers are willing to participate in Joint Forest management plan, the concerned territorial Deputy Conservator of Forests shall prepare a micro-plan 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.

19.24.4 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.

19.24.5 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.

CHAPTER XX

ESTABLISHMENT AND LABOUR

SECTION- 20.1: STAFF

The details of staff have been given in chapter IV of part I of this plan. The Statements showing the Ranges, Rounds and Beats will be given in the [Appendix-IV](#)

20.1.1. The Total area of the division 157326.33 ha. which is divided into 135 beats and therefore, on an average area of a beat comes 1165.38 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.

20.1.2. 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 Assistant 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.

20.1.3. 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. Therefore, to carry out prescriptions of this working plan successfully from protection and conservation point of view field staffs should be suitably be placed.

SECTION – 20.2 :- LABOUR

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 oppressive 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 neighboring 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 mechanized 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 - XXI

CONTROL AND RECORDS

SECTION – 21.1 CONTROL FORMS

The prescriptions regarding control and records are given in details in Chapter - IX of the working plan code, Bombay State which will be followed. All control forms and records shall be maintained as per the guidelines given in chapter No. IX of working plan code of Bombay State and the Standing Order No. 24, Chapter I prescribed by the C.C.F., M.S. Pune, dated 30.1.1967.

21.1.1 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. This has not been maintained in the previous plan. The prescribed Performa of control forms will be given in Appendices of the final draft plan. These will help to have an effective control over the working of these forests under this working plan. The control forms for harvesting in each working circle will be prescribed separately whereas those for plantation and silvicultural operation will be 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 Conservator of Forests, Working plan Division No.1, Chandrapur. The flying set will be sent annually by the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa 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 Conservator of Forests, Working plan Division No.1, Chandrapur will scrutinize the entries and offer his remarks to the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa on receipt of replies from him who will submit his report to the territorial Conservator of Forests, Gadchiroli Forest Circle, Gadchiroli, who will forward the report not later than 1st February of the following year to the Chief Conservator of Forests, Working plan , Nagpur and the Chief Conservator of Forests, Working plan Nagpur 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 – 21.2 COMPARTMENT HISTORIES

Compartment histories of the division have not been maintained properly by the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa since the beginning of the previous plan. The completion of

compartment histories is under progress. These are maintained in Form No.1 to 5 as mentioned in chapter VI of working plan code of Maharashtra. Compartment History will be maintained in form No. 1 to 5 whose proforma will be given in the [Appendix-L](#) Each Compartment will have a separate file for its records. Form No.1 will be written for each compartment during the preparation of this final draft plan and typed copies in duplicate will be supplied to the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa. 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 the month of 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 Assistant Conservator of Forests. One copy of the forms will be filled in the divisional compartment history file and another copy will be returned to the Range Forest Officer. The copies of annual compartment history files will be kept in the division office and after completion the same 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, Chandrapur the same will be returned to the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa in the month of September. This work would be given due attention.

SECTION - 21.3 :- PLANTATION AND NURSERY REGISTERS

The registers for all plantations and nurseries activities shall be maintained in appropriate forms. Plantation register will be maintained for all areas regenerated artificially in the Standard Form No.1 to 9 which will be given in the Appendices of the final draft plan. Also Nursery registers will be maintained in Standard Form No.1 to 10 which will be given in the [Appendix-LI,LII](#)

SECTION – 21.4 :- DIVISIONAL NOTE BOOK

All divisional important matters of will be recorded in the Divisional Note Book under standard headings by the Dy. Conservator of Forests, Wadsa Forest Division, Wadsa. The Dy. Conservator of Forests will 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.
- 3) Notes on fungi.
- 4) Notes on fire damage.
- 5) Notes on other causes of injury.
- 6) 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.

21.4.1 The Standard Form of Divisional Note Book will be given in the **Appendix-LIII**

SECTION – 21.5 :- 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.

SECTION –21. 6 :- OTHER RECORDS

List amendments to the working plan and list of area changes will be maintained in prescribed form.

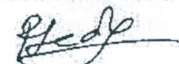
**State Level Committee Meeting held on 28th January 2011 at
Vansabhagruha, Nagpur**

Ref : Govt of Maharashtra Revenue and Forest Department G.R. No. MSC
2004/CR-102/F2 Mumbai Dated 25.06.2004

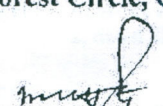

(Sanjay P. Thakre)
Conservator of Forests
Working Plan, Chandrapur


(R.M. Ramanujam)
Deputy Conservator of Forests
Wadsa Forest Dn. Wadsa


(Abhishek Krishna)
Collector,
Gadchiroli


(P.R. Yewle)
Conservator of Forests
Gadchiroli Forest Circle, Gadchiroli


(T.K. Choubey)
Chief Conservator of Forests
Working Plan, Nagpur

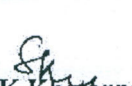

(N.B. Majumdar)
Chief Conservator of Forests
(Conservation)
Maharashtra State, Nagpur

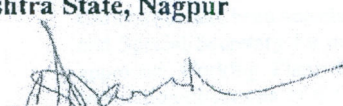

(Tasneem Ahmad)
Chief Conservator of Forests
(Protection) Controlling Officer
Maharashtra State, Nagpur

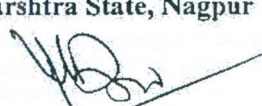

(Anil Mohan)
Chief Conservator of Forests
(PT & SP)
Maharashtra State, Nagpur


(A.K. Rana)
Chief Conservator of Forests
(Central) Representative of
Government of India, Bhopal


(Dr. S.K. Khetarpal)
Addl. Principal Chief Conservator of
Forests
(Production & Management)
Maharashtra State, Nagpur


(Dr. S.K. Khetarpal)
Addl. Principal Chief Conservator of
Forests
(Budget and Planning)
Maharashtra State, Nagpur


(D.C. Pant)
Principal Chief Conservator of Forests
(Wildlife)
Maharashtra State, Nagpur


(A.K. Joshi)
Principal Chief Conservator of Forests
(Hoff)
Maharashtra State, Nagpur



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

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"केन्द्रीय पर्यावरण भवन"
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अणुडाक /E-mail: rccfbhopal@gmail.com

सत्यमेव जयते

No. : 12-6/2001 (FOR) 1597,

21-09-10-2012,

To,

The Principal Secretary,
Revenue and Forest Department,
Mantralaya,
MUMBAI

Sub : Working Plan proposal for Wadsa Forest Division, written by Shri S.P. Thakare, IFS for the period of 2012-13 to 2021-22.

Ref : Revenue and Forests Deptt., Government of Maharashtra letter No. FDM 2012/C.R. 197/F-2, dated 22.08.2012.

Sir,

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

- (1) The currency of the Working Plan shall be for a period of 10 years i.e. from 2012-13 to 2021-22.
- (2) The orders of Hon'ble Supreme Court in the matter of Godaverman Therumalkpad Vs Union of India in W.P. (Civil) No. 202/95 and related Inter Locutory applications shall be strictly adhered to. Any prescription or operation at variance with the Hon'ble Supreme Court's order shall be kept in abeyance till the order is in force or otherwise modified.
- (3) Further, in compliance with orders of Hon'ble Supreme Court's dated 22.09.2000, the State Government of Maharashtra shall ensure that regeneration of forests is commensurate with fellings carried out under this working plan.
- (4) No felling shall be carried out without allocating necessary funds for implementation of regeneration operation so as to make regeneration commensurate with fellings. In the event of failure in regeneration or any shortfall in carrying out regeneration operation, no further felling shall be undertaken until the failure/shortfall is made up.
- (5) Following the directions of the Hon'ble Apex Court in their order dated 22.09.2000, a Core Group has been constituted under the Chairmanship of the Director General of Forests and Special Secretary for deciding the extent of harvesting that could be permitted under approved Working Plans for ensuring regeneration to be commensurate with fellings. Instruction/directions of the Central Government in the matter to be issued in future shall be strictly complied with. Felling is to be done by State Government only after seeking permission from Core Group constituted by the MOEF, New Delhi.

Contd..2

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पर्यायोजना-पूर्व नागपुर

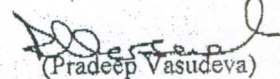
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JEF RO BHOPAL

- (6) No forests bearing naturally grown trees shall be clear felled for any purpose whatsoever.
- (7) Prescriptions of microplans for JFM (if made) should not deviate the broad framework/guidelines of the working plan and shall be in accordance with various orders of Hon'ble Supreme Court.
- (8) Felling carried out on forest land after seeking approval of the Central Government under Forest (Conservation) Act, 1980 will not be treated as deviation. However, proposed felling in the forest division shall be restricted proportionately in the current/following years to compensate this removal.
- (9) No deviations shall be made from the prescriptions of working plan read with the conditions stipulated herein without prior approval by the Central Government under Forest (Conservation) Act, 1980. However, deviations of positive nature i.e. out of turn plantations carried out outside the worked area under any project, schemes and compensatory afforestation may be approved by the competent authority of the State Government.
- (10) The Central Government reserves the right to review, modify, withdraw this approval at any time if any of the conditions of approval are not implemented or relevant modification in the working plan is required so as to keep it in conformity with the orders, circulars and guidelines issued by the Central Government or the Apex Court under Forest (Conservation) Act, 1980 or any other statute and National Forest Policy.

Yours faithfully,


(Pradeep Vasudeva)

Conservator of Forests (Central)

Copy to :

1. The Additional Director General of Forests (FC), Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi - 110 003.
2. The Addl. Principal Chief Conservator of Forests, Govt. of Van Bhawan, Nagpur.
3. The Addl. Principal Chief Conservator of Forests, (Working Plan Circle-West), Nagpur/Pune.
4. The Conservator of Forests, Chandrapur.


(Pradeep Vasudeva)

Conservator of Forests (Central)

o/c