GOVERNMENT OF MAHARASHTRA

WORKING PLAN
FOR
AMRAVATI FOREST DIVISION

FOR THE PERIOD
2004-05 TO 2013-14

VOLUME - I (TEXT)

BY
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C O N T E N T S

FOREWORD

The present working plan for Amravati Forest Division authored by Mr. Vinod Kumar, IFS, Mr. R.S.Yadav, IFS & Mr. G.P.Garad, IFS replaces the previous Working Plan of Mr. Shailendra Bahadur, IFS.

Mr. Vinod Kumar ,IFS , Mr. R.S.Yadav,IFS, & Mr. G.P.Garad, IFS had made an enormous efforts in writing this plan, which has many unique features. The important feature of this plan is the introduction of old teak plantations overlapping working circle & Non timber Forest produce overlapping working circvle. Another important feature of the exercise, is that work of GIS by these officers in their offices. The entire work of registration & digitization of Amravati Forest Division has been done in office of Dy.C.F. (W.P.) Amravati which is a great achievement. The entire work was completed in a record time. This has developed an expertise in the department. The entire exercise involves tremendous efforts of collecting land records.

I congratulate Mr. Vinod Kumar, Mr. R.S.Yadav & Mr. G.P.Garad for its magnificent efforts, in writing this unique plan.

Date: **08 / 03 / 04**

Place: Nagpur

(Shailendra Bahadur)
Conservator of Forest,
Working Plan Circle, Nagpur

INTRODUCTION

The tract dealt within this working plan of Amravati Forest Division comprises of four ranges. They are - 1) Amravati 2) Paratwada 3) Morshi 4) Warud.

Previously these areas were covered under Shri. Shailendra Bahadur's plan. It was in operation from 1991-92 to 2000-01.

The P.W.P.R. was submitted by Shri. Vinod Kumar. Allocation of areas to various working circles was done with due analysis of the crop & field inspections.

The state level committee meeting was held on 20th February 2002. Detailed discussions were held on various aspects & it was approved with some minor changes & with the suggestions.

Shri. Vinod kumar, Shri. R.S.Yadav & Shri. G.P.Garad has written the proposed working plan except the reorganization of working circles, working series & respective coupes. The undersigned with the help of valuable guidance of Shri. Shailendra Bahadur, IFS Conservator of Forests, Working Plan circle, organized the various working circles, working series & coupes.

Shri. Shailendra Bahadur, IFS Conservator of Forests, Working Plan Circle, Nagpur took keen interest in the preparation of this plan. Shri. A.K.Saxena, IFS then Conservator of Forests, Amravati Circle & Shri. Tasneem Ahmed, IFS Chief Conservator of Forests (Territorial) Amravati also took interest in the preparation of this plan & gave their valuable suggestions. All of them deserve thanks for their valuable suggestion & Co-operation. Shri. S.R. Dorle then Dy. Conservator of Forests. Amravati Forest Division & Shri. S.H.Patil, IFS. Dy. Conservator of Forests , Amravati Forest Division also deserves thanks for their full co-operation during all the field works & providing required basic information pertaining to the Amravati Forest Division . I also extend by sincere thanks to ACF & RFOs & Field staff of Amravati Forest Division for their personal interest & cooperation extended by them to the staff of this division during their enumeration work, stem analysis & other works.

Special thanks to Shri. K. Subramaniain, IFS & J.N. Saxena, IFS then Addl. Principal Chief Conservator of Forests (Production & Management) & Shri. Jwala Prasad, IFS, Addl. Principal Chief Conservator of Forests (Production & Management) for guiding me at various stages of Plan preparation.

I am also thankful to the entire team of staff at Working Plan Division, Amravati who took the challenge of preparing this working plan & cooperated whole heartedly.

Following names need special mention for their contribution.

1.	Shri. R.S.Bhawar	Range Forest Officer
2.	Shri. S.K. Shah	Range Forest Officer
3.	Shri. A.R.Tyde	Range Forest Officer
4.	Shri. O.S.Dhoke	Range Forest Officer
5.	Shri. K.N.Suple	Ranger Surveyor
6.	Shri. A.D.Deshpande	Surveyor
7.	Shri. S.R.Mohakar	Surveyor
8.	Shri. R.K.Molekar	Surveyor
9.	Shri. N.V. Mali	Steno typist

I am also thankful to the following officer staff at the office of Conservator of Forest, Working Circle, Nagpur who took interest in using GIS software & worked for digital database.

1.	Shri. B.V.Selukar	Range Forest Officer
2.	Shri. R.T.Dhabekar	Range Forest Officer

Dated: 08 / 03 / 04

Place: **Amravati**

(G. P.Garad)
Deputy Conservator of Forests,
Working Plan Division
Amravati

Summary of the Working Plan for the Amravati Forest Division.

Period from 2004 – 05 to 2013 – 2014

Distribution of the area:

This working plan Cover's the entire "A" class ' "C" Class protected forest of the division.

A - Class	-	25265.550 ha.
C - Class	-	26171.908 ha.
Protected forest	-	6.630 ha.
Unclassed forest	-	55.790 ha.
		51499.878 ha.

State of boundaries:

The outer boundaries of "A" Class have been well laid down on the ground. They are either the natural features or a clear-cut line. From 2001- 2002 onward new boundary pillars have been erected with permanent RCC structures at a places . In case of babulbans the boundaries have been demarcated through TCM but no pillars have been erected. In case of C- Class forests, no demarcation exists.

Legal position:

The entire forests of Amravati district have been declared as reserve forest under various notifications. However a distinction has been made by referring them as "A" & "C" class.

In previous working plan entire area (both "A" class & "C" class) has been brought under scientific management. In this working plan entire area (both "A" class "C" class & PF) has been brought under scientific management.

Rights & concessions:

No rights have been recognized, however few concessions have been granted.

The description of the forests:

According to Champion & Seth classification, the forests of Amravati division belong to sub group 5A- Southern tropical dry deciduous forest. They can still be classified as following.

(a) Teak forests (5 A/C1a)
(b) Open mixed forests (5A/C3)
(c) Babul Forests (5/E3)
(d) Salai forests (5/E2)
(e) Grass land reserves, (5/DS 4 and DS 2)

In teak forest, the percentage is even up to 80. The site quality is IV (a) and IV (b). Teak is found mixed with its usual associates.

The injuries to which the crop is liable:

i) Climate :- A long period of drought causes a large mortality.

ii) Grazing :- Heavy uncontrolled grazing does the damage to the growing stock

iii) Fire :- It is the single largest damaging factor to the forests here.

iv) Lantana :- It has invaded a large part of area affecting young seedlings in growth.

v) Wild animals :-Wild animals like Sambhar, Nilgai, Chital, wildboar & porcupines do considerable damage to the growing stock.

vi) Man :- No serious case of encroachment is seen, but the illicit sale of fuelwood by the local dweller & is causing a serious damage.

Erosion :- It is a serious problem in "C" class forests.

Agricultural customs & wants of the Population :-

Barring some portion of Warud range, the entire forests exist in small patches & are surrounded by big & heavily populated villages. They depend on forest for the products like small timber, fuelwood, grasses & grazing, Bamboo & other minor forest produce like palas, Mahul,Kulu etc.

Market & marketable produce:-

The following are the marketable produce obtained from the forests.
Timber, fuelwood, grasses, Rosha grass, tendu leaves etc.

Line of Export:-

There is a good network of all weather roads in Amravati forest division & there is no problem in transporting the material from one place to another.

Method of harvesting & their cost:-

The agency of harvesting is Departmental only except in case of grasses & gum where the Kosan units are sold to contractors.

Staff :-

The tract dealt with is under the administrative control of Deputy Conservator of Forests, Amravati Forest Division. At present staff position of the division is as under –

Permanent	Temporary	Total
205	41	246

Labour Supply :-

Due to flourishing agriculture there is a shortage of labour for the forestry work.

Past system of management :-

In 1902, the working plan for the forest of Amravati division was drawn up by Shri. E.E.Fernasdiz, the Conservator of Forests, Hyderabad assigned district. It laid the prescription for the period from 1902-03 to 1926-27 . Under this plan, 4149 acres of babulbans were proposed to be planted under agrisilviculture method. The method of treatment prescribed consists of clear felling followed by " Sowing in plough-made furrows 6'apart or in patches of 3'x5',6' apart . The control forms show that working was irregular. The Chirodi reserve was put in the Bushwood working circle with simple coppice treatment and a rotation of 15 years was prescribed. Only two felling series were laid down. The area did not give any satisfactory result, so the system was abandoned and it was replaced by a clear felling and planting under agrisilviculture. In Warur felling series, the system continued till 1922 and in Chirodi reserve upto 1928. Shekdari, Mehedari and Lakhara reserves of Morshi range constituted teak working circle. Each of three reserves was divided into two felling series, each felling series comprising ten coupes. The method of treatment prescribed was coppice improvement felling on a rotation of 20 years. This working plan was never sanctioned by the Government. In 1919, Shri. H.S. George prepared the working scheme for the babul bans. The scheme envisaged to plant 3776 acres under agri-silviculture method and fourteen coupes were laid down. This scheme was abandoned because of some unavoidable reasons. In 1930 a working scheme was prepared by Sardar Kesar singh, Extra Assistant Conservator of Forests. It was an attempt to revive Shri. Fernandaz's plan by dividing each felling series into 20 annual coupes. A light, a very light and ordinary improvement felling was prescribed. In 1935 Shri. Gurdial Singh's working plan came in force for babul ban and grass reserve areas. Shri. W.N.Sharma's plan came into force from 1941. From 1961-62 Shri. B.H.Upadhyay's working plan for Amravati division came into force. It had following working circles- the coppice with reserve working circle, the improvement working circle the miscellaneous working circle, the babulban working circle, the bamboo (overlapping working circle).The C class forests was not brought under any scientific management.

In coppice with Reserve Working circle the treatment map was to be prepared for each coupe. The total area included this working circle was 7944.4 ha. All areas capable of producing small timber and fuel-wood were kept in this circle. The treatment map was to contain the following details- unworkable area, areas to be clear felled for raising teak plantation, the old plantations and well stocked areas of forests with density above 0.4 but less than 0.7 salai forests over 0.4 density, remaining area. The different prescriptions were prescribed according to crop there. A similar treatment was prescribed in improvement working circle as well. The stress was made on taking plantation. In babulbans, thirty annual coupes were laid down and plantation was to be done by agri-silviculture method.

The total area allotted to this working circle was 9935.25 acres. The babul plantation raised on good soil i.e. black cotton soil established very well. While on the poorer soil, they turned out to be failure. In kuran Working Circle, there are total 29 ramnas, out of which 8

were developed during this plan period. Not much was done to establish the grasses there. The ramnas mostly remained under-stocked. Miscellaneous working circle included the compartment belonging to the forest villages. No treatment was prescribed with the result these compartments deteriorated. In Bamboo (overlapping) working circle, the areas of the coppice with reserve were included and it had two felling series. No efforts were made to restock the area by raising the plantation, with the result, the area has deteriorated.

Basis of Proposal :-

The Government of India on December -7-1988 revised the old forest policy of 1952. It laid a special emphasis on environmental Protection and ecological balance. It states that at least 1/3 of the country land should be under tree – cover. It emphasis sizes on large-scale plantation and meeting the requirements of the local people especially tribal who strive on forest . It states that no forest should be worked without management plan and forestland should not be diverted for the non-forestry purposes.
Factors influencing the general objects of management :-

The National forest policy, 1988 is the guiding principles to decide the general objects of management. This policy recognizes the services rendered by the forest to all living creatures. The services (indirect benefits) given to the society by the forest through its existence are indispensable & have more weightage then physical benefits in terms of timber & firewood coming from felling of trees. The existence of life on any planet simply cannot be imagined without the existence of the Negotiation. Therefore, taking out direct benefits from the forests cannot be the primary objectives of the forest management. However, the direct benefit will also come through operation & required to maintain the forests in healthiest conditions of the forests, automatically, both direct & indirect benefits will be optimum. Thus the orientation of the management is to have first the forest in balance & healthiest condition so as to have optimum perpetual benefits from it.

Objects of Management :

The basic objects of Management are to bring normalcy in the forest to prevent soil erosion, to meet the local demand, to increase the production of NTFP, to protect, develop & conserve wild animals, to involve JFMCs in harvesting ,afforestation and other forestry related activities.

Analysis & valuation of the crop :-

Under this plan density maps for the tract dealt with will be prepared by visual interpretation technique using remote sensing data in the office of Conservator of Forests Working plan Nagpur.

Enumeration:-

The enumeration of the existing stock was done by the survey of forest Resources unit , Amravati in the year 2001- 02 .

Functional classification :-

The Government of Maharashtra vide No.MFP-1365/ 13221 date 6th December 1968 announced the grazing policy of the State Government and along with that gave the functional classification of the forest,. The forest is classified into-

(a) Protection forests
(b) Tree forests
(c) Minor forests
(d) Pasture land
(e) Grass reserves.

Grazing Policy :-

The cattle were defined in terms of cattle unit and each type of above forest was assigned the carrying capacity for their areas.

(a) Protection forests:- No grazing was to be permitted, except in a very rare case and it should be one cattle unit for ten acre (approx.)
(b) Tree forests :- one cattle unit for three acres of land.
(c) Minor land :- one cattle unit for 1.5 to 2 acres of land.
(d) Pasture forest :- one cattle unit for one acre of land.
(e) Grass reserve :- No grazing is permitted. However agriculturists can remove grass for stall feeding as per rules.

The cattle units were also defined as below.

(a)	Adult Buffalo	-	2 units
(b)	Adult Cow, Bull	-	1 unit
(c)	Buffalo Calf under 3 year	-	1 unit
(d)	Cow Calf	-	½ unit

Treatment of the crop:-

The following working circles have been formed-

a) Selection cum improvement working circle and allotted to this working circle is 15097. 241 ha.
b) Afforestation working circle :- area allotted to this working circle is 27386.055 ha.
c) Kuran working circle: area allotted to this working circle is 7451.226 ha.
d) Miscellaneous Working Circle: Area allotted to this working circle is 1565.356
e) Old plantation working circle: area allotted to this working circle is 590.71 ha.
f) Bamboo overlapping working circle: This is an overlapping working circle in those area where bamboo has been successfully introduced.

g) Wildlife management overlapping working circle: area allotted to this working circle is 51499.878 ha.

h) Non Timber forest produce (overlapping) working circle. This is an overlapping working circle covering entire forest area.

Table

Range	SCI WC (ha)	Afforestat. W.C. (ha)	Kuran W.C.(ha)	Misc. W.C (ha)	Unclass (ha)	Total area in ha.
Amravati	5322.151	11057.119	4929.151	93.457	55.79	21457.662
Paratwada	1727. 038	5148.281	953.267	229.820	-	8058.406
Morshi	1405.400	7566.657	1405.561	1046.944	-	11424.562
Warud	6642.652	3613.998	163.247	139.351	-	10559.248
Total	**15097.241**	**27386.055**	**7451.226**	**1509.566**	**55.79**	**51499.878**

Period of the Plan:

The period of the plan shall be 10 years . However midterm review will be taken after five years.

I) Working plan for selection cum improvement working circle.

General constitution:

Total area allotted to this working circle is 15097.241 ha. This working circle contains the area with density generally over 0.4.

General Character of the vegetation :

The site quality of the tract is mainly IVa & IVb & even quality III is found in better soil supporting areas.

The density of the crop is less than 0.4, 0.4 to 0.6 or even more at places.

The area in general supports the poor, high and low forest crops of Teak & its associates & other trees which are largely of low grades. Teak constitutes more than 35% of the stock.

Blocks & Compartments :

The total compartments allotted to this working circle are seventy-three .

Enumeration :

The enumeration was carried out by S.O.F.R. Amravati unit.

Special objects of management:

i) To improve the crop stocking, composition & condition.

ii) To get maximum sustained outturns of small sized timber & firewood to meet the local demand.

iii) To involve JFMC's in harvesting & other forestry related activities.

Silvicultural system : Selection cum improvement**.**

Choice of species :

The species to be regenerated will be as per site requirement & if people's participation is available the site suitability & peoples requirement to be harmonized.

Rotation 40 years

Felling Series – Nine working series have been formed.

Yield:- It will be regulated by the area.

Agency for harvesting : It will be carried out departmentally.

Demarcation of coupes :

Demarcation of first & second coupes will be done in first year of operation. Barring first coupe rest of coupes will be demarcated one year in advance.

Treatment map :

The treatment map will be prepared & different treatment will be given to different category.

Method of Regeneration :-

In the first year of marking, soon after the monsoon is over, a treatment map will be prepared, which will show the following.

i) Areas with adequate natural regeneration .

ii) Areas with inadequate regeneration.

Areas with adequate regeneration:

In the next year of main felling, the naturally regenerated seedlings will be cleared off all undergrowth & will be spaced out uniformly so that the number of seedlings per unit area (hectare) is equal to the number given in normal stand table. The species indigenous to the area like Teak, Bamboo, ain, Arjun, shivan, Jamun, Ber, Biba, Anjan, Apta, Bija etc will be preferred.

Both NR & AR will be protected rigidly from fix Areas with inadequate NR. In such areas planting will be done in the following year of the main felling. In plantation upto 20 % Teak, 18 % fruit species & rest other superior miscellaneous species may be preferred.

Subsidiary cultural operations :

It will include cutting back operation & cleaning.

Fire Protection:

The main felling coupe will be rigidly & effectively fire protected for the period of five years & from the year of main felling.

Closure to grazing :

The main felling coupe will remain closed to grazing for a period of five years from the year of main felling.

II) Working plan for afforestation working circle

General Constitution :

Total area included in this working circle is 27386.055 ha.

General character of the Negotiation:

Normally vegetation here is scanty. However stunted growth of ber, ain, Khair, palas is seen oftenly.

Special objects of management

- to increase the green cover.
- to enhance the productivity of land.
- to meet the demand of local people.
- to maintain the biological diversity of forest.

Analysis & valuation of Crop :

Most of the areas are sparsely stocked or blanks, so no stock mapping was carried out . No enumeration has been done.

Silvicultural system:

No regular silvicultural system will be applied. The rootstock present in the area, which has been constantly hacked for firewood, will be redressed properly.

Babul will be harvested at 35 years rotation (105 cm at gbh). The species other than babul shall be marked for felling if the girth exceeds 105 cm.

Choice of Species:-

According to the soil conditions, the species will be planted. Indigenous species of local economic importance are preferred.

Rotation :

No rotation is fixed, as the primary object is to afforest.

Agency for working:

The work will be done departmentally. Local forest protection committees will be involved in afforestation work.

Demarcation of coupes:

Demarcation of first & second coupes will be done in first year of operation . Barring first coupe rest of coupes will be demarcated one year in advance.

Method of executing the work:

Treatment map will be prepared on the available map. The treatment map will include following type of areas:

Protection areas: No marking for felling.

Under stocked areas: Measures to increase the density.

Pole crop & old plantation areas: marking for thinning will be done.

Well stocked areas: No tree will be marked for felling unless it attains the girth of 105 cm gbh.

Plantation technique: It will be as per soil depth.

operations Subsidiary silvicultural: It will include CBO, cleaning & thinning.

Fire protection: Main working coupe will be rigidly fire protected for a period of five years from the year of main felling / working .

Closure to grazing: It will be for five years from the year of planting.

III) Working plan for the Kuran Working Circle:

General Constitution:

This working circle includes 52 Ramnas . Total area allotted to this working circle is 7451.226 ha.

General character of the vegetation :

Area allotted to this working circle is salai forest of under stocked nature & most of the areas are devoid of tree growth.

Special objects of management:

- to improve the quality & quantity of fodder.
- to meet the local demand for fodder

Analysis & valuation of the crop :

The area is sparsely wooded. The trees where ever present are young to middle aged.

Method of Treatment:

Every year 1/5 th of each Ramna has been proposed to be taken for treatment. In the first year of operation treatment map will be prepared for each coupe to be treated with following works.

- All obnoxious weeds & thorny shrubs will be uprooted
- Seeds of superior fodder grasses will be sown after ploughing the area
- The area under treatment will be effectively wire fenced or cattle proof trenches will be dug.

Choice of species:

Seed broadcasting & tussock planting of superior fodder grasses like Paunya, marvel, sheda etc will be taken up.

Fire Protection: Main working coupe will be fire traced every year.

Closure to grazing : Main working coupe will remain completely closed to grazing.

IV) Working plan for old plantation overlapping working circle:

General constitution of the working circle:

This working circle comprises of old plantations taken in past & scattered in all four ranges. Area allotted is 590.71 ha.

General character of the vegetation:

The area is fully stocked crop is uniform. In teak plantations, the subsequent silvicultural operations have been carried out to some extent but not such operations have been observed in plantations of miscellaneous species.

Special objects of management:

- to carry out thinning as per the yield table.
- to improve the crop, doing required silvicultural operations
- to cover thinning in all overdue plantations.
- to involve JFMC's in the management of Kurans.

Analysis Valuation of the crop:

All plantations have been shown on stock map on 1:50,000 scale. Generally crop is fully stocked.

Enumeration:

Enumeration has been carried out by SOFR unit of Amravati.

Treatment map:

Treatment map : Treatment map classifying total area in following three types.

Type- I	Fully stocked area
Type- II	Patches where plantation is failure
Type-III	This will include the portion of plantation, which is not completely failure, rather stem / ha. Is less than the required.

Thinning will be carried out in type I & type III areas.

Method of executing thinning:

- The number of stems / ha. & their distribution among different girth Diameter classes will be obtained by 1 % point sampling method.
- Site quality is assessed.
- Number of stems /ha. & their distribution among different diameter / girth classes will be obtained from the yield table.
- Comparing the actual stand table with that obtained from the yield table, the no. of stems to be retained in each diameter class will be obtained.
- The deficiency of teak stems in any girth class will be compensated with available miscellaneous species in that girth class
- If stems in higher girth classes are to be compensated with stems in lower girth class then the number to retained will be more & vice versa.

Fire protection: Plantations will be rigidly protected from fire.

Closure to grazing:

The worked coupes will remain closed to grazing for a period of five years from the year of working.

IV) Working plan for Bamboo (overlapping) working circle.

General constitution of the working circle:

This working circle will include all areas where bamboo is present in workable quality either in plantation or in natural forest.

General Character of the vegetation :

The general character of the vegetation in the area included in this working circle has been described in the respective working circles. Species of bamboo commonly found is Dendrocalamus strictus.

Special objects of management:

- To boast up clump formation

- To harvest bamboo from all over area.
- To meet demand of local people.
- To improve the productivity of the area.

Method of treatment:

Since crop is mostly young & clumps are yet to be formed. Therefore, in the first phase efforts will be made to boost up clump formation. The crop will be treated on clump basis i.e. each clump will be treated independently as per the requirement.

Method of working:

For regeneration:

- Around established bamboo plants a radius of 1 mtr. Will be cleared off all other seedlings.
- Soil of the cleared area will be ripped
- On the periphery of cleared area a circular trench of width 30 cm. & depth 20 cm will be dug & up soil will be heaped on soot of the planted bamboo.

For established clumps:

- No clump should be considered fit for harvesting unless it contains more than 12 mature culms.
- No culm below the age of two years will be felled.
- All dead, decayed bamboos to be removed.
- Digging of rhizomes prohibited.
- Climbers interfering with growth of bamboo clumps shall be cut .

Fire protection: Bamboo area will be protected completely from fire

Closure to grazing: In flowering area grazing will be strictly prohibited.

VI) Working Plan for NTFP (overlapping) working circle.

General constitution:

Forest area included in this working circle is 51499.838 ha.

Special objects of management:

- To manage NTFP scientifically
- To generate employment to local people.

Method of Treatment:

The treatment to be given will be different for different types of NTFP like moha flower, tendu, bamboo, broom grass, khair etc.

Research work :

There are so many NTFP & medicinal plants in the forest which are unidentified & untapped. The identification of medicinal plants in the field to be taken for study immediately.

VII) Working plan for wildlife (overlapping) working circle.

General constitution of the working circle:

Total area of the working circle is 51499.879 ha.

General condition of fauna & flora :

The forest area of Amravati forest division is found in scattered & small to medium blocks of forests. Never the less, ample number of wildlife are found in these forests.

Special objects of management:

- To educate & motivate local people for wildlife conservation.
- To conserve wildlife.
- To develop habitat.

Method of Treatment :

No regular schemes are being prescribed for the management of wild animals in this treat. However creation of environment of security to wildlife, increasing infra structure for wildlife management & trying to restore the status of wildlife in this tract.

VIII) Working plan for miscellaneous working circle:

This working circle includes the areas handed over to other department but not notified. The total area of this working circle is 1509.566 ha. No treatment has been prescribed.

Miscellaneous regulations:

i) **Demarcation of coupes:-** Annual coupes will be demarcated by cutting and clearing 3 meter wide line and erecting stout durable pillars of about 3o meter in length in a line.

ii) **Section:-** The coupe shall be divided into four sections. Each section will be demarcated by 1.5 meter wide cut lines. Trees above 45 cm. In girth will be given a two coal-tar bands 15 cm apart, the lower coal-tar band being at breast height.

iii) Unworkable coupes:- It will be demarcated by giving two geru bands and a serial number on selected trees on the periphery.

iv) Marking technique:-

(a) All trees to be felled will be given a geru band and will bear a distinct hammer mark at Breast Height and at base.

(b) Trees of valuable timber species of 45 cm. Girth and over and all other species over 60 cm. girth at breast height will bear digit serial number.

(c) All remaining trees shall bear serial numbers, which shall be given by coal tar.

ABBREVIATIONS USED IN THE PLAN

ACF	:	Assistant Conservator of Forests
AR	:	Artificial Regeneration
C.A.I.	:	Current Annual Increment
C.B.O	:	Cutting Back Operation
C.W.R.	:	Coppice With Reserve
C.C.T.	:	Continuous Contour Trench
Cum	:	Cubic Meter
Comptt.	:	Compartment
Dn.	:	Division
F.L.C.S.	:	Forest Labourer's Co-operative Society
FRSSU	:	Forest Resources Survey Scheme Unit
F.S.	:	Felling Series
F.Y.O.	:	First Year Operation
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.	:	Hectare
JFMC	:	Joint Forest Management Committee
M.A.I.	:	Mean Annual Increment
M.S.L.	:	Mean Sea Level
N.W.F.P.	:	Non Wood Forest Produce
N.R.	:	Natural Regeneration
No.	:	Number
P.A.	:	Protection Area
P.A.I.	:	Periodic Annual Increment
P.B.	:	Periodic Block
P.F.	:	Protected Forest
P.P.O.	:	Pre Planting Operation
P.Y.O.	:	Preliminary Year Operation
R.F.	:	Reserved Forest
R.F.O.	:	Range Forest Officer
S.C.I.	:	Selection Cum Improvement
S & M	:	Soil and Moisture
S.O.F.R.	:	Survey of Forest Resources
S.Y.O.	:	Second Year Operation
T.Y.O.	:	Third Year Operation
W.C.	:	Working Circle
W.S.	:	Working Series

GLOSSARY OF LOCAL NAMES

Adjat	:	Miscellaneous Species
Geru	:	Red Ochre or Red earth
Ghat	:	A Road with a Steep Gradient
Gairan	:	A Place for Herding Cattle
Gaothan	:	A Site Kept Reserved for Housing
Gully	:	Channel
Jamindar	:	The Holder of Jamin i.e. lands
Jhiras	:	Temporary Small Well Dug in Nalas During Summer
Jungle	:	Forest
Kharif	:	Monsoon Crop
Khasra No.	:	Serial number given to any portion of land entered in land Records
Malki Lands	:	Lands belonging to private individuals
Mouza	:	A village Area
Murram	:	A Reddish Hard Soil
Naka	:	Barrier on road for checking forest produce in transit
Nala	:	A Water Course
Nadi	:	River
Nistar	:	Forest produce required for bonafide agriculture or domestic purposes
Nistar Patrak	:	Record of Rights on Government land
Padit	:	A barren or Waste land
Patwari/Talathi		Village Revenue Officer
Patta	:	A Sanad granted for use of land
Pucca	:	Permanent Construction
Pulla	:	Bundles of Cut Grass
Rabi	:	Winter Crop
Rahadari	:	Transit
Ramna/Kuran		A Grass Reserve Close to Grazing
Regur	:	Black Cotton Soil
Rith	:	A Deserted Village Site
Taluka/Tahsil	:	A Revenue Administrative Block.

LOCAL AND BOTANICAL NAMES OF PLANTS IN AMRAVATI FOREST DIVISION.

Local Name	Botanical Name	Family
	A. Trees	
Achar	Buchanania lanzan	Anacardiaceae
Ain	Terminalia alata	Combretaceae
Ali/Aal/Bartondi	Morinda tinctoria	Rubiaceae
Amaltas/Bahawa	Casssia fistula	Caesalpiniaceae
Am	Mangifera indica	Anacardiaceae
Anjan	Hardwickia binata	Caesalpiniaceae
Amta	Bauhinia malabarica	Caesalpiniaceae
Aran	Cassine glauca	Celastraceae
Apta/Kachnar	Bauhinia racemosa	Caesalpiniaceae
Aonla	Phyllanthus emblica	Euphorbiaceae
Arjuna/Kahu	Terminalia arjuna	Combretaceae
Babul/Babool	Acacia Nilotica	Mimoseae
Bad/Wad	Ficus bengalensis	Moraceae
Bakain/Bakaneem	Melia azadirach	Meliaceae
Beheda	Terminalia bellerica	Combretaceae
Bel	Aegle marmelos	Rutaceae
Bhirra	Chloroxylon swietenia	Rutaceae
Bhoral	Hymenodictyon excesum	Rubiaceae
Biba/Bhilawa	Semecarpus anacardium	Anacardiaceae
Bija	Pterocarpus marsupium	Fabaceae
Bistendu	Diospyros montana	Ebenaceae
Bor/Ber	Zizyphus mauritiana	Rhamnaceae
Chandan	Santalum album	Santalaceae
Chichwa	Albizzia odoratissima	Mimoseae
Chinch, Imli	Tamarindus indica	Caesalpiniaceae
Dhak, Palas	Butea monosperma	Legumnosae
Dhaman	Grewia tilifolia	Tiliaceae
Dhaora/Dahwada	Anogeissus latifolia	Caesalpiniaceae
Dhoban/Phansi	Dalbergia paniculata	Fabaceae
Ghoti/Ghot	Zizyphus glaberrima	Rhamnaceae
Haldu	Adina cordifolia	Rubiaceae
Hiwar	Acacia leucophloea	Mimoseae
Hirda/Harra	Terminalia chebula	Combretaceae
Jambhul/Jamun	Syzigium cumini	Myrtaceae
Kalam/Mundi	Mitragyna parviflora	Rubiaceae
Karanj	Pongamia pinnata	Fabaceae
Karu (Cassia)	Cassia siamea	Caesalpiniaceae
Khair	Acacia catechu	Mimoseae
Kuda	Holarrhena antidysenterica	Apocynaceae
Kusum	Scheleichera oleosa	Sapindaceae

Kawat	Limonia acidissima	Rutaceae
Kulu	Sterculia urens	Sterculiaceae
Lasora, Gondon	Cordia myxa	Boraginaceae
Lendia/Lenda/schena/Asah	Lagerstroemia parviflora	Lythraceae
Lokhandi	Ixora arborea	Rubiaceae
Medsing	Dolichandrone falcata	Bignoniaceae
Moha/Mahuwa	Madhuca longifolia	Sapotaceae
Mokha	Schrebera swietenoides	Aristolochiaceae
Moyen/Mowai	Lannea coromandelica	Anacardiaceae
Neem	Azadirachta indica	Meliaceae
Panjara	Erythrina suberosa	Leguminosae
Pipal	Ficus religiosa	Moraceae
Rohan	Soymida febrifuga	Meliacae
Sag/Sagwan/Teak	Tectona grandis	Verbenaceae
Saja/Ain	Terminalia alata	Combretaceae
Salai	Boswellia serrata	Burseraceae
Satkuda/ White kuda	Holarrhena pubescenus	Apocynaceae
Semal(Borgu)	Bombax ceiba	Bombaceae
Shiwan/Siwan	Gmelina arborea	Verbenaceae
Sirus(Black)	Albizzia lebbek	Mimoseae
Sirus(White)	Albizzia procera	Mimoseae
Sissoo	Dalbergia sissoo	Fabaceae
Sitaphal	Annona squamosa	Annonaceae
Tendu	Diospyros melanoxylon	Ebenaceae
Tinsa	Ougenia oojeinensis	Fabaceae
Tiwas	Ougenia dalbergioides	Leguminosae
Thuar	Euphorbia neriifolia	Eyphorbiaceae
Umbar	Ficus racemosa	Moraceae
Warang/Baranga	Kydia calycina	Malvaceae

B. SHRUBS

Bhandara	Colebrooka oppositiflia	Labiatae
Bharati	Gymnosporia spinosa	Celastraceae
Chillari	Mimosa rubicaulis	Mimoseae
Chillati	Caesalpinia sepiaria	Caesalpiniaceae
Dudhi/Kalakuda	Wrightia tinctoria	Apocyanaceae
Dhavati	Woodfordia floribunda	Lythraceae
Kari Korando	Carrissa spinarium	Apocyanaceae
Korat	Barleria prionitis	Acanthaceae
Kunda, Indrajav	Holarrihena antidysenterica	Apocyanaceae
Muradsheng/Marorphal	Helicteres isora	Sterculiaceae
Nirgudi	Vitex negundo	Verbenaceae
Sindhi/Chhindi	Phoenix sylvestris	Arecaceae(Palmaceae)
Tarwar	Cassia auriculata	Caesalpinaceae
Waghoti	Capparis horrida	Capparidaceae

Zingrool/Pharsa	Grewia orbiculata	Tiliaceae

C. HERBS

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

D. GRASSES AND BAMBOOS

Bans/Bamboo	Dendrocalamus strictus	Poaceae
Bhurbhusi	Eragrostis tenella	Poaceae
Duswa/Haryalli/Doob	Cynodon dactylon	Poaceae
Dongri gavat	Chrysopogon montana	Poaceae
Guhar, marwel	Andropogon annulatus	Poaceae
Kans	Saccharum spontaneum	Poaceae
Khas	Vetiveria zizanioides	Poaceae
Kodmor	Apluda varia	Poaceae
Kunda	Ischoemum pilosum	Poaceae
Kusal	Heteropogon contortus	Poaceae
Mushan	Iseilema laxum	Poaceae
Paonia	Sehima sulcatum	Poaceae
Sabai or sum	Ischaemum angustifolium	Poaceae
Sheda	Sehima nervosum	Poaceae
Tikhadi/Rusa/Rosha	Cymbopogon martini	Poaceae

E. CLIMBERS

Bhuikand/Baichend	Dioscorea daemona	Dioscoriaceae
Chilati	Acacia pinnata	Mimoseae
Eruni	Zizyphus oenoplia	Rhamnaceae
Gunchi/Gunj	Abrus precatorius	Papilionaceae
Kajkuri	Mucuna pruriens	Fabaceae
Mahulbel/Mahul	Bauhinia vahlli	Caeslpiniaceae
Palasvel	Butea superba	Fabaceae
Piwarvel	Combretum ovalifolium	Combretaceae
Shatova/Satawari	Asparagus racemosus	Lilliaceae
Kawavel,Nagbel	Cryptolepis buchanani	Asclepiadaceae

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

LIST OF ANIMALS

Common Name	Scientific Name
Panther, Bibtya	Panthera pardus
Striped Hyena , Tadas	Hyaena hyaena
Jangali Kutra, Wild dog	Cuon alpinus
Jackal , Kolh	Canis aureus
Indian Fox, Lomad	Vulpes bengalensis
Jungle cat, Ran Manjar	Felis chaus
Black buck, Kalwit	Antilope cervicapra
Cheetal, Spotted Deer	Axis axis
Bhekad, Barkin deer	Muntiacus muntjak
Nilgai, Blue Bull	Boselaphus tragocemelus
Wild boar, Ran Dukar	Sus scrofa
Sloth bear, Aswal	Melursus ursinus
Common langur	Presbytis entellus
Porcupine , Sayal, Salu	Hystrix indica
Hare, Sasa	Lepus nigricollis
Sambar	Cervus unicolour

LIST OF BIRDS

Common Name	Scientific Name
Pond Heron or Paddy bird	Ardeola grayji
Cattle Egret	Bubulcus ibis
White Breasted Waterhen	Amaurornis phoenicurus
Grey Partridge	Francolinus pondicerianus
Jungle Bush Quail	Perdicula asiatica
Yellow Wattled Lapwing	Vanellus malabaricus
Rose Ringed Parakeet	Psittacula krameri
Blosson Headed Parakeet	Psittacula cyanocephala
Alexandrine Parakeet	Psittacula eupatria
Koel	Eudynamys scolopacea
Crow Pheasant (Coucal)	Centropus sinensis
Spotted owlet	Athene brama
Common Indian Night Jar	Caprimulgus asiaticus
White Breasted Kingfisher	Halcyon smyrenesis
Common Kingfisher	Alcedo atthis
Green Bee Eater	Merops orientalis
Hoopoe	Upupa epops
Indian Roller	Coracias bengalensis
Golden Backed Wood Pecker	Dinopium benghalense
Rufous Backed Shrike	Lanius schack

Golden Oriole	Oriolus riolus
Black Drongo	Dicrurus adsimillis
Brahminy Myna	Sturnus pagodarum
Common Myna	Acridotheres tristis
House Crow	Corvus splendens
Jungle Crow	Corvus macorthynchos
Small Minivet	Pericrocotus cinnamoneus
Commom lora	Aegithina tiphia
Red Vented Bulbul	Pycnonqus cafer
Common Babbler	Turdoides caudatus
White throated Fantail Flycatcher	Rhipidura albicollis
Paradise Flycatcher	Terpsiphone paradisi
Magpie Robin	Copsychus saularis
Idian Robin	Saxicoloides fulicata
Gray Wagtail	Motacilla cinerea
Pied or Whit Wagtail	Motacilla albo
Grey Tit	Parus mauor
Purple Sunbird	Nectarinia asiatica
House Sparrow	Passer domesticus

ENDANGERED WILDLIFE

Panther	Panthera pardus
Sloth bear	Melursus ursinus
Peacock	Pavo cristatus

CHAPTER – I

THE TRACT DEALT WITH

SECTION : 1.1 : NAME AND SITUATION:

1.1.1.1. This working plan deals with the entire forest area of present day Amravati Forest Division. Amravati Forest Division has a total forest area of 51,499.878 ha. and is comprised of Amravati, Paratwada, Morshi and Warud forest ranges. It lies in Amravati, Tiwsa, Chandur Railway, Nandgaon (Khandeshwar), Bhatkuli, Achalpur, Daryapur, Chandur Bazar, Anjangaon(Surji) (Part), Chikaldara(Part), Morshi and Varud Tahsils of Amravati District.

1.1.1.2. The Amravati Forest Division lies between the longitudes $76^0$38' and $78^0$30' East and latitudes $20^0$32' and $21^0$37' North. The forest areas are found both in compact blocks as well as in scattered patches. Shekdari and Hattighat Reserves lie on hill slopes while Mahendri and Lakhara Reserves lie on lower slopes. Chirodi Reserve comprises a line of low hill. Babul bans and Ramnas are scattered over plains of this division.

1.1.1.3. Pedhi, Chandrabhaga, Purna, Maru, Deo, Chargarh, Nala, and Wardha are the main rivers of the tract. Purna river flows through South Central part of the district and forms the part of Tapi basin meeting it in Jalgaon district of Maharashtra. The river Wardha flows along the Eastern and Southern boundary of Amravati Forest Division.

1.1.1.4. The boundaries of the tract are as follows:-

North	---	Betul and Chhindwara Districts of Madhya Pradesh.
East	---	Nagpur and Wardha Districts of Maharashtra.
South	---	Yavatmal and Akola Districts of Maharashtra.
West	---	Akola District of Maharashtra.

SECTION 1.2 : CONFIGURATION OF THE GROUND:

1.2.1.1. The tract of Amravati Forest Division is situated on the Southern Uplands of the Melghats of Berar, on the Western portion of the Satpura hills ranges. The tract is hilly and undulating broken by broad valleys and interspersed with gently sloping plains. Most of the land lies on a high level plateau at an average elevation of 210 M to 850 M above the MSL sloping gently towards Eastwards forming Wardha Basin and towards westwards forming the Tapi basin. Highest elevation is 854 meter from MSL and lowest elevation is of 213metre from MSL. At places, the plateau rises through steep slopes to higher elevations to form ridges carrying the flat masses on the top developing into sharp crested peaks. Amravati is the Division Head Quarter.

SECTION : 1.3: GEOLOGY, ROCK AND SOIL:

1.3.1.1. The geological formations of the tract are as follows:

Recent to Sub-Recent – Alluvium/Laterite.

Eocene to Cretaceous – Deccan trap (Basalt), (Ferroginous gravelly soils) with Inter-Trappeans.

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

Pre-Cambrian – Shale/Sandstone/Limestone. (Vindhyan System) Loamy soils.
Deccan trap is the major geological formation found in this division which covers all the earlier geological formations of Archean, Puranic and Gondvana types appearing in this order. So nearly all the forests are situated on Deccan trap with hard gray basalt in greatly varying formations as the prevailing rock. The trap formation mainly comprises of basalt with quartz and local intrusions of quartz, schist and sandstone.

1.3.1.2. Basalt trap formation has hard homogeneous texture of crystalline variety and its softer beds show peculiar exfoliation type of weathering. Disintegration of the basalt produce soils varying considerably in depth and physical properties. The soils vary in nature from sandy and clayey loam to hard murram inter-mixed with boulders. Murram, a partially disintegrated form of trap is shallow, reddish to light yellow in colour is found on the plateau and hill sides. Clay is found generally in the low lying areas and depressions etc. Though quite fertile, it has poor drainage capability and is thus not suitable for teak. Black cotton soil is also frequently met with and supports good quality forests. All these soil types blend with each other in varying proportions and are often found containing sand, lime and gravel. This area supports the good quality teak forest. Eastern part of division comprising of Amravati, Morshi, Chandur Railway and Warud Talukas consists of mainly basalt with quartz and local intrusion of quartz, schists and labenite. The area consists of deep black clay to light black cotton soil.

SECTION :1.4: CLIMATE:

1.4.1.1. The climate of the tract is hot and dry during the summers while it is moderately cool during the winters. The summer generally sets in the month of March and lasts upto the second week of June, May being the hottest month. The south-west monsoon brings the rains. The average annual rainfall in this Forest Division is 885 mm. The rainy season commences by the second week of June and generally ends by the last week of August. The highest rainfall 1229 mm was recorded during the year 1997 with 59 rainydays while minimum rainfall of 363 mm was recorded during the year 1993 with 51 rainydays. The winter season commences by the second week of November and continues till February. December generally is the coldest month. As per the data given by Meteorological Department Nagpur, the minimum temperature recorded during the month of December in the year 1997 at Amravati station was 12.0^0C and the maximum temperature in the month of May was 44.5^0C. The incidence of the frost is not known to these forest areas., The wind velocity though, is moderate, yet sometimes uprooting of teak and other shallow rooted tree species is observed temperature data & rainfall data is given in Appendix I(a) & I(b) respectively.

SECTION :1.5 : WATER SUPPLY:

1.5.1.1. The complete tract is dry with low water table. Wardha and Purna are the only perennial rivers with water throughout year.

1.5.1.2. Major Irrigation Projects are:- Upper Wardha Project(MorshiTahsil) which has 80250 ha. of area under irrigation and also supply drinking water to twin cities of Amravati and Badnera.

1.5.1.3. Medium Irrigation Projects are: (1) Shahnur Project Taluka Anjangaon and (2) Chandrabhaga Project Taluka Achalpur.

1.5.1.4. Apart from the rains, wells, tanks and a net-work of canals are the main source of water supply for irrigation as well as drinking water. The electric pump-sets and diesel engines are used at places to lift water from the wells, tanks or rivers for irrigating the fields. List of water bodies is given in Appendix No. VI a & VI b.

SECTION :1.6 : DISTRIBUTION OF AREA:

1.6.1.1. Range wise forest areas are as shown below:

Sr.No	Range	Range area(ha)	% wrt division
1	Amravati	21,457.662	41.60%
2	Paratwada	8,058.406	15.66%
3	Morshi	11,424.562	22.21%
4	Warud	10,559.248	20.53%
Total of Division		51,499.878	100.00%

1.6.1.2. Legal status wise forest areas of the division is as follows:

Sr.No	Range	RF (A)	RF (C)	PF	UF	Total
1	Amravati	10770.144	10631.728	----	55.790	21457.662
2	Paratwada	3166.878	4891.528	----	----	8058.406
3	Morshi	4439.780	6984.782	----	----	11424.562
4	Warud	6888.748	3663.870	6.630	----	10559.248
Division Total		**25265.550**	**26171.908**	**6.630**	**55.790**	**51499.878**

Where RF(A) = Reserved Forests of A class of erstwhile Nizam State under Berar Forest Law. RF(C) = Reserve Forests of C class as per the said Act. PF = Protected Forests and UF = Unclassed Forests taken in lieu of forest land diverted for agriculture before 1980 and yet not declared as RF or PF. Distribution of the area is given in Appendix III to V in Vol. II of this Plan.

1.6.1.3. The forests of this division are covered in the following 24 Survey of India toposheets. Scale 1 : 50000 :- (1) 55 K/6&7, (2) 55 K/7S, (3) 56 K/3, (4) 55/G/15, (5) 55G/11, (6) 55 G/4, (7) 55 G/8, (8) 55 G/12, (9) 55 G/16, (10) 55 K/4, (11) 55 L/1, (12) 55 H/13, (13) 55 H/9, (14) 55 H/5, (15) 55 H/1, (16) 55 H/10, (17) 55 H/14, (18) 55 L/2 and (19) 55 L/6. Old sheets of Scale 4" = 1 mile :- (1) 55 K/ 2&6, (2) 55 K/3 N.W/4 & NE 1&3, (3) 55 K/ 6&7, (4) 55 H/13 and Scale 2" = 1 mile :- (1) 110 NW & SW (Hattighat)

SECTION :1.7 : WATERSHED IN AMARAVATI FOREST DIVISION :

1.7.1.1. As per the Ground Water Resource Survey the entire geographical areas of this forest division have been divided into number of watersheds. For the total development of areas the watershed development approach is one of the criteria laid down by the Central government as well as by the State Government. The Watershed Numbers and the compartments covered under them have been given in the area statement table.

SECTION : 1.8 : STATE OF BOUNDARIES:

1.8.1.1. The outer boundaries of erstwhile `A` Class Reserve Forests which are old reserves namely Chirodi, Hattighat, Shekdari, Mahendri & Lakhara are either natural features or the artificial lines created by cutting and clearing the entire standing growth. From 2001-02 onward new Boundary pillars have been erected with permanent RCC structures at a places. In case of Babul bans (classified as A class), Fodder reserves and erstwhile C class reserves forests, the artificial boundaries have been created by digging TCM of standard size but no pillars have been erected. In case of C class forests no demarcation exists.

SECTION:1.9: LEGAL POSITION:

1.9.1.1..The Reserved Forests have been notified from time to time out of Government waste lands by notification or occasionally after acquisition under the Land Acquisition Act.

The first orders constituting State Forests were promulgated by the Forest Rules of 1871, which included the reserves demarcated at that time. In 1892 the Berar Forest Law was introduced and under it State Forests have from time to time , been notified. In 1911, The Indian Forest Act was applied to Berar. The forests were not notified again in detailed, but by general notification the constitution of State Forests under the Berar Forest Law was confirmed. Since then changes in the areas or classifications are notified under The Indian Forest Act. All the Reserved Forests and Protected Forests of the division are notified under Indian Forest Act 1927. The list of Notifications bearing the formation of forests has been given in Appendix no II of Volume II of this plan .

1.9.1.2..Shekdari, Lakhara, Mahendri and Chirodi reserves were originally constituted as A class forests by the notification issued under section 40(c) and section 11 of Berar Forest Law 1886 as amended by the Berar Forest Act of 1891.

1.9.1.3..Babul bans in this division were declared by Act XV of 1911 and applied to Berar with reference to Hyderabad Residency Orders by various notifications.

SECTION : 1.10: RIGHTS AND CONCESSIONS:

1.10.1.1. The Reserved Forests are not burdened with any rights, however, the following concessions are permitted:

i) The grazing of the cattle belonging to the agriculturists of certain villages in the vicinity of the reserved forests, in accordance with the grazing rules in force.

ii) The villagers of forest villages now declared as revenue villages are allowed the same privileges and concessions regarding grazing of the cattle and obtaining timber and other forest produce for their bonafide domestic uses , as were to the erstwhile forest villages.

List of forest village & privilege code for Amravati District is given in Appendix No. VII in Vol. II of this Plan.

iii) Agriculturists of the villages in the vicinity of the RF are given certain quantity of timber, bamboo for their bonafide domestic use at concessional rates from the coupe under working.

iv) Minor Forest Produces are allowed to be collected by villagers for their bonafide requirements from the forests on the payment of charges as per schedule of rates sanctioned by the Conservator of the Forests.

1.10.1.2. In Protected Forests the villagers are allowed to avail the Nistar and grazing as per the limits fixed by "Wajib-ul-Arz".

1.10.1.3. Rights of way, generally, have not been recorded. The Conservator of Forests is empowered to close any road passing through a forest block so long as a reasonable convenient alternative route is provided.

1.10.1.4. As mentioned in the letter dated 10th June 1985, addressed to the Special Secretary, Revenue & Forests Department by the C.C.F. (Production) the Nistar material, to be supplied to the needy farmers is as below -

a) 10 Poles up to 60 cms. girth
b) Cart load ($2m^3$) fuel wood

} To each needy farmer from the worked coupes

This will depend upon the availability of the material and would be provided as per the modified methods for provision of Nistar. The Nistar rates are decided after consulting the District Collector and they are generally fixed at 50% of the market rate.

1.10.1.5.Grazing Concessions :- Essential cattle, subject to a maximum of two plough units per cultivator family are allowed free grazing in the forests as per the Grazing Rules of Maharashtra State dated 3rd November 1973. Statement showing cattle population of Amravati district is given in Appendix No. VIII & grazing statement is given in Appendix No. XVIII in vol. II of this Plan.

CHAPTER – II
THE FORESTS.

SECTION : 2.1 : GENERAL DESCRIPTION AND CONDITION OF THE FORESTS:

2.1.1.1. The forests of Amravati Forest Division belong to the formation 'Tropical Dry Deciduous Forests' as per Champion and Seth's revised Classification of forest types of India and are classified as "Southern Tropical Dry Deciduous Forests". i.e., 5A/C. Certain local variations of subtypes are noticed on account of various factors like uncontrolled heavy grazing illicit - cutting and frequent fires.

2.1.1.2. The forests are found on the undulating terrain. The soil is derived from the underlying trap and in general is highly compact with little sub-soil moisture. Majority of the forest area belongs to all India teak site qualities IV, III/IV & III. Natural seedling regeneration of teak and its associates is inadequate in most of the areas but in old reserved forests blocks the natural regeneration is noticed at many places. The current recruits of these species are noticed at many places during the rainy season which some-how fail to establish due to heavy biotic pressure and hostile soil regime. Though the areas had been worked under coppice with reserve in previous plans operations, the extent of coppice forests is found inadequate and the standing forests are high forests with some coppice stands at places. The coppicing vigour of teak and its associates has reduced over the years of working under 'coppice system' resulting into stunted, and multiple coppice tree crops.

2.1.1.3. Understorey are not well defined and undergrowth is thin with fair growth of grasses during rainy seasons.

2.1.1.4. Local variations in the forest crop intermingle and abrupt changes in the crop composition can also be noticed within the same compartment. As per Champion and Seth's classification, following local sub-types are distinguished.

Group	Champion and Seth's Classification	Local Subtype
Group 5	Tropical Dry Deciduous Forest.	
subgroup 5A.	Southern Tropical Dry Deciduous Forests.	
Climax Type.		
1) 5A/Cia	Southern Tropical Dry Deciduous Forests.	Very Dry Teak Bearing Forests.
2) 5A/Ci b.	Southern Tropical Dry Deciduous Forests.	Dry Teak Bearing Forests.
3) 5A/E2	Southern Tropical Dry Deciduous Forests.	Boswellia Forest (Salai Forest)
4) 5A/E3	Southern Tropical Dry Deciduous Forests.	Babul Forest
5) 5A/E4	Southern Tropical Dry Deciduous Forests.	Hardwickia Forest (Anjan Forest)
6) 5A/C3	Southern Tropical Dry Mixed Deciduous Forests.	Open Mixed Forests
7) 5A/DS4	Southern Tropical Dry Deciduous Forests.	Dry Grassland.
8) 5A/DS2	Southern Tropical Dry Deciduous Forests.	Dry Savannah Forest.
9) 5A/IS1	Southern Tropical Dry Deciduous Forests.	Dry Tropical Riverian Forest.

The brief description of each local sub-type is given below -

2.1.2.1. Teak Forests- Majority of the area of Amravati Forest Division is covered by teak forests both of seed and coppice origin. The all India teak site qualities are IV, III/IV and III. The crop is stunted but mainly of straight boled. Though patches of malformed and pollarded trees due to either repeated coppice working or illicit felling are also noticed intermixed with the other crop. Teak and its associates belonging to top canopy grow upto height of 20-21 mtrs. The crop-density in general varies between 0.2 to 0.7. Barren patches are also frequently met with. Established NR by seeds of teak and its associates is found but is inadequate. Current recruits of teak species found during rainy season fail to establish due to heavy biotic pressure and compact soil. Natural seedling regeneration of Ain, Tendu etc. is observed to be better than teak while coppice vigour of teak is more than that of its associates. So repeated working of the forest under coppice system has led towards the purity of teak species at many places at the cost of its natural associates.

2.1.2.2. This type of forests is found in Shekdari, Mehendari, Lakhara, Wai reserves of the division. The soil is moderately deep, abundant with stones and rocks. Soil along Nalas is deep where large size of teak are often met with. In rest of the areas small size teak is found. Floristic composition of the subtype is as follows.

2.1.2.3.TOP STOREY:

i) Principal Associates : Dhawada - Anogeissus latifolia, : Ain - Terminalia alata, Tiwas - Ougenia dalbergioides, Lendia - Lagerstroemia parviflora, Tendu - Diospyros melanoxylon.

ii) Other Associates : Satpuda - Dalbergia paniculata, Bhera - Chloroxylon switenia, Kalam - Mitragyna parviflora, Rohan - Soyamida febrifuga, Salai - Boswellia serrata, Semal - Bombax ceiba, Beheda - Terminalia belerica, Shisham - Dalbergia latifolia, Bija - Pterocarpus marsupium, Bel - Aegle marmelos.

2.1.2.4.UNDER STOREY :

i) Trees : Amaltas - Cassia fistula, Aonla - Emblica officinalis, Char - Buchanaia lanzen, Dudhi - Wrightia tinctoria, Ghoti - Zizyphus xylopyra, Palas - Butea monosperma, Dhaman - Grewia tilliaefolia, Moyen - Lannea grandis, Bartondi - Morinda tinctoria, Lokhandi - Ixora parviflora.

ii) Shrubs : Bharati - Gymnosporia montana, Parijatak - Nyctanthus arbortristis, Murad Sheng - Helicteris isora, Dhawati - Woodfordia fructicosa, Raymunya - Lanatana camara, Tendu - Diospyros melanoxylon..

iii) Grasses : Bhurbhusi - Eragrostis tenella, Kodmor - Apluda varia, Marvel - Andropogan annulatus, Dub - Cynidon dactylon, Paonya - Sehima sulcatum.

iv) Climbers : They are few and are confined to moist localities. Palasbel - Butea superba, Mahul - Bauhinia vahlii, Pivervel - Combretum ovalifolium, Chilati - Acacia pinnata, Iruni - Zizyphus oenoplia, Grinj - Abrus precatoritus, Dioscoria bulbiferra, Vitex tenifollia.

2.1.3.1. Degraded Scrub Forests :- They are actually an extension of the teak forests indicating their degradation to such an extent to be reduced to scrub forests with little or no growth of trees. It includes the entire areas managed as fodder reserves as per the previous working plan as well as the major areas under "C" class R.F. Majority of this area lies adjoining or very near to the villages and so had been bearing acute biotic pressure for long. So the degradation of these forests has set in over the years mainly as a result of heavy unregulated grazing , frequent fires and heavy fellings for fuelwood and other purposes. The soil is generally murrumy, very dry and highly compact and lies bare without any humus. Moisture content and moisture retention capacity of these forests is very low. Trees, if found, stand apart singly or in small groups. They are generally crooked and very low in

height and quite often retain the shrubby character. Thorny shrubs are found scattered along with variety of grasses.

Following species are generally found :

i) Trees and Shrubs : Teak - Tectona grandis, Tendu - Diospyros melanoxylon, Khair - Acacia catechu, Amaltas - Cassia fistula, Palas - Butea monosperma, Bharati - Gymnosporia spinosa, Dhawati - Woodfordia fruticosa, Hiwar - Acacia leucophloea, Ghoti - Ziziphus xylopyra, Nirgudi - Vitex negundo.

ii) Grasses : Kusal - Heteropogon contortus, Kunda - Ischoemum pilosum, Bhurbhushi - Eragrostis tennela.

2.1.4.1. Boswellia Forest (Salai Forest): : In these forests salai is associated with moyen and garari. Proportion of salai is more than 40% of the growing stock in overwood. At places its proportion exceeds 80% over extensive patches tending to form pure salai crop. Next to salai moyen occurs frequently in overwood and in patches attains the proportion of 10-30% of growing stock in overwood. The quality of crop varies from III to IV and density from 0.4 to 0.6. The rock beneath is crystalline or lateritic trap and shales. The soil is usually bouldery, roubles, shallow and dry. The growth of trees is stunted and found between 10 – 15 meters and even below that. Teak is found as associate but of stunted growth. Fire is annual Phenomenon. Regeneration is practically absent. In fire prone areas salai has become prominent due to hardiness of salai to fire.

2.1.4.2.FLORISTICS:

I. TOP STOREY: Salai - Boswellia serrata, Bhirra- Chloroxylon swietenia,, Dhawada- Anogeissus latifolia, Tendu- Diospyros melanoxylon, Ain- Terminalia alata, Kalam- Mitragyna parviflora, Moha- Madhuca longifolia, Bija- Pterocarpus marsupium, Lannea coromandellica, Lagerstremia parviflora, Schrebera swieteniodes, Dalbergia paniculata, Dalbergia latifolia, Bombex ceiba, Adina cordifolia. Schleichera oleosa, Xylia xylocarpa, Albizia lebbek, Terminalia arjuna.

II. MIDDLE STOREY: Cleistanthus collinus, Brightia tinctoria, Acacia catechu, Zizyphus xylopyrus, Emblica officinalis, Buchnania lanzan, Cassia fistula, Bahunia malaberica, Butea monosperma Semecarpus anacardium, Mallotus phillippensis, Strychos potatorum etc.

II a Dendrocalamus strictus**.**

III Holarrhena antidysentrica, Helectreres isora, Woodfordia floribunda, Bridelia hemiltoniama, Gardenia gummifera, Indigofera tinctoria, Woodfordia fruicosa, Flemingai spp.

IV a Cassia tora, Phoenix acaulis.

IV b Ischaemum laxum, Andropogan contrtus, Cympopogon martni, Sorghum spp,

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

2.1.5.1. Babul Forest: These are widely scattered in strips and patches, occurring along river banks and small Nalas near villages. The crop consists of pure babul wherever the babul has failed to establish itself, it has been replaced by other species thriving well on poor soils.

2.1.5.2. The pure patches of babul occur mostly in the black cotton soil. They were planted mostly under the agri-silvicultural method. The plantations are largely successful on the black cotton soil but at the places where soil is poor and shallow it has been replaced by open scrub forest in which hiwar (Accacia leucophloea), khair (accacia catechu), bor (Zizyphus jujuba), palas (Butea monosperma), neem (Azadirachta indica) etc have come up. Surviving babul has become scruby. In good black cotton soil, babul trees attains a height of nearly 10 – 12 meter in thirty years. Some chandan (Santalum alba) trees are also found. In poor soil, the plantation of anjan (Hardwickia binnata) and neem (Azadirachta

indica) have been raised successfully. In the babul ban situated on the banks of Nalas, the main species found are sindhi (Phoenix sylvestris) , kahu (Terminalia arjuna) , hiwar (Acacia leucophloea) and Chichwa (Albizzia lebbek). Most of the babul bans do not have understorey. In open and sparse areas Cassia tora, Gymnosporia spinosa and Lantana camara are found.

2.1.6.1.Hardwickia Forest (Anjan Forest): Hardwickia forests are found in patches mixed with babul ban along the Nalas banks and near to villages and the areas where it has been planted. The established pure forests of anjan are not common. Due to use of leaves as fodder the trees are found in pollarded conditions. It is found in the areas similar to that of dry teak but in restricted form than the associates of teak. It is mainly found on shallow hard gravelly soils over trap but occurs on variety of other rocks mixed with other trees. It is found in pure form associating with salai, babul, neem, garadi, tendu, khair, teak etc.

2.1.7.1. Open Mixed Forests: These forests are generally open and are of site quality usually IV. They are found over the major part of the Chirodi reserve and on the tops of ridges, on the upper slopes and along the unfavourable aspects. It is also found on the hill slopes in Shekdari, Mahendari, Lakhara blocks. Here salai is the predominant species. Heavy grazing has led to thorny plants population. Grasses are found in open areas. The following species are found:

I. Dhawada, ain, salai, anjan, bhirra, khair, chandan (in sparse) etc.
II. Gymnosporia spinosa , Ziziphus spp.
III. Heteropongon contortus, Sehima nervsum etc.

2.1.8.1. Dry Grassland and Dry Savannah Forest: These types of forests represent the degradation stages where the forest cover has been destroyed. These are found in "A" type ramnas and in the most of the "C" class forests. The soils are shallow with underlying impermeable rock bed. The common grass species found are:- Heteropogan contortus, Schima nervosum, Andropogaon pumilus, Themeda quadrivalvis etc, The woody species are found : Accacia catechu, Bahunia racimosa, Butea monosperma, Boswellia serrata, Diospyros melanoxylon, etc.

2.1.9.1. Dry Tropical Riverian Forest: On the banks of river and perennial Nalas sandy soils often overlying more or less impervious rock liable to temporarily submerged during the shorter period of monsoon and usually retaining adequate water supplies most of the year the dry tropical Riverian forests are met with. This types forests are found in strips along the river passing through the forest areas of the tract dealt with. The main species found are sisso and khair along with their associates like arjuna, Dhawada, Kalam, Pongamia, Bahunia, tendu, palas, tamarind, etc.

SECTION : 2.2 : INJURIES TO WHICH THE CROP IS LIABLE :

2.2.1.1. Heavy uncontrolled grazing, illicit cutting and frequent fires are the major factors causing damage to the forest crop apart from few others. Each of these factors is described below separately.

2.2.1.2. Domestic animals: Continuous and unlimited grazing is harmful to the tree growth but the moderate grazing does little damage to the growing stock. Heavy grazing is always harmful to the soils. The trampling by cattle hardens the soils, and makes it unfavourable for reproduction of trees species by reducing soil aeration. In case of sandy soils it causes denudation. By heavy grazing young plants are browsed, trampled and crushed. It also reduces the grazing values of the forests as the palatable and succulent annual grasses are replaced by coarse perennial grasses or weeds. Grazing however reduces the damage done by the fire and the danger of fire. Grazing damage can be seen in the entire forest areas irrespective of classes of forests. Heavy uncontrolled grazing all over the forest

areas has resulted into serious damage to the young natural regeneration of teak and its associates. Repeated trampling of the forest flora by the cattle has resulted into a highly compact soil structure with little sub soil moisture. It has also badly affected the soil aeration. All these factors adversely affect the establishment of current recruits of teak and other species. The sheep and goats are by and large prohibited from grazing in the forest due to their low level grazing, resulting in uprooting of seedling or rhizome.

TABLE SHOWING THE NUMBER OF OFFENCE CASES OF FIRE AND GRAZING:

Sr.No	YEARS	No of Fire Cases	No of Grazing Cases
1	1994-95	14	309
2	1995-96	28	250
3	1996-97	55	143
4	1997-98	20	151
5	1998-99	35	143
6	1999-2000	50	136
7	2000-2001	28	134
8	2001-2002	16	136
9	2002-2003	15	87

2.2.1.3. Fires : The forest of Amravati forest Division is quite susceptible to fires during dry seasons. Recurrent fires badly damage the young NR of teak and its associates. They also damage the standing trees as well as the under growth. The fires may be accidental but usually are man made who set the forest to fire for the collection of mahua flowers and fruits or for getting good flush of Tendu leaves etc.

2.2.1.4. Man: The illicit fellings are not so common in the division. Fellings of the trees and lopping of the tree branches are often resorted to, both for fulfilling the domestic as well as commercial requirements but is under control by continuous patrolling of forests.

YEARS	No of cases of illicit cutting	Value of the trees cut in Rupees
1994-95	519	2,29,058
1995-96	383	3,69,624
1996-97	223	1,98,306
1997-98	308	4,80,389
1998-99	421	3,97,561
1999-2000	402	4,02,421
2000-2001	479	4,68,054
2001-2002	443	3,37,856
2002-2003	431	4,62,763

Statement of Forest Offences is given in Appendix No. XII in vol. II of this Plan.

2.2.1.5. Wild Animals : Nilgai, Sambhar and Chital cause damage by browsing in young woods and damaging the barks with their horns. Wild boar, hares and porcupines damage the plantations. Wild boar attacks on young bamboo plantations are noticed at many sites. No other significant injury caused by the wild animals, is noticed except shivan plantations seedlings are adversely affected due to monkeys.

2.2.1.6. Climbers and Weeds : No considerable damage due to climbers is noticed in the forest. Weeds like Lantana, Vitex, Bharati etc. are to some extent making inroads in degraded and open forests.

2.2.1.7. Insects:- Teak defoliator (Hybleae puera) and Teak skeltoniser (Hapalia machaeralis) attack on teak stand is common especially during the autumn and nearly 10% of the increment is lost. No permanent damage is caused but some decrease in growth of the teak. White Grub(Holitricae serreta) attack is also noticeable in teak nurseries cutting the new teak germinating shoots. No other prominent insects attacks have been reported so for.

2.2.1.8. Drought : The entire area faces the water scarcity during the summers except for the areas adjoining to the rivers Purna, Wardha and their tributaries. The area is also prone to droughts or drought like conditions due to erratic rainfall. Drought gives a set-back to sowing and planting of teak and other species. It also retards the coppicing - potential of the trees as well as the establishment of the young NR of teak and its associates.

2.2.1.9. Frost : The incidence of the frost is not known to this area.

2.2.1.10. **Erosion**:- In 'A' Class reserved forests of this tract gully erosion is noticed while in 'C' class Reserved forests and other low-density forests, sheet erosion is common. At places rock is exposed and big Nallas have been formed due to heavy soil erosion. In the interest of soil, control of erosion is a must.

CHAPTER – III

UTILIZATION OF THE FOREST PRODUCE

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

3.1.1.1. As per population census of 1991 the village population of the district is 67%. The main businesses in the villages of the district are agricultural farming, horticulture & farm labour. Forest adjoining villages depend mainly on forests for their daily needs such as timber, firewood, fodder etc. This tract is abounds in Orange growing sites, which need bamboo, ballies and labours on a large scale for various purposes. Also during the tendu leaves collection season quite a large number of labourers are engaged in collection and processing of tendu leaves. During non-agriculture season villagers adjoining to the forest areas are engaged in collecting minor forest produce such as flowers & fruits of Mahua, Charoli, Biba, Sitaphal, Honey, gum, Sindi fruits & leaves etc. The villagers depend upon the forest produces available from forests.

Talukawise Cattle Population of Amravati District

Name of Talukas in Amravati Division	Foreign Cross Breed Cows			Local Cows and Bullocks		
Sr. No. Talukas	Bullocks Over 3 ½	Cows Over 3 ½	Young Upto 3 ½	Bullocks Over 3 ½	Cows Over 3 ½	Young Upto 3 ½
1 Amravati	171	1338	942	12624	15498	11322
2 Tiwasa	313	647	910	12856	17049	14272
3 Chandur(Rly)	505	1614	1320	18857	19302	15796
4 Chandur(Bazar)	249	844	903	15378	13459	14736
5 Nandgaon(Kh)	81	796	711	18767	17569	14213
6 Bhatkuli	191	453	467	12537	9797	10861
7 Achalpur	401	578	658	15392	12056	10607
8 Daryapur	300	548	446	15854	10493	9915
9 Morshi	203	768	684	14417	17567	12735
10 Varud	292	1657	1564	15067	19857	13388
11 Anjangaon (Surji)	169	503	517	11343	9417	7816
Total in the Division	**2875**	**9746**	**9122**	**163092**	**162064**	**135661**

Sr. No	Buffalo			Total Cattle Units	Sheep	Goat	Horse	Other Live-Stocks	Total Live-Stock
	Male Over 3	Female Over 3	Young Upto 3						
1	254	11886	4880	64923	1226	30429	650	6564	**97784**
2	106	4525	2734	50452	3802	20642	93	4058	**82007**
3	120	4201	2379	59857	1622	32103	260	5660	**103739**
4	99	5062	2966	51038	288	23673	298	5378	**83333**
5	157	4866	3620	58341	432	31312	1644	3900	**98068**
6	79	3328	1909	37365	56	17256	343	5004	**62281**
7	165	6382	3737	50891	3945	25600	246	5379	**85146**
8	97	3284	1666	40804	4	20822	190	4170	**67789**

9	162	4802	2467	52060	5102	21732	119	6515	**87273**
10	132	6072	3744	60501	2132	22310	24	5698	**91937**
11	78	3563	1742	34623	2404	17575	186	3278	**58591**
	1449	**57971**	**31844**	**560853**	**21013**	**263454**	**4053**	**55604**	**917948**

(Source : Amravati District Economic and Social Assessment for the year 1998-99)

3.1.1.2. Timber: - Teak is in great demand for building construction wood, furniture and for other agricultural purposes but due to shortage of availability and higher cost of teak, species like ain, Tiwas, sajad, Kalam, neem, babul, amba etc are also used as timber species.

3.1.1.3. Firewood: - The demand for firewood in the villages in this tract is very large and requires Dhawda, Babul, Lendiya etc species as firewood.

3.1.1.4. Bamboo: - Bamboo is on the verge of disappearing from this tract. The farmers particularly orange grower needs bamboos on a large scale. Also bamboo is required for manufacturing of baskets in construction of huts & sheds. All these above requirements are fulfilled by importing bamboos from Madhya Pradesh and adjoining Forest Divisions of Maharashtra.

3.1.1.5. Grasses:- Grass serves mainly as fodder, some varieties of grasses are used for thatching of huts & cattle sheds. Major part of the available grass in this tract is from Wadali Range from existing Ramnas.

3.1.1.6. Grazing: - The demand for grazing is abnormally high in this tract. Cattle are permitted to the forest for grazing at concession & commercial rates. The grazing pressures have been increasing on forestland due to herds of cattle and goats reared by local villagers.

SECTION-3.2: - <u>MARKETS AND MARKETABLE PRODUCE</u> :

3.2.1.1. Market: - The forest produce collected, finds keen demand in the markets of Amravati, Chandur (Rly.), Chandur Bazar, Daryapur, Morshi, Warud etc. Regular weekly bazaars are held at above and other big villages of the tract. The list of timber & firewood depot is given in Appendix No. XIX.

3.2.1.2. Marketable Produce: - Teak is the main timber in demand along with Sajad, Tiwas, Kalam, Babul, Dhawada, Mango, Neem etc. The other marketable products are Tendu leaves for bidi, Moha flowers & fruits, Honey, Gum, Ber, Jamun, Sitaphal etc.; Grasses and Anjan leaves for fodder. The list of Saw mills is given in Appendix No. XX of vol. II of this Plan.

SECTION-3.3 :- LINES OF EXPORT: For the transportation of different forest products following network of roads & railways are used: -

3.3.1.1. Roads: There is a good network of roads in this tract, almost every village is connected with Taluka head quarter & every Taluka head quarter with District head quarter. List of few important roads is given below: -

i) Calcutta - Mumbai Road (National highway No.6)
ii) Amravati - Amravati
iii) Amravati - Hinganghat
iv) Amravati - Dharni-Burhanpur (M.P.)
v) Amravati - Warud-Pandhurna (M.P.)
vi) Amravati - Akot
vii) Amravati - Chandur Bazar
viii) Paratwada - Morshi
ix) Warud - Wardha
x) Warud - Nagpur

xi) Amravati - Bhatkuli Area
xii) Tiwsa - Chandur Railway
xiii) Warud - Multai (M.P.)
xiv) Paratwada - Anjangaon (Surji)
Besides above main roads maintained by Public Works Department & Zila Parishad, there are some forest roads maintained by forest Dept.

3.3.1.2.Railway: - Following railway tracks passes through the area of the Division.
Mumbai - Nagpur
Badnera - Amravati
Murtizapur - Achalpur
Amravati – Narkhed (Work in Progress)

SECTION:3.4: - METHODS OF HARVESTING

3.4.1.1. Timber and firewood are the major forest produce which are exploited departmentally or through forest labourer co-operative societies, as per the Govt. Policy & G.R. No. 1581/ 93544 / F-4 dt.4 / 4 / 81. But presently there is no F.L.C.S. working in the Amravati Forest Division.

3.4.1.2. Harvesting of Minor Forest Produce (MFP) is done through department or through the co-operative societies or village Panchayats or as per the Government instructions & resolutions, issued from time to time.

3.4.1.3. The Kurans are allotted in the following order of priorities fixed by Revenue & Forest Dept. vides their Resolution No. M.F.P. 1665/ii, 8931-y dated 8th November 1971 : Village Panchayats, Public bodies including Dairy Societies, Forest Labourer's co-operative societies. Kurans not allotted to any of the above but are sold by open auctions.

3.4.2.1. Outturn & Revenue for some important forest produce for the period 1987-88 to 2002-03 is given in Appendix No. XI of Vol. II of this Plan.

CHAPTER-IV

STAFF AND LABOUR SUPPLY

SECTION-4.1: -STAFF :

4.1.1.1. The tract dealt with is under the administrative control of Deputy Conservator of Forests, Amravati Forest Division, Amravati in Amravati Forest Conservancy. The Head Quarter of this division is at Amravati. List of officers who held charge of Amravati Division & Statement showing position of staff in Amravati division is given in Appendix No. XV & XXX III respectively in vol. II of this plan.

Sr.No	Class	Name of the Post	Sanctioned		
			Permanent	Temp	Total
1	I	Deputy C.F.	1	0	1
2	I	A.C.F.	0	2	2
3	II	R.F.O.	5	4	9
4	III	Forester	33	11	44
5	III	Forest Guard	127	20	147
6	III	Surveyor	2	0	2
7	III	Chief Accountant	1	0	1
8	III	Accountant	7	0	7
9	III	Clerk	13	2	15
10	III	Jr. Statistical.Asstt	1	0	1
11	III	Jeep Driver	2	1	3
12	III	Truck Driver	1	0	1
13	III	Police Constable	0	1	1
14	IV	Peon	4	0	4
15	IV	Sweeper	1	0	1
16	IV	Daftary	1	0	1
17	IV	Chowkidar	1	0	1
18	IV	Waterman	1	0	1
19	IV	Mali	4	0	4
20	IV	Forest Labour	-	-	-
Total			205	41	246

4.1.1.2.Accommodation : Accommodation made available by the forest department is inadequate. Majority of the staff members are not provided with accommodation. List of buildings is given in Appendix No. XIV in vol. II of this plan.

4.1.1.3. Rest House: There are FRH at Amravati, Mahendri, and another Inspection Huts at Morshi and other places.

4.1.1.4. Forest Communications: All the range headquarters are connected to the division by metalled roads. Round and Beat head quarters are connected by the state transport bus service. All ranges are provided with telephones.

4.1.1.5. Office Automation: The Division office and all Territorial and Depot offices have been equipped with computers and most of the staffs and officers of grade I, II and III have been trained to handle these computers. Maharashtra Forest Department is following IT developments.

SECTION:4.2: - LABOUR SUPPLY:

4.2.1.1. In the past labour for forestry works were available from the forest villages. But now these villages have been handed over to the Revenue Department. Earlier villagers were residing in the forest villages, it was binding on the villagers to work on forestry works. Now that situation has changed. Area of Amravati Division is full of orange gardens and other agricultural works and the labours get attractive wages during the seasonal works. Hence the staff faces difficulties in getting labours for forestry works. Statement showing wage board rates for different forestry operations is given in Appendix No. XVI in vol. II of this Plan.

CHAPTER-V

PAST SYSTEM OF MANAGEMENT

SECTION- 5.1 : - GENERAL HISTORY OF THE FORESTS :

5.1.1.1. Berar was assigned to the British Raj in 1853, and in 1865 the Forest Department started functioning by the appointment of an Assistant Conservator who worked under the guidance of the Conservator of Forests, Central Provinces. At the time, the forests of Amravati district continued to be managed by the Deputy Commissioner. In 1867-68, a daroga (Forest Ranger) was appointed in charge of the Amravati district forests under the control of the Deputy Commissioner. In 1869-70, two forest divisions were formed in Berar namely the northern and southern division. But the forests of Amravati district were still managed by the Deputy Commissioner and not included in these divisions. In 1871, the forests of this division were reorganized, but the management by the Deputy Commissioner continued under the settlement rules and district forest rules. In 1883, the Amravati forest division was formed and all the forests of the district were placed under the control of a Divisional Forest Officer, who was subordinate to the Deputy Commissioner, as his Assistant in all Forest matters and Deputy Commissioner with the Conservator of Forests. In 1901, D.F.O. Amravati was directly placed under the Conservator of Forests. The old Amravati division was divided into three administrative units namely (a) East Melghat, (b) West Melghat and (c) Amravati Sub-Division by the order of Government of Maharashtra, Agriculture Food and Forest Departments Resolution No. FDM_ 1361/ 12464-111-J dated 6th February 1964. The situation continued till 1983, when Amravati Sub-Division was raised to a status of a Division by the Government notification no. FDM/1880/1-F2 dated 29th of August, 1983.

5.1.1.2. In the year 1881, a classification of forests was introduced in Berar and following classes were distinguished:-

(i) Reserves:- Fairly large areas intended for the production of wood.

(ii) Woods (Bans):- Areas too small to be formed into reserves, but suitable for the growth of trees, chiefly babul forests.
(iii) Grass lands (Ramnas) :- Areas set aside for the production of fodder and thatching grass.
(iv) Grazing lands:- Areas permanently required for grazing.
(v) Open forests(parit):- Unoccupied assessed survey numbers.

Under this classification the Sekdari, Mahendari, Lakhara, Hattighat, Wishroli and Chirodi Reserves come under category (i); the babul bans under (ii); and the present grass ramnas under (iii); while categories (iv) and (v) refers to the present 'C' class and 'E' class forests.

5.1.1.3. The Berar Forest Law was passed in 1886, and it was implemented in 1892 due to the delay in framing rules under it. In 1911, the Indian Forest Act VII of 1878 was extended to Berar.

SECTION:5.2: PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS :

5.2.1.1. First working plan of the division:- . In, 1902, a working Plan for the forests of Amravati Division was drawn up by Shri E. E. Fernandez, Conservator of Forests, Hyderabad Assigned Districts. It laid down prescriptions for the period from 1902-1903 to

1926-1927. Under this plan 4149 acres of Babul bans were proposed to be planted under agrisilviculture. The method of treatment prescribed consisted of clear felling followed by "Sowing in plough made furrows 6′ apart or patches of 3′x5′, 6′ apart either way on the square or in notches similarly distanced." Control forms showing the results of the working in the circle were not maintained. Chirodi reserve was allotted to the Bushwood working circle and simple coppice treatment was prescribed with a rotation of 15 years. Two felling series, Warur (4368acres) and Brahmi (5463acres) were laid out in this working circle. Simple coppice system did not give satisfactory results, so the areas after clear felling were planted under agri-silviculture. The first eleven coupes of Warur felling series and eight coupes of Brahmi felling series were planted under agrisilviculture during the period 1904 to 1922. The species sown were khair (Acacia catechu), bor (Zizyphus jujuba), bhosa(Bahunia racemosa), goti (Zizyphus xylopyra), bharati(Gymnosporia montana), neem (Azadirachta indica), saja(Terminalia tomentosa), salai(Boswellia serrata), achar (Buchanania latifolia), anjan (Hardwickia binata), babul (Acacia nilotica) and palas (Butea monosperma).

5.2.1.2. No work was done in Chirodi reserve after 1926, when the last plot leased out for agrisilviculture was released.

5.2.1.3. Shekdari, Mahendri and Lakhara reserves of Morshi Range constituted Teak Working Circle under that plan. Each of the three reserves was divided into two felling series, each felling series comprising of ten coupes. The method of treatment prescribed was coppice improvement felling on a rotation of 20 years. The working plan for this area was never sanctioned by the government and the areas were worked under the working schemes annually sanctioned by the Conservator of Forests.

5.2.1.4. In 1919, Shri H.S. George prepared a working scheme for the babul bans. This scheme proposed to plant up 1528.098 hectare under agrisilviculture and 14 coupes to be worked from 1919-20 to 1933-34 were laid out. It met with variable success. The work was abondoned in 1937 when there was a slump in cotton prices and lease money offered for agrisilvicultural work was low.

5.2.1.5.. In 1930 a revised provisional working scheme for the Shekdari, Mahendri and Lakhara reserves was prepared by Sardar Sahib Kesar Singh, Extra-Assistant Conservator

of Forests and was introduced in 1930-31. Under that scheme, each of the six felling series formed as per Shri Ferdinadez`s plan, was divided into 20 annual coupes. It prescribed "Very light improvement fellings" for the two felling series of Lakhara reserve, "Light improvement felling" for the two felling series of Mahendari reserve and "Ordinary improvement felling" for the two felling series of Shekdari reserve. This working scheme was a failure.

5.2.1.6. From 1935, Shekdari, Mahendri and Lakhara reserves were being worked under the working plan drawn up by Shri Gurudayal Singh. For the "A" class reserves, Babul bans and grass reserves of Amravati, Morshi and Chikhalda (now Paratwada range) ranges and Chirodi reserve of the Amravati range, the working plan prepared by Shri W.N. Sharma, came in force from 1941. These two plans were combined into one plan by Shri Upadhyay.

5.2.1.7. The treatment prescribed and the results of the working carried under the two plans mentioned above were as follows:

5.2.2.1. Working plan for the "A" class babul bans and "A" class Grass Reserves of Amravati, Morshi and Chikhalda Ranges and Chirodi Reserve of Amravati Range.

The following working circles were formed:-

(i) The babul ban plantation working circle- area 2376.949 ha.
(ii) The Chirodi plantation working circle- area 2336.258 ha.
(iii) The Miscellaneous working circle- area 8785.755 ha.

5.2.2.2.The babul ban plantation working circle:- Under this working circle seven felling series were formed and a rotation of 30 years was fixed. The treatment prescribed was clear felling followed by regeneration by agri-silviculture. The forest species were to be sown in lines 18 feet apart in the third year after raising of pure agricultural crops during the first two years. Early thinning in congested rows of forest species in fifth year, tenth year and twentieth years were prescribed. In areas with heavy weed growth uprooting of the weeds was prescribed. Upto end of 1959-60, coupes I to XX were felled and coupes I to XVIII were regenerated by agrisilviculture. Parts of some coupes were written off as the areas were unsuitable for agrisilviculture while in two felling series (Morshi and Ner) some coupes remained in arrears.

5.2.2.3. In this Working Circle only such areas as were fit for cultivation and for which there was a definite demand for agri-silviculture were included. Out of 7 felling series one viz. Yaoli felling series in Amravati Range was provisional. As throughout the period of this plan, the demand for land for cultivation remained fairly keen, even the provisional felling series were regularly worked. Some Survey Nos. adjoining the babul bans were left out of the working circle for the reason that they carried a some what poorer soil unfit for cultivation, (e.g. Morshi Survey No. 141). As the method of regeneration was by agri-silviculture, the demand for land had to determine the progress of regeneration, but if the raising of forest crop were to be recognized as the primary object of management (and not the provision for cultivation) it was not necessary to exclude the unsuitable areas from working. The prescriptions did include the planting of poorer soils with suitable species other than babul which it exacting in its soil requirements, and so the areas with poorer soil should not have been excluded. In some cases, it was found that some areas unsuitable for cultivation were included in the working circle but these remained unregenerated, e.g. Tondgaon Survey No. 2 (c/VIII Sirasgaon felling series). However, such areas are very few and generally speaking the results of working in this working circle are quite successful. The prescription regarding planting of non-babul species like Prosopis juliflora, Acacia catechu, Soymida fabrifuga etc. on poorer soils and of bamboos and Albizzia lebbek on Nala banks did not receive adequate attention and it has resulted in small gaps or blanks in the babul crop.

5.2.2.4. Successful working in this working circle hinged around the demand for land for cultivation as also on the efficiency of supervision of Contractors work wherever the land hunger decreased, there was a tendency on the part of the Contractor to neglect the resowing, the tending of the forest species and the regeneration suffered.

5.2.2.5. The Chirodi plantation working circle:- Under this working circle, only one felling series was formed. Clear felling and planting by agri-silviculture were prescribed. After clear felling the annual coupe was to be divided into plots and each plot was to be leased out for raising pure agricultural crop during the first two year and planting suitable tree species in the third year in lines 15 feet apart. Selection weedings and thinnings in lines were to be carried out during the first four years after planting.

5.2.2.6. In the first two coupes, teak was planted over small areas. It established well and rapidly spreading in the adjoining, open mixed forests. After treating the first two coupes under the prescribed rules, Coupe III was worked through a Contractor and was taken up for raising experimental plantations. These were to be raised in 5 years taking 5 acres of area each year. Coupe IV was clear felled and left to be filled up by coppice reproduction. After working Coupe No. IV the prescriptions of paragraphs 82 , 83 and 85 of the plan were suspended and the coupes were ordered to be worked under improvement fellings vide Chief Conservator of Forests, C.P. and Berar's No. 3008, dated 26th July 1944. Since then

these areas have been worked under improvement fellings. Attempts to raise teak plantations over small area have been made in coupe Nos. XIII, XVIII and XXII but without much success as the site conditions were not suitable. The teak plantation in suitable areas however are quite well. The Working Plan prescriptions did not provide a definite thinning schedule and the young teak plantation in coupes I and II, raised during the period of this plan were congested and were in need of opening out immediately. The total areas worked and areas planted in this working circle upto the end of 1959-60 are 3,116 and 554 acres, respectively.

5.2.2.7. The Miscellaneous working circle:- This included all babul bans which were considered to be unsuitable for agri-silvicultural operations, all grass reserves, the poorer areas of Chirodi reserve, and all forest villages. No specific operations for this working circle were prescribed. All the grass reserves were closed to grazing and strictly fire protected. In the absence of direct measures for improvement there has been no improvement in the quality and yield of fodder from the grass reserves.

5.2.2.8. For the "C" class forests, no specific operations were prescribed. It was recommended that experimental rotational closures to grazing and experimental afforestation by agri-silviculture be carried out in suitable areas. Some areas were afforested under agri-silvi in Wadhona "C" class forests in Amravati Range. In Morshi Range, three plots were fenced and planted with paonia and other superior fodder grasses.

5.2.3.1.Working plan for Shekdari, Mehedari and Lakhara Reserves of the Morshi Range:- The following working circles were formed:-

(i) The Coppice Working Circle- Area 6296.930 ha.
(ii) The Miscellaneous Working Circle – Area 693.633 ha.
(iii) The Bamboo (overlapping) Working Circle-Area 3181.244 ha.

5.2.3.2. The Coppice Working Circle:- Four felling series were formed out of three reserves viz. the Shekdari, Mehedari and Lakhara. The **30 years rotation** was fixed. The forests allotted to this Working Circle were to be worked under 'Coppice with Reserves' system. Under this system, clear-felling was to be restricted to areas, which could yield sufficient coppice growth to restock the areas adequately, and in the remaining areas, improvement fellings were to be carried out. The prescriptions were simple but some-what

primitive. They were amended and elaborated vide amendment No. 10, dated 15th April 1941. After the main fellings, subsidiary cultural operations and cutting of climbers were prescribed. As per these prescriptions coupe Nos. I to XXVI were worked by the end of 1959-60.

5.2.3.3. The treatment actually given to the crop did not produce the conventional coppice crop, for the reasons that the completely clearfelled patches were few and small in extent or because the initial stocking was not full or due to apprehension that clear felling may result in pure crops. In the earlier coupes, where concentrated regeneration felling were carried out over larger areas, the results were excellent, but in the later years the reservation had been some what heavier. However, the progress of reproduction of teak is found satisfactory. As preference had been given to teak in almost all tending operations, teak becoming pure and had extended over considerable areas in the mixed forest patches and also in the open areas. Coupes from I to XXVI have been worked upto end of 1959-60.

5.2.3.4. It was mentioned in para 97 of the W.N.Sharma's Working Plan that extensive tending operations were not important in these low quality areas and thinning in the 16th year suggested. However, in the young teak crops of almost all worked coupes, some sort of cleaning operations were carried out and coupes IX to XVI were thinned in the 20th year. The young crops have benefited by these operations, but these were done on very conservative lines and congestion is still noticed in the existing crop.

5.2.3.5. The Miscellaneous Working Circle:- Besides the forest villages, only one compartment having forest growth was allotted to this working circle. No operation was prescribed or carried out in this working circle.

5.2.3.6. The bamboo (overlapping) Working Circle:- Only two felling series viz. the Bhemdi and the Mehedari were formed. They were worked on a 4 year felling cycle. The rule for working of bamboo coupes were inadequate to achieve improvement of the bamboo forests. Since the demand for bamboos in the tract was very heavy over exploitation was noticed and working of bamboos was later on stopped. This resulted in congestion in some of the clumps.

5.2.4.1..Working Plan by Shri B.H.Upadhyay was introduced in 1961-62. It expired in 1976-77. However due to non-revision of the plan, it remained operative till 87-88. No further extension was granted to the plan in view of directive of the government not to work a forest till the working plan is revised. There were six working circles. A summary of treatments prescribed and the results of working are summarized as under.

5.2.4.2.Coppice with the Reserve Working Circle:- The total area included in the working circle was 7944.4 ha. All exploitable tree forests capable of producing small timber, poles and firewood were included in this working circle. The silviculture system was coppice with reserve. Four felling series were formed and **rotation of forty** years was fixed. The Plan prescribed preparation of the treatment map for the coupe to be worked. The treatment map was to be prepared by showing the following details.

5.2.4.3. **(A)Unworkable steep slopes and protection areas:-** It included steep slopes over 25^{o} , understocked areas, eroded and erodable areas and Nala banks unto 1 chain width.

5.2.4.4. (B) Areas to be clear felled for raising Teak Plantation on well drained deep soil capable of supporting III or IV quality teak. Each patch was not to be less than two acres in area.

5.2.4.5. (C)Old Plantation and well stocked patches of growing pole crop of valuable species not less 1 acre in extent as future crop.

5.2.4.6. (D) Teak and miscellaneous forests with density over 0.4 but less than 0.7 (excluding salai forest).

5.2.4.7. (E) Salai forest over 0.4 density.

5.2.4.8. (F) Remaining areas.

5.2.4.9. The following marking rules were prescribed for each category:

Categories	Prescriptions
(A)	All dead and badly diseased and mature and over mature trees not likely to survive the entire rotation if silviculturally available were to be marked for felling.
(B)	These areas were marked for clear felling.
(C)	These areas were to be thinned.
(D)	In these areas only improvement felling was to be carried out by removing dead dying unsound, malformed, mature and over mature trees. No living tree was to be felled as it created permanent gap in canopy and reduced density. Trees needed for seed and soil protection were also to be retained
(E)	Only light thinning was to be carried out to help well grown, sound and vigorous trees.
(F)	In these forests, all advance growth upto 9" girth at b.h. well grown poles of teak and other valuable species e.g. Bija, Shisham, haldu, ain, etc. upto 30 cm. Gbh in quality IVb area upto 45 cm. Quality III area to be reserved. All fruit bearing healthy trees and also Semal, tendu, khair were to be retained and rest of the trees were to be clear felled.

5.2.4.10. Soon after the completion of main felling cutting back operation (CBO) involving removal of unfelled marked trees and damaged trees, cutting back of malformed and suppressed advance growth of teak, cutting of climbers and disposal of debris was prescribed. The cleaning and thinning were prescribed in 6^{th}, 11^{th}, and 21^{st} years in the coppice as well as in the plantation crop. The average spacing to be achieved was around 1/3 rd of the height of the crop.

5.2.4.11. The reservation of trees prescribed was not qualified and in normal circumstance it would lead to reservation not conducive to growth of coppice regeneration. Coppice regeneration should be supplemented by seedling regeneration in normal course. In other working circles due to ineffective protection against grazing and fire there is no seedling regeneration. The prescriptions have not been followed in respect of carrying clear felling over 0.7 density only. Also plantation have not been raised over 2 ha in the coupes worked. Due to favour to teak, non-teak species have become scarce. Due to depletion of forest cover lantana has invaded large tract especially in Wai Felling series along the road.

5.2.5.1. Improvement Working Circle:- It included 13,738 acres (5495.2 ha) formed into two fellings series. The areas allotted to the working circle were understocked due to continuous maltreatment and unrestricted grazing in the past. Chirodi felling series was divided into 30 coupes and Wishroli felling series into 20 coupes. The plan prescribed for preparing a treatment map by an officer not less than the rank of Range Forest Officer. The treatment was prescribed as follows:

(a) Unworkable and protection area included the slopes over 25°, understocked areas, eroded and erodable area and one chain wide strip along Nala banks.

(b) Areas to be clearfelled for raising plantation in the suitable areas should not be less than 2 acres.

(c) Old plantation and dense patches of young well grown crop of valuable species.

(d) Remaining areas.

5.2.5.2. The following rules were laid down for the above categories.

5.2.5.3. "A" type areas:- Except for dead trees, marking of any other tree was not permitted.

5.2.5.4. "B" type areas:- Area was to be marked for clear felling and plantation of suitable species like teak, anjan, prosopis and eucalyptus hybrid was to be carried out.
5.2.5.5. "C" type areas:- Light crown thinning was prescribed in favour of well grown teak and other valuable species.
5.2.5.6. "D" type areas:- In salai forests light crown thinning was prescribed. It was prescribed to remove dead, unsound, dying and seriously diseased and over mature trees if not for protection of site and supply of seed. All living trees of economic importance were to be retained. It was also prescribed to remove miscellaneous growth and bamboo interfering with well grown teak or other economically valuable species. Light crown thinning was prescribed in congested group favouring teak and other superior species. Malformed teak reproduction upto 12" was to be cut back.
5.2.6.1. Cut Back Operation (C.B.O.) immediately after the completion of coupe working was also prescribed. It was also mentioned to carry out cleaning in 6^{th} year and then thinning in 11^{th} year and 21^{st} year. Singling of coppice shoot and light crown thinning was prescribed.
5.2.6.2. This working circle was formed in the Chirodi Plantation working circle of the previous plan. During the course of the previous plan itself, the prescription was changed from the plantation to improvement. During the plan period the area has hardly shown any improvement as no improvement work was taken up. No plantation were taken up under category 'B'.

5.2.7.1. Babulban Working Circle:- All area suitable for raising babul were allotted to this working circle.The total area allotted to this working circle 9935.25 acr. (3974.1ha) divided into fourteen felling series and each felling series was in turn divided into 30 annual coupes. The plantations were to be raised by agrisilvicultural method. Babul (Acacia nilotica) was to be planted on good soil while plantation of other hardy species like prosopis juliflora, Acacia catechu, Dalbergia sissoo and Azadirachta indica was prescribed on poor soils.
5.2.7.2. Few of the initial plantations were raised successfully. They were mostly on good soils. The subsequent plantations fared badly because of many reasons. Firstly there was too much of biotic interference and secondly because of choice of wrong species. Babul was planted on sites, which were not suitable for it like murrumy soil. Babul planted on the black cotton soil has fared extremely well.
5.2.8.1.Kuran Working Circle:- The total area allotted to this working circle was 13974.27 acres (5589.7 ha). There are 29 ramnas in the Division. 21 were already developed and remaining 8 have been developed during previous plan period. Some of the grass ramnas are excellent while a few have deteriorated. The method of treatment prescribed in this working circle during the plan period was as under:

(a) Complete closure to grazing
(b) Fencing the area, which are liable to heavy illicit grazing with barbed wire. The fencing was to be completed in phases.
(c) Uprooting of the obnoxious weeds before their fruiting.
(d) Light burning was prescribed before monsoons and broadcasting of seeds of good variety of grasses was prescribed after soil working.
(e) The dense patches of shrubs and trees were to be opened up.
(f) Planting of tree species at a spacing of 50' x 50'
(g) Edible fruit and flower trees were to be reserved.

Plantation of the fodder species and opening of dense patches of shrub and tree was generally not done. Light burning in some of grass reserves was done, but seeds of grasses were broad cast without soil working with the result that the grasses did not establish. Some soil conservation works are also required occasionally, which was not done.

5.2.9.1. Miscellaneous Working Circle:- This included the compartment belonging to the forest villages. No treatment was prescribed for the land, which had a good forest cover. This resulted in deterioration of the existing forest cover in these compartments. No prescription was prescribed to demarcate the land out side the agricultural use within the compartment. It resulted in to encroachment on the forest land.

5.2.10.1. Bamboo (overlapping) Working Circle:- This working circle overlapped with area of coppice with reserve working circle, mostly in Warud and Morshi Range. The working circle was divided into two felling series. A felling cycle of four years was prescribed. The following treatment was prescribed:

(a) No culm under one year would be felled.
(b) A minimum of 8 culms over an year would be retained.
(c) No dead bamboo would be left in worked clump.
(d) The height at which the culms to be cut should be between 15 cm. 45cm above ground.
(e) No digging of rhizome would be allowed.
(f) No cutting of bamboo would be done from July to September.

This working circle deteriorated due to heavy illicit felling of bamboos.

5.2.11.1. <u>1991-92 to 2000-2001:Working Plan by Shri Shailendra Bahadur, IFS:-</u>

Shri Upadhyay working plan was taken under revision after a long gap and Shri Shalendra Bahadur IFS prepared the working plan for Amravati Forest Division for the period

1991-92 to 2000-2001. Based on factors affecting the general objects of management and objectives of National Forest Policy, Shri Bahadur put forwarded following general objects of management: -

(a) To preserve forest on the hill slopes and to prevent erosion of soil.
(b) To satisfy the local demand for the forest produce.
(c) To bring large area under plantation with a view to cover the soil and to provide fuel and fodder to the local people.
(d) To ensure a maximum sustained yield from the existing forests.

That working plan encompassed the entire Reserved Forests (both A and C Class) areas of Amravati forest division. The total area covered was 51493.248 ha which is in charge of the forest department. This working plan did not cover 55.790 ha. area, which is unclassified but which, is included in the area of the division. The following working circles were carved out:-

(i) Coppice with Reserve working circle
(ii) Improvement working circle
(iii) Fuel wood working circle
(iv) Kuran working circle
(v) Afforestation working circle
(vi) Bamboo Plantation (overlapping) working circle
(vii) Miscellaneous working circle
(viii) Wild life Management (overlapping) working circle.

Range wise and working circle wise area allotted to each working circle is given below:

(Area are in hectares) **Range**	**IWC**	**CWR**	**KWC**	**FWWC**	**AWC**	**MiscWC**	**Total**
Amravti	5325.8	----	4929.2	1777.6	9337.3	32.1	**21401.9**
Paratwada	1755.6	----	953.267	458.1	4891.5	----	**8058.4**
Varud	----	6642.7	164.8	121.4	3111.7	124.7	**10165.3**

Morshi	----	1405.04	1416.8	2015.0	5966.8	1007.9	**11811.9**
Total	**7081.3**	**8048.1**	**7464.1**	**4372.0**	**23307.3**	**1164.7**	**51437.5**

Where : IWC = Improvement Working Circle, CWR = Coppice with Reserve,
KWR = Kuran Working Circle, FWWC = Fuel Wood Working Circle,
AWC = Afforestation Working Circle. MiscWC = Miscellaneous Working Circle. All areas are in hectare.

5.2.11.2. Coppice with Reserve Working Circle:- It included the areas of Shekdari, Mehendri and Lakhara reserves. Total areas covered under that is 8048.052 ha. These areas contain some good tree forests growth of teak, and other valuable species but the overall quality of the forest is poor and are capable of producing only small sized timber and fuelwood.

5.2.11.3. Out of the total area allotted to this working circle, about 47% is teak forest, 25% as mixed forest and the remaining is understocked and blank. The common associates of teak are Dhaora, Lendia, khair, tendu, saja, salai, Dhaman, mahua etc. In these forests, the regeneration from coppice shoots is satisfactory and that from the seed is negligible.

5.2.11.4. Following were the special object of management:

(a) To improve the growing stock by intensive regeneration operations and tending of the crop.
(b) To obtain the maximum sustained yield of small timber, poles and firewood.
(c) To meet the local demand of the people for fuel, fodder etc.

5.2.11.5. The silvicultural system prescribed was coppice with reserve and the regeneration was to be achieved through coppice regeneration supplemented by artificial regeneration. The species to be planted were teak, ain, Bija, Shisham, Dhaora, tendu and Semal. The efforts were to be made during main felling and thinning to have the crop composition as 50% teak and 50% other mixed species.

5.2.11.6. The rotation of 40 years was proposed with 75 centimeters girth at breast height as the exploitable girth. In better site quality areas reserve upto to 45 cms to 60 cms girth could be retained. The following four felling series were formed with the area mentioned before each .

Range	Felling series	Areas (in ha)
Morshi	Lakhara	1405.400
Warud	Linga	1989.936
	Wai	2307.146
	Shekdari	2345.570
Total Areas (in ha)		**8048.052**

5.2.11.7. Main felling coupe was to be demarcated 4 years in advance and coupes were to be divided into four sections. All climbers were required to be cut.

5.2.11.8. Trees to be reserved:

(i) **In workable areas:-** In workable areas of coupes due for main felling, all trees of girth class 60-75 were to be first selected and given one coaltar band at breast height after scrapping the dead bark and were serially numbered.

(ii) In unworkable areas:- In unworkable areas all trees are to be reserved and unworkable areas were to be clearly demarcated to show it unworkable.

5.2.11.9. Trees to be removed:-: The area were to be cleared felled retaining all fruit bearing trees.

5.2.11.10. Method of obtaining advance seedling regeneration:- Soon after the demarcation of the coupe and section lines, a treatment map was to prepared by the range forest officer for taking up plantation showing the following aspects:

(A) Protection areas .
(B) Blanks and understocked areas.
(C) Pole crop.
(D) Wellstocked areas. (density 0.4 to 0.6)
(E) Wellstocked crop. (density over 0.6).

(a) Areas containing adequate seedling regeneration i.e.20 saplings over 1 meter in height or young poles upto 15 cm girth per 20m x 20m areas.
(b) Areas not containing adequate regeneration.

5.2.11.11. Method of planting:- Four to five species were to be chosen for plantation with due care that no species exceed by 50% in composition. Soil and moisture Conservation works were also prescribed.

5.2.11.12. Marking rules: Climbers would be cut all over the areas of the coupe. All dead trees would be marked for felling. In (A) type areas no trees would be marked for felling. All live high stumps would be marked for felling and recoppicing. In (B) type areas no marking of green trees for felling would be done. And in (C) type areas congested group of young pole would be thinned so as to bring the spacing to approximately 1/3rd of height of the group and in wellstocked areas all Semal and kullu tress would be retained. All healthy trees of salai upto 90 cm girth be retained if not interfering with the growth of superior species

5.2.11.13. Results: The required coppice regeneration was not obtained & the existing crop is of seed origin mainly.

5.2.12.1. Improvement Working Circle:- This working circle included areas of Improvement Working Circle of the previous working plan. The area was understocked but contained sizeable patches of well stocked forests. These forests had degraded due to biotic pressure because of their nearness to the habitation. The site were however suitable for raising plantations of valuable species. The extent of area assigned to the working circle was as under:

(Areas are in hectare)

Range	**Area of the Working Circle**	**% of the forest area of the Range**	**% of the forest area of the Division**
Amravati	5325.751	24.88%	10.35%
Paratwada	1755.588	21.76%	3.41%
Warud	----	----	----
Morshi	----	----	----
Total	**7081.339**		**13.76%**

5.2.12.2. This is mostly salai forest. Site quality is IV. These are open and under stocked forests. Mixed forests are met with on lower slopes of Chirodi reserve. Existing crop is malformed and crooked due to heavy illicit cutting. The important species occurring in the area are salai, anjan, char, khair, teak, salai, movai, tendu, bhosa, bor etc. The natural regeneration of teak and other species is scanty. In few favourable sites good plantations of teak, khair, salai, ajan, ber etc. raised under agri-silvi method can be seen in Chirodi Reserve. The entire forest is infested by lantana, an exotic weed introduced in Melghats some decades ago. Bamboo is found along Nalas near Pohara and Chirodi.

5.2.12.3. Following were the special objects of management of the forests included in this working circle:

(a) To check soil erosion by creating and maintaining proper vegetation cover.
(b) To improve the stock, composition and condition of existing forests.
(c) To get maximum sustained outturn of small sized timber and firewood which are locally in demand.

5.2.12.4. The felling in these forests was to be carried out purely on silvicultural considerations, which aimed at improving the growing stock. A felling cycle of twenty years for the purpose of improvement was prescribed. The Working Circle had been divided into five felling series and each into 20 annual coupes. The felling series are as under

Ranges	Name of felling series	Area in hectare
1.Amravati	i) Pohra	1356.506
	ii) North Chirodi	1188.157
	iii) South Chirodi	1465.043
	iv) Wadhona	1316.045
2.Paratwada	v) Wishroli	1755.588
	Total:	**7081.339**

5.2.12.5. Teak was the principal species(50% in mixture) followed by its valuable associates like ain, salai, khair etc. for raising plantation. In areas not suitable for raising teak plantations species like anjan, khair, chandan etc. was to be tried.

5.2.12.6. Method of executing fellings:- Felling would be carried out in following manners:

Coupes were demarcated one year in advance, after demarcation treatment map was prepared by dividing area into four zones as protection areas, old plantations, understocked areas with density below 0.4 and remaining areas and same was demarcated on the ground.

5.2.12.7. RESULTS:- Plantations have been taken in these areas under various schemes or project but the results are not satisfactory due to various reasons as lack of protection from grazing, fire, drought, improper selection of species etc.

5.2.13.1. Afforestation Working Circle:- This working circle included entire C- class Reserved Forests and all such compartments and sub- compartments, which have sparse tree growth below 0.4 density and are in degraded state. Due to heavy and excessive grazing, over-exploitation and failure of regeneration, the areas have become denuded and the depth and quality of the soil is poor. The total area included in this working circle was 23307.313 hectares. Out of which 8065 ha. was to be reforested during this plan period.

Range	**Area in hectare**	**Percentage to the total area of Range**	**Percentage to the total area of the division**
Amravati	9337.272	43.51	18.13
Morshi	5966.785	50.51	11.58
Warud	3111.728	30.61	6.04
Paratwada	4891.528	60.70	9.49
Total:-	**23307.313**	**185.33**	**45.24**

The areas allotted to this working circle are barren and the soil is under various stages of erosion. Stunted growth of ber, ain, khair, palas and teak are occasionally met with. The regeneration of tree species is absent. Good patches of vegetation are rare. Few plantations have been taken . The special objects of management were as follows:

(i) To conserve soil and moisture in the area by taking appropriate measures of reforestation.

(ii) To enhance the productivity of forest land and produce fuel, palas, bamboos and small timber for the local population and fodder grass for the cattle.

(iii) To restore ecological balance by increasing vegetal cover.

5.2.13.2. The existing crop found in patches, contained malformed growth to a considerable extent. To improve the condition of the crop it was necessary to cut back the stems that are capable of throwing vigorous coppice shoots. Improvement fellings were prescribed on wellstocked patches. The blanks and understocked areas were to be planted up with hardy species. The areas already afforested were also to be suitably tended and failed areas reboised by planting species suitable to the site. Where ample root stock in degraded forests was available, the same was to be protected and tended. Planting of hardy species was to be done wherever feasible.

5.2.13.3. With a view to cover the whole area of the working circle as quickly as possible, reforestation period of 20 years was fixed. Planting coupes have been identified for this plan period. There was however no objection if more areas than identified were also planted up subject to the availability of resources, with due regard to grazing requirements of the village cattle.

5.2.13.4. Demarcation of coupes was to be done 2 years in advance of the year of planting. Removal of trees marked for felling was to be completed in the year of demarcation itself.

5.2.13.5. Result: In afforestation working circle total plantations taken during Shri. Bhadur's Plan were 2502 ha. The survival percentages ranges from 13 to 77 % . The average survival percentage is 42 % . The species, which showed good result, are Teak and Khair. Other species couldn't survive due to grazing pressure.

SECTION:5.3:SEPCIAL WORKS OF IMPROVEMENT UNDERTAKEN:

5.3.1.1. In 1888 fire protection was introduced in Mehedari reserve and in 1893 in Lakhara reserve. All babul bans, fodder reserves and the Chirodi reserves were under general fire protection. Special fire protection measures were adopted for young plantation and worked coupes closed for grazing. "C" class areas were protected by law and no special fire protection measures were taken.

SECTION:5.4: PAST YIELD:

5.4.1.1. The annual revenue outturn of the major and minor forest produce is given in the Appendix no XI of vol. II of this Plan.

SECTION: 5.5: PAST REVENUE AND EXPENDITURE:

5.5.1.1. The details of revenue and expenditure are given in the Appendix No X and XI of this plan report.

Statement of Revenue for last 10 years (Revenue is in rupees)

Year	Timber (Cubic meter)		Fuelwood		Grass & grazing		Bamboo	
	Outturn	Revenue	Outturn	Revenue	Outturn	Revenue	Outturn	Revenue

1	2	3	4	5	6	7	8	9
1989-90	NA	4,60,338	NA	3,41,834	NA	1,74,507	NA	NA
1990-91	-"-	9,02,849	-"-	26,636	-"-	1,98,317	-"-	-"-
1991-92	-"-	8,56,332	3,70,563	64,380	-"-	1,57,520	-"-	-"-
1992-93	-"-	8,07,452	-"-	2,500	-"-	98,959	-"-	-"-
1993-94	-"-	3,99,376	7,17.000	2,05,542	-"-	1,09,919	-"-	-"-
1994-95	13.285	2,05,519	2	5,386	-"-	1,46,560	-"-	-"-
1995-96	97.007	9,54,604	65,500	22,812	-"-	1,05,958	-"-	-"-
1996-97	533.855	54,36,779	2,74,372	12,150	-"-	1,87,478	-"-	-"-
1997-98	171.271	59,46,968	19,25,441	1,08,994	-"-	1,68,984	-"-	-"-
1998-99	186.932	45,35,038	191	20,920	-"-	1,52,264	-"-	-"-

Russ Grass		Gum		Tendu(std .bags)		Other		Total	
Outturn	Revenue	Outturn	Revenue	Outturn	Revenue	Outturn	Revenue	Outturn	Revenue
10	11	12	13	14	15	16	17	18	19
NA	5,665	NA	1,55,400	442.662	8,11,603	--	3,13,032	--	**22,62,379**
-"-	Nil	-"-	65,800	2150.382	20,92,251	--	3,57,057	--	**36,42,910**
-"-	-"-	1488.22	1,59,500	4335.292	8,04,989	--	11,47,447	--	**31,90,168**
-"-	-"-	NA	98,200	5971.809	14,35,000	--	3,11,750	--	**27,53,861**
-"-	-"-	-"-	1,12,000	4353.693	17,90,000	--	5,65,325	--	**31,82,162**
-"-	-"-	-"-	Nil	NA	21,38,000	--	3,38,940	--	**28,34,105**
-"-	-"-	-"-	-"-	4333.849	22,66,666	--	640,119	--	**39,90,159**
-"-	-"-	-"-	-"-	3636.97	23,65,700	--	6,23,523	--	**86,25,630**
-"-	500	1016.48	1,15,000	3341.211	19,24,968	--	9,06,228	--	**91,71,642**
-"-	2100	1274.7	1,10,000	4825.215	17,35,059	--	1,45,573	--	**67,00,954**

Statement of expenditure for last 10 years

Year	Revenue	EXPENDITURES (in rupees)	Surplus (+) Deficit (-)

		Conservancy	Establishment	Development	Total	
1	**2**	**3**	**4**	**5**	**6**	**7**
1989-90	22,62,379	Nil	45,54,099	41,16,705	86,70,804	(-) 64,08,425
1990-91	36,42,910	Nil	45,66,695	1,80,71,260	2,26,37,955	(-) 1,89,95,045
1991-92	31,90,168	Nil	51,05,790	1,26,70,179	1,77,75,969	(-) 1,45,85,801
1992-93	27,53,861	Nil	59,83,086	2,14,98,372	2,74,81,458	(-) 2,47,27,597
1993-94	31,82,162	Nil	70,09,797	2,26,36,721	2,96,518	(-) 2,64,64,356
1994-95	28,34,105	Nil	73,86,520	2,06,58,151	2,80,44,671	(-) 2,52,10,566
1995-96	39,90,159	Nil	1,17,81,117	2,38,17,534	3,55,98,651	(-) 3,16,08,492
1996-97	86,25,159	Nil	1,58,35,618	2,20,12,957	3,78,48,575	(-) 2,92,22,945
1997-98	91,71,642	Nil	1,89,82,885	3,02,28,634	4,92,11,519	(-) 4,00,39,877
1998-99	67,0,954	Nil	2,19,38,973	2,30,54,642	4,49,93,615	(-) 3,82,29,661

CHAPTER –VI

STATISTICS OF GROWTH AND YIELD

SECTION :6.1: STATISTICS OF THE RATE OF GROWTH
(From Upadhyay's Working Plan)

6.1.1.1. During the field work of this plan' girths at B.H. and heights of coppice shoots were measured in coupes worked in the past. The rate of growth of teak coppice as indicated by this curve, is as follows. The following data is for the forest of Morshi Range.

Girth (at breast height) in centimeter.

Age	Upadhyay`s plan
2	14
4	19
6	24
8	29
10	33
12	37
14	40
16	43
18	46
20	48
22	50
24	51
26	53
28	54
30	55

The above figures indicate that on an average teak coppice attains a girth of 55 centimeter in a period of 30 years. In better quality areas i.e. areas with site quality IVa and III, teak trees of coppice origin attain 65 – 75 centimeter girth at B.H. in 30 years.

6.1.1.2. The rate of growth for the important miscellaneous species of coppice origin is as under:-

(Girth in cm. at breast height)

Age	**Khair**	**Saja**	**Dhaora**	**Salai**	**Lendia**	**Bija**	**Bhirra**
2	15.24	20.574	11.43	15.24	13.208	11.43	12.7

3	17.78	22.86	14.478	19.05	18.034	12.7	13.716
4	23.876	23.368	19.304	21.844	18.288	14.478	15.24
5	22.86	24.13	20.828	23.622	21.082	15.24	16.002
6	17.78	22.4	22.86	24.13	22.606	16.256	16.764
7	25.908	26.67	23.368	25.146	23.876	17.536	17.526
8	27.432	27.686	24.638	25.908	24.638	18.280	17.78
9	28.194	28.448	25.146	25.908	25.908	19.812	18.288
10	30.226	30.226	25.908	26.67	26.67	20.574	19.812
11	31.496	30.988	25.4	29.718	27.686	21.59	22.86
12	32.512	33.02	26.416	32.572	28.448	22.86	25.908
13	34.036	35.560	27.432	34.036	29.210	24.384	27.178
14	35.306	38.354	27.940	35.814	30.480	25.146	28.448
15	35.814	38.608	28.448	37.846	31.496	26.162	30.734
16	36.830	39.878	29210	39.370	32.512	27.178	31.750
17	38.100	41.148	30.226	41.402	33.020	27.940	32.766
18	38.608	42.672	30.734	42.418	33.528	28.702	27.940
19	39.878	43.180	31.242	45.720	34.798	29.464	33.528
20	40.640	43.942	32.258	47.752	35.560	30.480	34.290
21	41.910	45.212	33.020	48.260	36.576	31.242	35.306
22	43.434	45.720	34.290	49.276	37.338	32.258	36.068
23	43.942	46.990	34.798	51.308	38.354	33.020	36.830

SECTION :6.2: STATISTICS OF YIELD: The information regarding the past yield has been given in Appendix No. XI of this plan in volume II.

SECTION: 6.3: RESULT OF STEM ANALYSIS:-

6.3.1.1. During the course of preparation of the draft plan report, the stem analysis was carried out for coppice teak as per the site quality of the area and the same has been incorporated in Appendix No XXIV of this Plan in volume II.

STEM ANALYSIS

Age	MAI	CAI
0	0	0
10	0.0034	0.0042
15	0.0047	0.0083
20	0.0059	0.0094
25	0.0067	0.0104
30	0.0074	0.0101
35	0.0077	0.0098
40	0.0080	0.0084
45	0.0079	0.0069
50	0.0078	0.0064
55	0.0077	0.0059
60	0.0075	

Results: For site quality IV the cai and mai curves meet at the age of 45 years. Taking correction for age at the breast height as 2 years the as of culmination of cai and mai is 47 years. At that age the teak trees attain a girth of 74 centimeter.

SECTION.6.4.1. VOLUME :- Here only the standard volume has been taken into account, which is defined as below:

6.4.1.2. STANDARD TIMBER VOLUME :- It comprises of volume including stump, but excluding bark, down to the limiting diameter of 20 centimeter over bark.

SECTION.6.5.1. ENUMERATION :- The enumeration was carried out with help of existing staff in the year 2001-2002 for the areas earlier covered under coppice with reserve working circle or improvement working circle. The result of the enumeration so carried out is here by reproduced :

Girth Class	teak / ha	nonteak / ha	No of trees / ha
15-30	48.97	76.38	125.35
30-45	31.50	55.08	86.58
45-60	13.84	27.11	40.95
60-75	7.15	17.92	25.07
75-90	2.87	9.21	12.08
90-105	1.17	4.55	5.72
105-120	0.40	1.76	2.16
120-135	0.09	0.56	0.65
135-150	0.06	0.52	0.58
>150	0.00	0.00	0.00
Total	**106.05**	**193.09**	**299.14**

The result of enumeration has been computed and reproduced in Appendix No XXV in volume II of this Plan.

CHAPTER-VII

PRESERVATION OF WILD ANIMAILS

SECTION:7.1: DISTRIBUTION OF GAME:

7.1.1.1. The forests of Amravati Division are very sparse and they are not extensive enough to harbour big animals. However, the following wild animals are located:

Panther (Panthera pardus) very rare, Sambhar (Cervus unicolor),Chital (Axis axis), Barking deer (Muntiacus Muntjak), Chinkara (Gazella gazella), Blue bulls (Boselaphus tragocamelus), Wild Boar (Sus scrofa), Sloth Bear (Melursus ursinus), Black buck (Antilope cervicapra)

7.1.1.2. No serious damage to the forest by the wildlife is reported. However, wild boars often destroy the agricultural crops adjoining to the forests. Big carnivora like tiger and panther are practically absent . In Mehedari block, jungle fowl is often seen.

SECTION : 7.2 : PAST MANAGEMENT SYSTEM AND ITS RESULTS:

7.2.1.1. Shooting of games in Government forests was regulated by the shooting rules framed by the then Central Province and Berar Government under Wild Birds and Wild Animals Protection Act of 1887 which was later on replaced by the Wild Animals and Birds Protection Act of 1912. The rules were given in details in Appendix - VII of the forest Manual Vol. II of the then Madhya Pradesh.

7.2.1.2.. Management of wildlife was given special attention particularly after 1935. Shooting was permitted in the areas living abundant wildlife and areas deficient in wildlife were closed for shooting. Shooting permits granted under this system specified the kind and number of animals to be shot. The shooting blocks after hunting of permissible limit of game animals was given rest by closing the same for hunting for 1 to 3 years. Initially restrictions on number and size of meat animals i.e. deer and antelopes to be shot on individual permit were imposed. Carnivores however, were allowed to be shot without any limit. This resulted in indiscriminate shooting of tigers and other game animals.

7.2.1.3. Management of wildlife was regulated under the provisions of Indian Forest Act 1927 and rules framed by the then Govt. of C.P. and Berar Game Act of 1935 during the initial period of execution of different working plans/schemes. With the reorganization of

states in 1956 and subsequent formation of Maharashtra state , Mumbai, Wild Animals and Wild Birds Protection Act, 1960 was made to operate with effect from 1.6.1961 for these forests.

7.2.1.4. In fact in the past in the name of wildlife management regulation of shooting and issuing of shooting permits were done till the ban on shooting other than this nothing has been done for conservation and development of wildlife in the past in this tract.

7.2.1.5. Since management of wildlife was not done what would be results. Due to not having any management, wildlife has reached to the verge of disappearance. The condition of naturally existing, basic needs (food, water and shelter) have deteriorated sharply and to maintain and develop them nothing has been done substantially so far.

SECTION 7.3 : LEGAL PROVISION FOR WILDLIFE PROTECTION :

7.3.1.1. The provisions in Hyderabad and Berar Forest Law, 1886 passed on 22nd Oct,1886. No separate Act about the wildlife was in vogue at that time. However, under section 3, sub rule (7), the definition of the forest produce included skins, tusks, bones and horns". Under section (8) of the said Act, "any person who acts in contravention of the said Act in the State Forests was punishable with the fine which may go upto fifty rupees or when the damage resulting from his offence amounts to more than twenty five rupees, to double the amount of such damage." Under section 10, sub section (4) of the said Act "the residency by orders may regulate any part of the State Forests for the hunting, shooting, fishing, poisoning water and setting trap or snares."

7.3.1.2. The Berar Law, 1886 was amended by the Berar Forest Law. Here the scope of the Act was extended. The section 7(b) states that forest produce includes the following when found in, or brought from a forest, that is, to say :- Wild animals, skins, tusks, horns, bones, silk-cocoons, honey and wax and all other parts or produce of animals or forest produce. Section 7 (2) (b) states that any one who hunts, shoots, fishes, poisons waters or sets traps or snares, shall be punishable with the fine which may extend upto fifty rupees or when the damage resulting from the offence amounts to more than twenty five rupees to double the amount of such damage. The section 10(4)(iii) empowered the resident to frame the rules regarding regulation of hunting, shooting, fishing, poisoning water and setting traps and snares.

7.3.1.3. In the year 1911, vide Notification No.G.I.F.D. No. 2197-1-B, dated 13th Oct,1911 the Indian Forests Act, 1878 was made applicable. The section 2(b)(iii) included the wildlife in its definition of the forest produce. Under the section 25(i) of the said Act, any person in contravention of any rules which the local Government may time to time prescribe, kills or catches elephants, hunts, shoots, fishes, poisons water or sets traps or snares shall be punishable with imprisonment for a term which may extend to six months or with fine not exceeding five hundred rupees, or with both, in addition to such compensation for damage done to the forest as the convicting court may direct to be paid.

7.3.1.4. Prior to reorganization of states, the wildlife conservation in this part was through the implementation of the provisions of the Indian Forest Act, 1927, and the shooting rules framed under section 26(i) and 76(d) by Ex Madhya Pradesh Government as given in Appendix VII of M.P.Forest Manual, Volume II, combined with Wild Birds and Animals Protection Act 1912 as amended by the Central Provinces Amendment Act of 1935. From 1927, shooting blocks system was started. Under this system, the Conservator of Forests in consultation with the Divisional Forest Officer used to declare certain blocks of Reserved Forests with abundant games as open for shooting. The Divisional Forest Officer used to issue permits for shooting.

7.3.1.5. The Mumbai Wild Animals and Wild Birds Protection Act, 1951, for the protection of wildlife, was extended to Vidarbha region with effect from 1.6.1961. Though this Act did not propose a significant change in the management of game in Reserved and Protected Forests, yet it was important as it operated in areas out side Reserved and Protected Forests also. Under the provisions of this Act, arms license holders for sports were to register themselves with the wildlife preservation officer. This Act prescribed a closed season for hunting and classified games into four categories viz small game, big game, special big game and pet animals. It also sought to control transaction in trophies and other wildlife produce. The statutory Wildlife Advisory Board was constituted under this Act to advise the Government on various important matters concerning wildlife.

7.3.1.6. The Indian Board of Wildlife, was constituted in 1952 with the main object of devising ways and means for Conservation of wildlife through coordinated legislative and practical measures and sponsoring the setting up of National Parks and Wildlife Sanctuaries. A comprehensive and unified National and State Park Act, 1971 was passed which provided for appointment of any Advisory Committee to advise in constitution and declaration of National Parks and sanctuaries and formulation of administrative policy. The parliament then enacted the Wildlife (Protection) Act, 1972, which came into force in the State of Maharashtra with effect from 1st June, 1973. From the commencement of this Act, every other Act relating to any matter, contained in this act, and in force in the State stood repealed. The subsequent rules made under the Act are as follows :

(i) The Wildlife (Stock Declaration) Rules 1973 (became effective in Maharashtra with effect from 1.6.1973.)
(ii) The Wildlife (Transactions and Taxidermy) Rules, 1973 (became effective in Maharashtra with effect from 1.6.1973.)
(iii) The Wildlife (Protection)Rules, 1975 (became effective from 6.3.1975)
(iv) The Wildlife (Protection) Licensing (Additional matters for consideration) Rules, 1983 (became effective w.e.f. 13/4/1983).

7.3.1.7. The Wildlife (Protection) Act, 1972 is a piece of comprehensive legislation which provides for effective measures of protection and preservation of wildlife, restriction on hunting and regulation of trade in wild animal articles. Hunting of wild animals is strictly prohibited under this Act unless it is specially permitted. Wild animals have been categorized in five schedules and animals included in schedule-I and part II of schedule- II received the privilege of strict protection. Animals specified in these schedules are permitted to be hunted with special permission, if animal in schedule - I has become dangerous to human life or property, and animal in schedule - II has become so disabled or diseased as beyond recovery. Animals specified in schedule II (Part-I), III & IV were prohibited from hunting, except under and in accordance with specific license issued under that Act or it had become dangerous to human life or property or had become diseased or disabled beyond recovery. Only vermin included in schedule-V had been excluded from strict protection. Hunting of young female of any wild animal other than vermin or any deer with antlers in velvet is strictly prohibited unless specially permitted (Section - 15). The Act specifically requires declaration to be furnished by the individuals regarding trophies etc. in their control, custody or possession. Government of India, vide letter dated 18-9-1975 stated that the control over tanks and rivers in National Parks and Sanctuaries should be vested with management authorities and not with the fisheries or irrigation department.

7.3.1.8. Government of India, vide letter No. E-11011/3/75FRY9(WLF), has clarified that the certificate of legal procurement to be issued by the Chief Wildlife Warden is not

necessary where an animal is not included in any schedule of the Wildlife (Protection) Act, 1972. Its export will be regulated by the Ministry of Commerce. Subsequently, the delegation of power and duties of the Chief Wildlife Warden to the Police Sub-Inspector for the purpose of section 41(1) and section 55 of the Wildlife (Protection) Act, 1972 was granted by Government Resolution No. WLP-1973/197578-FI, date 5th April, 1976.The schedules are revised by the Government on and off as it was required under section 61 of the Wildlife (Protection) Act, 1972. The Government of Maharashtra, under section 64 of the Wildlife (Protection) Act, 1972 framed rules vide letter No. WLP-1679/95507/F-5. These rules were amended further by the Wildlife (Protection) Maharashtra Rules, 1975.The wildlife Protection Act was again amended to be called as Wildlife (Protection) Amendment Act, 1986 and it came into force from 25th Nov, 1986.

7.3.1.9. Under Section 44 of the Wildlife (Protection) Act, 1972, the Government vide letter No.WLP/1682/100208/CR-43(1)/F-5 permitted the trapping of cobra and Russell vipers by a licensed dealer for the purpose of extracting venom. Under the power conferred under sub section (1) and sub section (2) of the section 64, the Government of India vide letter No.WLP 1682/10020(iii)/F-5 framed the new rules called Wildlife (Frog Leg Industry) Rules, 1987, and it came into force from 25th Nov, 1987. The Government of India vide

Letter No. F-No.-2/91/WL/1, dated 21st Oct, 1991, further amended the Wildlife (Protection) Act, 1972. The following are the important amendments.

(a) The plants have also been included under the purview of this Act.
(b) The zoo and circus have been defined and included under this Act.
(c) The game reserves have been dropped.
(d) Section 9 of Wildlife (Protection) Act, 1972 has been amended and there is a total prohibition of hunting of animals specified in schedule I, II, III & IV , except as provided under section 11 and 12.

7.3.1.10. The following are restrictions on hunting as per section 17 of Wildlife (P) Act, 1972. The following acts are prohibited, i.e.

1) Hunting any wild animal, from or by means of a wheeled or mechanically propelled vehicle on water or land or by aircraft;
2) Use of mechanically propelled vehicle for the purpose of driving or stampeding any wild animals;
3) Use of chemicals, explosive, pitfalls, poisons, poisoned weapons, snares or traps, except in as far as there relate to the capture or wild animals under a Wild Animals Trapping License
4) Hunting of special game or big game other than with a rifle, unless specially authorized by the license;
5) Setting a fire to vegetation for the purpose of hunting.
6) Using artificial light for the purpose of hunting, except when specially authorized to do so under a license in the case of carnivore over a kill;
7) Hunting during night, except when specially authorized;
8) Hunting any wild animals on water holes or a salt - lick or other drinking places or on path or approaches to the same, except water-birds and sand - grouse;
9) Hunting any wild animal on any land not owned by Government without the consent of the owner , or his agent or lawful occupier or such claim;

10) Hunting during closed period as per section 16;
11) Hunting with the help of dogs, any wild animal except water-bird, chakor, partridge or quail.

7.3.1.11. In 1991, the Government of India has passed the Wildlife (Protection) Amendment Act, 1991, which came into force with effect from October 2, 1991, includes the Section 35 A, 44 (ii), 55(c) , Chapter IIIA and Chapter IVA. The salient features of this amended Act in brief are as follows :

i) The words "game reserves, big game and small game" have been omitted from the Act
ii) Hunting the wild animals specified in Schedule I, II, III and IV of the Act has been banned, except as per the provisions of section 11.
iii) A new chapter III-A has been introduced for the protection of specified plants. The specified plants have been included in a new schedule.

iv) Section 29 of the Act has been amended and like National Parks no wildlife can be exploited or removed from a sanctuary too. This means all concentrated felling and collection of minor forest produce from sanctuaries would be stopped.
v) A new section has been added in the Act which provides that no new arm licenses shall be issued within 10 km. of a sanctuary without prior concurrence of the Chief Wildlife Warden of the state.
vi) A ban has been imposed on dealing the imported ivory and articles made therefrom.

vii) A new chapter, IVA has been introduced to provide for central Zoo Authority and recognition of zoos.
viii) The penalties for wildlife offences have been enhanced substantially. Section 39 of the Act has been amended to the effect that vehicles, vessels, weapons, tools and traps that have been used for committing an offence and have seized shall become the property of the Government.
ix) Section 61 (I) of the Act has been amended and now the power to make any change in the schedules of the Act vests only with the Central Government.

SECTION:7.4 : RIGHTS AND CONCESSIONS :

7.4.1.1. No rights and /or privileges are granted to any person over wildlife. But a number of schedule tribes can subject to the provisions of Chapter IV of Wildlife Protection Act, pick, collect or possess in the district he resides any specified plants or plant derivative thereof for his bonafide personal use. However, permits can be granted by the Chief Wildlife Warden with prior approval of the State Government for the Special purpose of education, scientific research and collection of specimen for recognized zoos, museums and similar institutions.

SECTION : 7.5 : INJURIES TO WILDLIFE : The following agents are mainly responsible for injuries to wildlife.

7.5.1.1. POACHING / SHIKAR : Shikar is completely banned. illicit hunting is in practice. Presently this is the main cause of threat to the wildlife. It is believed that poaching is performed by using snares, traps, poisoning or by using powerful and modern weapons.

7.5.1.2. FIRE: The entire forest area is susceptible to forest fire. Almost every year most of forest is subjected some sort of fire with varying effect to damage to flora and fauna. Some areas might be exception to it but the remote areas, which are the ideal habitat, burns annually. The forest fire damages the natural habitat and drives animals to human habitation to take shelter and thereby they become easy prey to poachers and local villagers.

7.5.1.3. WATER : Most of the streams, except a few big rivers, becomes dry during summer. Therefore, animals had to visit only a few available water holes. This facts make the villagers and poachers easy to kill the wild animals.

7.5.1.4. DISEASES: A stray incidence of foot and mouth diseases amongst deer is occasionally noticed. In other animals injury or death due to diseases is not reported though it might be occurring. More research and monitoring work is needed in this regard.

SECTION : 7.6 : OTHER MEASURES ADOPTED AND EFFORTS MADE FOR PROTECTING WILDLIFE:

7.6.1.1. Besides the legal provisions under the Wildlife Protection Act, 1972, amended from time to time and the various rules made there under, following measures have been taken to protect the wildlife :

7.6.1.2.. Compensation is paid to the owner whose cattle is killed by a tiger in the forest areas as per the provisions contained in Govt. Resolution No. WLP/1570/224482-X-II, dated 30/09/1971, No. MSC-1075/113554/F-1, dated 25/03/1977 and No. WLP/1579/6200/4/F-1, dated 29.05.1979. This provision was extended to the cattle killed by panther also and the killing by tiger or panther outside the forest areas also was included vide Govt. Resolution No. WLP/1581/116974/F-5 dated 22.08.1984.

7.6.1.3. Provision has been made for compensation in case of death or injury to human life by wild animals vide Govt. Resolution. No. WLP/1679/105651/CR-6/F-5, dated 27.11.1986. The maximum amount of compensation in case of death is Rs. 5000/- and in case injury Rs. 2000/-. As per Government Resolution WLP/1090/CN-285/F-5, dated 17.6.1992, the compensation in case of death or permanent disability has been increased to Rs. 40,000/- in case of person supporting the family and to Rs. 20,000/- in case of minor. In case of serious injury the compensation is Rs. 6650/- and in case of minor injury it is Rs. 1000/- per injured person. Further the Government of Maharashtra has enhanced the compensation in case of death or injury to human life vide G.R.No. WL-P1002/CN/258/F-1/Mumbai dated of 17th January-2003. The compensation in case of death or permanent disability for adults has been increased to Rs. 2,00,000/- & Rs. 1,00,000/- in case of minor. In case of serious injury the compensation Rs. 50,000/- & in case of minor injury it is Rs. 7500/- per person.

7.6.1.4. In 1972, with a view to check illicit shooting of wild animals, the State Government sanctioned the grant of reward to the informants in respect of unlicensed shooting provided

that the information is found to be valid and leads to the conviction of the offender. In addition, the State Government has decided to sanction the rewards equal to 50% of the compensation actually recovered from the offender for illicit shooting to the Gram Panchayat or its office bearers or individuals who render cooperation in detecting such illicit shooting.

7.6.1.5. Besides, the ever mentioned legal provisions for protection of wildlife, public awareness for protection and preservation of wildlife is created through the celebration of wildlife week from 2nd October every year since 1951.

7.6.1.6. Under the purview of the aforesaid Acts Rules and G.R.'s, the efforts made for booking offences have been given in Appendix No. XII in volume II of this plan **.**

CHAPTER I
BASIS OF PROPOSALS

SECTION: 1.1 : NATIONAL FOREST POLICY :

1.1.1.1. Indian Forest Policy was first enunciated by the British Crown in the year 1894 in their resolution No.22-F, dated October19, 1894. After Independence First National Forest Policy was formulated by the Government of India by its Resolution No. (Agri) 13th January 1952-F, dated 12th May, 1952. Latest National Forest Policy was passed by Ministry of Environment and Forest in 1988. The changes in the policy were made as per the prevalent national needs and public requirements, both of local and general. The abstract of the above national forest policies of India is given as follows:

1.1.2.FOREST POLICY 1894 FOR INDIA :

1.1.2.1. The general forest policy was enunciated in the year 1894, by the Government of India vide Resolution No. 22F, dated October 19, 1894. As per this policy the forests were to be administered solely for the public benefit, both local and general. The outstanding principles of this policy were as under:

i) The preservation of climatic and physical conditions of the country was the foremost.

ii) The preservation of minimum amount of forest, necessary for the general well being of the country, was second to above.

On fulfillment of the above two conditions, the other priorities were as under:

(i) Cultivation to be given priority over forestry,

(ii) Satisfaction of the needs of the local people free or at non competitive rates to be given priority over revenue and

(iii) After satisfying the above requirements, the realization of revenue to the greatest possible extent was to be considered.

1.1.3. NATIONAL FOREST POLICY OF 1952 :

1.1.3.1. Since the enunciation of 1894 policy, considerable development of far reaching importance had taken place in the economic and political fields. The part played by forests in maintaining the physical conditions of the country came to be better understood. The

country had passed through two world wars, which disclosed unsuspected dependence of defense on forests. The reconstruction schemes, such as river valley projects, development of industries and communications, leant heavily on forest produce.

1.1.3.2. Taking into consideration the changes which took place in the physical, economic and political fields during the intervening period, the forest policy, was reoriented in 1952, vide Government of India in Food & Agriculture, Resolution No. (Agri) 13-1-52, dated 13/5/1952. It was based on six paramount needs of the country, namely :

(i) The need for evolving a system of balanced and complementary land use, under which each type of land is allotted to that form of use under which it would produce most and deteriorate least.

(ii) The need for checking:

(a) Denudation of mountainous regions, on which depends the perennial water supply of the river system whose basins constitute the fertile core of the country.

(b) The erosion that is progressing with a pace along the treeless banks of the great rivers leading to ravine formation and on vast stretches of undulating wastelands depriving the adjoining fields of their fertility.

(iii) The need for establishing tree lands, wherever possible for the amelioration of physical and climatic conditions, promoting the general well-being of the people.

(iv) The need for ensuring progressively increasing supplies of grazing, small wood for agricultural implements and in particular of firewood to release the cattle dung for manure to step up food production.

(v) The need for sustained supply of timber and other forest produce.

(vi) The need for the realization of the maximum annual revenue in perpetuity, consistent with the fulfillment of the needs enumerated above.

1.1.3.2. The National Forest Policy further stated that while observing these general principles, in paramount National interest the discretion of the State Government to regulate the details of forest administration in their respective territories is left unfettered to enable them to frame their policies and legislation for conserving and utilizing the forest resources. Provided that the declared forest policy of a state does not impinge adversely upon the general economy and physical balance of an adjoining State and that it is in consonance with the general principles underlying the forest policy laid down by the Center for preservation and development of the nations forest resources which are so vital to its general well-being.

1.1.4. NATIONAL FOREST POLICY OF 1988:

1.1.4.1. Indian Constitution in its original version enshrined Forest in State List. As per 42nd Constitutional Amendment Forest has been placed under Concurrent List. So Center has greater stake in preservation of forests and Environment. Over the years, forests in the country suffered serious depletion because of relentless pressures arising from ever increasing demand for firewood, fodder and timber; in adequacy of protection measures, diversion of forest lands to non-forestry uses without ensuring compensatory afforestation and essential environmental safeguards and the tendency to look upon forests as revenue earning resources. With a view to mitigate the above problems a new Forest Conservation Policy based on preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment, was enunciated in December,1988.

1.1.4.2. 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 atural 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 firewood, fodder, minor forest produce and small timber of the rural and tribal population.

vi) Increasing the productivity of forests to meet essential national needs.

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.

1.1.4.3. The forest policy further states that in the management of the existing forests and forest lands the emphasis should be on protection, improving their productivity, conservation of total biological diversity by strengthening the network of National Parks, Sanctuaries, Biosphere Reserves and other Protected Areas, providing sufficient fodder, fuel and pasture in areas adjoining forest, to prevent their depletion and protecting, improving and enhancing the production of minor forest produce which provides sustenance to tribal population. The other important features governing the management of the forests are as under:

(i) Severe restriction on schemes and projects, which interfere with forests that, clothe steep slopes, catchment of rivers, lakes and reservoirs.

(ii) No working of forests without the Center Government having approved the management/ working plan.

(iii) Non – introduction of exotic species without long term scientific trials.

(iv) The rights and concessions, including grazing, to always remain related to the carrying capacity of forests.

(v) Rights and Concessions which cannot be met from the forests to be met by development of social forestry.

(vi) The rights and concessions enjoyed by the tribal should be protected. Their domestic requirements of firewood, fodder, minor forest produce and construction timber should be the first charge.

(vii) Forest management/ working plan to take special care of the needs of wildlife conservation.

(viii) Effective action to be taken to prevent encroachments on the forestland and not to regularize the existing encroachments.

(ix) Forest based industries to raise the raw material needed by them themselves in arrangement with the private cultivators.

(x) Survey of forest resources to be completed on scientific lines for updating information.

1.1.4.4. This National Forest Policy states "Forest should not be looked as a source of revenue, but as a national asset to be protected and enhanced for the well-being of the people and the nation." This Policy clearly states, "The people will be actively involved in programs of protection, conservation and management of the forests." The document further states that non-timber forest products, "should be protected and improved and their

production enhanced" to generate employment and income for the forest dwelling communities.

1.1.4.5. In June 1990, the Government of India passed a significant national resolution providing more specific guidelines regarding the formation, functioning, rights and responsibilities of the community forest management groups. It specifies the sharing arrangements in which village forest committees "successfully protect the forests, may be given a portion of the proceeds from the sale of trees when they mature, as well as non-timber forest products for subsistence use". This policy clearly directs that forests be managed first as an ecological necessity, second as a source of goods for local populations and only third as a source of wood for industries and other non-local consumers.

SECTION :1. 2: CLASSIFICATION OF FORESTS :

1.2.1. The broad and general principles for the classification of forests is embodied in the State Government vide R & FD Resolution no. MEP-1365/132211-Y, dated December 6, 1968. Taking the above principles into consideration, the forests of the state are to be classified and managed as follows:

(a) Protection Forests,
(b) Tree Forests,
(c) Minor Forests,
(d) Pasture Lands and
(e) Miscellaneous Forests.

1.2.1.1.PROTECTION FORESTS: This includes forests which occur on very steep slope (25 degree and over) or along river banks, and forests that have become depleted through maltreatment, and further harvesting of which will accelerate soil erosion and adversely affect the productivity of agricultural lands in the lower regions. The management should be aimed at rapidly conserving these forests so that they may once again exert their beneficial influence on the soil, the water regime and the physical and climatic factors of the locality.

1.2.1.2.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.

1.2.1.3.MINOR FORESTS : This includes forests that are interspersed with cultivated lands and are capable for producing small timber and firewood and providing grazing, which are the indispensable needs of the adjoining agricultural population.

1.2.1.4. PASTURE LANDS : These are open forests or scrub lands that have ceased to yield even small timber but which are conveniently situated for providing grazing to the cattle used on agricultural works.

1.2.1.5. MISCELLANEOUS FORESTS : These include **:**

a) GRASS RESERVES : These are small blocks of forests situated almost intensively tracts carrying scrubby growth and capable of producing good fodder grasses which are in short supply.

b) Remaining areas, which are needed for other purpose.

1.1.2.CLASSIFICATION : On the above functional basis forests of the tract dealt with are classified as under :

CLASSIFICATION OF FORESTS
Stockmapping during Bahadur`s plan period

WC	sq	teak	mixed	salai	teak	others	us&blk	cltvn	total
IWC	ivb	479.58	1784	932.93	143.45	152	3532.9	56.433	**7081.3**
CWR	iii	15	0	0	0	0	0	0	**15**

CWR	iva	610.95	45.21	0	0	0	0	0	**656.16**
CWR	ivb	3095.6	1967	15.835	87	19	2156.4	35.96	**7376.9**
FWWC	babul	0	1062.9	0	0	0	3302.3	6.809	**4372**
KWC	ivb	57.7	828.19	1043.8	0	54.822	5479.6	0	**7464.1**
AWC	ivb	0	251.09	90	886.54	0	20901	1178.7	**23307**
Misc.	no	0	0	0	0	0	1164.7	0	**1164.7**
Total		**4258.9**	**5938.5**	**2082.5**	**1117**	**225.82**	**36537**	**1277.9**	**51437**

Areas are in hectare.
iwc = improvement working circle,
cwr = coppice with reserve,
fw wc = fuelwood working circle,
kwc = kuran working circle,
awc = afforestation working circle,
misc. = area under miscellaneous works.
Sq = site quality

SECTION :1. 3 : FACTORS INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT :

1.3.1.1. The National Forest Policy, 1988 is the guiding principles to decide the general objects of management. This policy recognizes the services rendered by the forest to all living creatures. The services (indirect benefits) given to the society by the forest through its existence are indispensable and have more weightage than physical benefits in terms of timber and firewood coming from felling of trees. The existence of life on any planet simply can not be imagined without the existence of the vegetation. Therefore, taking out direct benefits from the forests can not be the primary objectives of the forest management. However, the direct benefit will also come through operations required to maintain the forests in healthiest conditions. On achieving these conditions of the forests, automatically both direct and indirect benefits will be optimum. Thus the orientation of the management is to have first the forest in balance and healthiest condition so as to have optimum perpetual benefits from it.

1.3.1.2. So far we followed the path and policy of management decided by the British Administration, whose main objective was to have maximum revenue. The basics of management were side tracked. The basic principle of management is to use the interest keeping principal intact. The optimum level of balanced stocking in any site is the principal; however, this could not be quantified. Without its quantification it is not possible to identify interest and distinguish interest from principal.

1.3.1.3. Forest with balanced distribution of age classes is called normal forest. In such a state of forest, there is a balanced movement of stems from lowest to the highest girth classes in a very natural way. This is the ultimate state of the forest, which is to be achieved and maintained.

1.3.1.4. The distribution of the number of stems/ha in different girth classes forms a structure of the forest. In a normal forest this structure is inverse J-shaped curve. With reference to this structure we can easily evaluate our efforts to achieve the ultimate goal.

1.3.1.5. Forest crop is a dynamic biological entity, which keeps on changing and putting on increment. The rate of increment depends on the site quality, age, species and stocking of the individual trees in the crop. The optimum stocking varies with age of the crop and corresponds to maximum increment. In an all aged crop, optimum stocking implies the

balanced distribution of stems of all ages. Total increment falls off as the stocking changes from the optimum level.

1.3.1.6. The main object of management is to obtain an optimum level of stocking and to extract the optimum increment periodically, on a sustained basis, without harming the future crop. Thus there are two aspects of the management:

(i) To visualize the ideal state of the forest i.e. optimum stocking, distribution of stems and species in different age classes etc. (This is what we want to have, i.e. goal).

(ii) To devise means to take out optimum increment periodically, without disturbing the future crop. (This is what we should do to have what we want.)

Thus what we want to have and what we should do to have the same, is the essence of any scientific management system

1.3.1.7. The achievement of goal corresponds to the state of optimum production. However, this optimum production is in terms of quantity of the species existing in the crop. To optimize the production in both in terms of quality and quantity, modification in crop composition is needed. The change in composition of the crop can be brought about in two steps:

(A) In first step, crop composition will be improved by way of giving preferential treatment, in the existing crop while carrying out silvicultural operations. However, this cannot bring the crop composition to the desired level because of the two limitations:

(i) Fixed number of seedlings of preferred species in the existing crop, that number cannot be increased. And

(ii) The number of stems surplus in that girth class against which preference is to be given to the desired species.

(B) In the second step, if the existing seedlings of preferred species are less than the desired numbers, gaps plantings of those species in required number will be initiated. The experiment of gaps planting should be started with only one or two silviculturally suitable species. For this local valuable species should be preferred. On getting success, the number of species may be increased upto six. After introduction, the principle of preferential treatment should be kept on applying to maintain them.

1.3.1.8. The tribal people, being the part and parcel of the forest, their welfare should have one of the considerations of the management. The management of non-timber forest produce on scientific lines has the direct bearing with the welfare of the tribal and local villagers and therefore, this aspect is to be taken into consideration.

SECTION: 1.4: GENERAL OBJECTS OF NEW MANAGEMENT:

1.4.1.1. On the basis of National Forest Policy 1988, points discussed above, the general objects of management decided are as follows:

(i) To bring normalcy in the forest.

(ii) To preserve forest cover on steep slopes, along Nala banks and water courses to prevent soil erosion and to preserve site and environment.

(iii) To meet the requirement for small timber, firewood, fodder and non-timber forest produce of the local population on top priority. Consistent with above objectives, to produce large sized timber on sustained yield basis.

(iv) To take up activities aiming at welfare of the tribal and local villages and thereby to increase the production of non-timber forest produce and to manage the same scientifically to utilize the potential to the optimum possible extent on sustained yield basis.

(v) To take up measures to protect, develop and conserve wild animals in this tract.

(vi) To involve JFMC in harvesting afforestation and other forestry related activities.

SECTION : 1. 5: METHODS OF TREATMENT TO BE ADOPTED :

1.5.1.1. National Forest Policy have laid down the emphasis on conservation of bio-diversity and meeting the demands of local people. Accordingly, the object of management of the forests has been fixed. To achieve these objectives of the management comprehensive approach has been adopted in the management of the forests. For the conservation of biodiversity and the site, soil and moisture conservation works will be taken. These works will be conducive to watershed development and for that sequencing of coupes will be from ridge to valley. Natural regeneration will be preferred over the artificial regeneration, in areas where it is adequate. Suitable soil working and tending operations will be carried out to stimulate and enhance the growth of naturally regenerated seedlings. To meet the local demand of the people, an assessment of their requirements will be made by the territorial division and efforts will be taken to meet these requirements to the possible extent. Active participation and involvement of local people in protection, regeneration and development of forests have been made through Joint Forest Management. Special emphasis on protection of forests from fire, grazing and illicit cutting has been made.

Taking into the consideration the above aspects besides the growing stock and condition of the site has made the functional classification of forests. The various types of forests will be treated as follows:

1.5.2.1. PROTECTION FORESTS : Most of these areas lie along the steep slopes of Satpura hills and other hillocks, along the Nala banks, along the river banks and other water bodies and are found in scattered. They will be treated under the category 'A' of the respective coupe in each working circle. No felling except overmature and dead dying trees is prescribed in these areas. Soil and Moisture Conservation works will be taken up with artificial regeneration with seed sowing on the bunds created for that.

1.5.2.2. TREE FORESTS : These forests are mainly of better quality, timber producing and less prone to erosion. They belong to all India Teak and Mixed Site Qualities, III, III / IV, and IV. The trees are generally straight boled The management prescriptions will be as per the site quality and it will be oriented to give more importance to Cut Back Operations, Cleaning, Thinning etc. silvicultural operations along with extraction of silviculturally available material ensuring eternal future crop. Therefore, during this plan period SCI working circle have been prescribed for betterment of hygiene of forest and meeting the future requirement of the population.

1.5.2.3. MINOR FORESTS : These forests are of comparatively of low quality and badly treated in the past by prescribing inappropriate silvicultural system, which has reduced the proportion of valuable and important trees in the crop. They were worked under Coppice With Reserve in previous working plan periods. Crop is young with scattered middle aged and rare mature and over mature trees. Mature trees, which are rarely seen, are mainly fruit trees species, which had been selected as reserve for long time. Among such species, moha is prominent. Since forests are badly disturbed and so during this plan period only appropriate silvicultural operations at an appropriate intervals has been prescribed. Special thoughts and measures have been prescribed to solve the problems of grazing and fire, which are main hurdles in the way of achieving normalcy.

1.5.2.4. MISCELLANEOUS FORESTS :

1.5.2.5. OTHER FORESTS:. In these areas survey and demarcation of the areas will be first priority. Since the areas are mostly open and under tremendous pressure of biotic interface due proximity to habitation and age old practices of free grazing or use as camping ground for local cattle, the vegetation cover is sparse or dismal. Afforestation is to be taken. Besides these to develop the areas under forests cover soil and moisture conservation works will be emphasized.

SECTION :1.6 : ANALYSIS AND VALUATION OF THE CROP :

1.6.1.14. During this plan preparation all the compartments of the whole tract have been covered, including Reserved Forests, Protected Forests and area taken by Division as acquired under Compensatory Afforestation Scheme, for enumeration of growing stock after sorting the areas with the help of satellite imageries maps and density of stock therein. Area under less than 0.4 density have not been taken under enumeration. In the remaining area 1% sampling have been carried out for enumeration with the help of existing staffs in the working plan division. Results have been computed and report generated with the help of specific software package specially developed for this purpose.

1.6.1.2. Under this plan the density maps for the tract dealt with have been prepared by visual interpretation technique using remote sensing data at the office of Conservator of Forests Working Plan at Nagpur (MS). These data had been used for enumeration of growing stock.

SECTION:1. 7 : WORKING CIRCLES:

1.7.1.1. Based on the above considerations, following working circles have been carved out:

i)	Selection Cum Improvement Working Circle.	15097.242
ii)	Afforestation Working Circle,	27386.055
iii)	Kuran Working Circle,	7451.226
iv)	Misc.Working Circle	1565.356
	Total	**51499.879**
v)	Old Plantation (Over lapping) Working Circle,	
vi)	Bamboo Overlapping Working Circle,	
vii)	Wildlife Management Overlapping Working Circle,	
viii)	Non Timber Forest Produce and Medicinal Plants (Overlapping) Working Circles.	

1.7.1.2. The extent of areas under each working circle have been given in Appendix No. XXVI in Volume II of this plan . Constitution of working circles along with number of compartments and area incorporated therein have been given in Working Plan. The extent of areas, working circle rangewise have been given in the Working Plan. The statement showing the allotment of compartments to different working circles have been given in Appendix No. XXVI of this plan.

SECTION :1.8: BLOCKS AND COMPARTMENTS:

1.8.1.1. The forests of Amravati, Paratwada, Morshi and Warud Forest Ranges are either divided into Blocks or scattered The entire forest areas included into this plan is 51499.878 hectare out of which 51437.458 hectare of Reserved Forests, 6.630 hectare of Protected Forests and 55.790 hectare of Unclassed Forests. New compartment numbers wherever necessary have been given to the areas covered under this plan for the first time treating each separate polygon of forest as distinct compartment. Similarly, old compartments those

have more than one polygon have been renumbered for the sake of computer compatible identity for each forest area for computer compatible data creation and report generation. Statement showing existing organization of Ranges, Round & Beats of Amravati Division is given in Appendix No. XXI of Vol. II of this plan.

SECTION:1. 9: PERIOD OF THE PLAN:

1.9.1.1. The period of the plan is fixed as 10 years after final sanction from competent authority after that it will be revised. Mid term review of the prescriptions of the working plan may be carried out after expiry of 5 years of operation and if any noticeable changes in achievement of any objective are observed those would be accordingly incorporated after getting sanction from competent authority.

Period of the plan:- From 2004-2005 to 2013-2014 .

CHAPTER II

WORKING PLAN FOR SELECTION CUM IMPROVEMENT WORKING CIRCLE

SECTION : 2.1 : GENERAL CONSTITUTION:

2.1.1.1. The areas included in this working circle were previously treated under improvement working circle or coppice with reserve working circle during Shri Shailendra Bahadur`s plan period. The area allotted to this working circle is 15097.241 ha. Though these areas were supposed to be treated under coppice with reserve system with aim to regenerate them with coppice or under improvement with aim to improve the forests by giving them hygienic operation to prepare them to be ready for selection felling, the required coppice regeneration was not obtained and the existing crop is of seed origin mainly. The main objective of the management is to have the forests produce in perpetuity and the demand of local population to have small timber and pole is to be met. The goal to have normal forests with optimal sustained production can be met if we have the silvicultural system of selection cum improvement. In this system the regeneration is obtained naturally by opening the crown through removal of stem of above specific girth known as harvestable girth and giving hygienic treatment to rest of the crop below harvestable girth eg cut back operation, thinning of young crop, removal of dead, dying trees and preparing the soil ready to have natural regeneration established.

Allotment of area in SCI (area is in ha)

Sr.No	Range	Range area	SCI area	% wrt range	% wrt division
1	Amravati	21457.662	5322.151	24.9%	10.4%
2	Paratwada	8058.406	1727.038	21.4%	03.4%
3	Morshi	11424.563	1405.401	12.3%	02.7%
4	Warud	10559.248	6642.652	62.9%	12.9%
Total of Division		51499.879	15097.242	29.4% wrt division	

Table showing the Working Circle & Working Series wise area of previous Plan and Present Plan (area: in hectare)

Previous Plan	Present Plan
1. CWR WC	**SCI WC**

Sr.No.	**Felling Series**	**Area(ha)**	Sr.No.	**Working Series**	**Area(ha)**
1	Wai FS	2307.146	1	Wai WS	2307.146
2	Linga FS	1989.936	2	Linga WS	1989.936
3	Shekdari FS	2345.570	3	Shekdari WS	2345.570
4	Lakhara FS	1405.400	4	Lakhara WS	1405.401
Total		**8048.052**	**Total**		**8048.053**
2. Improvement WC			**SCI WC**		
1	Pohara FS	1356.506	5	Pohara WS	1356.506
2	N Chirodi FS	1188.157	6	N Chirodi WS	1188.157
3	S Chirodi FS	1465.043	7	S Chirodi WS	1465.043
4	Wadhona FS	1316.045	8	Wadhona WS	1312.445
5	Wishroli FS	1755.588	9	Wishroli WS	1727.038
Total		**7081.339**	**Total**		**7049.189**
Grand Total		**15129.391**	**SCI WC**		**15097.242**

SECTION : 2.2 : GENERAL CHARACTER OF THE VEGETATION :

2.2.1.1.Site quality : All India teak site quality of the tract is mainly IVb and IVa and even quality III is found mixed with crop in better soil supporting areas.

2.2.1.2.Density : The density of the crop is less than 0.4, 0.4 to 0.6 or even more at places.

2.2.1.3.Major species : Teak (Tectona grandis).

2.2.1.4.Other species - Salai, Dhawada, mowai, ain, Hirda, behada, etc.

2.2.1.5.Age of the crop : Young to middle aged. The area in general supports the poor high and low forest crops of teak and its associates and other trees which are largely of low grades. Teak constitutes more than 35 % of the stock.

2.2.1.6. Salai forests are of Site quality IV. These are open and under stocked forests. Mixed forests are met with on lower slopes of Chirodi reserve. Existing crop is malformed and crooked due to various factors. The important species occurring in the area are salai, anjan, char, khair, teak, salai, movai, tendu, bhosa, bor etc. The natural regeneration of teak and other species is scanty. In few favourable sites good plantations of teak, khair, salai, anjan, ber etc. raised under agrisilvi method can be seen in Chirodi Reserve. The entire forest is infested by lantana (Lantana camara), an exotic weed introduced in Melghats some decades ago. Bamboo is found along Nalas in Pohara and Chirodi blocks.

SECTION :2.3: SPECIAL OBJECTS OF MANAGEMENT:

2.3.1.1. Most of the forests allotted to this working circle are degraded in quality. Due to various adverse factors which resulted due to maltreatment of the forest in the past, they are not in a normal state. At present, the crop is generally young to middle aged. Therefore the prime object of management here is to have a normal forest. Though in previous working plan most of the areas were kept under coppice with reserve working circle or improvement working circle. The main objective under cwr was to achieve the crop for final harvesting when it attains the age of rotation. In iwc the objective was to treat the crop to bring it to be ready for selection felling. But in both cases due to non implementation of the prescriptions

as envisaged in previous plans and poor coppicing power of non teak species has resulted into the crop of mainly seed origin. Thus the special objects of management of these forests are.

i) To improve the crop stocking, composition and condition.
ii) To get maximum sustained outturn of small sized timber and firewood to meet the local demand.
iii) To involve JFMC in Protection, harvesting, regeneration and the forest related activities.

SECTION :2.4: COMPARTMENTS AND WORKING SERIES :

2.4.1.1. 95 Compartments have been allotted to this Working Circle. The areas have been divided into nine felling Series having 10 coupes in each Series. Average area of the coupe is 165 ha. The details of working series , coupes and sequence of working have been given in Appendix No XXVII in volume II of this plan .

Sr. No	Range	Working Series	Compartments	Area (ha)
1	Warud	Wai	93,94,95a,95b,96,97,98,99, 100a,100b,102a,102b,103b,	2307.146
2	Warud	Linga	103a,104a,104b,105,106, 107, 108,109,110.	1989.936
3	Warud	Shekdari	83a,83c,84,85,86,87,88,89, 90,91, 92	2345.570
4	Morshi	Lakhara	72a,72b,73,74,75,76a, 76b,77a, 7b,78,79,80,81,82.	1405.401
5	Paratwada	Wishroli	111to113,114to117,121,121a 121b,122p,123, 124p,125p	1727.038
6	Amravati	Wadhona	47,48,49,50a,50b,51,52,53, 54a,54b,55,56	1312.445
7	Amravati	Pohra	27,28, 39, 40, 41	1356.506
8	Amravati	North Chirodi	34a, 35, 36,37,38	1188.157
9	Amravati	South Chirodi	28a, 29a,30a,31,32,42a,43,45 33a,43,44,46.	1465.043
Total area of SCI WC in division				**15097.242**

SECTION : 5 : ANALYSIS AND VALUATION OF THE CROP.

2.5.1.1.Stock mapping:- No stock mapping was carried during the preparation of current plan report. The density of crop was assessed with the help of satellite imageries at the GIS laboratory at the office of Conservator of Forests Working Plan Nagpur The abstract is given in Appendix No. XL

2.5.2.1.Enumerations:- One percent enumeration's have been carried out by the existing staffs of the Forest Resource Survey Unit under working plan division Amravati during 2001-2002. The results have been analyzed and the abstract is given below –

SELECTION CUM IMPROVEMENT WORKING CIRCLE
(2001-2002 ENUMERATION DATA)
(NUMBER OF TREES PER HECTARE.)

Girth Class	teak / ha	Non-teak / ha	No / ha
15-30	48.97	76.38	125.35
30-45	31.50	55.08	86.58
45-60	13.84	27.11	40.95
60-75	7.15	17.92	25.07
75-90	2.87	9.21	12.08
90-105	1.17	4.55	5.72
105-120	0.40	1.76	2.16
120-135	0.09	0.56	0.65
135-150	0.06	0.52	0.58
>150	0.00	0.00	0.00
Total	**106.05**	**193.09**	**299.14**

2.5.2.2. Comparison of growing stock during 1990-1991 to 2000-2001.

Girth Class	1990-91			2001-02			%Change over the period		
	Teak	Non-Teak	Total	Teak	Non-Teak	Total	Teak	Non-Teak	Total
15-30	29.4	40.1	69.4	49.0	76.4	125.4	67%	91%	81%
30-45	24.2	51.0	75.2	31.5	55.1	86.6	30%	8%	15%
45-60	15.8	30.5	46.3	13.8	27.1	41.0	-13%	-11%	-11%
60-75	9.2	18.4	27.6	7.2	17.9	25.1	-22%	-3%	-9%
75-90	2.8	8.1	11.0	2.9	9.2	12.1	4%	14%	10%
90-105	1.1	3.9	5.0	1.2	4.6	5.7	9%	18%	14%
105-120	0.2	1.0	1.2	0.4	1.8	2.2	100%	80%	83%
120-135	0.1	0.5	0.6	0.1	0.6	0.7	0%	20%	17%%
>135	0.0	0.7	0.7	0.1	0.5	0.6		-29%	-14%
Total	**82.8**	**154.2**	**237.0**	**106.1**	**193.1**	**299.1**	**28%**	**25%**	**26%**

It is observed that the overall trees number has increased from **237.0** to **299.14** per hectare i.e. **26%** increase is noticeable. This is due to rest given to crop and artificial and natural regeneration efforts taken by division during this period. Teak number has increased by **28%,** while non teak has increased by **25%.** If we compare the girth wise distribution we find that there is increase in 15-30 and 30-45 girth classes i.e. in lower girth classes. But in 45-60 and 60-75 girth classes there is decrease in number and above 60-75 girth classes increase is steady. Decrease in middle girth classes is obvious as in previous working mostly removal was from these girth classes and these girth classes cater the local requirements. Local people need small timber and poles for their house hold requirement of shelter and agricultural implements. If the requirements are not fulfilled legally they resort to illegal means of illicit cutting.

2.5.2.3.Crop compositions in various working series of this working circles are as follows:

2.5.2.4. SCI WC : SHEKDARI WORKING SERIES :

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak %	%Nonteak
15-30	87.12	53.13	33.99	61%	39%
30-45	74.10	42.47	31.63	57%	43%
45-60	36.42	18.26	18.16	50%	50%
60-75	26.25	10.35	15.90	39%	61%
75-90	15.21	4.20	11.01	28%	72%
90-105	7.12	1.67	5.45	23%	77%
105-120	2.43	0.45	1.98	19%	81%
120-135	1.04	0.14	0.90	13%	87%
135-150	0.56	0.00	0.56	0%	100%
>150	0.00	0.00	0.00		
Total	**250.24**	**130.66**	**119.58**	**52%**	**48%**

2.5.2.5. SCI WC : WAI WORKING SERIES

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak%	%Nonteak
15-30	101.63	52.82	48.82	52%	48%
30-45	71.53	28.15	43.38	39%	61%
45-60	33.46	12.46	21.00	37%	63%
60-75	22.06	7.27	14.79	33%	67%
75-90	9.97	2.37	7.60	24%	76%
90-105	4.04	0.74	3.31	18%	82%
105-120	1.76	0.20	1.55	11%	88%
120-135	0.29	0.00	0.29	0%	100%
135-150	0.49	0.04	0.45	8%	92%
>150	0.00	0.00	0.00		
Total	**245.63**	**104.04**	**141.58**	**42%**	**58%**

2.5.2.6. SCI WC : LINGA WORKING SERIES

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak%	%Nonteak
15-30	98.31	41.10	57.20	42%	58%
30-45	84.84	27.12	57.72	32%	68%
45-60	52.59	16.29	36.30	31%	69%
60-75	35.92	9.93	25.99	28%	72%
75-90	16.90	4.61	12.29	27%	73%
90-105	5.70	1.51	4.19	26%	74%
105-120	1.84	0.28	1.55	15%	84%
120-135	0.56	0.09	0.47	16%	84%
135-150	1.32	0.19	1.13	14%	86%

>150	0.00	0.00	0.00		
Total	**297.98**	**101.13**	**196.85**	**34%**	**66%**

2.5.2.7. SCI WC : WISHROLI WORKING SERIES

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak%	%Nonteak
15-30	238.44	84.37	154.07	35%	65%
30-45	120.00	44.74	75.26	37%	63%
45-60	38.48	14.96	23.52	39%	61%
60-75	27.81	7.00	20.81	25%	75%
75-90	12.48	2.85	9.63	23%	77%
90-105	10.00	1.96	8.04	20%	80%
105-120	4.56	1.00	3.56	22%	78%
120-135	1.37	0.30	1.07	22%	78%
135-150	1.00	0.15	0.85	15%	85%
>150	0.00	0.00	0.00		
Total	**454.15**	**157.07**	**297.07**	**35%**	**65%**

2.5.2.8. SCI WC : CHIRODI WORKING SERIES

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak%	%Nonteak
15-30	81.02	17.40	63.62	21%	79%
30-45	60.23	15.84	44.40	26%	74%
45-60	30.34	8.53	21.81	28%	72%
60-75	14.21	3.75	10.45	26%	74%
75-90	6.90	1.44	5.46	21%	79%
90-105	2.10	0.24	1.85	11%	88%
105-120	0.76	0.22	0.54	29%	71%
120-135	0.29	0.02	0.27	7%	93%
135-150	0.07	0.02	0.05	29%	71%
>150	0.00	0.00	0.00		
Total	**195.91**	**47.47**	**148.44**	**24%**	**76%**

2.5.2.9. SCI WC : LAKHARA WORKING SERIES

Girth Class	Total/ha	Teak/ha	Nonteak/ha	teak%	%Nonteak
15-30	189.84	67.49	122.35	36%	64%
30-45	146.15	40.59	105.56	28%	72%
45-60	76.96	16.54	60.42	21%	79%
60-75	36.49	6.44	30.05	18%	82%
75-90	15.97	2.65	13.32	17%	83%
90-105	7.89	1.52	6.38	19%	81%
105-120	2.27	0.25	2.02	11%	89%
120-135	0.38	0.00	0.38	0%	100%
135-150	0.38	0.00	0.38	0%	100%
>150	0.00	0.00	0.00		
Total	**476.33**	**135.48**	**340.85**	**28%**	**72%**

SECTION : 2.6 : SILVICULTURAL SYSTEM :

2.6.1.1. As the most of the crops is of uneven age and is of mixed composition with some clusters of pure crops, the Silvicultural System to be adopted must be in tuning with the betterment of the crop. Most of the crop is mainly of seed origin. Also some coppice crop is met with . The system for the tract dealt with here is prescribed as Selection Cum Improvement System. Though the selection girth has been prescribed the removal of stems from lower girth classes are also necessary to have improvement of the crop. Site Quality wise treatment is sought for. The science of growth for non-teak is not available. We will have assumption that the growth pattern of non-teak species is comparable to that of teak. With the help of yield table prepared for teak plantation the crop composition would be compared and removal of stems from various girth classes will be carried out if the requirement arises. If the site is found having inadequate crop composition natural regeneration will be promoted. If the crop is having any hygienic problem that would be solved accordingly to improve the existing crop for betterment in future. Improvement felling will include all operations aiming at improvement in the crop within the coupe. Selection of stems for this purpose have been based on factors other than the harvestable girth. To achieve the special objectives of management, "Selection Cum Improvement fellings supplemented by tending of the crop " shall be adopted.

SECTION : 2.7 : WORKING CYCLE & HARVESTABLE GIRTH :

2.7.1.1. Felling cycle has been fixed at 10 years. Since we are resorting to selection cum improvement fellings, the selection girth for teak prescribed here is 75 centimeter girth at breast height. The overall site quality of the tract is IV and as trees get starting badly hollowed after attaining the gbh over 75 centimeter gbh. Selection girth for trees of miscellaneous species other than Lendia and garadi is prescribed at120 centimeter gbh while that of Lendia and garadi it is fixed at 45 centimeter gbh as these species are very good fuel and their growth is very fast if they are retained beyond that girth they suppress other species. Irrespective of girth class there will be improvement marking and therefore from the all girth classes surplus trees will be removed. Further dead and dying trees will be removed irrespective of girth classes.

Harvestable girths:

Teak: 75 centimeter girth at breast height over bark. of coppice origin and 120 cm. GBH of the seed origin.

Non Teak : 120 centimeter girth at breast height over bark.

Garadi and Lendia : 45 centimeter at breast height over bark.

SECTION : 2.8 : CHOICE OF SPECIES.

2.8.1.1. The species to be regenerated will be as per site requirement and if people's participation is available the site suitability and people requirement will be harmonized.

SECTION : 2.9 : FORMATION OF WORKING SERIES AND COUPES:

2.9.1.1. Area under this working circle has been divided into 9 Working Series. Each Working Series contains 10 coupes having an average area of 165 ha. The coupe wise details have been given in Appendix No XXIX of volume II of this plan .

SECTION :2.10: REGULATION OF YIELD:

2.10.1.1. The Annual Yield will be regulated by area. But efforts have not been made to make the coupes either equiproductive or equiextentive. Because the main objective behind the idea of equiproductive coupes had always been to avoid fluctuations in the

market price. But in the existing scenario, the demand for timber is so high that small fluctuations in the yield will hardly have any effect on the market trend.

2.10.1.2. Similarly, efforts have been made to keep the boundaries of the coupes as natural as possible. Therefore the coupes could not be made equiextentive as well .

2.10.1.3. For yield regulation, Brandis's formula with modification suggested by K.P.Sagreiya has been used.

Harvestable Girth (g.b.h.) for teak :

a) For Teak Site quality IV - 75 centimeters for coppice origin crop and 120 cm GBH for seedling origin.

b) Non Teak - 120 centimeter.

2.10.1.4. The percentage of any species of trees that shall be reaching the harvestable girth has been calculated on the basis of number of trees of that species that ideally should have been in each girth class, if the present stock was evenly (normally) balanced. The ideal number of trees in different girth classes in an evenly balanced growing stock is obtained by applying F.de. Liocourt's formula. F.de. Liocourt's formula states that in a fully stocked selection forest i.e. in a normal growing stock of the uneven aged forests, the number of stems falls off from one diameter/girth class to the next higher diameter/girth class in a

geometrical progression with a constant ratio. In other words, the percentage reduction in the number of stems from one diameter/girth class to the next to that is constant.

2.10.1.5. Thus according to F.de. Liocourt, the number of trees in successive diameter / girth classes is represented by a geometrical series as a, ar, ar^2, ar^3, ….Where 'a' represent the number of trees in the lowest diameter/girth class and ar^1, ar^2…etc. represent the number of trees in the next higher diameter/girth class. 'r' represents the common ratio of the geometrical progression. Allowance for unplanned removal in form of illicit cutting or other form has been given.

2.10.1.6. Thus if the value of 'r' and the number of trees in any dia./girth class are known, the whole series can be worked out which would give a proportionate distribution of trees in an ideal forest. But in reality such balanced distribution does not exist due to various reasons. For a given stand, the values of 'r' and 'a' can be obtained as below.

$$a_2/a_1 = a_3/a_2 = a_4/a_3 = \ldots\ldots\ldots = a_n/a_{n-1} = r$$

$$r = (a_2 + a_3 + a_4 + \ldots\ldots\ldots + a_n) / (a_1 + a_2 + a_3 + \ldots\ldots\ldots + a_{n-1})$$

Where a_1, a_2,…. are number of trees in various girth classes.

Similarly, first term of G.P. i.e 'a' can be obtained as below.

$$a = S(1-r)/(1-r^n)$$

Where a = Number of trees in the lowest girth class.

S =. Sum of trees of all girth classes

And r =. Common ratio of G.P.

From these values of 'a' and 'r' the whole series of an ideal distribution (De Liocourt's distribution) for any given distribution of trees can be found out.

2.10.1.7. TABLE SHOWING AVAILABLE TEAK TREES IN SHEKDARI W.S.

Sr. No.	Girth Class Cms.	Actual No. of the teak trees/ ha. B	Ideal No of the teak trees/ ha. as per De Lio Courts Formula D	Survival percentage reaching harvesta ble girth %	Percentage of unplanned removal trees. % D	Actual percentage of survival E	Stem per ha. reaching harvestable girth. F	Years required to pass over to next girth class G	Average annual recruitment reaching harvestable girth R
I	15-30	53.13	55.08	13.49	1.00	12.49	6.64	9	R_4 =0.74
II	31-45	42.47	33.39	22.26	2.00	20.26	8.61	8	R_3 =1.08
III	46-60	18.26	20.24	36.74	2.00	34.74	6.34	12	R_2 =0.53
IV	61-75	10.35	12.26	60.61	3.00	57.61	5.96	12	R_1 =0.50
	76-90	4.20	7.43	100.00	3.00	97.00	4.08		
	Total	128.41	128.4						
	>90	2.26							
	Total	130.66							

$$r = \frac{A_2 + a_3 + \ldots\ldots + a_n}{a_1 + a_2 + \ldots\ldots + a_{n-1}} = \frac{a_1 + a_2 + a_3 + \ldots\ldots + a_n - a_1}{a_1 + a_2 + a_3 + \ldots\ldots + a_n - a_n} = \frac{(S - a_1)}{(S - a_n)}$$

$$r = (S - a_1)/(S - a_5) = 0.61$$

$$a = S(1-r)/(1-r^5) = 55.08$$

2.10.1.8. RECRUITMENT IN SUCCESSIVE WORKING CYCLES

WORKING CYCLES	TOTAL RECRUITMENT DURING THE WORKING CYCLE	
I	$R_{11}=10*R_1$	5.0
II	$R_{12}=2*R_1+8*R_2$	5.3
III	$R_{13}=4*R_2+6*R_3$	8.6
IV	$R_{14}=2*R_4+8*R_5$	8.1

2.10.1.9.REALIZABLE RECRUITMENT DURING THE SUCCESSIVE WORKING CYCLES: All the recruitment during the period of a Working cycle is not realizable because in the first year coupe recruitment of only one years is available and so one till the 10^{th} coupe in which all the recruitment for 10 years shall be available.

The total realizable recruitment in a working cycle can be calculated by -

Rrn = [Rn - P (Rn/F-Rx)]/2

It is the Sagreiya's modification of Brandis 's and Smythie's formula.

Where

Rrn - Realizable Recruitment during n th working cycle.
Rn - Total Recruitment during the n th working cycle.
P - Period during which the initial rate of Recruitment exists.
F - working cycle.
Rx - Initial rate of recruitment.

The recruitment realizable during the successive working cycles is as follows.

2.10.1.10. YIELD IN VARIOUS WORKING CYCLES

Cycle	Accruing	Realizable Rrn	Accumulating Ran	Total realizable in cycle
1 st	5	2.5	2.5	2.5
2 nd	5.3	2.62	2.68	5.12
3 rd	8.6	3.64	4.96	6.32
4 th	8.1	4.1	4	9.06

If the stock in hand is liquidated in one, two, three or four working cycles, then the annual realizable yield per ha. per working cycle shall be as follows.

Liquidation in Cycle/s	Annual realizable yield if whole WC is worked (trees/ha.)				Removal % in 1st cycle
	1st cycle	2nd cycle	3rd cycle	4th cycle	
1 cycle	0.90	0.51	0.63	0.91	95%
2 cycles	0.60	0.60	0.63	0.91	50%
3 cycles	0.61	0.61	0.61	0.91	33%
4 cycles	0.69	0.69	0.69	0.69	38%

Liquidation in Cycle / s	Annual realizable no of trees/ha.				Removal % in 1st cycle
	1st cycle	2nd cycle	3rd cycle	4th cycle	
1 cycle	9.0	5.1	6.3	9.1	95%
2 cycles	6.0	6.1	6.3	9.1	50%
3 cycles	6.1	6.1	6.1	9.1	33%
4 cycles	6.9	6.9	6.9	6.9	38%

Thus, it is seen from the above table that most sustained yield is realizable if the stock in hand is liquidated in four cycles. To achieve this 38% of and above the selection girth (say 2 out of 5) trees can be felled in each coupe.

Yield will go on increasing from Ist coupe to Xth coupe. But the average yield will be7 trees/ha.

Since the yield is varying for the reasons discussed above it is not possible to give any figure about the yield per coupe. It may be estimated only after carrying out 100% enumeration's of the teak trees of and above the exploitable girth.

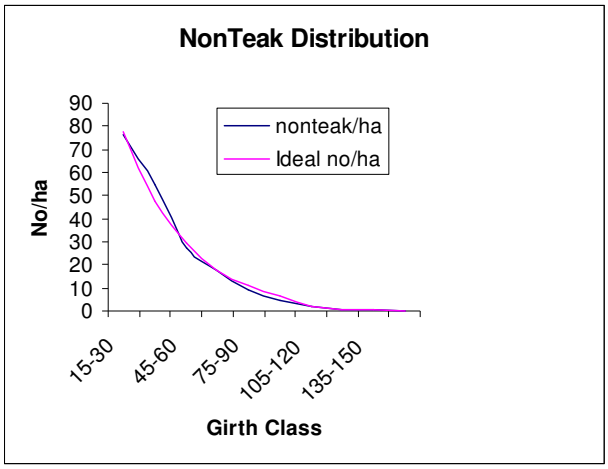
2.10.2. YIELD CALCULATION FOR NON TEAK :-

2.10.2.1. Growth patterns of non teak trees are not known to us as in case of plantation teak to some extent natural teak. In the absence of proper data it is very difficult to ascertain that what period a species takes place to cross the one girth class to successive girth class. It is

also uncertain to arrive at the point at which the mean annual increment is equal to that of current annual increment and hence the age of silvicultural maturity cannot be justified. Looking the site quality of the area to be IV and the soil supporting only poor quality of crop it is hereby suggested not to go for harvest the non teak species. To save the bio diversity it is recommended to adhere it in principle. To bring the normalcy in the crop the excess number in particular girth class is hence recommended for removal as to improve the crop hygiene.

2.10.2.2. Comparison between actual and ideal Number of trees / ha.

Girth Class	nonteak / ha	Ideal no / ha
15-30	76.38	77.72
30-45	55.08	47.66
45-60	27.11	29.22
60-75	17.92	17.92
75-90	9.21	10.99
90-105	4.55	6.74
105-120	1.76	1.76
120-135	0.56	0.56
135-150	0.52	0.52
>150	0.00	0.00



Total	193.09	193.09

Graphical observation clearly shows that the distribution of stems in different girth classes are very near to ideal distribution as per law of proportionality of distribution of trees in various diameter/girth classes. Hence the ideal condition for the tract is some what near to the actual distribution. Therefore, removal of non teak species is not recommended in the light of above fact. But the dead dying and badly diseased trees are to be removed leaving one tree per hectare for wildlife purposes. But in case of Lendia and garadi which have

tendency to occupy the available space thoroughly due to strong light demand and the utility of these species as very good fuel wood and the demand of the people for fuel wood these species are to be removed after attaining the girth at breast height at 45 centimeter.
In case of other working series the result for yield is found to be approximately same as in the case of Shekdari Working Series and it may be worked out easily as the data for different working series have been given above.

SECTION : 2.11 : AGENCY FOR HARVESTING:

2.11.1.1. Felling will be done through JFMC or FLCS or departmentally and protection and plantation works may be carried out as per the Government directions under J.F.M

SECTION : 2.12 : DEMARCATION OF COUPES, PREPARATION OF TREATMENT MAP AND MARKING RULES.

2.12.1.1. DEMARCATION :- Demarcation of first and second coupes will be done in first year of operation. Barring first coupe rest of coupes will be demarcated one year in advance.
2.12.2.1.TREATMENT MAP :- A broad treatment map will be provided by Geomedia cell at Nagpur showing density class ,blank area, unworkable areas etc. the final details will be given by R.F.O. & verified by A.C.F.. Deputy Conservator of Forests in charge of Amravati Forest Division will check at least one treatment map as early as possible and guide the staff. Treatment map will include following types of areas :-

2.12.2.2. "A" Type of area: Protection Areas : It includes the following areas:
i) Areas with steep slopes i.e. more than 25^{0}.
ii) Thirty meter's wide strip on either side of the water course.
iii) Areas around any sacred place.
iv) Area important for wildlife shelter and breeding.
2.12.2.3. "B" Type of area:- Understocked Areas : It includes areas with crown density less than 0.4 but exceeding 5 ha. in extent at one place.
2.12.2.4. "C" Type of area:- Pole Crop: It includes patches of well grown pole crop of teak and other species suitable for retention as a future crop during the working of previous plan operation. The patch should not be less than one hectare at a place.
2.12.2.5. "D" Type of area:- Well Stocked Areas It includes areas with crown density more than 0.4 Area will be delineated on the basis of site quality.
2.12.3.1.TREATMENT :- Gully Plugging, and Nala Bunding etc will be carried out wherever feasible.
2.12.3.2. "A" Type of area: Protection Areas: No marking for felling shall be done**.** Dead tree ,barring two/ ha. will be removed. Seeds will be sone.
2.12.3.3. "B" Type of area:- Understocked Areas :- Measures will be taken to increase the density of the area naturally.
i) Rooted stocks will be treated as available established stock and tended to cover the area.
ii) Seeds of suitable species will be sown in bushes to increase the species regime.
iii) Malformed trees will be cut back .
iv) Singling will be done wherever needed.

2.12.3.4. "C" Type of area :- The congested pole crop shall be spaced out to 1/3 of the top height. However if there are any plantation , which could not be, included in working plan of old teak plantation working circle, shall be delineated and thinned to 1/3 of the top height as per yield table.

2.12.3.5. "D" Type of area :-

(i) Climbers of non medicinal value on the trees will be cut.

(ii) All trees (teak and non teak) of approach class and above will be enumerated girth class wise.

(iii) No tree will be marked for felling unless it is siliviculturally available.

(iv) Only estimated % of harvestable girth classes of teak and non teak trees preferably of coppice origin and that of harvestable girth and above will be marked for felling. Those harvestable teak trees , which are preventing the development of the seedling regeneration of the desired species, will be removed in preference to others. Otherwise felling of trees from these girth classes will be first from the highest girth class and then next below and so on. Due care should be taken to remove teak trees of coppice origin while retaining the teak trees of seedling origin as far as possible. Only those trees shall be removed which are silviculturally available. There will be different exploitable girth for the trees of seedling origin it will be 120 cm. G.B.H. and for trees with coppice origin, it will be 75 cm. G.B.H.

(v) No sound miscellaneous tree species of edible fruit, will be marked for felling so as to improve their stocking in the forest.

(vi) Irrespective of girth classes all malformed and dead trees will be marked for felling, retaining two dead trees per hectare. To avoid the reckless felling, it is prescribed that malformed trees having straight clear bole exceeding 2.5 meters in height from the ground level will not be felled.

(vii) The undesirable undergrowth of non medicinal value, which is preventing or likely to prevent the development of seedling regeneration of the desired species, will be removed.

[**Malformed tree** : A tree with a badly shaped and defective stem occupying more space than its future value warrants.]

2.12.4.1.MARKING RULES:- Marking, technique has been described, in detail, in the Other Most Important Regulations. Marking will be as follows:

2.12.4.2.TYPE A: No marking will be done.

2.12.4.3.TYPE B:

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

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

(iii) Malformed seedlings to be cut back.

(iv) If it is in the interest of crop, the coppice shoots will be removed. If not possible then established multiple coppice shoots and poles will be reduced to one per stool retaining the vigorous one.

(v) The undesirable under-growth, which is preventing or likely to prevent the development of seedling regeneration of the desired species, will be removed.

2.12.4.4.TYPE C:

The congested crop will be thinned to 1/3 of the top height the plantation not included in old teak plantation working circles , shall be thinned as per Yield table.

2.12.4.5.TYPE D: As envisaged under treatment for "D" type of area the marking will be carried out accordingly.

SECTION :2.13: METHODS OF REGENERATION:

2.13.1.1. "B" type of areas if found suitable will be planted with species suitable to site. If required seed sowing may be done using khair and other species. This will be done in the year following the year of main felling.

SECTION: 2. 14: SUBSIDIARY SILVICULTURAL OPERATIONS:

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

2.14.1.1. CUTTING BACK OPERATIONS: These will be done in the following year of main felling. This will include following operations:

i) Felling of standing trees, marked for felling but not felled.
ii) Felling of damaged trees, damage caused during felling, which are not likely to be recovered.
iii) Cutting of non medicinal climbers.
iv) Cutting of all coppice shoots where natural regeneration is adequate.
v) Cutting of all malformed regeneration upto 15cm gbh.

2.14.1.2. CLEANING : In the sixth year from the year of the main felling, the following operations will be done.

i) Non medicinal climber cutting.
ii) Cutting of all coppice shoots where naturally regenerated or planted seedlings are adequate.
iii) Removal of non medicinal undergrowth interfering or likely to interfere with the growth of seedlings (natural or planted)

SECTION : 2.15 : OTHER REGULATIONS :

2.15.1.1. The success of regeneration will depend upon the protection of all areas from fire and control on grazing. The vulnerable areas will be protected from illicit cutting also.

2.15.1.2. FIRE PROTECTION : Special attention is needed to control the fire. The main felling coupe will be rigidly and effectively fire protected for a period of 5 years from the year of main felling. The area will be cleared off, of all the dry and cut remains of bushes, leaves etc. by the end of February to avoid fire hazards to standing crop as well as to the NR. Effective protection against fire for a period between February 15 to June 15 is a must to ensure survival and establishment of NR of all species for developing it into the further growing stock. It is established fact that fire is the foremost reason of non establishment of natural regeneration. Grazing comes next. Co-operation of local people will be sought by forming JFMC's.

2.15.1.3. CLOSURE TO GRAZING : The main felling coupes will remain closed to grazing for a period of 5 years from the year of main felling. The closed coupes will specifically be mentioned in the grazing license and the villagers will be made aware of them by regular drum beating in the villages. The suggestion given in Other Important Regulations to solve the grazing problem should be tried.

PEPOLE'S PARTICIPATION : Local people shall be involved in all activities of the coupes including marking, harvesting, regeneration, protection etc. as per the Govt. resolution No.MSC/2000/CN/43/F-2, Mumbai dt. 25/4/2003.

CHAPTER – III

WORKING PLAN FOR AFFORESTATION WORKING CIRCLE

SECTION : 3.1 : GENERAL CONSTITUTION OF THE WORKING CIRCLE :

3.1.1.1. Areas included in this working circle are as follows:

i) Areas of fuel wood W.C. and afforestation W.C. from the previous Plan.

ii) Areas taken by division for compensatory afforestation.

3.1.1.2. Total area included in this working circle is 27386.055 ha. Range wise distribution is as under :-

Sr.No	Range	Range area	C Class	Babul Bans	AWC area
1	Amravati	21457.662	9292.452	1764.667	11057.119
2	Paratwada	8058.406	4690.258	458.023	5148.281
3	Morshi	11424.562	5554.074	2012.583	7566.657
4	Warud	10559.248	3492.566	121.432	3613.998
Total of Division		**51499.878**	**23029.350**	**4356.705**	**27386.055**

'C' Class reserved forest will be divided into 13 afforestation series, each having thirty annual coupes, while the 'A' Class babul ban reserved forest will have only one afforestation series of same number of annual coupes. The details of the coupes & their sequence is given in Appendix No. XXIX in Vol.-II of this plan.

SECTION : 3.2 : GENERAL CHARACTER OF THE VEGETATION :

3.2.1.1. Forests included in this working circle are mostly Babul bans, Reserved Forest of "C" class and Unclassed Forests. Most of the areas are near heavily habitated villages. Out of these areas some of the areas have been already covered under plantation in previous plan period under different schemes with varying success to total failure. Main vegetation is babul (Acacia nilotica). In successful or partial successful plantation areas mainly teak (Tectona grandis), bamboo (Dendrocalamus strictus), khair (Acacia catechu) etc are found. Under storey or ground vegetation are almost non -existence.

3.2.1.2. The areas, which are in the immediate vicinity of human habitations, are under tremendous biotic pressure. Due to heavy biotic interference like grazing and illicit cutting for fire wood, the crop has been reduced to scrubby growth. The status of natural regeneration is very poor. The heavy pressure of grazing has resulted in compaction and erosion of soil. Due to this many patches have become almost blank. However, in some patches very good miscellaneous crop of 0.5 density is noticed. Common species found in such patches are bhirra, Dhaoda, ain, tinsa, tiwas, lendia, mowai, palas, tendu, bija etc.

SECTION : 3. 3 : BLOCKS AND COMPARTMENTS :

3.3.1.1. This working circle includes Babul bans, and some Reserved Forests. The details of compartments allotted to this working circle by working series have been given in Appendix No XXIX in Volume II of this plan.
Number of "C" Class compartments = 421 and that of Babul bans = 564.

SECTION : 3.4 : SPECIAL OBJECTS OF MANAGEMENT :3.4.1.1. These areas have degraded due to heavy grazing, illicit cutting and fire. Keeping in view these factors, special objects of management for these areas will as follows :

(i) To reclaim the suitable area by afforestation works and to enhance the productivity through planting of indigenous species of small timber, firewood and fodder value to meet the local demand wherever the grazing pressure is less and soil is good .
(ii) To involve the local people in afforestation works through Joint Forest Management.
(iii) To meet the demand of local people for small timber, firewood and fodder to the maximum possible extent.
(iv) To manage the existing Babul bans on sustained basis.

SECTION : 3. 5 : ANALYSIS AND VALUATION OF THE CROP :

3.3.1.1.STOCKS MAPS : Most of the areas are sparsely stocked or blanks. No stock mapping was carried out.

3.3.1.2. DENSITY : The density of the crop is below 0.4 marked with blank areas except in few patches where density is more than 0.4.

3.3.1.3.ENUMERATION : Enumeration has not been done in these areas. Most of the areas is under stocked, blank and below 0.4 density.

SECTION : 3.6 : SILVICULTURAL SYSTEM :

3.6.1.1. The primary object of management in these areas is to restore the soil fertility and increase the productivity. The areas will be afforested with suitable species. No regular silvicultural system will be applied. The existing growth will be tended by suitable operations. The root-stocks present in the area which have been constantly hacked for firewood will be redressed properly to obtain coppice growth. Suitable areas with deep soil

and very little grazing pressure will be selected for planting . Co-operation of the local people will be sought in protection of the plantation and area.

3.6.1.2. In Babul bans babul will be harvested at 35 years rotation age (105 cm at g.b.h). Pods may be harvested for fodder for goats and seed purpose annually. Gum should be collected as per availability. The species other than Babul shall be marked for felling if the girth exceeds 105 cm. After harvesting the area will be ploughed and Babul seeds sown before oncoming monsoon.

SECTION : 3.7 : CHOICE OF SPECIES :

3.7.1.1. The choice of species will depend upon soil type, its depth, drainage and local requirement. However, indigenous species of small timber, firewood and fodder will be preferred. In areas suitable for Teak, 50% Teak and 50% indigenous edible fruit and flower yielding trees of local economic importance like Sitaphal aola, biba, harra, beheda will be planted. Ficus species may be planted at the rate of two trees per ha for wildlife. Bamboo may be planted in suitable areas. Where the local requirement is for fuel, short rotation species like subabul, ecalyptus (of the provenance suitable to the area, clones can be taken from I.T.C. Bhadrachalam or FDCM Ltd.) and neem etc. should be considered in preference to other species provided soil is found suitable for raising these species. Grass development may be taken up in areas where demand for grass or grazing is excessive. In such areas plantation of tree species may be taken only if the local people through JFMC are willing to protect it from fire and grazing. List of plantations is given in Appendix No. XXXIX of vol .II of this plan.

SECTION : 3.8 : FORMATION OF COUPES :

The "C" class forest will have 13 working series and the "A" class babulban will have only one working series. Each series is further divided into 30 annual coupes . The details are given Appendix No.-XXIX on vol. II of this plan.

SECTION : 3.9 : REGULATION OF YIELD :

3.9.1.1. Rotation:-

Babul : 35 years when it is expected to reach 105 cm gbh(ob).

Other species : 105 cm. gbh(ob).

3.9.1.2. Yield calculation:- It will be calculated by areas.

3.9.1.3. Since most of area is degraded, no appreciable yield will be available. However, the small timber and firewood removed during the working may be given either free or at concessional rate to the members of Forest Protection Committee if they take up the responsibility for planting and protection of the forest area or as per the provisions contained in G.R. dated 25/4/2003.

SECTION : 3.10 : AGENCY FOR WORKING :

3.10.1.1. The demarcation, marking and felling will be done through J.F.M.C. or departmentally or through F.L.C.S. The small timber and firewood extracted out of the coupe during the felling and subsequent operations will be given to the local people at concessional rates. For the afforestation works the committee of local people will be formed. The Forest Protection Committee of local people as per G.R. dated 25/4/2003 will be formed who will undertake the plantation and protection works. But the over all supervision will be of the department.

SECTION:3.11: DEMARCATION OF COUPE, PREPARATION OF TREATMENT MAP AND MARKING RULES :

3.11.1.1. DEMARCATION :- Demarcation of first and second coupes will be done in first year of operation. Barring first coupe rest of coupes will be demarcated one year in advance.

3.11.2.1.TREATMENT MAP :- Basic treatment map will be provided by the Geomedia cell at Nagpur which will show steep area, a 30 meter width strip area of nallas, eroded areas, the understocked areas, any old teak plantation & good density forest lands. The finer details will be shown by the field staff preferably by R.F.O.

3.11.2.2. "A" Type of area: Protection Areas : It includes the following areas:

i) Areas with steep slopes i.e. more than 25^0.
ii.) Thirty meters wide strip on either side of the water course.
i) Areas around any sacred place.
ii) Area important for wildlife shelter and breeding.

3.11.2.3. "B" Type of area:- Understocked Areas : It includes areas with crown density less than 0.4 but exceeding 5 ha. in extent at one place.

3.11.2.4. "C" Type of area:- Pole Crop : It includes patches of well grown pole crop of teak and other species suitable for retention as a future crop during the working of previous plan operation. The patch should not be less than one hectare at a place.

3.11.2.5. "D" Type of area:- Well Stocked Areas It includes areas with crown density more than 0.4 Area will be delineated on the basis of site quality.

3.11.3.1.TREATMENT :- The various treatments proposed are as under .

3.11.3.2. "A" Type of area: Protection Areas: No marking for felling shall be done**.**

3.11.3.3. "B" Type of area:- Understocked Areas :- Measures will be taken to increase the density of the area naturally and/or artificially.

i) Rooted stock will be tended.
ii) Seeds of suitable species like neem and chandan will be sown in bushes through Vanmajoors and baramahi labourers available in the beat. Infact the beat guard should carry these seeds each day he visits forest at the onset of monsoon and carry out seed sowing in bushes and degraded are as. This should be repeated year after year till sufficient seedlings get established.
iii) Suitable area will be planted with species as given in para 3.7.11.
iv) Malformed trees will be cut back .
v) Singling will be done wherever needed.

3.11.3.4. "C" Type of area :- The pole crops will be thinned 1/3 of the top height.

3.11.3.5. "D" Type of area :-

(i) Climbers of non medicinal value on the trees will be cut.
(ii) All trees (babul and non babul) of approach class and above will be enumerated girth class wise.
(iii) No tree will be marked for felling unless it attains the rotation girth of 105cm gbh.
(iv) Only trees of above rotation girth classes of babul and non babul trees preferably of coppice origin and that of harvestable girth and above will be marked for felling. Those harvestable babul trees , which are preventing the development of

the seedling regeneration of the desired species, will be removed in preference to others. Otherwise felling of trees from these girth classes will be first from the highest girth class and then next below and so on. Due care should be taken to remove teak trees of coppice origin while retaining the teak trees of seedling origin as far as possible. Only those trees shall be removed which are silviculturally available.

(v) No sound miscellaneous tree species of edible fruit, will be marked for felling so as to improve their stocking in the forest.

(vi) Irrespective of girth classes all malformed and dead trees will be marked for felling.

3.11.4.1. MARKING RULES :- Marking, technique has been described, in detail, in the Other Most Important Regulations. Marking will be as follows:

3.11.4.2.TYPE :A: No marking will be done.

3.11.4.3.TYPE :B:

(i) All dead trees shall be marked for felling.

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

(iii) Malformed seedlings will be cut back.

(v) If it is in the interest of crop the coppice shoots will be removed. If not possible then established multiple coppice shoots and poles will be reduced to one per stool retaining the vigorous one.

3.11.4.4. TYPE "C" : The congested crop will be thinned to 1/3 of the height of the retaining pole. The pole crop will be spaced.

3.11.4.5.TYPE :D: As envisaged under treatment for "D" type of area the marking will be carried out accordingly.

SECTION :3.12 : REGENERATION :

3.12.1.1. The artificial regeneration in suitable areas may be resorted. Where replanting is resorted to in the some area it should be ascertained that the factors responsible for failure of plantation do not exist now. Mainly the reasons for failure are excessive grazing , wrong choice of species, and poor soil depth. Natural regeneration through coppice and natural seedling will be treated as supplementary to artificial regeneration and will be properly tended. After visiting the areas planted in past it is found that mixed plantations of Khair & teak are doing much better than other species.

3.12.1.2.(I) COPPICING : After felling is over, the stools will be dressed at 10 to 15 centimeter height above the ground with a sharp axe.

3.12.1.3.(II) ARTIFICIAL REGENERATION : Soon after the receipt of approved treatment map for marking a detailed treatment map for planting in suitable area will be prepared by the RFO under the guidance of an ACF. As far as possible J.F.M.Committee may be involved in the afforestation works.

The planting will be taken in the next year of main working. Seeds used for raising nursery should be collected from the known sources or taken from seed unit in FDCM. Seeds used should be of good quality.

For grass development area will be ploughed and sown with seeds of grasses like Paonia,Marvel,Sheda, Dinanath and other suitable species . In bushes seeds of neem and chandan will be sown before next monsoon.

SECTION:3.13 : SUBSIDIARY SILVICULTURAL OPERATIONS :

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

3.13.1.2. CUTTING BACK OPERATION.

(i) All standing trees and live high stumps marked for felling but not felled will be felled.

(ii) All trees damaged during main working which are not likely to recover will be felled.

(iii) All climbers will be cut.

(iv) Dressing of stumps will be done.

3.13.1.4. THINNING : In planted areas silvicultural thinnings may be carried out at 10 years interval.

SECTION: 3.14: OTHER REGULATIONS

3.14.1.1. FIRE PROTECTION: Main working coupes will be rigidly fire protected for a period of five years from the year of main felling. The local Forest Protection committee will be assigned this work.

3.14.1.2.GRAZING : Areas of main working coupes will remain closed to grazing for a period of five years from the year of planting.

3.14.1.3.:PEOPLES PARTICIPATION: Joint Forest management committee shall be formed in the villages adjoining the coupe and the cooperation of the members of this committee shall be sought in protection of the forests and forest area. Without cooperation of the local people it will not be possible to raise successful plantations. To raise plantations of fire wood, small timber and grass suitability of the site, needs of the local people and level of their cooperation must be kept in mind and necessary awareness for this should be created. It will be worthwhile if the planting operations are carried out by JFMC . Protection of planted area should be assigned to the JFMC for which it should be paid at the rates sanctioned for watch and ward.

CHAPTER-IV

WORKING PLAN FOR THE KURAN WORKING CIRCLE

SECTION:4.1: **GENERAL CONSTITUTION OF THE WORKING CIRCLE :**

4.1.1.1. This Working Circle includes the entire areas of Kuran Working Circle of previous (Bahadur's) Working Plan, which includes 52 Ramnas. Total area allotted to this working circle is 7451.226 ha. The whole area is incapable of growing good tree growth.

KURAN WORKING CIRCLE : AREA IN HECTARE

Sr.No	Range	Range area	A Class	C Class	Total area
1	Amravati	21457.662	3634.695	1294.456	4929.151
2	Paratwada	8058.406	953.267	552.088	1405.561
3	Morshi	11424.562	853.473	000.000	953.267
4	Warud	10559.248	000.000	163.247	163.247
Total of Division		**51499.878**	**5441.435**	**2009.791**	**7451.226**

SECTION:4.2: GENERAL CHARACTER OF THE VEGETATION :

4.2.1.1. Area allotted to this working circle is Salai forest of under stocked nature and most of the areas are devoid of tree growth. The area is seen scattered and stunted growths of shoots like Salai, Anjan, Moin, Khair, Bor, Hiwar, Palas, Bhosa, Teak and tall grasses are present. The grasses found area Kusali (Andropogon contortus). Paonia (Sehima sulcatum), Sheda (Sehimaa nervosum), Bhurbhusi (Eragrosits tennela) , Gondal etc.

SECTION :4.3: BLOCKS AND COMPARTMENTS:

4.3.1.1. In this working circle, 52 Ramnas have been constituted. Out of which 29 Ramnas consists of 50 compartments with 5445.435 ha of "A" class forests and 23 Ramnas are in 23 villages consisting of "C" class forests with an area of 2009.791 ha. Thus 73 compartments are there in this working circle.

Range wise distribution is given as follows:

Range	TotalRange area (ha.)	No of comptts	Area of wc (ha.)	% wrt range	%wrt wc
Amravati	21457.662	37	4929.151	23.03%	66.15%
Paratwada	8058.406	9	1405.561	11.83%	12.79%
Morshi	11424.562	23	953.267	12.30%	18.86%
Warud	10559.248	4	163.247	01.19%	2.19%
Total of Division	**51499.878**	**73**	**7451.226**		**100%**

SECTION:4.4: SPECIAL OBJECTS OF MANAGEMENT:

i) To improve the quality and quantity of fodder in the forest by introducing the better varieties of fodder grasses and fodder tree species.

ii) To meet the local demand for fodder and thereby to reduce heavy grazing pressure on the forests.

iii) To cover the whole area and prevent site erosion.

iv) To involve JFMC committees in the management of Kurans.

SECTION :4.5 : COMPARTMENT AND WORKING SERIES :

4.5.1.1. The details of the compartments allotted to this working circle along with the working series formed have been given in Appendix No. XXVIII in Volume II of this plan. The entire area has been divided into five working series as given below:
Range wise types of ramnas are as follows:

Sr.No	Range	Type of Ramna	Working Series
1	Amravati	"A" Class	Amravati Working Series
2	Paratwada	"A" Class	Paratwada Working Series
3	Morshi	"A" Class	Morshi Working Series
4	Amravati	"C" Class	Amravati Working Series
5	Morshi & Warud	"C" Class	Morshi & Warud Working Series

Range wise areas are as follows:

Sr.No	Range	"A" Class	"C" Class	Total
1	Amravati	3634.695	1294.456	**4929.151**
2	Paratwada	953.267	0.000	**953.267**
3	Morshi	853.473	552.088	**1405.561**
4	Warud	0.000	163.247	**163.247**
Total		**5441.435**	**2009.791**	**7451.226**

SECTION : 4.6 : ANALYSIS AND VALUATION OF THE CROP :
4.6.1.1.Stock-mapping - Not needed.
4.6.1.2.Age and density - The area is sparsely wooded. The trees wherever present are young to middle aged.
4.6.1.3.Enumeration –Not necessary.

SECTION : 4.7 : METHOD OF TREATMENT :

4.7.1.1. Every year 1/5th of the each Ramna has been proposed to be taken for treatment. Thus in the entire plan period of this plan each area will be treated twice.

4.7.1.2. In the 1st year of operation treatment map will be prepared for each coupe to be treated and following works are proposed to be taken:

i) All obnoxious weeds and thorny shrubs and bushes will be uprooted., out of the closed area about 10% area fit for ploughing and sowing of seeds will be selected.
ii) The seeds of superior fodder grasses like Sheda, Paunya and Marvel etc. will be sown after ploughing the area. Seed sowing or preferably tussock-planting of grasses like Marvel, Sheda, Paunya etc. will be done on the freshly excavated and heaped soil bund. Weeding will be carried out if necessary in favour of fodder grasses raised.
iii) The fodder grasses raised will not be permitted to be cut during the first two years of their introduction so as to allow them to seed and multiply.
iv) The area under treatment will be effectively fire-traced every year. It will be permanently closed to grazing. Cutting of grasses will only be allowed after October 31st from third year onwards.

SECTION : 4.8 : CHOICE OF SPECIES :

4.8.1.1. Seed broadcasting and tussock planting of superior fodder grasses like Paunya (Ischoemum sulcatum), Marvel(Andropogan annulatus), Sheda(Ishchoemum laxum)Dinanath will be taken up.

SECTION : 4.9 : FORMATION OF COUPES :

4.9.1.1. The details of the coupes formed have been given in the Appendix No XXVIII in Volume II of this plan.

SECTION : 4.10 : IMPLEMENTING AGENCY :

4.10.1.1. All the prescriptions will be carried out by the department as per policy taken by Government from time to time.

CHAPTER – V

WORKING PLAN FOR MISCELLANEOUS WORKING CIRCLE

This working circle includes all the area which have been handed over to various developmental agencies but as a result of such a handing over disforestation notification has not been issued, earlier steps should be taken to disforest the areas that has been permanently diverted to non-forest use. The total area of this working circle is 1565.356 ha. The details are given in the Appendix No.-XXXI in vol. II of this plan.

Table

Range	**Area allotted to miscellaneous working circle (ha.)**
Amravati	93.451
Morshi	1046.944
Warud	139.351
Paratwada	229.820
Unclassed	55.79
Total	**1565.356**

CHAPTER - VI

WORKING PLAN FOR OLD PLANTATION (OVER LAPPING) WORKING CIRCLE

SECTION:6.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE :

6.1.1.1. This working circle comprises of old plantations taken in past and scattered in all four ranges. Teak plantations were taken in coppice with reserve working circle, improvement working circle, selection cum improvement working circle and afforestation working circle in previous plans. Besides, some plantations both of teak and miscellaneous species were also taken under different schemes in the past. Therefore, areas included in this working circle are not in a consolidated block rather in scattered patches, spread over in all four ranges. Areas regenerated with coppice regeneration also need attention for improvement. These are also included for that purpose.

SECTION:6.2 : GENERAL CHARACTER OF THE VEGETATIONS :

6.2.1.1. Most of the plantations taken earlier in small patches are successful. Site quality varies from IV to III. The area is fully stocked. Crop is uniform. In teak plantations, the subsequent silvicultural operations have been carried out to some extent but no such operations have been observed in plantations of miscellaneous species.

SECTION:6.3 : BLOCKS AND COMPARTMENTS :

6.3.1.1. The rangewise details of compartments and their areas allotted to this working circle has been given in Appendix No. XXX in volume II of this plan

Sr.No	Range	Range area	Area in wc
1	Amravati	21457.662	219.14
2	Paratwada	8058.406	58.91
3	Morshi	11424.563	81.51
4	Warud	10559.248	225.15
Total of Division		**51499.879**	**590.71**

SECTION:6. 4: SPECIAL OBJECTS OF MANAGEMENT :

6.4.1.1. The main objective of teak plantation in different working circle was to have the teak crop with growth parameters comparable to those in the yield table. For this, it was essential to follow all silvicultural operations, prescribed in the scheme, after doing plantation, which could not be observed meticulously.

6.4.1.2. Miscellaneous species are in good proportion. Besides, plantations of miscellaneous species have been taken with an object to have miscellaneous forest. Therefore, to achieve the goal of the plantation to the greatest extent, the objectives of management are as follows

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

(2) To improve the crop by doing required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.

(3) To cover thinning in all overdue plantations in the shortest possible time and to ensure thinning and other silvicultural operations in other plantations when they are due.

SECTION:6. 5: ANALYSIS AND VALUATION OF THE CROP :

6.5.1.1.Stock maps : All plantations have been shown on stock map on 1:50000 scale.
6.5.1.2.Density : Generally crop is fully stocked.
6.5.1.3.Enumeration : 1% stratified random sampling enumeration has been carried out. Enumeration has been done by existing staffs of SOFR unit of Amravati.
6.5.1.4. Age and Site Quality : Plantations taken right from agrisilviculture plantation after clearfelling and planting during 1902-03 to 1926-27 to recent plantations taken under various schemes. But the data for old plantations are not available. Recorded data of plantations raised after 1960 onwards are available and on that basis this working circle has been carved out to give adequate attention to it. Site quality is generally found to be IV and sometimes that of III is found intermixed with it.

SECTION:6.6: TREATMENT MAP :
6.6.1.1. Treatment map, classifying total area in following three types, will be prepared by the R.F.O. and checked by an A.C.F.
6.6.1.2.TYPE-I: This will include fully stocked areas i.e. the portion of plantation, which is successful.
6.6.1.3.TYPE-II: This will include the patches where plantation is failure.
6.6.1.4.TYPE-III : This will include the portion of plantation, which is not completely failure, rather stem/ha is less than the required.

SECTION :.6.7 : SILVICULTURAL OPERATIONS :
6.7.1.1. Silvicultural operations will be taken as per types shown on treatment map. Silvicultural operations to be taken are as follows :
6.7.1.2.THINNING : Thinning will be carried out in Type-I and Type-III areas. The thinning schedule for all plantations have been given in Appendix No. XXX in volume II .
6.7.1.3. The distribution of stems in different girth classes for a given site quality and age at an interval of five years have been given as per the Yield Table for teak plantation prepared by Forest Development Corporation of Maharashtra Limited. This will provide reference for thinning marking. If the difference in number of stems/ha between the actual and those as per yield table is large, the decision for retaining the number of stems per hectare should be taken judiciously. In this case if thinning is done as per yield table, large opening may be created. Teak, being shallow rooted, is susceptible to uprooting by strong winds and therefore, the actual number of stems/ha required will be achieved gradually. To carry out thinning in such plantations weighted average of diameter/girth can be used. To break the mono-culture some valuable miscellaneous species, such as Shisham, Bija, Shivan, Ain and fruit trees will also be retained. But the distribution of stems in different girth classes will be maintained as per yield table. In older plantations, the populations will be reduced to the desired number as per the yield table. The deficiency in any girth class should be adjusted from the nearest girth class on the basis of basal area/volume.
Basal area may be measured with the help of Wedge Prism of suitable BAF (Basal Area Factor) or by computing the basal area of individual trees and summing them to get the basal area. Thus arrived crop girth is compared with the crop girth for the plantation teak of that age with the help of yield table. After marking of the trees for felling the basal area of the remaining crop will be computed by excluding the trees marked for felling as they would have been removed. If the basal area is found approximately near to that what we

required then the marking is fit for felling for thinning otherwise the marking would be adjusted to achieve the desired result.

6.7.1.4. First thinning will be done in 10th year and second thinning in 15th year and subsequent thinnings will be at an interval of 5 years. The subsequent thinning at an interval of 5 years should be as per the yield table in case of teak. In the case of other species first thinning will be in the 10th year, 2nd thinning in 15th year and subsequent thinnings at the

interval of 10 years. The first two thinnings should be carried out to provide space on purely silvicultural consideration. The subsequent thinnings will be executed so that normalcy condition is to be achieved. The thinning schedule for teak plantation is given in Appendix No. XXX.

6.7.1.5.CLEANING : Cleaning will be carried out in all types I, II and III areas. Cleaning schedule for all plantations will be given in Appendix. No.XXX. The cleaning operations will be done in next year after thinning. 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 planted healthy seedlings or healthy natural growth of superior miscellaneous species will be cut.
(iii) Superior miscellaneous species will be preferred to damaged teak plants.
(iv) Damaged seedlings will be cut.
(v) Coppice growth will be removed.

6.7.1.6.PLANTING : In Type-II area planting with appropriate model will be taken. Planting will be taken in the next year of thinning. P.P.O. will be done during the year of thinning.

6.7.1.7.PRUNNING : In Type II & III areas pruning of existing sapling/poles will be carried out. This will be carried out annually with the help of watchman in the supervision of forest guard in charge of the area.

SECTION :6. 8 : WORKING CIRCLE :

6.8.1.1. Total area is to be covered under appropriate thinning during this plan period i.e. in 10 years. In new plantations 1st and 2nd thinnings will be carried out in 10th and 15th year respectively and subsequent thinning in the teak plantations will be at an interval of each five year.

SECTION 6. 9 : WORKING SERIES & COUPES :

6.9.1.1. Total areas under this working circle will be worked under one working series. Total plantations included in this working circle will be thinned at the interval of multiple of five to have compatibility with the 5 year interval thinning regime as per yield table. The working will be as per the schedule laid down in Appendix No XXX. in volume II of this plan.

SECTION .6.10 : METHODS OF EXECUTING THINNING :

6.10.1.1. Before marking for thinning cleaning will be done. Thereafter, the following steps in sequence will be taken :

(i) The number of stems/ha and their distribution among different girth/diameter classes will be obtained by 1% point sampling method. Sample of size 60 m x 60 m will be taken. Result for both teak and miscellaneous species will be shown separately.

(ii) With known age and average height site quality will be assessed as site quality is measured in terms of average height of dominant trees in the plantation area.

(vi) Corresponding to age and site quality the number of stems/ha and their distribution among different diameter/girth classes will be obtained from the Yield table.

(vii) Comparing the actual stand table with that obtained from the yield table, the number of stems to be retained in each diameter class will be obtained.

(viii) The deficiency of teak stems in any girth class will be compensated with available miscellaneous species in that girth class.

(ix) The deficiency in stems in any girth class even by compensating with miscellaneous species will be compensated with the surplus or healthy stems in nearest girth classes on the basis of basal area/volume. If stems in higher girth classes are to be compensated with stems in lower girth class then the number to be retained will be more and vice versa.

(vii) Badly upset crop will be brought in normal gradually in a number of thinnings and accordingly on silvicultural ground judicious thinnings should be taken.

(viii) To carry out the thinning work, sample plots of 60 m x 60 m size for every five ha area will be taken in which thinning will be done in presence of Gazetted Officer not below the rank of an A.C.F. After marking and before felling basal area/ha should be obtained by using suitable wedge prism excluding trees already marked for felling. The comparison of it with that of yield table value, the correctness of thinning marking will be checked. As per the sample marking, marking for thinning will be done in whole plantation area. Again using wedge prism, the correctness of thinning marking will be checked and tested as above.

(ix) The detailed enumeration and marking list will be prepared and the same will be kept in record.

(x) At an interval of 5 years, the measurement of diameter and height will be recorded for growth study and yield calculations. Yield of thinning should also be recorded.

(xi) Coppice shoots will be cut unless they do not create permanent gap. Climbers will be cut. Dead and badly damaged trees will be removed.

SECTION:6.11 : AGENCY FOR EXECUTION :

6.11.1.1. All the operations will be carried out as per the policy laid by the Government from time to time.

SECTION:6.12 : OTHER REGULATIONS :

6.12.1.1.FIRE PROTECTION : Plantation will be rigidly protected from fire taking all measures. Local villagers will have to be taken into confidence to ensure success in this mission.

6.12.1.2.GRAZING : The current coupes will remain closed to grazing for a period of five years from the year of working. The local people will be persuaded to graze their cattle in areas other than closed areas. For co-operation extended by them in protecting area from

grazing, they should be allowed to cut grasses from the closed coupes free of cost. Repeated dialogue with local villagers should be continued to have better understanding with them. Besides, the suggestions and measures to control grazing, given in Other Important Regulations will be followed.

All marking operations will be carried out departmentally, however the execution of felling may be give either to JFMC, FLCS or departmentally .

CHAPTER – VII

WORKING PLAN FOR BAMBOO (OVERLAPPING) WORKING CIRCLE

SECTION:7.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE :

7.1.1.1. This working circle includes all areas where bamboo is present in workable quantity either in plantation or in natural forests. Workable means that there are sufficient bamboo clumps, which require independent working . Area with scattered bamboo have been included in this working circle. The area of the working circle in those areas where bamboo has been successfully introduced and bamboo clumps are now in a position to be worked for removal of matured culms. In general, in this division bamboo is not found in large scale in the areas to be harvested. Even then this working circle has been carved out to work the areas which are found suitable for that. It is hereby left on the description of Deputy Conservator of Forests in Charge of division to decide the area and its extent to have bamboo felling in consultation with the controlling authority.

SECTION 7. 2 : GENERAL CHARACTER OF THE VEGETATION :

7.2.1.1. The general character of the vegetation in the area included in this working circle has been described in the respective working circles. Only the condition of bamboo in this tract has been described here. Species of bamboo commonly found is Dendrocalamus strictus. Earlier it was found in most of the areas. But as discussed in past management it was wiped out from the area due to reckless and illicit removal by the local people. Now, this is found where it has been introduced by means of artificial plantation. Where clump formation has completed exploitation of bamboo will be carried out for sustenance of produce. The extent of area is not given due to reason as cited above.

SECTION:7.3: LOCAL AND COMMERCIAL DEMAND :

7.3.1.1. Bamboo is used in a variety of ways by the local tribals and people. Tribals make tattas, baskets and so many other articles of bamboo. Local people use bamboo in orange orchards as stake to fruit laden orange trees, hut construction, temporary walls of hut, compound fencing, cattle shed etc. Local demand for bamboo is very high, considering the population and variety of its uses. There is a vast gap between demand and supply of bamboo in this tract. Presently, village communities meet their demand of bamboos by purchasing in auctions held in other bamboo producing areas of Maharashtra and Madhya Pradesh and producing it in their land.

7.3.1.2. To meet the growing demand of bamboo it is proposed that bamboo should be main species in plantation where Forest Protection Committee are formed under joint forest management purview. The division should do exhaustive exercise to assess the village and familywise bonafide requirements of the local people and the period during which it is required.

SECTION .7.4 : BLOCKS AND COMPARTMENTS :

7.4.1.1. No blocks have been formed. Areas included in this working circle is exclusively bamboo plantation areas spread over the division. The allotment of compartments to this working circle have been not given. In recent bamboo plantations the bamboo clump formation is yet to be completed and it is in the process of formation.

SECTION.7.5: SPECIAL OBJECTS OF MANAGEMENT :

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

(i) To boost up clump formation.

(ii) To harvest bamboo from all over area scientifically to get the optimum sustained annual yield.

(iii) To meet demand of the local population.

(iv) To improve the crop to increase the productivity of the areas.

SECTION:7.6: METHODS OF TREATMENT :

7.6.1.1. Since crop is mostly young and clumps are yet to be formed, in general. Therefore, in the first phase efforts will be made to boost up clump formation. In case of established clumps harvesting will be done as per the standard method**.** The crop will be treated on clump basis i.e. each clump will be treated independently as per the requirement.

SECTION:7.7: CUTTING CYCLE:

7.7.1.1. The harvesting of bamboo will be done on a cutting cycle of 4 years. Entire area of established bamboo has to be constituted into one working series. This working series has to be divided into 4 coupes, viz A, B,C and D and one of the coupes will be worked annually. Allotment of compartments to the different coupes and sequence of felling have been left for DCF in charge of the division.

SECTION.7.8: ANALYSIS AND VALUATION OF THE CROP :

7.8.1.1.STOCK MAPPING : Since the bamboo areas are mainly plantation areas. There is no need to have separate Stockmapping of these areas

7.8.1.2.ENUMERATION : No enumeration was carried out separately for bamboo. It is the part of enumeration inventory build up.

SECTION.7.9 : IDENTIFICATION OF AGE OF BAMBOO :

7.9.1.1. Since the marking of bamboo is highly selective, it is necessary to distinguish current year, previous year and mature culms from one another.

7.9.1.2.CURRENT YEAR : Culm sheath is present on lower half of the culm, branches are present throughout the length of the culm and bloom (white powdery dust) is present abundantly and comes off easily when touched.

7.9.1.3.SECOND YEAR : Culm sheath absent, branches are present practically at all nodes. Bloom is patchy and does not come off easily.

7.9.1.4. THIRD YEAR : Culm sheath absent, branches are present practically at all nodes, white bloom is absent and it becomes blackish Grey.

SECTION7.10: AGENCY FOR HARVESTING :

7.10.1.1. Since there is heavy local demand of bamboo, therefore, all coupes shall be worked by any one Agency as decided by the Government.

SECTION :7.11: METHODS OF EXECUTING THE TREATMENT

7.11.1.1. The coupes due for working will be demarcated in April/May (before the onset of monsoon) in the year in which they become due for harvesting by erecting poles at suitable intervals. On the poles, compartment number, coupe number and name of cutting series will be written.

7.11.1.2. Soon after the rains, the entire coupe due for working will be thoroughly inspected by the R.F.O and 10% checking will be done by an A.C.F. The inspection will be carried out compartment wise and the area containing bamboo will be shown on the map. In this area sample enumeration of bamboo will be done and on its basis estimate of bamboo clumps will be made. As per the enumeration the estimate of various works and yield of bamboos will be made.

SECTION:7.12 : METHODS OF WORKING :

7.12.1.1. The methods of working will be different for both regeneration and established clumps as given below :

7.12.1.2.FOR REGNERATION : No harvesting will be carried out until clumps are established.

7.12.1.3.FOR ESTABLISHED CLUMPS :

(i) No harvesting works should be permitted between 15th June to 30th Sept.

(ii) No clump should be considered fit for harvesting unless it contains more than 12 mature culms (one year as well as more than one year old culms but having among them some culms at least two years old).

(iii) No culms below the age of two years will be felled.

(iv) Following culms shall be removed from all clumps;
   (a) All dead, decayed and dry bamboos.
   (b) Culms whose half or more top part is broken or damaged.
   (c) Twisted or malformed culms.

(v) In a mature clump the following types of culms (Green and living) will be retained:
   (a) All culms below age of two years.
   (b) From the culms of age more than one year, equal in number to the current season's (i.e. less than one year old) culms or 12 whichever is more. The remaining culms will be considered available for harvesting.

(vi) Culms should be cut 15 cm to 45 cm above ground level i.e. above the first internode above the ground with a sharp instrument. The cut should be slanted.

(vii) In case of any flowering, no culm from flowered clump shall be felled in the year of flowering.

(viii) Harvesting of bamboos shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two years old are retained on periphery for the purpose of support to the new culms.

(ix) Following acts will be strictly prohibited:
   (a) Digging of rhizomes.
   (b) Lopping of bamboo culms for fodder.
   (c) Use of tender bamboo culms for bundling.

(x) Climbers interfering with growth of bamboo clumps shall be cut.

(xi) After cutting, the debris will be removed away from the clump and will stacked at a distance not less than 2 m from the outer periphery of each clump.
   Cutting should be supervised by forest officers knowing the rules of felling.

SECTION7.13: BAMBOO FLOWERING AND TREATMENT TO GREGARIOUSLY FLOWERED AREA :

7.13.1.1. Since the bamboo crop dealt with are of mainly plantations of 1st year to 15th years during this plan there is no chance of gregarious flowering. But operations necessary to be followed after flowering are required to be known to field staffs and authority. Therefore, operations to be followed in sequence are given hereunder :

7.13.1.2. Since in gregarious flowering all bamboos dry simultaneously and as dry bamboo is vulnerable to fire hazard, its quick removal is essential. But the volume of work is so much that to carry out this operation advance planning and preparation is essential. As soon as the gregarious flowering occurs in any locality its extent should be found out and recorded in the compartment histories and also in the "Divisional Note Book". The same

will immediately be reported to the Conservator of Forests, Silviculturists and Deputy Conservator of Forests, Working Plan. As soon as bamboo starts flowering gregariously , the entire area will be effectively closed to grazing and strictly fire protected for a period of 8 to 10 years from the year following the year of flowering, so that the seeds falling on ground could germinate, germinated seedlings could establish and clump formation could start. The dry culms after seeding should be cut and disposed of as soon as possible.

7.13.1.3. After seeding profuse regeneration of bamboo comes up in the following monsoon. It takes nearly 8 years for new regeneration to reach the harvestable size, but often it takes considerably more time if proper tending operations are not carried out on time.

COLLECTION OF SEEDS AND IT'S DISPOSAL :

7.13.2.1. The fresh seed of bamboo will be collected from clumps. The seed so collected will either be sent to the silviculturist for storage and further distribution among various divisions or be used locally as per the requirement.

TENDING OPERATIONS :

7.13.3.1. After completion of seeding it is essential to properly look after the young regenerated crop till the start of clump formation. The following operations will be carried out in the natural regeneration of bamboo.

(A) CROP OF AGE BETWEEN 1 AND 3 YEARS :

7.13.3.2. During this period the area will normally contain thick seedlings crop and the clump formations does not start. For timely formation of clumps the following tending operations will be carried out.

(i) The area will be thoroughly worked over and 0.8 m diameter foci, at the rate of 300 to 400 per ha 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 foci formed as above, will be cleared so that the growth of the bamboo seedlings in the selected foci is not hampered.

(iii) All climbers within and around the foci upto 1.5 meter distance will completely be removed.

(iv) The whole area will be strictly protected from fire and grazing.

(B) CROP OF AGE BETWEEN 3 AND 8 YEARS :

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

(i) All badly grown, twisted and damaged culms from the selected 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, 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 areas will be strictly protected from fire and grazing.

(C) CROP OF AGE ABOVE 8 YEARS :

7.13.3.4. 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.

SECTION 7.14: CYCLE OF TENDING OPERATIONS :

7.14.1.1. The operations, as prescribed under (A) or (B) above, will be carried out annually. When it is not possible due to administrative reasons, these operations, except fire protection, will be carried out alternate years or at the most in a cycle of 3 years. This will be decided by the Chief Conservator of Forests. The fire protection will be carried out every year and the grazing will remain closed till completion of clump formation.

SECTION :7.15 : INJURIES DUE TO INSECTS AND THEIR CONTROL :

7.15.1.1. The insects known to attack the bamboo culms are Estigmina Chinensis (Chrysomelidae colioptera) which attacks new culm and make galleries inside the inter nodes. Crytotrachelus 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.

7.15.1.2. The attack of these insects can be controlled by taking up the following measures :

(i) All the infected culms will be cut and burnt during winter when the insects hibernate.
(ii) To cause light ground fire run through the infected areas in winter as the insects hide under the debris and
(iii) Taking advantage of the insectivorous birds.

SECTION :7.16: OTHER REGULATIONS :

7.16.1.1.. FIRE PROTECTION : The new shoots of bamboo are badly affected by fire **a**nd therefore, bamboo area will be protected completely from fire.

7.16.1.2.GRAZING : In flowering areas grazing will be strictly prohibited.

CHAPTER – VIII

WORKING PLAN FOR NON TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

SECTION :8.1 : GENERAL CONSTITUTION OF THE WORKING CIRCLE:

8.1.1.1. This is an overlapping working circle covering the entire forest area of the tract dealt with. Thus the total forest area included in this working circle is 51499.838 ha.

SECTION:8.2 : NON TIMBER FOREST PRODUCE OF THE TRACT :

8.2.1.1. There are numerous Non timber Forest Produces and Medicinal Plants available in this tract and are found in almost all ranges with varying extent. These contribute a sizeable revenue to the State exchequers as well as generate employment for local people during their lean season. These play an important role in rural economy and health.

8.2.1.2. The important Non timber Forest Produces, found in this tract are Moha flower and Fruits, Tendu, Myrabolons, Gum, Broom, Grass etc.

SECTION :8.3: SPECIAL OBJECTS OF MANAGEMENT :

8.3.1.1. As per the National Forest Policy, 1988 the development of Non Timber Forest Produce and Medicinal Plants (NTFP) has been one of the objectives in the forest management. Therefore, consistent with the above policy, the special objects of management decided are as follows :

(i) To manage NTFP scientifically to utilize the existing potential optimally and thereby to enhance the productivity and production of the same.
(ii) To take measures for its sustained yield.
(iii) To generate employment for local people thereby improving their financial status.
(iv) To provide better and improved quality of life and culture supporting items to the local people.

SECTION :8.4 : METHODS OF TREATMENT :

8.4.1.1. The treatment to be given will be different for different types of NTFP. Therefore, each NTFP will have separate treatment as follows :

MOHA :

8 4.2.MOHA FLOWER :

8.4.2.1.USE AND NUTRITIVE VALUE : Moha flower is a rich source of sugar, vitamins and calcium. The flower, in its ripe form, has almost 73% sugar and is, therefore, even a better medium for fermentation than grapes. Moha flower is eaten raw or cooked. This is eaten also after frying or baking into cakes. More usually, the corolla tubes, after removing the stamens, are boiled for about 6 hours and left to simmer until water evaporates completely. The odour disappears as a result of cooking and the material becomes soft and jelly like. It is eaten with rice, tamarind, salai seeds, grains or other food or as sweetmeat. Dried Moha flower is also boiled with rice and mixed with wheat flour and this provides a wholesome food. After drying, it becomes valuable food additive to diet. Moha flower is largely used in the preparation of distilled liquor also. This liquor is actually the beer of India having strong smoky foetid odour, which disappears on aging. It is reported to excite gastric irritation and produce other adverse effects. Redistilled and carefully prepared liquor

is good quality without having adverse effects and closely resembles to Irish Whisky. The corollas were in the past, exported, to France for distillation of cheap brandy However, the French Government in order to protect their home industry prohibited the import of the same. Subsequently, it was imported by Europe for feeding pigs.

8.4.2.2. Moha spirit prepared by distillation of liquid containing fermented moha flowers is the most important alcoholic drink in many of the areas. It makes a potent drink and efforts are required to be made to refine it in modern distilleries. The flower is also used for the preparation of certain kinds of non-alcoholic food drink by some tribes. The flower is also used for the preparation of vinegar. Moha having appreciable proteins and vitamins has valuable nutrition content.

8.4.2.3. A syrup of good quality is prepared from the corollas by extraction with hot water clarification with activated charcoal and evaporation under vacuum. The syrup with very high sugar content (61%) has a golden yellow colour with the odour of fresh flower. It is a substitute for honey. Apart from human consumption, moha flower offers an excellent food to the livestock and wild animals as well.

8.4.2.4. Nutrition analysis of flower showed digestible crude protein 3.08 %, total digestible nutrients 73.7% and starch equivalent to 53.1 % . The flesh of animals particularly of pigs, fed on moha flowers, acquires a delicate flavour.

8.4.3.MOHA FRUIT :

8.4.3.1.USE AND NUTRITIVE VALUE : A ripe fruit has cream coloured epicarp, which is edible. Moha berries were eaten raw or cooked. They are also eaten by cattle, sheep, goats, monkey and parrots. They have medicinal value as well. Fruits felled on the ground are easily attacked by insects and ants thus becomes unfit for human consumption.

8.4.3.2. The moha seed yield oil. A thick oil light yellow in colour and extracted from the seeds, is used by forest tribes for cooking purpose, as an illuminant and hair oil. It is also used in the manufacture of soaps, particularly, laundry chips. In many areas it is also used as an adulterant for 'Ghee' for which it is clarified with buttermark to mask the disagreeable colour. The oil finds use in medicines also.

8.4.3.3. Crude oil has a deep colour, high acidity, unpleasant odour and bitter test. Refining and hydrogenation yield product similar to mutton tallow or cocoa butters. Oil having acid value below 13 may be refined by treatment with caustic soda and that with higher acid value is extracted with alcohol and further treatment with alkali. Refined oil finds use in the manufacture of lubricating grease and fatty alcohol. The oil is also used for candles, as a batching oil in Jute Industry and as a raw material for the production of stearic acid.

8.4.3.4. The yield of oil from the seeds depends on the efficiency of the equipment's employed for crushing them. It is 20-30% of the weight of the kernels when crushed in 'Ghanis', 34-37% in expellers and 40-48% when extracted by solvents.

8.4.3.5. Moha oil should have a set of characteristics. For this purpose ISI standards have been prescribed which are as below :

MOHA OIL PROPERTIES:

		Grade		
Sr.No	**Characteristics**	**I**	**II**	**III**
1.	Moisture and insoluble impurities % by mass max.	0.10	0.25	0.50
2.	Color in a ¼ in a cell on the Loviband scale expressed are Y + 5R not deeper than.	0.20	30	50
3.	Refractive index at 40^{o}C	1.459	to	1.460
4.	Sp. gravity at 90^{o}F /30^{o}C	0.862	to	0.875

3.	Saponification value	187	to	196
6.	Iodine value	58	to	70
7.	Unsaponification matter % by mass	2.0	3	3.0
8.	Acid value max	0.5	20.0	>20

8.4.3.6.YIELD : Moha trees starts bearing flowers and fruits between 10^{th} to 15^{th} years of planting. A study with reference to the yield of moha flowers and fruits has been conducted by the MVSS, Chandrapur in comptt.No.195 in Tadgaon Range of Bhamragarh Forest Division in the year 1992. The trees of different shapes and girths were selected for the purpose of this study Results obtained are as below :

YIELD OF MOHA FLOWER AND FRUITS:

Weight in Kg.			
Sr.No.	**G.B.H. in Cm**	**Flower**	**Seed**
1.	076 - 090	06.00	1.20
2.	091 - 105	10.00	1.00
3.	106 - 120	11.25	2.00
4.	136 - 150	13.30	2.75
3.	151 - 175	13.00	3.80
6.	176 - 190	13.00	4.00
7.	206 - 220	20.00	4.30
	Average	**12.94**	**2.72**

As per year 1992 was not a good seed year, the average obtained above is on lower side.

8.4.3.7. The rates of royalty in Rs/Qtl. Of Moha flower and seed as decided by the T.D.C. in the year, 95-96, 96-97, 97-98, 98-99, 1999-2000.

RATE OF ROYALTY OF MOHA FLOWER AND FRUIT GIVEN BY TDC.

Sr.No.	**Produce**	**1995-96**	**96-97**	**97-98**	**98-99**	**1999-2000**
1.	Moha Flower	3.00	3.00	3.00	3.00	3.00
2.	Moha seed	3.00	3.00	3.00	3.00	3.00

8.4.3.8. As per the tree enumeration carried out by the SOFR. Unit II of Chandrapur, the number of Moha trees/ha having gbh>45 cm is 7.31. On the basis of the study mentioned above expected yields of flower and seed come to 94.59 kg/ha and 19.74 kg/ha respectively. However, the phenological character of the species is that flowering and fruiting generally occur alternate years or twice in three years.

FORMATION OF UNITS AND COUPES :

8.4.3 9. The range will be the unit of working for the purpose of this working circle. Since operation is to be carried annually throughout the area and so the unit will be the coupe in this case.

AGENCIES FOR COLLECTION :

8.4.3.10. The collection of moha flowers and seeds is presently being done by individuals. Normally they confine themselves around their village only to collect moha flower and

seeds. As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that is to be carried out by the gram panchayat as decided by the concerned gram sabha. Most of the tract is under schedule areas. Hence the collection and disposal of these minor forest produces will be governed by the panchayat concerned. In the non scheduled areas, for large scale operation, collection may be done either by FLCS or other agency under terms and conditions as decided by the Government.

MARKET :

8.4.3.11. Moha flower and seed come under monopoly Act and so the collection of moha flower and seed is done by people and purchased by the TDC.

OTHER REGULATIONS :

8.4.3.12. Compartment wise list of moha trees should be prepared and maintained at beat, round and range levels.

8.4.3.13. As it is a bare fact that one of the important reasons of forest fire is the burning of leaf litter on ground under moha trees by the people to collect moha flower and fruits. Therefore, before the start of flower falling, the ground under the moha tree crown should be cleaned with the cooperation of villagers and chaukidars. This may be treated as one of the most important duties of the Beat Guard, failure in it and occurrence of fire should be viewed very seriously.

8.4.3.14. The measures for enhancing the production and productivity by local means should be explored and taken. Local people may be of great help in this regard.

8.4.4. GUM :

8.4.4.1.USE AND VALUE : Kulu (Sterculia urens), Dhaora (Anogeissus latifolia) and Salai (Boswellia serrata) gums are the main sources of gum production in this tract. These are used in medicines, chemicals, cosmetics and food industries. Salai gum is mostly used as an incense and is said to be used in the Indian medicines for rheumatism and nervous diseases. It has the possibility of becoming an important substitute for imported Canada balsam, used as mounting media in the preparation of microscopic slides. This gum is very similar to turpentine oil. Varnish and paints prepared from it have been found to be suitable. It may also be suitable in the manufacture of elastic adhesive, lacquers, oilcloth compositions, ink and perfumery. Kulu gum is the costliest gum and is having export potential. Dhaora gum is very good for the preparation of many food articles.

8.4.4.2.YIELD : The study of yield of gums has not been done in this tract. The production is low. No scientific method for tapping has been used so far in this area. This is a very potential field of employment generation and revenue earning. Besides, the regulations of the collection is very important from protection of forest from the fire point of view.

8.4.4.3.TAPPING RULES : The rules for tapping, derived by the FRI, Dehradun, are as follows :

(i) The tapping season will commence from November to end of May each year. No tree below 90 cm in girth will be tapped.

(ii) Tapping will be confined to the main bole of trees between 15 cm from ground level to the point from which first branch is given off.

(iii) Only trees above 90 cm in girth at breast height will be tapped.

(iv) Each tree will be tapped continuously for 3 years and will be given a rest for 3 years thereafter. The second tapping cycle will begin in the 7th year after the commencement of tapping season and will continue for another period of 3 years.

(v) The initial blaze of 20 cm wide and 30 cm in length or height may be made in the month of November on trees at 15 cm above ground level with a sharp edge having 7.5 cm wide blade. The blaze is made 0.6 cm deep in the bark.

(vi) Blaze may be made horizontally leaving approximately equal space between the blazes. The blazes should not have any loose fiber. The lower surface of the blaze should be slightly slopping outwards to avoid lodging of guggul in the blazed pocket in case initial blazing is done by edge.

(vii) The guggul starts oozing out soon after blazes are made and may be collected initially after a month i.e. by about December when the blazes may also be freshened. Subsequent collections and freshening may be done at fortnightly upto May. Thus 12 freshening may be required to be made during the year.

(viii) In each freshening, the lower surface is not to be freshened. The edges may be scraped so that only 3.8 cm is increased on either side in width at the end of 12 freshening. This means that about 0.3 cm should be scraped off either side in width in each freshening.

(ix) The lowest row of blazes will be at one 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 the other.

(x) The number of blazes to be made on each tree will depend on its girth at breast height as given below :

NO OF BLAZES ON EACH TREE

Sr.No	Girth at breast height	Max. No. of blazes to be made on each tree
1.	0.9 m to 1.3 m	2
2.	1.3 m to 2.0 m	3
3.	2.0 m to 3 m	4
4.	Over 3 m	1 blaze for every 45 cm girth in addition to category 3 above

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

(xii) 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.

(xiii) At the end of the session, the height of the blaze shall not be greater than 12.50 cm. Maximum permissible dimension of each blaze shall be 10 cm x 12.5 cm x 0.6 cm in width, height and depth respectively.

(xiv) 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.

(xv) In the second cycle i.e. in the 7th year (after three years rest) new blazes will be made in the same way in the unblazed portion, in between the blazed portions of the

first cycle. This blazing will continue for another three years in the manner described above and the operation will be repeated till unblazed portion is fully covered.

8.4.4.4.FORMATION OF UNITS AND COUPES : Range is the unit. Since working is annual and covers the entire area and so unite will also be the coupe.

8.4.4.5.AGENCY : As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that is to be carried out by the gram panchayat as decided by the concerned gram sabha. Hence the collection and disposal of these minor forest produces will be governed by the panchayat concerned. In the non scheduled areas, for large scale operation, collection may be done either by FLCS or other agency under terms and conditions as decided by the Government.

8.4.4.6.MARKET: There is monopoly purchase by TDC under the provisions of Monopoly Act. Besides, the export of raw or finished goods should also be thought of :

8.4.4.7.OTHER REGULATIONS :

(i) The compartment wise list of such trees should be prepared and maintained at beat, round and range levels.

(ii) Cleaning around the trees to facilitate gum collection and to avoid fire, should be done.

(iii) To increase the population of salai trees, soil should be dug up in the form of a ring with radius 1.5 times that of crown. By doing so root suckers are injured and from which profuse shoots come out. Singling and tending them will increase the population of this species. The same may be tried for Kulu as well.

(iv) Gum producing trees should be reserved from felling.

(v) A strict watch is necessary to enforce tapping rules and check unauthorized collection of gum and tapping during the period of rest.

8.4.4.5.TENDU :

8.4.5.1.USE : This is one of the most important NTFP of the tract, which gives handsome revenue. This is used for manufacture of bidi. Presently people benefit from this NTFP only by way of getting wages for collection of leaves. But by setting cottage industry for bidi manufacture will provide the maximum benefit from tendu to the people. Bidi making is such an activity, which can be started without any costly infrastructure. Besides, bidi making can be done at any leisure time.

8.4.5.2.YIELD : The estimated yield of tendu leaves is approximately 4600 standard bags. The details of production and royalty received by the Division have been given Appendix No. XI of Vol. II of this plan.

8.4.5.3. No scientific efforts are seen to have been made to augment the tendu leaves production in this tract so far. On the contrary, every year pruning is carried out officially to get good flush of leaves. Besides, this clandestine burning after pruning is got done by the contractors to get good flush off leaves. Both these operation are detrimental to the future production of the leaves. During pruning all small size plants, whether of seed origin seedlings or coppice origin seedlings, are cut every year resulting into a threat to future seed bearers. If such type of operations continue, the seed bearer will go on diminishing season after season. Besides, in the greed of flush of leaves, yearly entire forest is burnt which cause much more damage as compared to the benefits obtained out it. This is undisputed fact that this is the most important reason of forest fire. This practice for so for called augmentation of leaves production is required to be stopped forthwith.

8.4.5.4. FORMATION OF UNITS : The tract dealt has been divided into 2 tendu units. Which has been divided into 2 working units/groups.

8.4.5.5.AGENCY: With the enactment of "Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969" the trade in tendu leaves has been nationalized. Now tendu has been excluded from the list of minor forest produce after due amendment to this act by the

government of Maharashtra. Tendu is covered under the Nationalized Produce and accordingly the collection and disposal of tendu leaves is being done by State Government through Chief Conservator of Forests MS. Under this Act, tendu units are sold by tender.

8.4.5.6 MARKET : Under the present system the units are sold by tender. As per the present proposition under this plan, instead of selling units, units should be auctioned by tender for collection of leaves on commission basis. The final disposal should be done departmentally in open auction or by tender as has been discussed above.

8.4.5.7.OTHER REGULATIONS :

8.4.5.7.1. To augment the tendu tree population, soil should be dug up 15 to 20 cm deep around the tree, in a circular ring of diameter equal to that of the crown so as to cause injuries to the root suckers. The trees of gbh more than 45 cm could be selected for such operation. This will cause injuries to the root suckers to stimulate growth of seedlings through them. The tending and singling of shoots from root suckers will increase the population of the tendu tree.

8.4.5.2. Pruning should not be done yearly. It should be done at an interval of 3 years, during which some seedlings could establish and become the future seed bearer. Pruning should strictly and exclusively be of branches and not of seedlings irrespective of their origin.

8.4.6. BAMBOO :

8.4.6.1.USE : This is one of the important non timber forest produce of this tract. As the bamboo is timber from the definition of timber as per the definition given in Indian Forest Act, it is not treated as minor forest produce and has been excluded from the list of minor forest produces. This is popularly known as poor man's timber. The local people make use of it in a variety of ways. People eat tender rhizomes as vegetable during the monsoon. Besides, it is used by Burads to prepare bamboo articles and local people in construction of huts, houses, cattle sheds and fencing. This is used by outsiders in a number of industries such as Paper and Pulp, Ice cream etc.

8.4.6.2.YIELD : As the main crop is from recently raised bamboo plantations, the yield so far has not been estimated.

8.4.6.3. FORMATION OF COUPES : The details of it are given in bamboo overlapping working circle.

8.4.6.4.AGENCY : This has been discussed in detail in Bamboo Overlapping Working Circle.

8.4.6.5.VILLAGE INDUSTRIES : Making bamboo tatta is one of the important and potential propositions. This should be encouraged, alongwith the other activities with bamboos by the local people. There is huge demand of the same in this area by many people mainly orange growers. This will increase sharply the economic status of the local people.

8.4.6.6.MARKET : The general market for the bamboo has been described in detail in Bamboo Overlapping Working Circle.

8.4.6.7.OTHER REGULATIONS : A list of firms requiring bamboo tatta and its quality should be prepared and maintained at range and division levels.

8.4.7.MYRABOLONS:

8.4.7.1.USE : These NTFP are used in many ways. Hirda, Beheda and Aonla are most common amongst myrabolons. These are of high medicinal value and are used in many Ayurvedic medicines. Hirda and Beheda are given to children in villages invariably for cold, cough and stomach disorder.

8.4.7.2.YIELD : So far no study has been conducted to know the yield of fruits for trees of such species.

8.4.7.3.FORMATION OF UNITS AND COUPES : The range will be the unit. Since working is annual and covers the entire area and so unit will also be the coupe.

8.4.7.4.AGENCY FOR HARVESTING : As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that is to be carried out by the gram panchayat as decided by the concerned gram sabha. Hence the collection and disposal of these minor forest produces will be governed by the panchayat concerned. In the non scheduled areas, for large scale operation, the units should be given on lease. The lessee will collect the same as per the direction of the Deputy C.F. concerned. The lease period should be from 1st July to 30th June. Lease should be given for one year by calling tender at division or circle level. On failure of tender, departmental harvesting can be thought of, if it is profitable and market is surveyed and assured.

8.4.7.5.MARKET : Market should be surveyed and recorded so that in case of departmental working the same could be used.

8.4.7.6.OTHER REGULATIONS :

(i) The detailed list of such species should be prepared and maintained at beat, round and range levels.

(ii) These species should be excluded from felling.

8.4.8.BROOM GRASS :

8.4.8.1. USE : This grass is used in preparation of broom, which is usually used in houses. It is a seasonal crop and localised one.

8.4.8.2. YIELD : So far no study has been conducted to assess the yield of this grass.

8.4.8.3. FORMATION OF UNIT : The range will be the unit.

8.4.8.4. AGENCY : As per latest amendment to Panchayati Raj Act, the ownership of the minor forest produces in schedule areas is of gram panchayat. The collection and disposal of that is to be carried out by the gram panchayat as decided by the concerned gram sabha. Hence the collection and disposal of these minor forest produces will be governed by the panchayat concerned. In the non scheduled areas, for large scale operation, the unit will be sold by calling tender.

8.4.8.5. OTHER REGULATIONS :

(i) The areas suitable for this grass should be sown.

(ii) The compartments wise details should be prepared and maintained at beat, round and range levels.

(iii) The area should be fire protected.

8.4.9.SABAI GRASS (Eulaliopsis binata)

8.4.9.1. 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.

8.4.9.2. PLANTING PATTERN : This is planted at a close spacing of 45 cm x 45 cm in the intervening space in plantation. In the areas selected for plantation by people's participation, this can be introduced on experimental basis.

8.4.9.3. YIELD AND RETURN : Sabai grass is not available in this tract and so study for yield and return has not been made. However, a successful study has been conducted in Kendbona village in West Bengal, the results of which published in Vol. 118 of Indian Forester, for the month of December, 1992, is reproduced as follows : "The sabai, planted in 1989, in 17 ha areas was cut back, more by way of a tending operation than regular harvest, to induce better growth, in 1990. The total beneficiaries were 48 families. Each beneficiary received as share of Rs. 135/- . In 1991, each received a share of Rs. 1000/- during the month of September, which is the leanest month of the year for the village people. The yield of sabai continues to increase reaching its peak around the 7^{th} year after planting, and the area has to be replanted on the 8^{th} or 9^{th} year. Sabai when made into ropes, fetched a price of Rs. 6/- per Kg as against Rs. 2/- per Kg for the grass. Hand operated rope making machine, that can be operated by a team of two, has been designed and fabricated in West Bengal."

8.4.9.4.FORMATION OF UNIT AND COUPE : The range will be the unit and coupe will overlap with coupes in which plantation is to be taken in any Working Circle.

8.4.9.5.AGENCY : The Forest Protection Committee will be formed under the umbrella of G.R. No. MSC/2000/C.N.43/F-II, Mantralaya, Mumbai, dated 25^{th} April,2003 in view of people's participation in forest management. The same will be motivated to take the scheme. If the people fail to come forward, on an experimental basis department should take such plantation on an appropriate size in suitable area. The above committee should be involved right from the time of formulation of the scheme. Frequent discussions are also required to be held with them regarding the management of the assets so created. Ladies should also be encouraged to take part in it.

8.4.9.6.MARKET : market for sabai rope can easily be available. All the nearby cities will serve the role of the market. Besides, this will be used in large scale for bundling of bamboos in bamboo working coupes of this tract and nearby divisions.

8.4.9.7. OTHER REGULATIONS :

(i) 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.

(ii) The training for making ropes to a few selected villagers, on an experimental basis, should be imparted.

(iii) Z.P. should be involved for solving financial bottleneck.

8.4.10.KHAIR :

8.4.10.1. The Khair tree is distributed more or less in all ranges of the division. Khair is very valuable species, its proper use is essential to increase the productivity of the area hence taking it under the purview of scientific management is must. Keeping in view the past bottleneck in management, practical proposition has been made here under.

8.4.10.2. PROPERTIES : Khair is known to occur on granite, gneiss, schist, quartzite, basalt, trap, limestone, conglomerate and Laterite. It grows best on porous alluvium composed of sand and shingle. It also occurs on black cotton soil. Khair is strong light-demander. It is capable of growing in dry situations where almost every other species fail to survive. The tree coppice well upto moderate size and produces root suckers, particularly where the roots have been exposed. This character can be used for its propagation as has been suggested for Tendu. Coppice shoots, however, require complete light for their development. Root and shoot cuttings are also possible mode of propagation.

8.4.10.3. The wood is very hard and heavy. The average weight at 12% moisture is about 1010 kg/m^3 (ranging from 880 to 1170). The density of Khair is 0.873. Growth rings are formed and are fairly distinct, demarcated by a fine, interrupted line of parenchyma occasionally accompanied by somewhat larger vessels. The timber is very hard and strong,

very steady and moderately tough. The sap wood is not durable. The heartwood is very durable and is described by Pearson "one of the most durable Indian Woods which is seldom, if ever, attached by white ants and fungi"

8.4.10.4.USE OF KHAIR : The Khair heartwood is chiefly used for the production of katha and cutch since very long time. It is valuable structural timber due to its natural durability of heartwood. This species has been classified as "Super group" timber suitable for large span more than 12 m and is placed as the first choice of selection for management structure (ISI : 1962). It is eminently suitable for tools and tool handles, especially for mallets and plane bodies. It is used for all kinds of agricultural implements and is excellent for making spokes and hubs of cart wheels. It is used for posts in house construction and for making rice pastels, oil expellers, gun butt etc. The spent heartwood is also used as fuel in the Katha-boiler and Katha bhatties. The charcoal of dead Khair wood is much valued and used by goldsmiths. The calorie values of moisture free sapwood and heartwood are 5142 and 4946 calories respectively. The exhausted Khair heartwood shavings can economically be utilized for making partition boards and decorative boards and also can be used as top of table for drawing room.

8.4.10.5. The results of experiments in FRI on sapwood and spent heartwood of Khair showed the profitable utilization of the same for producing bleached cellulose, which will find use in multifarious cellulose base industries, like carboxy ethyl cellulose, cellulose acetate and even for paper and paper boards if made available in large quantities.

8.4.10.6. Khair gum is considered to be very good and it is a good substitute for gum Arabic. It is advisable that the Khair trees should be tapped for some years to obtain gum prior to felling for katha production.

8.4.10.7. The bark has a stringent taste and it is useful in the treatment of snake bites and the paste of the bark is also useful in conjunctivitis. The juice of the fresh bark is given with asafoetida in haemoptysis (spitting of blood).

8.4.10.8. YIELD : The Khair is the species mainly of degraded miscellaneous forests. The yield of Khair has not been estimated separately.

8.4.10.9. KATHA AND CUTCH : Khair heartwood yields an stringent extract composed chemically of two constituents :

i) **KATHA (CATECHIN) :** A crystalline substance, of pale brown colour, soluble in hot water, but insoluble in cold water, sweetish in taste.

ii) **CUTCH (CATECHU TANNIE ACID) :** A non crystalline substance, of dark brown colour and soluble in cold hot water, contains insoluble and some of gummy matters. Katha samples produced by different methods contain catechin content 30 to 70 % and water soluble substance 5 to 7%. Generally the extract (mother liquor) of heartwood is found to contain:

1. Catechu tannie acid (cutch)	8 - 10 %
2. Catechin (Katha)	2 - 6 %
3. Mucilage	6 - 8 %
4. Residual matters	5 - 7 %

8.4.10.10.USES OF KATHA : Katha is used in pan (Betal) for chewing purposes. It is a principal ingredient in the preparation of pan. Besides, it has many medicinal uses in Ayurvedic and Unani systems of medicine; cooling, digestive; useful in relaxed condition of throat, mouth gums, and also in cough and diarrhoea. Externally, it is used as an stringent and as a cooling application to ulcer boils and eruption of the skins.

8.4.10.11.USES OF CUTCH : It is extensively used as a tanning material, for dying purposes and as a preservative for fishing net to import them long life. It is also used for treating ropes and fabrics, which are liable to come in contact with sea and other water, such as sailing ropes, sails , tents, canvas, mail bags etc. It is also used mostly as mordant in dying leather and as a retaining material. It is also used in the manufacture of stencil and printers ink, in oil for well drilling operations for reducing the viscosity of drilling mud (ONGC).

8.4.10.12.METHODS OF EXTRACTION OF KATTHA : The prevalent methods for extraction of katha & cutch from Khair wood are by the factories and small scale manufacturers in the forests. To set up a factory is a problem but a small scale, the manufacture by indigenous method can be thought of for this area. For setting up such small scale manufacturing units can be got done using 10% forest grant. This will solve the financial bottleneck.

8.4.10.13.DESCRIPTIONS OF INDIGENOUS METHOD OF KATTHA MANUFACTURING : The indigenous process, which is commonly known as "Handi" method for the manufacture of edible katha is being followed in India since centuries. In this process generally earthen vessels are used to various operations, viz extraction, evaporation, crystallization etc. This method was having a number of defects, which were removed by improved indigenous method devised by FRI, Dehradun. Outlines of the improved method of katha and cutch manufacturing are as follows :

(i) PREPARATION OF CHIPS : The Khair logs, after being removed of their bark and sap wood are converted into thin chips by trained labourers by means of hand axes.

(ii) EXTRACTION OF CHIPS : The heartwood chips are boiled in the extractors of aluminium keeping the chips in the cages (basket) made of aluminium wire in order to avoid direct contact of the chips with heat. Each cage takes a charge of about 12 Kg of chips and are extracted with about 36 liters of water for about 2 hours in first stage at boiling temperature (chips and water should be in the ratio 1:3). The extraction is repeated second time with fresh water giving a boil for about 2 hours. A third extract may also be taken if necessary in the same conditions. This third extract (mother liquid) of the same chips is used for extracting a fresh batch of the chips.

(iii) CONCENTRATION OF MOTHER LIQUOR : These extracts are filtered through marking cloth and are collectively concentrated in open aluminium cauldrons(Karahis) by boiling with steam or with direct heat (Bhatties) to the requisite density of 1.08 to 1.113 depending upon the quality of heartwood and the weather conditions.Each charge is completed (concentrated within about 3 hours.).

(iv) CRYSTALLIZATION : After completion of concentration to the requisite density, the concentrated mother liquor is transferred in the aluminium crystallizer and allowed to stand aside in shade for slow crystallization of katha for about 2-3 days or more as the case may be depending upon the season. Seeding of cooled and concentrated liquid (mother liquor) with some crystals of good quality katha always accelerate the crystallization and separation of katha from the crystallized solution. The crystals of katha separate out on the bottom and the thick mass of crystallized katha is separated from the mother liquor, which may gain be seeded, if necessary, for a second crop of katha.

(v) FILTRATION : The crystals of katha thus separated into a thick mass (like thick curd) are diluted with requisite amount of cold water and pumped through a hand operated filter press fitted with canvas cloth to separate the katha from the mother liquor. A couple of washings with fresh cold water may be necessary to obtain fairly

good quality of katha. Now the filtered mass katha is scraped off the canvas and put again under a hand screw press (book binder type). The last traces of tan liquor are thus drained out.

(vi) TABLETING PROCESS : The katha plate of about 2 cm thick is taken out from the wooden frame and cutter, made of copper or aluminium wire, with wooden plate. These tablets are allowed to dry under shade, as open sun drying is injurious to the catechin, which gets decomposed and blackened.

The whole processing of one batch is completed within about a week's time, giving a product (Katha) of good quality.

8.4.10.14.CUTCH : The mother liquor (cutch solution) obtained from separation of katha is further concentrated to a suitable consistency (when it gives a thread while hot, lifting by means of a stick) so as to give a solid product of cutch on being poured into wooden frames or cakes of suitable sizes. The cutch naturally takes longer time to dry. It should also be dried in shade.

8.4.10.15. No heavy capital layout is involved and the industry can satisfactorily be run by educated man on a cottage scale.

8.4.10.16.ADDRESS FOR EQUIPMENT PROCUREMENT :

A. **Filter press and other equipment :**

M/s. Batli Boi and Company
Post Box No. 190A, Forbes,
Street Fort, Bombay -*1*.

B. **Chipping machines :**

M/s. Singhania Engineering Works,
84/25, Factory Area,
Kanpur - 12.

C. **Pulveriser and Baby Boiler :**

M/s. Rank and Company,
A95/3 Wazirpur Industrial Area,
Delhi - 110 052

Available addresses have been written. There may be other places also in Maharashtra from where, such equipment's can be made available. This is for guidance to start preliminary survey etc. After starting the production of Katha, thought should be given for improving quality. By changing the process of manufacturing, the quality of Katha can be improved.

8.4.10.17.FORMATION OF UNITS : The range will be the unit.

8.4.10.18.AGENCY : The harvesting of Khair will not be done separately. With the main felling as per the prescriptions in the working plan, Khair will be harvested. The harvesting will be done either through FLCS or through department.

8.4.10.19.MARKET :TDC should explore the market. TDC should receive the produce at the rate fixed by the Government or the officer authorized by the Government.

8.4.10.20.OTHER REGULATIONS :

(i) To increase the population of Khair tress in suitable sites, circular ring around the tree of radius 1.5 times the crown radius should be made. The depth of the ring should be such that roots are exposed so that shoots come out from root suckers. Singling and tending of such shoots will increase the stocking of this species without spending much.

(ii) The record of production of Khair should be maintained at Beat, Round, Range and Division levels. The record of supply of Khair wood to the small scale industry should be maintained at Range and Division levels. The Conservator of Forests will decide the form in which records are to be maintained.

(iii) Gum tapping should be started in the coupe which will be due for felling after 5 years. For gum tapping only mature trees should be used.

In this working circle, subject has been written in short. The objective is to draw the attention towards this and to translate into reality. By doing this the importance of NTFP will increase and eventually they will be managed in better way and the economic status of the local people will be elevated.

SECTION 8.5: RESEARCH WORKS :

8.5.1.1. There are so many Non Wood Forest Produce and Medicinal Plants 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. Besides, quantification and localization of the same are the fields for future study Innovation and research works should always be carried out and the same be recorded and reported properly so that those could be of use to those who come next.

SECTION 8.6 :OTHER IMPORTANT PRINCIPLES AND PROCEDURES :

8.6.1.1. The following are important principles and procedures:

(i) The annual estimates for collection of Non Timber Forest Produce and Medicinal Plants shall be based upon the experience.

(ii) The annual estimates for collection of NTFP shall be approved by the Chief Conservator of Forests.

(iii) The Range Forest Officer for the respective range shall issue the passes for collection of NTFP to the lessees and keep record of the collection etc.

(iv) The Non Wood Forest Produce and Medicinal Plants lease units should have distinct boundaries.

(v) NTFP collection estimates shall be based upon the inventories of forest resources.

(vi) Scheme shall be formulated for improving yield of Non Timber Forest Produce and Medicinal Plants e.g. plantations, protection against disease etc.

(vii) Measures shall be taken to maintain and improve the present output of the Non Timber Forest Produce and Medicinal Plants.

(viii) It is prescribed to maintain record of NTFP harvested legally /illegally from the forest alongwith the quantities & the collection charges paid to the labourers.

(ix) It is prescribed to select the representative area, in each beat comprising of around one hectare & continuous efforts be made by the territorial staff to visit this plot every month & to identify & record the occurrence of flora along with flowering & fruiting period.

(x) It is prescribed to collect the information regarding all types of Non timber forest produce . Their quantities & sale price during the weekly Bazar days throughout the year during the working plan period.

(xi) It is prescribed to collect & document the traditional knowledge about the use of wild plants/ animal products by the locals/ tribals & traditional medicine /food/fruit/vegetable etc.

(xii) It is prescribed that the Vanmajurs & forest guards should collect minimum 100 kgs of seed annually of most traded & economically important medicinal plants & use the same for sowing in bushes & in blank areas in the beat.

(xiii) It is prescribed to maintain a register at every Beat, Round, Range & Division level noting the present unscientific & destructive harvesting practices & to collects the information regarding scientific harvesting of NTFP for sustainable production from various publications.

(xiv) It is prescribed to maintain a register at village level for domestic consumption of NTFP.

(xv) It is prescribed to maintain a register of names of barefoot botanist, field taxonomist, traditional vaidu's.

(xvi) It is prescribed to maintain a register of all the vendors, purchasers, manufacturers, stockiest of NTFP including medicinal plants by prescribing fees & format as being followed in Thane circle.

(xvii) It is prescribed that the register should be maintained by the purchaser at every collection center having following information viz serial number, full name of the collector of forest produce, approximate place of collection, village, name of forest produce, quantity, rate at which purchased & all other forward linkages

CHAPTER –IX

WORKING PLAN FOR WILDLIFE (OVERLAPPING) WORKING CIRCLE

SECTION 9.1:GENERAL CONSTITUTION OF THE WORKING CIRCLE :

9.1.1.1. National forest policy 1988 aims at conserving the natural heritage of the country 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. "Forest management should take special care of the needs of wildlife conservation and forest management plans should include prescriptions for this purpose. It is specially essential to provide for `corridor` linking the protected area in order to maintain genetic continuity between artificially separated sub sections of migrant wildlife." Also the wildlife (protection) Act 1972 emphasizes to protect wildlife.

9.1.1.2. For better management of wildlife and to preserve the bio-diversity, creation of protected areas (PAs) and their specific management practices are in force in approximately 4% of the forest area of the country. But wildlife do not know the political boundaries. They are found in forest areas other than protected areas in varied proportion. These areas are also the store house of bio-diversity. Hence these forest areas are also to be managed with specific focus on wildlife both flora and fauna.

9.1.1.3. Amravati District is well known for its wildlife areas of Melghat Forests. The tract dealt with is outside Melghat. As per the Government Notification No.WLP-1087/103442/F-5 date 14th January, 1988 and as appended in Appendix No XXIII in Volume II in this plan .Wadali, Malkhed Game Reserve has been declared. The said area is in Amrawati Forest Range and encompasses the reserved forests of **4368.53ha** "A" class and **2709.41ha** "C" and **7248.81ha** revenue areas totaling **14416.75ha** within the limit of 27 villages.

9.1.1.4. The wildlife concerned encompasses the entire tract. Hence, an overlapping wildlife working circle has been constituted which includes entire forests of this division.

Sr.No	Range	Range area	Area in wc
1	Amravati	21457.662	Area under wild life overlapping working circle is 51499.878ha
2	Paratwada	8058.406	
3	Morshi	11424.562	
4	Warud	10559.248	
Total of Division		**51499.878**	

SECTION:9.2: GENERAL CONDITION OF FAUNA AND FLORA :

9.2.1.1. The forest areas with present Amravati Forest Division are found in scattered and small to medium blocks of forests. Nevertheless, ample number of wildlife are found in these forests. Now–a-days these forests areas are in proximity to human settlements and forest areas are close to agricultural areas and also the approaches to these forest areas have become more convenient due to network of roads both pucca and kaccha roads. Earlier most of the forest areas were declared as grazing lands and grazing of cattle have been continuously being practiced for known history of 130 years. These areas also suffer from acute water scarcity during summer. Therefore, wildlife in these areas are under tremendous

pressure of biotic interference. These factors have resulted in depletion of wildlife both floral and faunal

9.2.1.2. The wild animals noticed in the tracts are:
1) **Carnivora** :- Panther (Panthera pardus), Hyena(Hyena hyaena), Jackal(Canis aureus), Indian Fox, (Vulpes bengalensis), Jungle cat (Felis chaus).
2) **Herbivora** :- Black buck (Antilope cervicapra), Spotted deer(Axis axis), Blue bull(Boselaphus tragoca melus), Sloth bear (Melursus ursinus),Wild boar (Sus scrofa), Common Langur(Presbytis pileatus), Indian Hare(Lepus nigricollis).
3) **Aves** :- Apart from the common birds the following avi-fauna are observed -Pea fowl(Pavo cristatus),Grey jungle fowl(Gallus sonneratii),Painted partridge (Francolinus pictus), Common quail (Conturnix), Crow pheasant(Centrupus sinensis), Golden backed woodpeacker(Dinopium bengalensis), Black drongo (Discrurus adsinillis) etc.
9.2.1.3. The floral species found have been enlisted under the botanical plants found in Amravati Forest Division. The tract dealt with has been the natural habitat of a variety of wild animals. The numerical strength present has reduced to the alarming extent mainly due to excess biotic interference. The flora description of the tract has been given in Chapter II of Part I.

SECTION : 9.3 : SPECIAL OBJECTS OF MANAGEMENT :

9.3.1.1. The priority of National Forest Policy is ecological balance and therefore, management of forests is to be done for the same. Since wild animals are the part of the ecosystem and therefore, their management is essential. So far management has economic considerations and so wild animals were ignored and they were managed for entertainment. On recognizing the fact that wild animals are essential for the survival of living being as becoming an important part of ecosystem, the orientation of management of wildlife is changing very fast. Due to some limitations, the intensive management practices are confined to Protected areas only. However, time has come to realize the fact and to manage it in a rational way is essential in areas other than protected areas as well.
9.3.1.2. The conservation and protection measures are required to be taken through out the forest areas. Keeping this aspect into view, the special objects of management decided are as follows :

(i) To educate and motivate people for protection and conservation of wild animals and thereby providing an environment of security to the wild animals.
(ii) To preserve and develop the existing wild animals in this tract.
(iii) To develop infra structure for existence and development of wild animals, such as water holes, anicuts, salt lick etc.

SECTION : 9.4 : LEGAL POSITION:

9.4.1.1. Wildlife (Protection) Act,1972 is applicable for entire Maharashtra. Indian Forest Act 1927 also deals with wildlife. Maharashtra Wildlife (Protection) Rules,1975 are applicable. Hunting of wild animals has been completely banned as per the amendments made to the Wildlife (Protection) Act,1972 in the year 1991.

SECTION : 9.5 : METHODS OF TREATMENT :

9.5.1.1. No regular schemes are being prescribed for the management of wild animals in this tract. However, following prescriptions are being given for the protection of wild animals, creation of environment of security to them, increasing infrastructure for wildlife management and trying to restore the status of wild animals in this tract:
(i) People should be made to realize the reasons of depletion of wild animals to such an

extent in this tract and the way to restore the status through repeated dialogue with them.

(ii) Teaching and motivating them for conservation. This principle should be taught to them through stories like the teaching in Panchatantra to bring attitudinal change. This will be more effective because they are not educated to read and understand any literature.How the wrong doing of them is affecting and likely to affect adversely to their life and life style is to be stressed and they should be convinced.

(iii) Besides, by persuading, teaching and motivating people should be made aware of the Acts and their coverage for the protection of the wild animals. Gram Panchayat will give the name of offender who will be prosecuted under the provision of the Acts. People will be made aware of the penalties for which offenders can be liable.

(iv) The villagers as well as our people should keep a vigilant watch over poacher. As soon as any incidence of poaching in this tract is noticed all possible measures should be taken to completely close the door for poachers. Poachers from outside will not dare to enter in this area if the protection is done jointly by villagers and our staff.

(v) Strict checking at the checking gates erected to check or prevent illicit transport of forest produce.

(vi) The provisions of rewards to the informed or informer in respect of unlicensed or without permit shooting are required to be followed and payment of reward should be made promptly. Besides, giving two advance increment to the staff as a reward is also being proposed.

(vii)For development of basic amenities for wild animals the following works will be carried out:

(a) While preparing the treatment map of a coupe for felling in any of the working circles potential habitat of wild animals and existing waterholes will also be identified and will be shown on the treatment map.

(b) Marking of dead trees in any felling coupe will be done only if their number is more than 2 / ha. These trees will be required to provide snag and den trees for nesting and resting of the wild animals. Trees of commercially low utility be used for this purpose.

(c) During harvesting, some unsound and hollow logs of commercially low utility, not exceeding 3 per ha will be left in the forest to serve as shelter for wild animals.

(d) In the plantations, few fruit trees will also be planted to provide food to some wild animals and to fruit given as birds The choice of species will be the discretion of the Deputy Conservator of Forests.

(e) The waterholes, which are frequently visited by wild animals, will be excluded from grazing by making a special mention of such areas in the grazing permit license.

(f) The existing waterholes will be maintained and at possible sites new waterholes will be created to make the waterholes distributed evenly through out the tract so far as possible.

(g) Suitable locations will be identified where forest tank will be constructed to provide water to the wild animals.

(h) Hoarding on the importance of wild animals and its protection will be exhibited at strategic locations.

(i) The labour camps and transit depots will be established away from the areas having high density of wild animals.

(j) At the selected important places blocks of salt lick will be kept.

9.5.1.2. Estimation of wildlife will be carried out every year by using water hole count method during first week of May.

These prescriptions shall be explained to the field staff and shall be followed while doing the regular working in respective working circle.

SECTION : 9.6 : GENERAL MEASURES FOR PROTECTION :

(i) Area will be strictly and effectively fire protected.
(ii) Constant vigilance will be kept on the waterholes during summer where animals expose themselves as easy prey due to shortage of water. Every person residing in or within 10 km of these forests and possessing a fire-arm shall register his name with the Deputy Conservator of Forests.
(iii) During summer, the scarcity of water leads to drive the animals to a few water pools exposing themselves as easy prey to poachers including local inhabitants. Such areas should be kept under constant vigilance.
(iv) Compensation for cattle and human killing by wildlife should be made immediately as per the law to create sympathy towards wildlife and to check any sorts of revenge to be taken by villagers.
(iv) If there exists any cattle lifter or man eater that should be translocated safely to safe areas to have rapport with villagers.
(vi) To have awareness for the wildlife in the area drive regarding wildlife will be taken from time to time.
(vii) To have an orphanage to rear the ailing animals to recoup and then to be set free in there natural home.

SECTION:9.7: WATER SUPPLY:

9.7.1.1. In the areas where there is an acute shortage of water required by wildlife, constructions of water holes will be made with provision to regular supply of water there. Creation of Vantalis (Vantalab) to harvest water for purpose of wildlife, construction of anicuts, bunds on Nalas at suitable place should be made to provide permanent water holes to the wildlife.

SECTION:9.8: ECO TOURISM:

9.8.1.1. An Eco Tourism Center at Amravati needs to be developed as is centrally located place at Wadali. An ideal site Mahendri that is in the midst of forests and conveniently, linked with Warud and Nagpur two prominent towns in the area.

CHAPTER – X

OTHER IMPORTANT REGULATIONS

SECTION :10. 1 : DEMARCATION OF COUPE AND PREPARATION OF TREATMENT MAP.

10.1.1.1. Except for first coupe, every coupe will be demarcated one year in advance of its due year of working. First coupe will be demarcated and marked in the first year itself to have felling in that year. The coupe will be demarcated as per sequence given for working as mentioned under different working circles and a treatment map will be prepared by the R.F.O., which will be verified by an A.C.F. After that a coupe demarcation certificate alongwith the treatment map will be furnished by the concerned R.F.O. in the following format :

I , ----------, R.F.O.---------- ---------- certify that I have personally inspected the demarcation of coupe No. ----------in Compartment No.----------of ----------W.S. in ---------- W.C. on dated ---------- and have prepared the treatment map as per the prescriptions of the working plan. The area of the coupe is---------- ha.

(----- -------- ------- --------)
RANGE FOREST OFFICER,
Signature of the RFO with date.

Counter Signed by

(----------)
Assistant Conservator of Forests,

Counter signature of ACF with date

10.1.1.2.DEMARCATION OF COUPE :

(i) Annual coupe will be demarcated by cutting and clearing bushy undergrowth on 3 m wide line and by erecting pillars or posts in the middle of the line at suitable intervals, except where the coupe boundary runs along a big Nala, a fire line or a road. Coupe number and felling series will be written on the pillars on the side away from the area of the coupe.

(ii) Selected trees at suitable intervals, standing on the periphery of the coupe, will be given two coaltar bands and a geru or red band in between. The lower coaltar band will be at B.H. and the other coaltar band will be 15 cm above it. Just below the lower coaltar band serial number in Arabic will be given on the side away from the area of the coupe. The serial numbers of such trees will be maintained in the marking register in the following format :-

Serial Number.	Species	GBH(OB) in Centimeter	Remarks
1	2	3	4

(iii) No trees bearing coupe demarcation bands will be marked for felling.

10.1.1.3.DEMARCATION OF SECTIONS :

(i) To control harvesting, each coupe marked for felling will normally be divided into four approximately equal sections. Sections will be demarcated by 1.5 m wide cut lines by clearing brushwood unless the section line runs along a permanent feature, e.g. Nala.
(ii) Trees above 45 cm girth, selected at suitable intervals on the inner edge of the 1.5 m wide cleared section line will be given two coaltar bands 15 cm apart, the lower coaltar band being at breast height. Just below the lower coaltar band section number will be given on the side away from the area they would denote.
10.1.1.4. DEMARCATION OF PROTECTION AREAS : Selected trees, on the periphery of the protection areas will be given two geru bands 15 cm apart, lower band being at b.h. In addition, a cross in geru colour between the bands will also be given on the side away from the protection areas. All those trees will be serially numbered. The serial number will be given just below the lower geru band, on the side bearing the cross. All the protection areas will be numbered in Roman numerals and the trees standing on the periphery of each protection area will be numbered in Arabic, adopting separate series for each area, so that the trees on the periphery of protection area No.1 will bear the Sr.No. I/1 and the similar trees on the priority of protection area No. II will bear the No.II/1 etc. The serially numbered trees will be recorded in the following format :-

Serial Number.	Species	GBH(OB) in Centimeter	Remarks
1	2	3	4

10.1.1.4. DEMARCATION OF OTHER AREAS GIVEN IN THE TREATMENT MAP : The other categories of areas will be demarcated by giving one geru band and one coaltar band. The geru band will be at b.h. and the coaltar band above this and at a height of 5 cm above this.
10.1.1.5. METOD/TECHNIQUE OF MARKING OF TREES :
(i) All trees to be marked for felling will be given a geru band at b.h. after removing the bark and will bear marking hammer marks at both b.h. and base on a clear blaze of size - (10 cm x 10 cm).
(ii) Following trees marked for felling in addition will bear digit serial nos. at both b.h. and base (a) All trees of teak, bija, shisham, ain, tiwas, haldu, karam, dhaora and shiwan of 45 cm and over in girth at b.h.(o.b.). (b) Trees of all other species of and above 60 cm girth at b.h.
(iii) All remaining trees marked will bear serial number, which will be given by coaltar. The digit and coaltar serial numbers will form separate series. Malformed trees alone will be recorded as fuel trees except that of teak. A tree will be classified as fuel tree only when it is incapable of yielding any useful sawn timber or pole.
iv) All trees bearing serial number will be individually recorded in marking (recording) book giving following details :

Serial Number		Species	GBH(OB) in centimeter	Remarks
Digit	Coaltar			
1	2	3	4	5

(v) Abstract of trees marked for felling will be made in 15 cm girth classes. Timber, poles and firewood trees will be shown separately.
(vi)The number on the trees will be put in the vertical direction as shown below :

7
Tree No. 786 → 8
6

** If a tree is capable of yielding 30% of the timber expected from it as per the form factor, it is classed as 'Timber tree', 10% to below 30% as "carpentry tree" and below 10% as "Fire wood tree."

SECTION :10. 2: HARVESTING AND DISPOSAL OF FOREST PRODUCE :

10.2.1.1.Timber and firewood : All coupes of main felling will either be worked departmentally or allotted to Forest Labours Co-operative Societies. All timber and firewood will be extracted to the established Government depots for sale by auction. The quantity of timber, poles and firewood to be given on Nistar at concessional rates will be kept separately in these depots.

10.2.1.2. Tendu Leaves : With the enactment of "Maharashtra Forest Produce(Regulation of Trade) Act, 1969" the trade in tendu leaves has been nationalized. The disposal of this produce will be done in accordance with the provisions of this Act. In all 4 tendu units have been formed which have been grouped into 4 working units. Tendu leaves are auctioned by Chief Conservator of Forest, Evaluation and Nationalization M.S. Nagpur.

10.2.1.3. Grass : : Disposal of grass from closed coupes will be done as per instructions contained in Govt. Resolution No. MFP 1169/118931 - (6) - F-2, 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 off either by public auction or may be allowed to be removed free of cost without damaging the forest. As per central government new policy in tribal areas tribals will have proprietary right over collection and disposal of MFP in forests. Similarly in tribal areas this right will vest in Gram Panchayat. It has become obligatory on the part of Forest Department to have its hold on protection of MFP bearing trees and their health and allow the Gram Panchayats to use them for prosperity of tribal people in case of all minor forest produces.

10.2.1.4.Gum : The right to collect natural gum may be sold by public auction. Making injuries to trees to collect gum is not permitted.

10.2.1.5. General : Sound and young growth of all important species yielding minor forest produce such as Moha, Charoli, Aonla, Tendu fruits etc. will be retained in areas earmarked for harvesting in such a manner that they are suitably dispersed and would also serve as a subsidiary crop to main species and would constitute a source of availability of minor forest produce to the tribals and local people. In the light of the Central Government recent provisions of the Panchayats (Extension to the Scheduled Area) Act,1996 section 4(m)…while endowing Panchayats in the Scheduled Areas with such powers and authority as may be necessary to enable them to function as institutions of self-government, a State Legislature shall ensure that the Panchayats at the appropriate level and the Gram Sabha are endowed specially with---(ii) the ownership of minor forest produce. Thus proprietary right over MFP will vest in Gram Panchayat in Schedule Areas. The Forest Department will monitor the collection of MFP in Schedule Areas and ensure the hygiene of the Forests as per the scientific and silvicultural requirements of the M F P producing trees.

SECTION : 10.3: IRREGULAR HARVESTING :

10.3.1.1. Irregular harvesting of timber, firewood and other minor forest produce is prohibited except in the following cases -

10.3.1.2. Removal of dead, fallen firewood on rated passes is permitted from all parts of the forest except in the coupes due for working. Every year in the month of October, each beat guard will report the availability of the dead fallen firewood compartment wise to the concerned R.F.O. The Deputy Conservator of Forests in charge of the division will compile this information and fix the quantum of the dead fallen firewood to be removed from each range by mid - November. Each R.F.O. under the guidance of the concerned A.C.F., will distribute the targets of the available material amongst various gram panchayats as per their demand and availability along with the location of the area from where it could be collected. The list of the persons so prepared by each gram panchayat will be handed over to the concerned R.F.O. latest by 15th December. Based on this list, the rated passes will be issued to the concerned persons by the R.F.O. No felling of trees will be permitted to obtain firewood . The Deputy Conservator of Forests in charge of the division may however stop extraction of firewood on rated passes from a specified area, in case, he is satisfied that no firewood exists in that area for such removal.

10.3.1.3. Felling of trees on fire- lines if necessary may be carried out by the Deputy Conservator of Forests in charge of the division without reference to the Conservator of Forests. The felling of trees under electric and telephone lines may be carried out by the Deputy Conservator of Forests in charge of the division in manner as permitted under the Forest(conservation)Act, 1980 and the guidelines issued by the GOI from time to time. The cost of the harvesting of trees will be provided by the concerned department using the land.

10.3.1.4. Felling of trees on forest land required by other departments such as irrigation, B & C etc. should only be undertaken after the proposals for the use of forest land for non-forest purposes are approved by the GOI under the provisions of Forest (conservation)Act, 1980 .The cost of harvesting of trees is to be provided by the concerned agency.

10.3.1.5. Forest produce required for departmental works and free grants may be removed on the orders of the Deputy Conservator of Forests in charge of the division under the provisions contained in art. 256 of BFM Vol. I and art. 147 of BFM Vol. III respectively upto the limits of his power. The fellings under these provisions, however, must be on silvicultural lines and as far as possible will be confined to the coupe of the year or to the coupe to be worked next. Felling of fruit trees will be excluded and fellings in a radius of 40 mtr. from the perennial water-holes, Nalas and springs will be prohibited.

10.3.1.6. Essential fellings for research related purposes may be carried out with the permission of Chief Conservator of .Forests Territorial such felling should also be reported to working plan officer.

SECTION :10. 4.1: SURVERY AND DEMARCATION :

10.4.1.1. As far as “A” class babulban and "C" Class Reserved Forests are concerned, they are scattered in hundreds of small patches. They are neither properly demarcated on the ground nor on the maps. These areas have received second grade treatment in the past.. These areas have not been properly surveyed and accordingly their boundaries are not maintained properly. Some of the areas have been handed over to other departments prior to 1980, but without demarcation on the ground or on the maps. Even after so many years they have not been disforested legally. Non forests taken over by the division and areas to be taken over by the division are not surveyed and properly demarcated. Hence total areas of division will be surveyed in first five years of plan operation. In the next five years 1/5th

boundaries maintenance works will be carried out as per the schedule given in Appendix No. XXXIV in Volume II of this Plan. The outer boundaries will have Pre Cast Reinforced Cement Concrete Pillars of specification as stipulated by PCCF MS. The schedule of works have been enlisted in the Appendix No. XXXIV in Volume II.

The objectives of survey and demarcation are to: (1) To know and maintain the exact boundaries on the ground as well as on the map. (2) To remove encroachments if any.

10.4.1.2. : COMPARTMENTS: For Survey and Demarcation all the compartments and 51499.878 ha of forest areas. Range wise details of the compartments to be surveyed and demarcated have been given in Appendix No. XXXIV in Volume II.

10.4. 1.3 : TIME BOUND PROGRAMME: The work of survey and demarcation shall be completed within five years. Year wise program have been given in Appendix No. XXXIV in Volume II of this plan. In the next five years of operation of plan maintenance of boundaries will be carried out as 1/5th boundaries maintenance.

10.4.1.4 : METHOD OF EXECUTING THE WORK. The village maps and land records shall be obtained. They shall be compared with the maps and record available with the forest department. Discrepancies shall be identified and shall be removed with the help of D.I.L.R. and final map of the area shall be prepared and the area shall be demarcated on the ground. The method for demarcation shall be as per the direction given by Office of Principal Chief Conservator of Forests, Maharashtra State vide his Letter No 68 dated 29.5.2001(Marathi) and appended as Appendix No XXXIV of Volume II of this plan.

10.4.1.5 : EXPECTED EXPENDITURE. The expected expenditure for the erection of RCC Pre-Cast pillars will be as per the proposed expenditure for Class I and Class II pillars for which model expenditure have been provided by the office of the PCCF MS. The details of model wise estimate of expenditure and specification of RCC Pillars with their diagrams have been given Appendix No. XXIV in Volume II of this Working Plan.

SECTION :10. 5.1.1 : MAINTENANCE OF BOUNDARIES :

10.5.1.2. With reference to legal status, the forest areas within the tract dealt which can be classified as Reserved Forests, Protected forests, and Unclassed Forests. The maintenance of boundaries of these three classes are described as follows :

10.5.1.3.RESERVED FORESTS : Reserved forests boundaries are being maintained by traditional boundary pillars known as cairn class I and cairn class II. Due to increasing population, the biotic pressure on forests has been increasing and it has crossed the threshold. This has resulted the encroachment mentality of the people. So far the number of cases of encroachments in R.F. of the tract is almost nil as per the record but pressure is tremendous. Therefore, looking into the future of the forest, it is essential to change the external boundary pillars from traditional to R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, Maharashtra.

10.5.1.4.PROTECTED FOREST :These areas are not demarcated by any type of boundary pillars. These are normally around the villages and therefore very vulnerable to encroachment. Therefore, survey and demarcation of the P.F. areas should be done on priority bases. R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, Maharashtra should be used as boundary pillars. This work should be started from the first year of the implementation of this plan.

10.5.1.5. UNCLASSED FORESTS : New areas are being taken over from Revenue Department as land bank against compensatory afforestation. These were not demarcated. It's survey and demarcation should be done forthwith before taking any other action. The proposal for declaration as Reserved or Protected Forests should be mooted. So long as it is not declared either R.F. or Protected Forests, it should be demarcated by R.C.C. Pillars of convenient shape and size to avoid chance of encroachment. After notification of the same

under section 20 or 29 of IFA, 1927, the same should be demarcated by R.C.C. pillars of standard shape and size approved by the Principal Chief Conservator of Forests, Maharashtra for reserved/protected forests.

10.5.1.6. For sake of uniformity through out the state, the shape, size and estimate in terms of man days of the R.C.C. boundary pillars for both R.F. and P.F. have been approved by the Hon'ble PCCF. Details of RCC boundary pillars and estimate will be given Appendix No. XXXIV (C) of Vol. II of this plan.

10.5.1.7. The internal boundary marks/pillars/cairns/ will be traditional and maintained as per the 1/5 th boundary demarcation and verification scheme, which is given in Appendix. Where natural features form the boundary, demarcation need not be done either by R.C.C. or traditional boundary pillars.

10.5.1.8. BOUNDARY LINES :The width of the cleared line of outer boundary of the forest will be 13 meters (40 feet). Nothing will be cut growing outside the true forest boundary line. The clearing will consists of cutting down only all the undergrowth that impedes the view, preventing one forest boundary mark being seen from its neighboring one. Trees on the boundary lines will not be cut down so long as they do not obscure the view of the boundary marks one from the other.

10.5.9. BOUNDARY MARKS / PILLARS SPECIFICATION :

10.5.9.1. The specifications of RCC pillars boundary marks/pillars and the method for demarcation shall be as per the direction given by Office of Principal Chief Conservator of Forests, Maharashtra State vide his Letter No 68 dated 29.5.2001(Marathi) and appended as Appendix No.XXXIV(C) in Vol. II of this plan . Demarcation will be done by erecting Pre Cast RCC pillars of 1st Class at an interval of 50 meters along the sensitive areas adjoining to private holdings. Along the boundaries, which are not so sensitive 1st Class pillars will be at an interval of 100 to 150 meters, apart and 2nd class pillars at an interval of 30 to 40 meters will be erected. The Pre Cast RCC Pillars will be of the specifications given by PCCF MS as appended in Appendix No.XXXIV(C) in Vol. II of this plan

10.5.9.2.SHAPE : As stipulated by the order of PCCF.

10.5.9.3.DESCRIPTION : As prescribed by competent authority.

10.5.9.4. FOUNDATION : It will be as per the sanctioned dimension.

10.5.9.5. DIMENSIONS : It will be as per the sanctioned dimension.

10.5.9.6. INDICATOR : As per the directional requirement given by the competent authority.

10.5.9.7. COLOUR WASH : The pillars will be colour washed red in case of closed forest and white in case of open forest and lines of the same colour will be applied on the top of the cairns radiating from the center to show the direction of the boundary lines.

10.5.9.8. POSITION : The boundary marks pillars will be placed at visible distance one from the other, so that from any mark it's neighbouring one on both sides can be seen clearly. Where there is no change in direction over a large distance, the boundary marks will be erected at intervals not greater than 250 meters and distance would be maintained as per the direction from competent authority. Demarcation will be done by erecting Pre Cast RCC pillars of 1st Class at an interval of 50 meters along the sensitive areas adjoining to private holdings. Along the boundaries, which are not so sensitive 1st Class pillars will be at an interval of 100 to 150 meters, apart and 2nd class pillars at an interval of 30 to 40 meters will be erected. The Pre Cast RCC Pillars will be of the specifications given by PCCF MS as appended in Appendix No .XXXIV(C) in Vol. II of this plan. Each pillar will bear a serial number, a separate number will be given for each adjoining village. In addition to the boundary marks, tin plates will be fixed on the boundary trees at a height of 3 m above

ground, preferably at the boundary of two compartments. These plates will indicate the compartment numbers with arrows and below them will be pillar numbers on either side of the plates. The metal plates will be size of 45 cm x 45 cm . They will be painted white and compartment number and boundary pillar number will be written in red.

10.5.9.9. While carrying out annual maintenance, the following points need special attention

(i) that the pillars are correctly located as per map and demarcation register,
(ii) that the forest boundary is cut to the required width,
(iii) that the repairs to the cairn is done.
(iv) that the boundary post bear the correct number and the same is engraved and written coaltar or paint,
(v) that there are no encroachments.

If there are any encroachments or are suspected, the matter should be pursued and all legal measures should be taken to remove the encroachments.

10.5.9.10. Rules for inspection and maintenance of forest boundary marks :

(i)The forest guard of the beat will be responsible for the maintenance and protection of all the boundary marks in the forests of his beat. He himself will colour wash them annually after rains and will make a special report of having performed this work. Each forest boundary mark in his beat will be specially inspected by him at least once every year, and a record of his inspection will be entered in his diary.

(ii) The Round Officer will be responsible for the maintenance and protection of all the boundary marks in the forests of his round and he will see that they are maintained properly, repaired and colour washed by the concerned beat guard, as directed. The Round Officer will check all the boundary marks in a year, which come up for maintenance and repair as per the 1/5th boundary demarcation scheme. A mention of this will be made by him in his diary. The Round Office will annually submit to the Range Forest Officer a certificate in the following format :

"I, ……. Certify that the annual length of boundary lines in my jurisdiction as prescribed under the scheme given in Appendix No. XXXIV of the working plan for the Central Chanda Forest Division has been verified by myself 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 cairns on either side of a cairn are visible and they are in proper condition and bear correct serial number. There are no encroachments or are encroachments as detailed below :

(iii)The Range Forest Officer will check at least 25% of the annual boundary line as per the 5 year program and 5% verification will be carried out by the ACF.

10.5.10.MAINTENANCE OF COMPARTMENT BOUNDARIES :

10.5.10.1. The compartment boundaries will be cleared to a width of 3 meters, except where the same runs along big Nala or road. Rectangular tin plates of size 30 cm x 30 cm will be fixed with nails on the trees at 3 meter height standing on the boundary of the compartment at regular intervals of 250 meters and also at all the corners. After painting the tin plates white, the compartment numbers will be written on them with red paint.

10.5.10.2. Legal provisions available for protection of the boundary marks. Under section 26 (c) of the IFA, 1927 altering, moving, destroying or defacing any boundary marks of any forests to which the provisions of this Act apply, is punishable with imprisonment for a team which may extend to two years, or with fine, or with both. This offense is non-compoundable under section 68 of the above Act. This legal provision should be made use at all levels by the field staff. Strict watch will be kept on the persons who do so and they should be booked under the above provisions contained in IFA, 1927.

10.5.11. MAINTENANCE OF BOUNDARIES :

10.5.11.1. As the survey of areas and erection of permanent boundaries pillars have been provided on priority basis, it needs accurate mapping of the forest areas and the position of the pillars on the maps. Hence it is necessary that the Deputy Conservator of Forests Amravati Forest Division should attend to this work without loss of time and get the accurate maps prepared. One trace map showing the boundary pillar numbers should be given to Deputy Conservator of Forests, Working Plan Division Amravati showing these pillar number on the master set maintained in his office.

10.5.11.2. The external and internal boundaries of the forest will be maintained according to1/5th boundary demarcation and verification scheme. The boundaries of the forests will be maintained as per the guidance given by PCCF, MS, in his letter appended as Appendix No. XXXIV(C) in vol. II of this plan.

10.5.11.3. A 12 mtr. wide outer boundary of the forest will be cut by clearing off the brushwood and shrubs so that one boundary mark is visible from its neighbouring one. Trees on the boundary line will not be felled so long as they do not obstruct the view of the boundary marks one from the other.

10.5.11.4: Rules for the inspection and maintenance of forest boundary marks .

i) The forest beat guard will be responsible for the maintenance and protection of all the boundary marks in his Beat. He will himself 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 atleast once every year and a record of his inspection will be entered in his diary.

ii) The round officer will be responsible for the maintenance and protection of all the boundary marks in his round and will see that they are maintained in properly and colour washed by the beat guard. He will check all the boundary marks in a year, which come up for erection or maintenance and repair as per the survey or 1/5th boundary demarcation scheme. A mention of this will be made by him in his diaries. He will also annually submit to the R.F.O. , a certificate in the following form -

" I Shri, _____ R.O.

_____ certify that the annual length of the boundary lines as prescribed under the scheme given in the Appendix No. XXXVI in Volume II of the Working Plan for Amravati division has been verified by me personally and that boundary line and marks are found to be correct as per the maps. I further certify that each pillars bears a correct serial number and next pillar is visible from either side of each pillar. There are no encroachments or encroachments are as detailed below.

Signature of the R.O. with date

10.5.11.5:Legal Provisions Available for Protection of the Boundary Marks: Under section 63(c) of the IFA 1927, altering, moving, destroying or defacing the boundary marks of any forest 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.

10.5.11.6: OTHER REGULATIONS: Area register shall be updated every year according to the changes brought about during detailed survey and demarcation of the areas as described above. Territorial Deputy Conservator of Forests shall supply the copy of the corrected maps and area register to the Deputy Conservator of Forests Working Plans every year in the month of June.

SECTION :10. 6: FIRE PROTECTION :

10.6.1.1. Uncontrolled fires cause immense harm to the forest in the form of damages to flora and fauna, young crop, regeneration and the soil - fertility. Fire incidence is noticed in the forests of the Amravati division also. For effective protection of the forest, various forest areas are classified as follows.

10.6.1.2. Class 1: Forests completely protected : It includes the following.

i) All Plantations.

ii) All regenerated coupes of all the Working Circle till the young crop has attained an age of 10 years.

iii) All government timber depots.

iv) Any other areas of special importance as ordered by the Chief Conservator of Forests(Territorial). All the above specified areas will be fire protected by isolating these areas by means of fire-lines and cut guidelines and will be patrolled by the fire-watchers. Any fire in these areas must be reported to the Deputy Conservator of Forests in writing giving the details of the area burnt and various types of losses.

10.6.1.3. Class II : Forests generally protected : This class includes :

i) The remaining areas of 'Selection cum Improvement Working Circle', ' 'Kuran Working Circle.'

ii) Any other areas of special importance as ordered by the Chief Conservator of Forests (Territorial). All these areas will be isolated by means of external fire lines and will be divided into convenient blocks of interior fire lines. No guidelines will be cut. Fire watchers may be engaged for patrolling if sanctioned by the Chief Conservator of Forests (Territorial)..

10.6.1.4. Class III : Forests protected by law only :

(a) All other forests not included in the above two classes are included in this class. Deliberate burning in these forests is prohibited by law, but no special measures for protection will be undertaken.

(b) The following lines will be maintained as fire-lines and will be kept clear of all growth and combustible material during the fire season i.e. from February till May.

i) All external reserved forest boundary lines upto 12 meters width.

ii) 6 meter wide lines around all plantations upto 10 years from the year of planting.

iii) 6 meter wide lines on both sides of all roads and cart tracks passing through the forests.

iv) 40 meter wide line on all sides of the timber and fire wood depots.

(c) The following rules will be followed to reduce the incidence of forest fires :

i) The cutting and cleaning of fire-lines will be completed by the end of December and burning should be completed before the end of February.

ii) Dry leaves on fire-lines will be burnt after the end of February except with the express order of the Deputy Conservator of Forest. In case, such a permission is granted, the burning should be done in the presence of the R.F.O.

(d) The fire watchers will prevent the carrying and kindling of any kind of fires in the forest and will keep the fire-line completely free of all kind of combustible material. On noticing a forest fire, he should at once inform the beat guard and will assist him in extinguishing the same with the help of the local people. The R.F.O. must inform about the outbreak of fire in his range to the DCF at once. After the fire is extinguished the RFO should submit a final report along with a sketch to the Deputy Conservator of Forests within 15 days after thorough inspection of the burnt area. The Deputy Conservator of Forests will submit a monthly return to the C.C.F. mainly covering the cause of the fire, the

area and the extent of the damage and measures taken to extinguish the fire. A separate fire-record must be maintained in the division office. Areas deliberately burnt for silvicultural reasons eg; to destroy felling debris or to stimulate regeneration etc. will be excluded from the scheme of fire protection provided it is prescribed in the Working Plan or sanctioned by the C.C.F. 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 Deputy Conservator of Forests. Statement of Fire lines is given in Appendix No. XXXV of Vol. II of this plan.

SECTION :10. 7 : GRAZING CONTROL :

10.7.1.1. 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 Government of Maharashtra vide its resolution No. MFP - 1365/13221 - Y, dated 6-12-1968 and the grazing rules as framed by the Govt. of Maharashtra vide its resolution No. MFP/1371/237035- Z, date 3.11.1973. The grazing will be controlled as per the prescribed grazing incidence for each class of forests. Keeping in view, the above provision, the grazing in the various working circle of this plan will be regulated as under.

10.7.1.2. Selection cum Improvement Working Circle : As per functional classification, this working circle comprise of tree forests and the maximum grazing incidence prescribed for it is 1.2 ha. per cattle unit. All main felling coupes will remain closed to grazing for a period of 10 years from the year of planting. In addition to this some of the compartments which bear good N.R. shall be permanently closed to grazing.

10.7.1.3. Afforestation Working Circle : The forest of this working circle can mainly be classified as 'Minor forests' and pasture lands. The grazing incidence for these lands should not be more than one cattle unit per 0.8 ha. The main coupes will remain close for a period of 10 years from the year of planting.

10.7.1.4. Kuran Working Circle : Grazing shall be completely banned in ramnas. However cutting of grasses shall be allowed only after seeding. In other areas grazing shall be allowed to the extent of one cattle unit per 0.4 ha. However main coupes shall remain closed to grazing for consecutive 3 years. During this period cutting of the grasses shall be allowed after seeding.

SECTION :10. 8 : DEVIATIONS :

10.8.1.1. The following works will not be constituted as deviation from the plan.

i) Removal of dead and fallen firewood.
ii) Petty fellings carried out as mentioned in irregular harvesting.
iii) Works to be carried out as per sanctioned Micro Plan under Joint Forest Management.

10.8.1.2.The following works will constitute a deviation from the Working Plan

i) The felling and disposal of forest produce from submergence areas of dams, tanks, canal sites, road sides and other cases coming under the purview of the Forest Conservation Act, 1980. The sanction to it will be obtained.
ii) All other deviations can be classified into following two categories as per draft amendment to article 191 and 192 of Working Plan Code vide Agriculture and Forest Department Govt. Resolution No. FWP 1062/5625(ii)-J, dated 25.5.1962.

10.8.1.3. A Type Deviations :- which would seek to alter the schedule of working given in the Working Plan**,** the examples of which are -

i) Both non-working a coupe in the prescribed year or working the coupe in the year not prescribed by the plan.

ii) Changes in the areas of coupe on account of disforestation or undertaking areas for execution of any special scheme under plan-program; and

10.8.1.4. B Type Deviations : which would involve alteration in the silvicultural treatment, for example;

i) Stopping or curtailing fellings or planting because of shortage of labour, funds, material for plantation work, or unsuitability of terrain and soil for undertaking plantations to the extent prescribed by the Working Plan.

ii) Extensive fellings of dry trees killed by fire, fungus, insect attack or other natural calamities.

iii) Fellings of unusual size and extent for special departmental works.

iv) Special fellings to meet a sudden new demand of a particular industry.

v) Fellings involving modifications in the prescribed marking rules.

10.8.1.5.Procedure for obtaining sanction for deviation : All types of deviations are to be got approved from Central Government .Hence in case of the deviation of any type, the Deputy Conservator of Forests of Amravati Forest Division will submit, in eight copies, the proposals of deviations to the Chief Conservator of Forests (Territorial) Amravati through the Deputy Conservator of Forests Working Plan Amravati who on scrutinizing the proposals will forward them to the Territorial C.C.F. with his opinions and report as to the manner, the departure decided upon should be recorded. The C.C.F. territorial will pass on the proposals to the P.C.C.F.(MS) through C.F. WP with his remarks. Then P.C.C.F. will forward the proposals to the Central Government through proper channel with his remark for final approval. The standard proforma for submission of deviation proposals will be used & is given in Appendix No. XXXVII (b).

SECTION :10.9 : SOIL AND MOISTURE CONSERVATION :

10.9.1.1. Heavy grazing and recurrent fires during the dry season has resulted into the compaction of soil in the forest and as a result there is heavy runoff and little percolation of water. The forest floor lies bare with little or no humus resulting into little sub soil moisture. Due to all the above factors, the NR of teak and its associates die back before getting established. Hence soil and moisture conservation works are of utmost importance for ensuring the success of the various silvicultural prescriptions. Main operations namely contour trenching and Nala Bunding/check dams are detailed below :

10.9.1.2.Nala bunding /Check dams : The main objective of nalla bunds or check dams is to reduce the run-off water to arrest the silt. Nalla-bunding will start from the top of nalla downward. They will be made from the loose boulders found in or around the nalla bed. No digging or blasting will be done. Where sufficient boulders are not available, brushwood may also be used. Nalla bunding will be done on nallas upto 8 mtrs. bed width only, beyond which these structures may not be useful and permanent engineering structures will be required. The design of Nala bunds or loose boulder structures will be as per the design sanctioned by the competent authority. The distance between the successive bunds will be such that, top of the lower bund shall be in line with the base of the upper bund. In general, the distance between successive bunds for different slopes will be the same as that for contour trenches.

10.9.1.3. Vantalis : To provide water to wildlife during the pinch period small water bodies in the form of Vantalis will be dug at suitable site and the structure design duly sanctioned by the competent authority.

SECTION : 10.10 : WATERSHED MANAGEMENT :

10.10.1.1. Proper management of Watershed leads towards sustainability of resource utilization. Land is the major resource in Rural Indian Economy. Forest Land forms mostly the upper ridges of the topography. So the management of watershed cannot be effected in isolation by the Agriculture Department or Water Conservation Department. Integrated and coordinated watershed development project implementation has become the need of time. Hence our planning too needs to be consistent with the overall approach of watershed management. Attempt has, therefore, been made to sequence the coupes from ridge to valley and micro watershed boundaries have been shown as additional layers using the G.I.S. techniques to facilitate effective co-ordination and communication with other related departments.

SECTION : 10.11 : MISCELLANEOUS AREAS.

10.11.1.1. The areas, to the extent of 1565.356 ha have been included in this category. Most of the areas have already been handed over to the other departments prior to 1980. But they have not yet been legally disforested by issuing the notification. Other areas are being utilized for various purposes like nurseries, sale depots, forests parks, quarters, inspection huts etc. Thus though these areas are forest lands they cannot be managed under any silvicultural system. Hence no treatment is prescribed for these areas. However survey demarcation and mapping works shall be carried out as per the program given under Survey and Demarcation section of other important regulations . The list of the comptts etc. has been given in Appendix No. XXXI in Volume II of this plan .

SECTION : 10.12 : FORESTRY EXTENSION :

10.12.1.1. The growing biotic interference has resulted into heavy degradation of Amravati forest. Unregulated grazing, illicit cutting and heavy lopping of trees for fuel are few of the bad trends which could be curbed if people are made aware of the harm, they are perhaps unknowingly inflicting on the forests and in turn to themselves. For this forestry extension work, the territorial Deputy Conservator of Forests will chalk-out a detailed program for holding the 'Awareness Camps' at regular intervals in different villages with the active participation from the voluntary agencies and gram panchayats. The Deputy Conservator of Forests will try to participate in most of these 'Awareness Camps' himself. All forest officers will freely interact with the villagers highlighting the following points.

i) Various uses of the forest to the people.
ii) Consequences of the vanishing forests to them and their future generations.
iii) To make villagers aware about the alternatives available for fuel wood like bio-gas, LPG, fuel efficient chullah like Vanjyoti, solar cookers etc.
iv) The concept of stall- feeding to the cattle should be propagated and the benefits derived therefrom.
v) All land - owners in the village should be convinced to grow the fuelwood and fodder trees species on the field bunds or unutilized or under-utilized area of their own land so as to reduce the pressure on the forest.
vi) Villagers should be actively involved in the forest protection and various afforestation schemes. Village school teachers and educated children will be involved in all these activities as the resource personnel and motivators.
vii) Short orientation courses will be conducted for the forest staff, to equip them with better communication skills and to orient them towards the forestry extension.

SECTION :10.13: JOINT FOREST MANAGEMENT:

10.13.1.1.: WHY J.F.M.? National Forest Policy 1988 emphasizes the importance of the traditional rights of forest dwellers and the importance of their role in protecting the forest. Priority for the use of forest products is given to forest dwellers and the use of the forests for industrial purposes is discouraged. As a follow up action on this new forest policy, and the encouraging experiences from West Bengal in J.F.M., the Government of India issued a set of J.F.M. guidelines in 1990 encouraging Forest Departments to involve local people in the management of the forests. During last decade, most of the states have issued their own guidelines. Similarly Maharashtra Government has also issued the guidelines and passed Government Resolution to that effect on 16th March 1992. Similarly, in the present context, it is observed that the previous efforts to afforest the Govt. of Maharashtra has issued guidelines vide Govt. resolulation/MSC/2000/CN/43/F-2, Mantralaya, Mumbai dated 25.4.2003 degraded forest areas which are adjoining to the villages and which are heavily burdened under grazing pressure, could not be afforested successfully mainly due to non involvement of the local people. Thus in the name of J.F.M. Forest Department has got an effective tool for afforesting the degraded forest areas and at the same time to fulfil the needs of the local community. Hence the J.F.M. The other reasons for favoring J.F.M. approach are (1) Effective protection, (2)To show respect for rights and needs of indigenous people and (3) Community development and environmental consciousness.

10.13.1.2. It should be applied to entire forest of this division wherever people cooperation are available in positive mood. Joint Forest Management may be taken up in any village if the forests belong to the category as defined in the Government of Maharashtra Resolution dated 25th April-2003. List of villages taken under JFM is given in Appendix No. XXXII. in vol. II of this plan.

10.13.1.3: SPECIAL OBJECTS OF JFM: After analyzing the reasons for the present deteriorated condition of these areas, it is found that non involvement of the local people in our efforts to develop these areas is the main cause for our continuous failure. Naturally, therefore, prime objective will be to involve local people in the development of the areas. The other objects of JFM will be :

1) To increase vegetal cover.
2) To Check soil erosion.
3) To bring about soil and moisture conservation.
4) To utilize the land for the productive purpose according to its capability.
5) And ultimately bring about the integrated development of the adjoining villages with the help of all other development agencies.

10.13.1.4. COMPARTMENTS AND WORKING SERIES: Implementation of the prescriptions under this scheme are totally dependent on the willingness of the villages, neither the compartments are allotted nor the working series are formed. If some villages do not show interest, the areas of those villages shall be tackled under the concerned Working Circle. The micro plan prepared under the overall frame work of the respective working circle of the working plan for that village shall supercede the working plan so for as that village is concerned. This shall not be considered as a deviation from the working plan prescriptions.

10.13.1.5. Following principles should be adhered to during the implementation of J.F.M. in any village.

Eco system Protection. Participatory, Democratic structure.
Open communication.
Management Responsibility and Benefit sharing in Relation to Traditional usage.
Gender Equity.
Community Responsibility,
Effective Conflict Resolution.
Traditional Rights and use.
Discrete Jurisdictions and Explicit Agreements and last but not the least.
Effective Monitoring and Advocacy.

10.13.2.1. METHOD OF TREATMENT: The areas shall be treated according to the J.F.M. Plan for the village, to be prepared in consultation with the villagers as per the guide lines issued by the Govt. vide G.R.No.MSC/2000/CN/43/F-2, Mantralaya, Mumbai dated 25.4.2003 Similarly, the guidelines issued by the Central Govt. in this connection vide its letter No.6-21/89, F.P., dated 01.06.1990 shall also be considered. Micro Plan to be prepared should broadly conform to the prescriptions given to the areas as if there were no JFM, which will be in consonance with prescription in other working circles considering silvicultural requirement of species. Micro Plan duly sanctioned by competent authority will form the part of working plan component.

SECTION :10.14 : SURVEY AND MAPS :

10.14.1.1. Eight sets of fresh maps on 1 : 15,000 scale have been prepared with the help of GIS application center at Conservator of Forests, Working Plan, Nagpur as follows :

1. Management maps - 6 sets (4 cut and mounted + 2 uncut and mounted).
2. Stock maps - 2 sets (uncut and mounted)

The distribution of these maps will be as follows :

10.14.1.2. Deputy Conservator of Forest, Working Plan Division : One rough uncut and mounted set showing the existing compartment boundaries and stocking details, has been prepared based on which the master sets of stock maps and management maps showing the compartments, coupes, felling series, Working Circle and other management details will be prepared.

i) Management map - 1 master set (uncut and mounted)
ii) Stock map- - 1 master set (uncut and mounted)

10.14.1.3. Deputy Conservator of Forests, Amravati Forest Division **:**

i) Management map- 3 sets (1 uncut and mounted + 2 cut and mounted)
ii) Stock map - 1 set (uncut and mounted)

10.14.1.4. Conservator of Forest, Working Plan Circle, Nagpur**.**

i) Management maps- 1 set (cut and mounted)

10.14.1.5. Chief Conservator of Forest, (Territorial) :

i) Management map - 1 set (cut and mounted)
Any alteration in the forest areas due to disforestation (as per the gazette notifications) or due to compensatory afforestation has been shown in the maps.

10.14.1.6. In addition the following maps has been prepared **-**

i) Reference map : This Working Plan include a reference map 1 : 1,50,000 scale showing Working Circles, Range boundaries, Roads and other details.

ii) Grazing map : Two maps showing the grazing units have been prepared on 1 : 25,000 scale, one copy of which is to be supplied to the Deputy Conservator of Forest, Amravati Division and the other is to be retained in the Working Plan office Amravati

SECTION :10.15 : MANAGING NTFP YIELDING TREES :

10.15.1.1. The various NTFP found in the tract are Tendu leaves Kadai gum, Dhaoda gum, Charoli, Mahuwa flowers and seeds, Baheda and Hirda seeds, grass etc. The entire division is divided into various units, which are sold annually by open auction. All NTFP yielding species like Tendu, Mahua, Charoli, Kulu, Dhaoda, Hirda and Baheda. etc. are scattered all over the area and well mixed into other species in the forest. Special measures are needed to enhance the yield and collection of various NTFP yielding species by employing improved management and collection techniques.

10.15.1.2. The following points has been considered for managing the NTFP yielding species.

i) Compartments with promising regeneration of species has been identified and tended by removing the congestion in established crop and by doing soil mulching in case of current year recruits.
ii) Soil working in case of Tendu and Mahua trees by digging one feet deep trench encircling tree trunks with a diameter that of the tree crown, is found to be quite useful. It initiates the development of new plantings from the suckers so developed. Proper pruning in case of Tendu shrubs, give rise to new flush of leaves with higher yield, so it will be practiced regularly.
iii) In the various afforestation schemes depending upon the site suitability and the local needs, different NTFP yielding species will be given due representation (normally 10 to 15% of the total)to increase the stocking of these species.
iv) Only those NTFP yielding trees, which are dead, will be marked for felling during the coupe working.

SECTION:10.16: BAMBOO MANAGEMENT :

10.16.1.1. Bamboo in this Forest Division is a scarce commodity. Several attempts have taken in past to have bamboo in second storey, but the result is almost elusive one due to various reasons**.** Most unfavourable reason is uncontrolled grazing and attacks by pigs on tender shoots and uprooting of rhizomes leading to near extinction of this most sought species from the forests of this division. During tour to the forests of this division it was

noticed that in some plantation areas the young clumps of bamboo are found which need urgent attention to develop these clumps. It is, hereby, prescribed that wherever these clumps are found those to be enumerated compartment wise by territorial staffs and special treatment plan should be prepared by a Gazetted officer. The emphasis will be given on following points: (1) Cleaning of clumps; (2) Loosening of soils in a circular shape forming a ring of 60 centimeter wide with mean radius of 1meter to 2meter depending upon the existing diameter of clumps.

10.16.1.2. Where bamboo clumps are found mature enough to be exploited they should be first enumerated first compartment wise and then a three year rotation wise exploitation would be carried out leaving first year culms intact and second year culms as support as given in marking rule for bamboo in Bamboo Overlapping Working Circle of this plan.

SECTION : 10.17 : POSITION OF ENCROACHMENTS :

10.17.1.1. Ministry of Environment and Forests, Regional Office Western Region E3/240 Arera Colony, Bhopal had raised points about the position of encroachment upon forest lands both pre 25/10/1980 and post 25/10/1980. As per the information received from Deputy Conservator of Forests Amravati there are nil encroachers who had encroachment upon nil hectare of forest land before 31st March 1978 i.e. pre 25/10/1980 and out of which nil encroaches with an area of nil ha found eligible for regularization. There are … encroachers who had encroachment pre 25/10/1980 on nil ha and found to be ineligible to be regularized have still not been vacated them. There is 320 encroachers an area of 42.31 hect. post 25 / 10 / 1980 encroachments information on forest land which are yet to be vaccated.

CHAPTER - XI
CONTROL AND RECORDS

SECTION :11. 1 : CONTROL AND RECORDS :

11.1.1.1. The following will be maintained in the division office :

i) Control Form
ii) Compartment History
iii) Plantation and Nursery Registers.
iv) Divisional Note Book.

11.1.2.1. CONTROL FORM : The record of all harvesting, subsidiary cultural operations, regeneration works and soil and moisture conservation works carried out as per the Working Plan prescriptions, will be maintained in the control forms. The prescribed proforma of the following control forms have been given in Appendix No XXXVII(a) in the volume II of this plan. Two sets of control forms will be prepared. One set will be kept in the divisional office and the other set will be the flying set for the use of the Deputy Conservator of Forests Working Plan Amravati. The flying set will be sent annually by the Deputy Conservator of Forests Amravati division, to the Deputy Conservator of Forests Working Plan Amravati not later than October 1 every year taking the necessary entries. All entries showing the deviations from the prescriptions will be underlined in red. The Deputy Conservator of Forests Working Plan Amravati will scrutinize it and will send it to the territorial C.C.F. along with his remarks to the C.F. Working Plan, Nagpur not later than February 1 of the following year. The Conservator of Forests, Working Plan in turn will forward them to the Addl. C.C.F. (Production) for perusal and orders where required. C.C.F. (Territorial) will ensure that the required Control Form is being maintained as stipulated above by Office Inspection of DCF.

11.3.1.1 DEVIATION

11.3.1.2. COMPARTMENT HISTORIES : Compartment histories i.e. the record of various forestry activities and observations made in the past year, will be maintained in form nos. 1 to V as shall be given in the Appendix. XXXVII(c) in Volume II of this Plan.

Form I : Description of the Compartment.
Form II : Records of plantation and changes in the growing stock.
Form III : Records of operations and out-turns.
Form IV : Records of observations.
Form V : Records of injuries.

11.1.3.2. Each compartment must have a separate file for its records. Compartment histories must be maintained by the division since they keep the record of past management practices and their effects on the growing stock. Every year, in July, the Range Forest Officer should fill in the necessary information and will send it to the Deputy Conservator of Forest Amravati division for scrutinizing, editing through the concerned Assistant Conservator of Forests, who after doing so, will get them typed and sign them. One copy of the forms will be filled in the divisional compartment history file while one copy each will be sent to the Range Forest Officer and the Deputy Conservator of Forest, Working Plan Division in the month of August. DCF Territorial will ensure that the required Control Form is being maintained as stipulated above by Office Inspection of RFO.

11.1.4.1. PLANTATION AND NURSERY REGISTERS : Plantation registers will be maintained for all the areas regenerated artificially in the Form Nos. 1 to 9 as have been given in the Appendix. No. XXXVII(d) in Volume II. Nursery registers will be maintained in Form Nos. 1 to 10. These forms shall be given in the Appendix. No XXXVII(e) in Volume II of this plan.

11.1.5.1. DIVISIONAL NOTE BOOK : The matters of divisional importance will be recorded under standard headings for records and ready reference in the divisional note-book. A brief note of the plantations will also be recorded by the Deputy Conservator of Forest Amravati division under the appropriate heads. The form of Divisional note book have been given in the Appendix. No.XXXVII (f) in Volume II of this plan.

CHAPTER XII

FINANCIAL FORECAST IN AMRAVATI DIVISION FROM 2004-05 ON WARDS

SECTION : 12.1. (A) : ANNUAL EXPENDITURE

12.1.1. The following table shows the annual expenditure in implementing this Plan . The expenditure includes the plantation cost & soil conservation work.

i)	Non – Plan	3,64,55,976
ii)	Plan	27,01,068
iii)	Plantation	2,86,63,676
iv)	Soil Conservation	39,22,099
Total Rs.		**7,17,42,819**

B) ANNUAL REVENUE

12.1.2. The following table shows the revenue from different important sources.

i)	Timber, poles, firewood	1,54,22,600
ii)	Tendu	25,02,000
iii)	Grasses ,gum & other	6,25,500
Total Rs.		**1,85,50,100**

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Deputy Conservator of Forests,
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Amravati

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Conservator of Forests
Working Plan Circle,
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(Tasneem Ahmed)
Chief Conservator of Forests (Territorial)
Amravati Circle ,
Amravati.

(Manisha Verma)
Collector, Amravati

(Jwala Prasad)
Additional Principal Chief Conservator of Forests
(Production & Management)
Maharastra State , Nagpur.

(B. K. Singh.)
Principal Chief Conservator of Forests
Maharastra State , Nagpur.

Chife Conservator of Forests (Central)
Ministry of Enviroment & Forests
Government of India
Bhopal – 462 016 (M.P.)

PART - II

FUTURE MANAGEMENT DISCUSSED

AND

PRESCRIBED
