

FOREWARD

The present Working Plan for Chandrapur Forest Division, Chandrapur prepared by Dr.S.S.Srivastava, IFS, Deputy Conservator of Forests, Working Plan Division-II, Chandrapur envisages to replace the earlier Working Plan of West Chanda Division (1977-78 to 1991-92) by Shri Kartar Singh which included the areas of the present Chandrapur and Bramhapuri Forest Divisions. This Working Plan has been prepared for an area of 88648.734 ha. and it does not include the areas transferred to Tadoba and Andhari Wildlife Sanctuary and Forest Development Corporation of Maharashtra Ltd. for specific management purposes who are having their own management plans for the management of areas under their control.

Dr.S.S.Srivastava, and the esteemed members of his team deserve full appreciation for producing this document which is unique in many sense. The most important feature of this Working Plan, is inclusion of Teak Plantation Working Circle for planting of teak by overwood removal on the same principles of permission granted to Forest Development Corporation of Maharashtra Ltd. by the Government of India. The prescriptions given in this working circle will go a long way in the regeneration of teak because the clear felling and planting of teak is the best silvicultural system possible for establishing teak forest in the area provided the various physical and chemical parameters of soil are compatible for the success of teak in the area. Dr.S.S.Srivastava, Deputy Conservator of Forests has taken due care in the selection of site for this working circle. The stock maps and management maps of this working plan for Chandrapur Forest Division, Chandrapur have been prepared through G.I.S. System using Geo-media Software at Nagpur.

Dr.S.S.Srivastava and his staff have done an excellent work and deserve full praise and appreciation for accomplishing this tasks.

Chandrapur

Date 30th December/2002.

**(Shailendra Bahadur,IFS)
Conservator of Forests
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INTRODUCTION

This Working Plan for Chandrapur Forest Division replaces the earlier Working Plan for West Chanda Division by Shri Kartar Singh, D.F.O. Working Plan Division, Chandrapur for the period 1977-78 to 1991-92. The preparation and revision of working plan for Chandrapur Forest Division, Chandrapur was undertaken by Shri B.S.Thengadi, IFS, Deputy Conservator of Forests, Working Plan Division, Amravati in 1996 and the enumeration of growing stock was done by Survey of Forest Resources Unit, Amravati in 1996-97 and partly by the staff of Chandrapur Forest Division in the year 2001-2002. The Preliminary Working Plan Report was submitted before the Committee on May 7, 1996 chaired by Shri B.M.Parab, IFS, the then Chief Conservator of Forests,(Production) Maharashtra State, Nagpur. The Committee approved the P.W.P.R. vide P.C.C.F. Office letter No. Desk-14/WP/269/96-97 Nagpur dated July 2, 199 and suggested some modifications to be incorporated in the Final Draft Working Plan.

The Conservator of Forests, Working Plan Circle, Nagpur assigned the responsibilities of preparation and revision of Working Plan for Chandrapur Forest Division vide his letter dated November 21, 2000 to the Deputy Conservator of Forests, Working Plan Division No.II, Chandrapur and accordingly the works of preparation and revision of working plan of Chandrapur Forest Division was undertaken by this office in December, 2000.

The present Working Plan for Chandrapur Forest Division, Chandrapur comprises of an area of 88648.734 ha. excluding the areas transferred to Tadoba Andhari Wildlife Sanctuary and Forest Development Corporation of Maharashtra Ltd. for specific management purposes.

The Working Plan for Chandrapur 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. This Working Plan has prescribed for the formation of Teak Plantation Working Circle for plantation of teak on suitable sites by overwood removal, recognizing the fact that teak is a light demander species and comes up very well after clear felling the overwood. The other important working circles are Selection-cum-Improvement Working Circle, Improvement Working Circle, Non-wood Forest Produce (Overlapping) Working Circle, Wildlife (Overlapping) Working Circle and Bamboo (Overlapping) Working Circle which have been prescribed for the better scientific management of the forest areas in order to meet the ever growing demand for large size timber and the small size timber for construction of houses, agricultural implements, firewood and 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 for the first time has suggested prescriptions for identification, multiplication and marketing of medicinal plants in the forest areas in

order to increase the potential of growth and harvesting of medicinal herbs in the forest areas as well as to provide employment to the local people in the field of marketing of natural herbs and medicines.

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

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

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

I am extremely thankful to Shri J.N.Saxena, IFS, Additional Principal Chief Conservator of Forests, Maharashtra State, Nagpur for his keen interest and valuable guidance provided in the preparation and revision of this working plan. I am also thankful to him for providing the logistic support i.e. Computer and its peripherals without which it would have been very difficult to accomplish this task. I am also grateful to Shri K. Subramaniam, IFS, Additional Principal Chief Conservator of Forests, Maharashtra State, Nagpur for his kind inspiration and guidance.

I am also highly grateful to Shri Shailendra Bahadur, IFS, Conservator of Forests, Working Plan Circle, Nagpur whose keen interest, valuable guidance and suggestions have helped me to complete this working plan in time. I am also thankful to Shri S.D.Sontakke, IFS, Conservator of Forests, North Chandrapur Circle, Chandrapur and Shri S.P.Thakre, IFS, Deputy Conservator of Forests, Chandrapur Forest Division, Chandrapur for extending their full support and cooperation in the preparation of this working plan.

I am also thankful to Shri T.K.Choubey, IFS, Deputy Conservator of Forests, Working Plan Division-I, Chandrapur for extending his kind co-operation and valuable suggestion in the preparation and revision of this working plan.

I am personally thankful to the staff of this working plan division who have made it possible to complete this working plan and they have put in their best endeavour in the preparation and revision of this working plan and therefore Shri B.E.Nandanwar, Ranger Surveyor, Surveyors S/Shri S.R.Mohkar, G.T.Kalambe, E.N.Pakmode, P.Y.Mahitkar, V.G. Gurav, K.D.Dhakate have put in their sincere

efforts in the completion of this working plan. I am also thankful to Shri R.T.Dhabekar, RFO for completing the working plan maps through G.I.S. system in the office of the Conservator of Forests, Working Plan Circle, Nagpur.

I am extremely thankful to the administrative staff of this division and Shri R.G.Muraskar, Steno-typist who has 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.

Chandrapur.

Dated 26th December 2002.

(Dr.S.S.Srivastava,IFS)
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Chandrapur.

SUMMARY OF THE WORKING PLAN FOR CHANDRAPUR FOREST DIVISION, CHANDRAPUR.

(2002-03 TO 2011-12)

NAME AND SITUATION:- Chandrapur Forest Division lies between 18° 41' 15" to 19° 30' 0". North latitudes and 79° 55' 19" to 80° 22' 30". East longitudes.

The boundary of the division in the North is bounded by Wardha district and in the East by Chandrapur district and in the west by Yavatmal district & Wardha district and in the south by Central Chanda Forest Division.

The total forest area of Chandrapur Forest Division is 165453.122 ha. The present working plan covers an area of 88648.734 ha of forest area of Chandrapur Forest Division. Out of this 65684.724 ha is reserved forest, 22790.900 ha is protected forest and 173.110 ha is unclassified forest land obtained under Forest Conservation Act, 1980. An area of 46368.425 ha has been transferred to Tadoba National Park and Andhari Wild Life Sanctuary which was declared vide Government notification No.WLP/1085/ CR-75/F-5 (iii) dated 25 February, 1986. An area of 29267.740 ha has been transferred to Forest Development Corporation of Maharashtra Ltd. for specific management purposes.

CONFIGURATION OF THE GROUND:- The Forest areas of the Chandrapur Forest Division are mostly plain however some undulating and hilly terrain is also present such as Mul hills.

GEOLOGY ROCK AND SOIL:- The tract comprises of archean age of rocks which are rich in lime stone, clays, granites, gneisses, quartzites, magnesites, laterites, sandstones etc. The soils are red as well as black soils.

CLIMATE:- Climate is hot summer with well distributed rainfall during south-west monsoons. The mean daily maximum temperature in December is 38.6 degree centigrade and mean daily minimum is 23.6 degree centigrade. The humidity exceeds 70% in the South-West monsoon season.

WATER SUPPLY:- Chandrapur District fall within Godavari drainage and the whole district is covered by important rivers like Wardha, Irai etc. and nalas which supply water throughout the year.

RIGHTS AND CONCESSIONS:- There are no rights in the Reserve Forest except right to way and access to water however the nistar rights are fulfilled from Protected Forest Areas. Grazing settlement has not been done so far in this division and therefore grazing units are not formed.

TYPE OF FORESTS:- According to H.G.Champion and S.K.Seth, the forest type is 5A/C3 Southern-Tropical Dry Mixed Deciduous Forests. Teak is the important timber species and its associates are bija, dhaora, ain, semal, moha, tendu, lendia,

kullu, siras, haldu, salai, moyen, bhirra, aonla, gongal, hirda, kumbhi, bamboo etc. The important grasses are kushal, chir, bhurbhushi, mushan etc.

INJURIES TO WHICH THE CROP IS LIABLE:- The forests are liable to injuries due to fire, illicit felling, encroachments, grazing by domestic and wild animals, insects and fungal attack, climbers and weeds, parasites and epiphytes, wind and drought . The drought is common.

UTILISATION OF THE FOREST PRODUCE:- The local people depend on the forest particularly for small timber, firewood, bamboos, thatching grass, fodder, fruits and flowers, fibers, etc. The total number of villages in the Chandrapur District is 1792 and out of this 319 are deserted villages.

STAFF AND LABOUR:-The head of the territorial division is Deputy Conservator of Forests who is assisted by four Assistant Conservator of Forests. The labour required for forestry operations come from adjoining villages.

PAST SYSTEM OF MANAGEMENT AND THEIR RESULTS:-The forest of the tract dealt with form the parts of ex-Aheri Zamindari till 1951. The first working plan was written by Shri F.J. Langhorne in 1897 for Mohorli Range and by Shri Poona Swami in 1898 for Warora Range. Improvement fellings were prescribed.

A. Working Plan for North Chanda Forest Division, Central Provinces by Shri S.A.Vahid 1927-1937: This working plan was written for a period of 10 years and this plan was written after carrying out detailed survey and inspection of the forest. The entire forest was divided into 792 compartments distributed in 45 blocks. The main objects of management were to obtain the maximum sustained annual yield of timber and the revenue and in order to meet the above objects the main working circles prescribed were- high forest working circle, coppice with standard working circle, low forest working circle, bamboo working circle and low forest unworked circle.

B. Working Plan for North Chanda Forest Division, Central Provinces and Berar by C.E.Hewetson (1936-37 to 1945-46):- 5.2.15 The general objects of management of the forest under this working plan were to obtain the maximum sustained yield of all classes of forest produce and to meet the local demand. Consequent to this the methods of treatment to be adopted under this plan were, the better quality forest were to be managed for the production of large timber and the rotation period was 80 years and the regeneration was possible when advance growth is established under the mature crop. The poor quality forest were to be managed on rotation period of 40 years for the production of poles and fuels to the local people and the regeneration was to be obtained by coppice. Bamboos were to be worked on 4 year felling cycle. The following working circles were formed:

- (I) THE HIGH FOREST WORKING CIRCLE :
- (II) COPPICE WITH STANDARD WORKING CIRCLE:
- (III) BAMBOO WORKING CIRCLE
- (IIV) MISCELLANEOUS WORKING CIRCLE:

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

**C. WORKING PLAN OF SHRI SINGH AND SHRI MUJUMDAR
(1949-50)**

In this plan all A class forests were stock mapped showing the quality classes and types of forests. Forests having 15% and over of teak were shown as teak forests and the remaining were shown as mixed forest. Under stocked areas and blanks too were indicated. The forests were classified for the first time on the functional basis in the trees, minor, pasture and miscellaneous forests. An average grazing incidence of 3 cattle units was fixed. Better quality forests of North Sindewahi and South Sindewahi ranges were included in this class. Forests which could not produce large size timber but grow medium sized timber, poles and firewood classed as minor forest. Grazing incidence of 2 cattle units per acre was fixed. Beside, periodic closures were prescribed. Areas having no or little tree growth were classed as pasture. Keeping in view the above classification, the following working circles were formed:

- i) Coppice-with Reserves Working Circle
- ii) Miscellaneous Working Circle.

**D. WORKING PLAN OF SHRI. KARTARSINGH
(1977-78 TO 1991-92)**

This working plan was prepared for 15 years of working spread over 33 blocks divided into 555 compartments running in two series The one series covered forest of Warora, Chimur, Mohorli, Kolsa, Mul and Chanda ranges and other series comprised of Nagbhid range.

The general objects of management in this plan were: The preservation and improvement of "Tree Forests" for the production of big size timber, specially teak to the extent possible and to provide for the maximum sustained yield. To increase the proportion of valuable species such as teak, semal, bija, shisham etc. by giving preferential treatment and by plantations. The preservation and improvement of "Minor Forests" on the basis of the maximum sustained annual yield of mainly firewood and poles. To aim at the creation of the normal forests. To create grass reserves in the heavily populated areas. To arrest soil erosion. To reboise the understocked patches. Consistent with the above to derive maximum revenue for the state.

In order to meet the above objectives, the following working circles were constituted. (i) Conversion Working Circle. (ii) Coppice With Reserve Working Circle. (iii) Improvement Working Circle, (iv) Kuran Working Circle, (v) Misc. Working Circle. (vi) Bamboo overlapping Working Circle.

RESULTS OF PAST WORKING:-

WORKING PLAN OF SHRI KARTAR SINGH (1977-78 TO 1991-92):

1. In the conversion working circle the conversion period had been kept as 80 years. Therefore the areas could not be as such fully converted. Further the areas to be clear felled were 'C' type fit for clear felling and planting teak and old plantation areas which have failed to establish. In the 'D' type areas of under stocking afforestation was to be carried out. The P.B. unallotted is basically to accord the healthy silvicultural treatment to attain the growth. However only part of it has been covered. Moreover, such conducive treatments have not been scrupulously followed. Therefore, the crop is highly irregular in nature with great variation in ages and sizes and growth pattern. Bulk of these forests were worked under C.W.R. in previous plan with the rotation of 40 years.
2. In coppice with reserve working circle, the areas of forests of inferior quality capable of producing small to medium sized timber, poles and firewood with rotation of 40 years were included and Clear felling in density 0.7 & above capable of restocking the areas after clear felling from the resultant coppice and advanced growth was prescribed. Suitable areas of mixed forests to be felled for teak. Under stocked area (0.4) and below 0.7 for improvement felling. As clear felling had been prescribed in areas of density 0.7 and above the bio-diversity was lost in favour of coppice and miscellaneous species having advance growth only. This lost the opportunity to get the high forest of miscellaneous nature. Obviously due to such felling yield of coppice perpetuated the coppice with decreasing vigour.
3. The Improvement Working Circle comprised of marginal areas which have generally failed to regenerate due to adverse biotic factors in the last plan and included degraded miscellaneous forest and the areas were liable to erosion. These areas have high pressure of grazing & illicit cutting. However, 20 years felling cycle was kept and yield was regulated. In the areas of density below 0.4 climber cutting was prescribed. The brushwood and bamboo were to be cleared to take pits for plantation of ain, sisoo, siris, khair, mahua. In the remaining areas, the improvement fellings were prescribed. Therefore, under stocked areas could not be improved. Further due to practice of calling the whole areas as unworkable the improvement in better areas was arrested.
4. In Kuran Working Circle, the objective of improving the quality & quantity of fodder grasses, could hardly be done.
5. The proposal of converting certain part of the protected forests of Chandrapur division into the Reserve forest was under consideration during the plan period of Kartar Singh in the year 1974 to 1977. But the area was not declared reserved and as such it was not taken in the Kartar Singh's Plan. But the same proposal was accepted in the year 1983 and area of 4519.62 ha. from five ranges, of Chandrapur division was declared as Reserved Forest. The Kartar Singh's Plan had not prescribed any working for the said area.
6. In Bamboo Overlapping Working Circle, the division of areas into Commercial and Nistar Felling Series could not be done on the basis of production and demand.

7. The status of wildlife is very poor and no particular attention was given to the growth and development of wildlife.

STATISTICS OF GROWTH AND YIELD:- Stem analysis of teak trees was conducted in order to study the growth and yield of teak trees for site quality II, III and IV on the basis of this study the harvestable girth for teak has been fixed as 135 cm. g.b.h. o.b.

.WILDLIFE PRESERVATION:- Wildlife in the division has been managed under various rules and regulations framed from time to time till enactment of wildlife (Protection) Act 1972 which came into existence in the state of Maharashtra w.e.f. June 1, 1973 which has been amended in 1991. In the amended Act the words game reserves, big game and small game have been omitted.

BASIS OF PROPOSALS:-

A) NATIONAL FOREST POLICY OF 1988

The National Forest Policy of 1988 is in force and the basic objects are outlined below :-

(i) Maintenance of environmental stability through preservation and restoration of ecological balance that has been adversely disturbed by serious depletion of the forest of the country.

(ii) Conserving the national heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna which represent the remarkable biological diversity and genetic resources of the country.

(iii) Checking soil erosion and denudation in the catchment areas of the rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs.

(iv) Increasing substantially the forests/trees cover in the country through massive afforestation and social forestry program, especially on all denuded, degraded and unproductive lands.

(v) Meeting the requirements of fuelwood, fodder, minor forests 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 the forest produce and maximum substitution of wood.

(viii) Creating a massive people's movement with the involvement of all women, for achieving these objects and to minimize pressure on existing forests.

Based on above objects the salient features of 1988 forest policy are severe restrictions on schemes and projects which interfere with forests that clothes steep slopes, catchment of rivers, lakes and reservoirs, no working of forests without the Government having approved the management plan, non-introduction of exotic species without long term scientific species trials, the rights and concessions including grazing always remain related to the carrying capacity of forests, rights and concessions enjoyed by the tribal should be protected and their domestic requirement of the fuel wood, fodder, minor forests produce and timber for construction should be the first charge.

Forest management plans to take special care of the needs of wildlife conservation, effective action should be taken to prevent encroachments on forest land and the existing encroachment should not be regularized, forest based industries should raise the raw material needed by themselves in arrangement with the private cultivators and survey of forest resources to be completed on scientific lines for updating information.

(B) GENERAL OBJECTS OF MANAGEMENT :

- i) To preserve and enrich the growing stock in natural forests and to restock all under-stocked and degraded areas of the forests with the help of soil and moisture conservation measures.
- ii) Preservation and improvement of minor forest to obtain progressively increasing yield of small timber, fire wood, and poles in order to meet the demands of local people and to provide grazing to local cattle.
- iii) To combat ill effects of soil erosion wherever it has already started and to prescribe preventive measures.
- iv) To increase the production of non-timber forest produce and to manage the same scientifically.
- v) To increase the productivity and ensure progressively increasing yield of forest produce in demand.
- vi) To achieve compatible wildlife management.
- vii) To maintain and conserve the medicinal plants in the conservation area, to preserve and multiply the endangered species, to ensure sustainable and non-destructive harvest of medicinal plants, to cultivate and harvest medicinal plants in degraded forest treated in the JFM and to motivate the cultivation of medicinal plant

CONSTITUTION OF WORKING CIRCLES:- On the basis of the crop composition, site quality, crop density, type of the forest, soil type, topography and terrain of the area, need of the local population and their dependability on the forest produce, the forests of the Chandrapur Forest Division shall be managed under the following working circles:

- i) Selection-cum-Improvement Working Circle.
- ii) Improvement Working Circle.
- iii) Teak Plantation working Circle.
- iv) Bamboo (Overlapping) Working Circle.
- v) Non-wood Forest Produce (Overlapping) Working Circle.
- vi) Wildlife (Overlapping) Working Circle.

1) SELECTION-CUM-IMPROVEMENT WORKING CIRCLE:-

AREA:	21747.902 ha.	
CHOICE OF SPECIES:	Teak and other local miscellaneous species ain,shisham,haldu,kalam,moha, rohan,lendia,bija etc.	such
SILVICULTURAL SYSTEM:	Selection-cum- Improvement	
FELLING CYCLE:	10 years	
HARVESTABLE GIRTH		
Teak,ain,bija,shisham,haldu	135 cm	
Other timber species	120 cm	
Garari and Lendia	45 cm	
FELLING SERIES	18	
Regulation of yield	By area	

2) IMPROVEMENT WORKING CIRCLE:

AREA:	60914.062 ha.	
CHOICE OF SPECIES:	Teak and other local miscellaneous species such as ain,shisham,haldu,kalam,moha, rohan,lendia,bija etc.	
SILVICULTURAL SYSTEM:	Improvement Fellings	
FELLING CYCLE:	10 years	
FELLING SERIES	56	

3) TEAK PLANTATION WORKING CIRCLE:

Area	5986.770 ha	
Silvicultural system	Clear felling followed by artificial regeneration.	
Rotation	10 years	
Felling series	4	
Choice of species	Teak	

4) BAMBOO (OVERLAPPING) WORKING CIRCLE:

Area	51546.380 ha.	
Cutting cycle	3 years	

Method of treatment:- Crop will be treated on clump basis:

- I) No harvesting works should be permitted between 15th June to 30th September.
- ii) No culms below the age of two years will be felled.
 - (a) Following culms shall be removed from all clumps:-
 - i) All dead, decayed and dry bamboos.
 - ii) Culms whose half or more top part is broken or damaged.
 - iii) Twisted or malformed culms.
 - iv) In a mature clump the following types of culms (green and living) will be retained.
 - All current season's i.e. less than one year old culms.
 - From the rest culms equal in number to the current season's (i.e. less than one year old) culms or eight, whichever is more.
 - (b) The remaining culms will be considered available for harvesting.
- iii) The cutting height of culms will be between 15 cm to 45 cm. above the ground level i.e. above the first internode above the ground. The cut shall be slant with a sharp instrument. In case of any flowering, no culms from flowered clump shall be felled in the year of flowering.
- (iv) No clump should be considered fit for harvesting unless it contains more than 12 mature culms (one year as well as two years old included)
- (v) Harvesting of bamboo shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two years old are retained on periphery for the purposes of support to the new culms.
- (vi) Following Acts will be strictly prohibited.
 - a) Digging of rhizome.
 - b) Lopping of bamboo culms for fodder.
 - c) Use of tender bamboo culms for bundling.
- (vii) 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

BAMBOO FLOWERING :

Flowering is either periodic or annual. It is either gregarious, sporadic or both. Gregarious flowering is usually followed by the death of clumps, but in some cases of sporadic flowering the clumps do not die after flowering. The gregarious flowering proceeds from one end of the forest to another in waves.

TREATMENT OF BAMBOO FLOWERING AREA :

(a) Collection of seeds and their 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.

(b) Method of harvesting

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.

(c) Tending Operations

After completion of seeding it is essential to properly look after the young regenerated crop till a time the clump formation starts. The following operations will be carried out depending upon the age of the crop.

A) Crop age between 1 to 3 years :

During this period the area will normally contain thick seedling crop and the clump formation does not start. During this period following tending operations will be carried out.

- i) The area will be thoroughly gone over and 0.6 meter diameter foci at the rate of 300 per hectare will be formed, distributed evenly over the whole area.
- ii) All the rank growth of grasses, weeds and even bamboo seedlings upto a distance of 1.5 meter all around the foci formed as above, will be cleared so that the growth of the bamboo seedlings in the selected foci are not hampered.
- iii) All climbers within and around the foci upto 1.5 meter distance will be completely removed.
- iv) The whole area will be strictly protected from fire and grazing.

B) Crop age between 3 to 8 years. :

During this period the clump formations starts but the crop is yet immature for harvesting. During this period following operations will be carried out.

- i) All badly grown, twisted and damaged culms from the selected foci, will be removed.
- ii) All weeds, grasses and climbers, within and around the foci upto a distance of 1.5 meter, will be completely removed.

- iii) Tree growth of species, others 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.

NON WOOD FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE:- This working circle shall comprise of an area of 88648.734 ha. consisting of management of minor forest produce and medicinal plants.

WILDLIFE (OVERLAPPING) WORKING CIRCLE:- This is also an overlapping working circle and mainly comprises of habitat development works and protection of wild life.

MISCELLANEOUS REGULATIONS:

DEMARCATON OF COUPES:

- i) Annual coupes will be demarcated by clearing 3 metre 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 numbers on selected trees on the periphery.

MARKING TECHNIQUE:

- i) All trees to be felled will be given a geru band and will bear district hammer marks both at breast height and base.
- ii) All valuable trees of 45 cm and over in girth and other species of girth over 60 cm at breast height will bear digit serial number both at 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 removed. 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 R.C.C. cairn class/ & II will be started on the external boundary of the division. The works of 1/5th boundary demarcation scheme will be followed for other boundaries.

FIRE PROTECTION: Complete fire protection for the whole area has been prescribe.

GRAZING: Worked coupes in all working circles will remain closed for grazing for 5 years,.

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: The present labour supply is inadequate.

CONTROL AND RECORDS:

CONTROL FORMS: Separate control forms have been prescribed for each working circle.

COMPARTMENT HISTORIES: Compartment history form No. 1 to 3 will be maintained in the Division and Range Offices in the given proforma.

PLANTATION AND NURSERY REGISTERS: These will be maintained in the standard format.

DIVISIONAL NOTE BOOK: It will be maintained in the standard format.

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.	Centimetre
Cm ³	Cubic centimetre
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 Labourers 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	Milli-metre
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
VAM	Vesicular Arbuscular Mycorrhiza

GLOSSARY OF LOCAL TERMS

LOCAL TERM	MEANING
Adjat species	Miscellaneous species
Bhatti	Localistillery 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

XIX

Patwari	Village Officer (Sub-ordinate of Revenue Department)
P.C.No.	Patwari Circle Number
Pucca	Permanent Construction
Pulla	Bundles of cut grass
Rabi	Winter Crop
Rahadari	Transit
Raiyatwari	A form of land tenure, applied to land in raiyatwari tenure and to villagers.
Regur	Block cotton soil.
Rith	A deserted village site
Satkatha	Miscellaneous tree species
Seri-culture	Rearing silk/tussar worms.

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LOCAL AND BOTANICAL NAMES OF PLANTS OCCURING IN CHANDRAPUR FOREST DIVISION

A. TREES

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

Khair	<i>Acacia catechu</i> Willd	Mimosaceae
Khirni	<i>Manilkara hexandra</i> Roxb	Sapotaceae
Kullu	<i>Sterculia urens</i> Roxb	Sterculiaceae
Kumbhi	<i>Careya arborea</i> Roxb	Lecythidaceae
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> Roxb	Aristolochiaceae
Moyen/mowai	<i>Lannea coromandelica</i> Houtt Merr	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 Taub	Fabaceae
Pangara	<i>Erythrina variegata</i> Linn	do
Papra	<i>Holoptelea integrifolia</i>	Urticaceae
Rankela	<i>Dillenia pentagyna</i>	Magnoliaceae
Rohan	<i>Soyimida 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.	Malvaceae
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 xylocarpa</i> Roxb.	Mimosaceae
Tendu	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae
Tiwas/Tinsa	<i>Ougenia oojenensis</i> Roxb.	Fabaceae
Umbar/Gular	<i>Ficus recemosa</i> Linn	Moreaceae
Warang/Baranga	<i>Kydia calycina</i> Roxb	Malvaceae

B. SHRUBS AND HERBS

Aal	<i>Moringa citrifolia</i> (Linn)	Celastraceae
Aghada	<i>Achyranthus aspera</i> (Linn)	Amarantaceae
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 lampas</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>Tribulus terrestris</i> , Linn	Zygophyllaceae
Harsingar/ Kharsui	<i>Nyctanthus arbortristis</i>	Oleaceae
Jine	<i>Leea crispa</i>	Leeaceae
Ranbhendi	<i>Dodonea viscosa</i>	Sapindaceae
Koril	<i>Petalidium barlerioides</i> nees	Acanthaceae
Kasterua	<i>Hygrophila auriculata</i> k.Schum	Acanthaceae
Kharoti	<i>Grewia hirsuta</i> vahl.	Tiliaceae
Kudursi	<i>Bridelia hamiltoniana</i> wall	Euphorbiaceae
Kudmudi	<i>Gardenia gummifera</i> Linn	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</i> Roxb	Rubiaceae
Morarphal	<i>Helicteres isora</i> Linn	Steculiaceae
Maruadona	<i>Carvia callosa</i> Ness	Acanthaceae
Nirmali	<i>Strychnos potatorum</i>	strychnaceae
Neel	<i>Indigofera tinctoria</i>	Papilionaceae
Phetra-safed	<i>Gardenia turgida</i> Roxb	Rubiaceae
Phetra-kala	<i>Tamilnadia uliginosa</i> (Retz)	do
Tarwad	<i>Cassia auriculata</i>	Caesalpinaceae
Tarota	<i>Cassia tora</i> Linn	do
Thuar	<i>Euphorbia tirucalli</i> Linn	Euphorbiaceae
Warangal	<i>Celastrus paniculata</i> Willd	Celastraceae

C. GRASSES AND BAMBOOS

Ghonad	<i>Themeda triandra</i>	Gramineae
Bamboo-karka	<i>Dendrocalamus strictus</i> (Roxb) Nee	do
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	<i>Heteropogon contortus</i> (Linn) Beau	do
Diwartan		
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

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

E. PARASITES

Amaraval	Cuscuta refferxa (Roxb)	Cuscutaceae
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F. EPIPHYTES

Vanda	Vanda cesellata (Roxb)	Orchidaceae
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G. ENDEMIC/THREATENED PLANT SPECIES

Alichettu	Eonymus godaverensis	Celastraceae
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**COMMON AND ZOOLOGICAL NAMES OF THE
ANIMALS AND BIRDS COMMONLY FOUND IN
CHANDRAPUR FOREST DIVISION.**

COMMON NAME	SCIENTIFIC NAME
A : ANIMALS	
Tiger	<i>Panthera tigris</i>
Panther	<i>Panthera pardus</i>
Hyaena	<i>Hyaena hyaena</i>
Wild dog	<i>Cuon alpinus</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 ragocamelus</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	
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>Coturnix coromandelicus</i>
Red spur 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

Bison
Wolf
Panther
Sloth bear
Tiger

BIRDS

Pea fowl