

EXECUTIVE SUMMARY

➤ Formation of Kinwat Forest Project Division- 1976

➤ Headquarter at Kinwat

1. **GENERAL:-** The total area of the Management Plan is 15789.721 ha.

➤ Total Area Covered : 15789.721 ha.

➤ Period of plan : 2015-16 to 2024-25

➤ Total No. of Ranges : 4

➤ Total No. of Rounds : 9

➤ Total No. of Beats : 18

➤ Total No. of Compartments : 67

2. **OBJECTIVES OF MANAGEMENT PLAN:-**

The National Forest policy of 1988 will be the guiding principal to decide the general objects of management are mentioned as under-

- (i) To preserve forest cover on steep hill slopes, along the nalla banks and water courses and to prevent soil erosion.
- (ii) To enrich the growing stock in the natural forests and to restock all the under stocked and degraded forests, to achieve normality of growing stock in shortest possible time.
- (iii) To increase the productivity of forests by using improved technology and to maintain the same on sustained yield basis.
- (iv) To meet the requirement of small timber, fuel wood, fodder and minor forest produce of the rural and tribal population on top priority.
- (v) To increase the production of minor forest produce and to manage the same scientifically to utilize the potential to the maximum possible extent on sustained basis.
- (vi) To conserve and protect wildlife.

3. **THE FOREST TYPE:-**

According to classification of forest types by Sir H.G. Champion and Shri. S.K.Seth belongs to “5” (Tropical Dry Deciduous Forests) and sub group “5A” (Southern Tropical Dry Deciduous forests) the climax types is “5A/clb”

❖ **Sub types-**

• Group 5 Tropical Dry Deciduous Forests

5A Southern Tropical Dry Deciduous forests

5A/clb climax types is

Predominant Species - Teak, Ain, Bija, Dhawada, Lendia, Tendu, Salai, Mowai,

Moha, Kalam, Khair, Bamboo etc.

4. PAST SYSTEM OF MANAGEMENT

The Management Plan for the Kinwat Forest Project Division was prepared by Shri V.B.Thakare, Divisional Manager for the period 2006-07 to 2015-16 and implemented. Total area of 22169.756 ha was allocated to following working circles.

S. N.	Name of the Working Circle	Number of Compartments	Gross Area(in ha)
1	Teak Plantation Management W.C	22	979.973
2	Teak Plantation & Reboisement W.C.	35	2819.277
3	Improvement W.C.	71	8698.916
4	Afforestation W.C.	33	1840.975
5	Bamboo W.C.	39	1352.000
6	Protection W.C	92	6478.615
Total:-		92	22169.756

4.1:- Teak Plantation Management Working Circle

- ✓ This working circle comprises of areas of successful Teak plantations that are suitable for thinning. F.D.C.M. has raised Teak plantations after clear felling as well as enrichment plantations from 1976 to 1987. Area of such plantations under this working circle is 979.973 ha.
- ✓ Teak plantations that have been raised by Forest Department in the year 1976 and 1977 in the areas allocated to FDCM over an area of 60 ha were also included in this working circle.
- ✓ Total area under this working circle is 979.973 ha which is distributed in 22 compartments of the division.

Special objects of Management:-

- ✓ To carry out tending operations to produce good quality and big size teak timber.
- ✓ To get intermediate yield and revenue.
- ✓ To carry out thinning as per the yield table on the basis of age and site quality.
- ✓ To improve the crop by carrying out required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.
- ✓ To obtain maximum sustained yield of teak timber of commercial value.

4.2:- Teak Plantation & Reboisement Working Circle

- (A) Un-tackled portion of natural Standing crop that is suitable for raising teak plantations after removal of over wood.
- (B) The areas of failure Bamboo & miscellaneous plantations under natural well stocked forest and suitable for raising Teak plantations are also been included. Though the total area of this working circle was 2819.277 ha., 1032.428 ha. area were handed over back to forest department in 2006-07 and 922.922 ha. area where lay within 10 km of Penganga wild life Sanctuary. So only 863.927 ha. remains for treatment purpose.

Special objects of Management:-

- ✓ To enhance productivity of the area by converting less valuable forest into valuable Teak stand by following improved technology.
- ✓ To convert existing uneven aged forest to even aged Teak forest.
- ✓ To provide employment to the local people in remote areas.

4.3:- Improvement Working Circle

- ✓ This working circle includes the area, which has by and large a mixed nature of crop, with a crown density varying from 0.4 to 0.6 and with site quality from IVa to IVb.
- ✓ The crop is predominant teak which needs improvement. Small under-stocked teak forest patches are also included in this working circle. The teak crop is suppressed and requires opening.
- ✓ Total area allotted to this working circle is 8698.916 ha which spread over 71 compartments of the division. Though the 8698.916 ha. area allotted to this working circle 2661.543 ha. area were handed over back to forest department in 2006-07 and only 6037.397 ha. area retained for treatment.

Special objects of Management:-

- To improve the forest in terms of composition and density.
- To promote natural regeneration of various species.
- To maintain biodiversity.
- To remove dead, dying and diseased trees with a view to facilitate establishment of natural regeneration of important species.

4.4:- Afforestation Working Circle

The areas having sparse tree growth (under stock) and fit for afforestation is included in this working circle. It also includes areas of successful miscellaneous plantations under taken under E.G.S. and unsuccessful planted areas of Teak, Bamboo and miscellaneous species. Total area allotted to this working circle is 1840.975 ha which spread over 33 compartments. Though the 1840.975 Ha. allotted to this working

circle, 605.324 Ha. area was handed over back to forest department in 2006-07 and 893.002 Ha. area fall within 10 km from Penganga wild life sanctuary.

Special objects of Management:-

- ✓ To maintain the biological diversity of forests by introducing mixture of species & restore eco- balance.
- ✓ To check soil erosion and improve moisture regime.
- ✓ To reclaim the area by intensive soil and moisture conservation works and afforestation works to enhance the productivity through artificial regeneration consisting mainly the indigenous species of small timber, firewood and fodder value to meet the local demand

4.5:- Bamboo Production (Over lapping) Working Circle

- ✓ This working circle includes mainly the area of successful Bamboo plantation raised from 1992 to 2000 under Maharashtra Forestry Project. Natural Bamboo clumps are not found in this division.
- ✓ All established Bamboo plantations which are capable of giving marketable bamboo are included in this working circle.
- ✓ This working circle includes Areas of successful established Bamboo plantations undertaken under Maharashtra Forestry Project from 1992 to 2000. Extent of such area is 291 ha. Areas of un-established successful Bamboo plantations under taken with F.D.C.M. Ltd funds since 2002 on words. The extent of such area is 1230 ha.
- ✓ The total area allocated under this working circle is 1521 ha (Including 169 ha. overlapping area of Bamboo plantations taken up under Teak plantations) which spreads over 39 compartments.

Special objects of Management:-

- ✓ To enhance the productivity of Bamboo.
- ✓ To sustainably harvest bamboo areas following established silvicultural system.
- ✓ To meet the demand of local population to the maximum possible extent.

4.6:- Protection Working Circle

This working circle include unworkable areas on account of various reasons such as steep slops, exposed rocks, refractory areas, water logged areas and nalla bank etc. This working circle includes mostly the areas of refractory sites, scattered and dwarf tree growth or blanks, areas of inferior site quality unfit to sustain good tree growth which need protection from further deterioration of the site. Though the extent of area included in this working circle is 6478.615 ha., 1874.100 ha. area handed over back to forest department in 2006-07. And 4604.515 ha area balance for treatment in this working circle.

Special objects of Management:-

- a) To protect the available crop from any further deterioration.
- b) To conserve and protect the vegetative cover on steep slopes so as to check the soil erosion and denudation in these areas.
- c) To reclaim this area by adequate soil and moisture conservation works along with seed sowing.
- d) To protect vegetative cover along the nalla and riverbank and to minimize further erosion and to keep forest belt intact around water bodies.
- e) circle is highly susceptible for erosion and deterioration. Vegetative cover existing on steep slope has to be protected and conserved to avoid soil erosion and further degradation of sites. So these areas along with available to improve the quality and density of Forest.
- f) To maintain the bio diversity.

5. FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

Basis of Proposal:-

- The National forest Policy of 1988 will be the guiding principle to decide the general objects of management of the new management plan.
- The new policy has emphasized the need for environmental stability as the prime objective.
- The general objects of management will be on the basis of the principles laid down in the National Forest Policy and the functions which forests have to perform as per State Government's Orders, the objects of scientific management, the depletion of growing stock due to heavy grazing and illicit cutting.

Working Circle wise Allocation of Area :-

S. N.	Name of the working circle	Area (in ha)	No. of Comptt	% of area to total area
1	Teak Plantation Management Working Circle	1108.473	25	7.02
2	Teak Plantation & Reboisement Working Circle	1696.249	26	10.74
3	Afforestation Working Circle	1439.651	28	9.12
4	Improvement Working Circle	6950.373	51	44.02
5	Protection Working Circle	4566.615	67	28.92
6	Miscellaneous Working Circle	28.360	1	0.18
	Total	15789.721		100
7	Bamboo Overlapping Working Circle	1187.000	29	
8	Wildlife Management (OI) Working Circle.	15789.721		100
9	Soil and Water Resources Management (OI) Working Circle..	15789.721	1187	100
10	Non-Timber Forest Produce (OI) Working Circle..	15789.721		100

Range wise and Working Circle wise Distribution of Area:-

S. N.	Name of the working circle	Range (Area in Ha.)				
		Ambadi	Kinwat	Jaldhara	Shiwani	Total
1	Teak Plantation Management W.C.	649.423	76.000	157.050	226.000	1108.473
2	Teak Plantation & Reboisement W.C.	803.657	521.192	371.400	0.000	1696.249
3	Aforestation W.C.	361.560	562.442	410.649	105.000	1439.651
4	Improvement W.C.	455.510	1309.952	2099.867	3085.044	6950.373
5	Protection W.C.	1417.788	834.407	924.390	1390.030	4566.615
6	Miscellaneous W.C.	0.000	22.750	5.000	0.610	28.360
	Total	3687.938	3326.740	3968.365	4806.684	15789.721
7	Bamboo overlapping W.C.	341.000	293.000	218.000	335.000	1187.000
8	Wildlife Management (OL)W.C.	3687.938	3326.74.	3968.356	4806.684	15789.721
9	Soil and Water Resources Management.(OL)W.C.	3687.938	3326.74.	3968.356	4806.684	15789.721
10	Non-Timber Forest Produce (OL) W.C.	3687.938	3326.74.	3968.356	4806.684	15789.721

5.1:- TEAK PLANTATION MANAGEMENT WORKING CIRCLE

GENERAL CONSTITUTION:-

Successful Teak plantations raised by Forest Department & F.D.C.M. Ltd upto 2015 which are fit for thinning are allotted to this working circle. Total area allotted of this working circle is 1108.473 ha.

The distributions of the areas of this working circle into various ranges are as under-

S.N.	Name of The Range	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
1	Ambadi	3687.938	649.423	17.610	4.120
2	Kinwat	3326.743	76.000	2.300	1.750
3	Jaldhara	3968.356	157.050	3.960	9.000
4	Shivni	4806.684	226.000	4.700	1.430
	Total	15789.721	1108.473	7.030	7.030

GENERAL CHARACTER OF THE VEGETATION:-

The crop consists of mainly planted Teak species of site quality ranging from III to IV. Old successful and established teak plantations raised under various schemes constitute this working circle.

The area is well stocked with density 0.4 to 0.7 in established plantations. The crop is young to middle aged. The Natural Regeneration of Teak and other species are sparse. The species like Dhawada, Ain, Lendi, and Bhirra also occur naturally in the plantation areas.

SPECIAL OBJECTS OF MANAGEMENT: -

1. To carry out tending operations to produce good quality teak timber.
2. To get intermittent yield and revenue.
3. To carry out thinning as per the yield table on the basis of age and site quality.
4. To improve the crop by carrying out required silvicultural operations so as to achieve growth parameters comparable to those in the yield table.
5. To obtain maximum sustained yield of teak timber of commercial value.
6. To meet the market demand of poles, small timber and firewood.

METHOD OF TREATMENT:-

First thinning will be carried out in 10th year of planting and second thinning will be carried out at 15th year of planting. Second and subsequent thinning in teak plantation will be carried out as per the revised instructions for thinning in Teak Plantation vide Managing Director letter No.PLN/05/F-III/2874, Nagpur dated 02/09/1999. Third and subsequent thinning will be carried out at an interval of 5 years.

ROTATION:-

The rotation period of Teak in F.D.C.M. Ltd is fixed at 80 years vide Managing Director's Letters No.PLN/11/2004-05/984, Nagpur, dated 2.06.2004. However none of the plantations will complete rotation period during the period of this plan.

SUBSIDIARY CULTURAL OPERATIONS:-

The following operations will be carried out in the year following the year of thinning as per requirement.

- (i) Worked area will be protected from fire.
- (ii) Felling of badly damaged or broken trees.
- (iii) Cutting back of malformed advance growth of teak.

5.2:-TEAK PLANTATION REBOISEMENT WORKING CIRCLE

GENERAL CONSTITUTION:-

Un-tackled portion of natural Standing crop suitable for raising Teak Plantations after removal of over wood or failure patches of Teak Plantations. The area is 1696.249 ha.

Distribution of Area into various ranges-

S. N.	Name of The Range	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
2	Ambadi	3687.938	803.657	21.79	5.10
3	Kinwat	3326.743	521.192	15.77	3.31
4	Jaldhara	3968.356	371.400	9.36	2.35
5	Shivni	4806.684	-	-	-
	Total	15789.721	1696.249	10.76	10.76

GENERAL CHARACTER OF THE VEGETATION:-

The forest is good quality Teak forest of site quality III. Teak is the main species which is about 49 % of the total stock followed by Dhawada, Lendi, Salai, Ain, Bhirra, Movai and other miscellaneous species respectively. Shisham is rarely found & confined to Ambadi Range only.

The crop is young to middle aged with crop density varying between 0.4 to 0.8. Natural regeneration of Teak . Dhawada, Ain, Bija, Lendi though noticed throughout the area, but it is inadequate except in few patches in Ambadi Range.

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To enhance productivity of the area by converting less valuable forest into valuable Teak stand by following improved technology.
- ✓ To convert existing uneven aged forest to even aged Teak forest.
- ✓ To provide employment to the local people in remote areas.

METHOD OF TREATMENT:-

The Silvicultural system of "Conversion to uniform system with supplemental artificial regeneration of genetically superior Stock" as suggested by Government of India shall be adopted. The broad prescriptions for over wood removal for raising teak

plantation are as under and are in consonance with the guidelines of Government of India.

- (i) All young to middle aged fruit bearing Trees up to 20 Trees per ha will be retained.
- (ii) Young to middle aged trees of Semal, Khair, Rosewood and other superior miscellaneous species having medicinal values up to 20 trees per ha uniformly spread over the areas will be retained.
- (iii) No felling will be done on either side of Nallas, Streams, and River banks up to a distance of 20 meters.
- (iv) The section size at a place should not exceed 20 ha.
- (v) 5 meter wide strip of natural forest will be retained around a section called section line.
- (vi) Effective measures will be adopted to protect the plantation from fires for all times to come.
- (vii) Improved Planting stock will be used in order to increase the productivity of the area.

METHOD OF EXECUTING FELLING/ WORKING.

The instructions for working in the Teak Plantation working circle in relation to removal of over wood received from the office of the Managing Director F.D.C.M. Ltd. Nagpur vide letter No. PLN-26/(2001-02)/5154, dated 04/02/2002, is given in the **Appendix No. XLI of Vol-II**. The sequence to be followed in executing felling is given in brief as under.

- **Demarcation of Coupe-** Coupe line of 20 mtr. wide strips of natural forest.
- **Demarcation of Section-** Section line of 5 mtr. wide strip of natural forest.
- **Preparation of Grids-** Grids of size 100m x 100m (1 ha.)
- **Unworkable Area –**
 - 1) Area of site quality IV
 - 2) Water logged area
 - 3) Rocky area
 - 4) Eroded area
 - 5) Steep slopes
 - 6) Areas having crop girth less than CCG
- **Enumeration-** 100% trees above 15 cm
- **Basal Area -** Basal Area in each grid will be measured by using wedge prism of suitable BAF (Basal Area Factor) or computed by summing up the cross sectional area of the individual trees based on over bark girth measurements.
- **Crop Girth -** Crop girth = $2 \times \text{square root of } (\pi \times B/N)$

$$\text{Crop girth in cm} = 250 \times \text{square root of } (B/N)$$

Where B = Basal Area, N = Number of trees in each grid (1 ha.)

Advanced growth will not be considered while finding basal area and number of trees

Advanced Growth = Girth upto 30 cm for site quality III

Girth upto 45 cm site quality II/III and II

Girth upto 60 cm site quality I/II and I

SUBSIDIARY SILVICULTURAL OPERATIONS: -

Operation will be carried out in the plantation already raised and to be raised during this plan. Cleaning operations will be carried out during 4th and 7th year as per the standard instructions.

OTHER REGULATIONS:-

- i) Fire protection measures will be carried out in plantations.
- ii) The area planted will be closed for grazing for 5 years period.

5.3:- IMPROVEMENT WORKING CIRCLE

GENERAL CONSTITUTION:-

- This working circle includes the area, which has by and large a mixed nature of crop, with a crown density varying from 0.4 to 0.6 and with site quality from IVa to IVb.
- The crop is predominant teak which needs improvement. Small under-stocked teak forest patches are also included in this working circle. The teak crop is suppressed and requires opening.
- Total area allotted to this working circle is 6950.373 ha which spread over 51 compartments of the division.

Distribution of Area into various ranges-

S.N.	Name of The Range	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
2	Ambadi	3687.938	455.510	13.53	2.88
3	Kinwat	3326.743	1309.952	39.37	8.30
4	Jaldhara	3968.356	2099.867	53.04	13.33
5	Shivani	4806.684	3085.044	64.18	19.54
	Total	15789.721	6950.373	44.05	44.05

GENERAL CHARACTERS OF THE VEGETATION:-

- Teak forests of site quality of IVa and IVb constitutes major part of this working circle. The teak is most dominant species. Other species are Dhawada, Salai, Ain, Bhirra, Moha, Lendi, Movai, Tendu, and Char etc.
- The crop is young to middle aged. The species like Shisham & Bija are found rarely probably in Ambadi Range.
- The density of the crop varies from 0.4 to 0.7 except few patches of under stocked forest.
- Natural regeneration of Teak, Dhawada and Ain is noticed but it is very inadequate. The proportion of malformed and unsound trees is considerably higher in degraded patches.

OBJECT OF MANAGEMENT: -

- To improve the forest in terms of composition and density.
- To promote natural regeneration of various species.
- To maintain biodiversity.
- To remove dead, dying and diseased trees with a view to facilitate establishment of natural regeneration of important species.

METHOD OF TREATMENT:-

Type A Area :-Protection Areas No marking will be done in such areas. However seed sowing of Neem, Maharukh etc. will be carried out.

Type B Area :-Under stocked areas.

- i) Removal of dead, dying, diseased and crooked trees.
- ii) All high live stumps shall be cut back.
- iii) Enrichment of sizable gap with plantation of Teak, Khair, fast growing species like subabul, and other medicinal plant species etc. or any other suitable species feasible. The plantation of Bamboosa Balcooa shall be taken where irrigation facility is available.

Type C Area :-

- i) The advance growth upto the extent of 0.50 ha. and above will be demarcated and thinning will be carried out to a spacing of one third of the top height of healthy poles, intended to be retained.
- ii) Removal of dead, dying, diseased and crooked trees. All high live stumps shall be cut back. Subsidiary cultural operations such as cut back operation, cleaning etc.

Type D Area:-

- i) These are well stocked areas with miscellaneous species. where valuable misc. trees occur. The trees with girth more than harvesting girth prescribed in Management Plan will be marked for felling

5.4:- AFFORESTATION WORKING CIRCLE

GENERAL CONSTITUTION :-

- The areas having sparse tree growth (under stock) and fit for afforestation is included in this working circle.
- It also includes areas of successful miscellaneous plantations under taken under E.G.S. and unsuccessful planted areas of Teak, Bamboo and miscellaneous species.
- Total area allotted to this working circle is 1439.651 ha.

Range wise distribution of areas-

S. N.	Name of TheRange	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
2	Ambadi	3687.938	361.560	9.80	2.28
3	Kinwat	3326.743	562.442	16.90	3.56
4	Jaldhara	3968.356	410.649	10.34	2.60
5	Shivni	4806.684	105.000	2.18	0.66
	Total	15789.721	1439.651	9.11	9.11

GENERAL CHARACTER OF THE VEGETATION:-

1. The areas under this working circle are under stocked & open with crop density below 0.4. Crop is young to middle aged.
2. The forest is degraded with compact soil.
3. The principal species is Teak which is found along with its common associates like Dhawada, Ain, Salai, Bhirra, Lendi, Movai, Khair etc. & fruit species like Tendu, Char, Moha etc..

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To maintain the biological diversity of forests by introducing mixture of species & restore eco- balance.
 - ✓ To check soil erosion and improve moisture regime.
 - ✓ To reclaim the area by
- a. Intensive soil and moisture conservation works.

b. Afforestation works to enhance the productivity through artificial regeneration by mainly medicinal plants, the indigenous species of small timber and suitable species of Bamboo including Bamboosabalcoa.

- ✓ To ensure maximum land utilization so as to generate additional revenue and employment.
- ✓ To enlist participation of local communities in order to develop awareness regarding medicinal plants, their cultivation, harvesting and marketing.

METHOD OF TREATMENT : -

The primary object of management of these areas is to restore the soil fertility and increase the productivity of land. Therefore, soil and moisture conservation works will be taken up and the areas will be afforested with suitable indigenous species of medicinal value as well as non-wood forest produce. The species to be planted will depend upon the soil type, its depth and local requirement. The following operation will be carried out.

- (i) Removal of dead and dying trees as a part of hygienic operation.
- (ii) Tending of coppice growth, if any with preference to fruit trees and important species.
- (iii) Intensive soil and moisture conservation works will be carried out in the entire area.
- (iv) In Ex-situ conservation, plantation of medicinal plants and local species will be carried out as per the site requirement.

5.5:- BAMBOO OVERLAPPING WORKING CIRCLE

This working circle includes mainly the area of successful and un established Old Bamboo plantation raised from 1992 to 2000 under Maharashtra Forestry Project. Natural Bamboo clumps are not found in this division. All established Bamboo plantations which are capable of giving marketable bamboo are included in this working circle. This working circle includes areas of successful established Bamboo plantations undertaken under Maharashtra Forestry Project from 1992 to 2000. Extent of such area is 291 ha. Areas of un-established Bamboo plantations under taken with F.D.C.M. Ltd funds since 2002 on words. The extent of such area is 83 ha. Area of Under stock area and Nursery area feet for irrigated Bamboo Plantation to the extent of 65 ha. The total area allocated under this working circle is 1187 ha which spreads over 29 compartments.

The distribution of the areas of this working circle into various Ranges are as under.

S. N.	Name of The Range	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
2	Ambadi	3687.938	341.000	9.27	2.16
3	Kinwat	3326.743	293.000	8.80	1.85
4	Jaldhara	3968.356	218.000	5.49	1.38
5	Shivni	4806.684	335.000	6.97	2.12
	Total	15789.721	1187.000	7.51	7.51

GENERAL CHARACTERS OF THE VEGETATION

Bamboo plantations have been undertaken either under natural Teak forest having density of 0.6 and above or under old Teak plantations. Species planted is *Dendrocalamus strictus* locally known as Manvel. Natural regeneration of Bamboo is rarely seen and is almost absent. Some bamboo plantations were under taken in the division under Maharashtra Forestry Project. Site quality of the standing forest varies from III/IV to IVb. Variation in quality, growth of Bamboo in these plantations was observed due to variation in soil and drainage condition. These are capable of giving marketable bamboo if worked in a systematic manner. The common variety of bamboo planted in this tract is *Dendrocalamus strictus*. These bamboo plantations formed an under-storey in the better quality forest.

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To enhance the productivity of Bamboo area.
- ✓ To sustainably harvest bamboo areas following established silvicultural system.

METHOD OF TREATMENT:-

- ✓ Bamboo will be harvested on a three years cycle basis.
- ✓ The crop will be treated on clump basis i.e. each clump will be treated independently as per the requirement.
- ✓ A cutting cycle of 3 years has been fixed. As 1st and 2nd year bamboo culms provide food and nourishment to the rhizomes under soil, the same will not be cut.
- ✓ Only 3rd year culms are fit for harvesting.

SUBSIDIARY SILVICULTURAL OPERATION:-

- Climbers interfering with the growth of Bamboo clumps should be cut.

5.6:- PROTECTION WORKING CIRCLE

GENERAL CONSTITUTION OF THE WORKING CIRCLE:-

This working circle include unworkable areas on account of various reasons such as steep slopes, exposed rocks, refractory areas, water logged areas and nalla bank etc. This working circle includes mostly the areas of refractory sites, scattered and dwarf tree growth or blanks, areas of inferior site quality unfit to sustain good tree growth which need protection from further deterioration of the site. The extent of area included in this working circle is 4566.615 ha.

The distribution of the areas of this working circle into various Ranges are as under.

S. N.	Name of The Range	Total Area of Range in ha.	Area of the W.C. in ha	% of the area of the Range	% of the area of the Division
2	Ambadi	3687.938	1417.788	38.44	8.99
3	Kinwat	3326.743	834.407	25.25	5.29
4	Jaldhara	3968.356	924.390	23.29	5.86
5	Shivni	4806.684	1390.030	28.92	8.82
	Total	15789.721	4566.615	28.96	28.96

GENERAL CHARACTERS OF THE VEGETATION:-

The areas with steep slopes have a better quality Teak forest. Density of the crop varies from 0.4 to 0.7 i.e. moderately dense to dense forest. The site quality of such crop is varied from III, IVa to IVb. Eroded blank area bears a sparse tree growth. The crop is young to middle aged. The forest areas allocated to this working circle are rocky and refractory type. It consists of degraded blanks of rocky patches as well as under stocked areas with low density and having stunted growth of Salai, Dhawada, Moha, Palash, Ain, Bheda, Anjan, Garari, Khair, Lendia and shrubby growth.

Area needs soil and moisture conservation works supplemented by direct seed sowing.

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To protect the available crop from any further deterioration.
- ✓ To reclaim this area by adequate soil and moisture conservation works along with seed sowing.
- ✓ To Protect vegetative cover along the nala and river banks and to minimize further erosion and to keep forest belt intact around water bodies.
- ✓ To reclaim encroachment areas and to prevent any further encroachment.

- ✓ To ensure maximum land utilization so as to generate additional revenue and employment by conservation of medicinal plants.
- ✓ To enlist participation of local communities in order to develop awareness regarding medicinal plants, their cultivation, harvesting and marketing.

METHOD OF TREATMENT:-

- ✓ The primary object is to protect available crop from further deterioration.
- ✓ To restore the soil fertility, to check further soil erosion by intensive soil and moisture conservation works along with the suitable tending operation.
- ✓ As area allotted to this working circle is unworkable due to various reasons.
- ✓ No harvesting work will be as area is unworkable.
- ✓ Area will be completely protected from fire, grazing & illicit cutting etc.
- ✓ Soil & moisture conservation work like continuous contour trenches, gully plugging and Nalabunding.
- ✓ Seed sowing on-trenches of suitable local indigenous species such as Neem, Khair, and Babul including species of medicinal plants and non-wood forest produce.

5.7:- MISCELLANEOUS WORKING CIRCLE

The areas reserved for Timber & Firewood depot, Nurseries, roads, building, water bodies are included in this working circle. The extent of area is 28.360 ha.

Distributions of the area of this working circle into various Ranges are as under.

Name of Range	Total area in Ha.	Area of the working circle	% of the area of the work centre	% of area to the total area of working circle	% of division
1	2	3	4	5	6
Kinwat	3326.743	22.750	0.680	80.21	0.188
Shivani	4806.684	0.610	0.013	2.15	0.005
Jaldhara	3968.356	5.000	0.125	17.63	0.041
Total	12101.783	28.360	0.234	100.00	0.234

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To maintain existing buildings, roads, sale and Jungle depots.
- ✓ The existing depots are maintained and will be expanded as per requirement and demand.
- ✓ Roads will be maintained for extraction of forest produce as well as for Intensive patrolling of forest areas for effective protection.
- ✓ Culverts and small bridges will be maintained for effective communication.

5.8:- NON-TEAK FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

This is an overlapping working circle. The total area included in this working circle is 15789.721 ha. Non-Timber Forest produces (NTFP) include all forest produce other than timber and firewood of both plant and animal origin, occurring naturally or sometimes as augmentation in forests. As compared to animal products like honey and wax, plant products natural and man-made are much diversified depending upon the availability of forest types NTFP is an output from the forest without disturbing the eco-system. Reduction in revenue from timber could be compensated.

SPECIAL OBJECTS OF MANAGEMENT:-

- To manage the Non-wood Forest Produce on a sustainable basis,
- To integrate the developmental activities for the welfare of local people to improve their standard of living
- To develop and adopt a package of scientific practices for sustainable extraction and usage of medicinal plants.
- To ensure holistic development and welfare of local people of the region

NON TEAK FOREST PRODUCE OF THE TRACT:-

- | | |
|----------------------------|-----------------|
| 1. Mohaflowers. | 10. Behada |
| 2. Gum | 11. Hirda |
| 3. Myrabolons and Dikamali | 12. Achar |
| 4. Honey | 13. Amaltas |
| 5. Biba | 14. Awala |
| 6. Bel | 15. Murud sheng |
| 7. Broom Grass | 16. Salai |
| 8. Sabai Grass | 17. Siras black |
| 9. Bija | 18. Siras white |

METHOD OF TREATMENT.

- All climber except medicinal valuable species interfering with trees and advance growth would be cut.
- Mature and fruit bearing trees should be freed from over head and lateral shade.
- These species will be planted in regular plantation programme as well as gap filling operations.
- Wherever possible plantation of these species be done to the extent of 5 %.

5.9:- SOIL AND WATER RESOURCES MANAGEMENT (OVERLAPPING) WORKING CIRCLE.

The problem of soil erosion in this division is in hilly and undulating areas. Slow and inevitable loss of surface soil is leading to exposure of the underlying unstable gravel structure and the formation of new deep gullies at many places. Some forest areas of division have been severely affected by soil erosion and want immediate

treatment. With a view to provide desired soil conservation treatment to the affected areas of the division, this Working Circle is being newly created.

SPECIAL OBJECTS OF MANAGEMENT:-

- To improve the water regime.
- To reduce the soil erosion.

5.10:- WILD LIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

Comprises of entire forest area covered in this Management plan. Total area is 15789.721 ha.

WILD LIFE FOUND IN THE AREA-

- a) **Carnivore** - Panther, Hyena, Wild dog, Wolf, Jackal, Fox and Jungle cat.
- b) **Herbivore**- Sambar, Cheetal, Nilgai, Barking deer, Wild boar, Sloth bear, Black buck.
- c) **Rodents**- Three striped palm squirrel, Jungle striped squirrel, Porcupine, Hare, Jungle Rats.
- d) **Birds**- Painted sand grouse, Common sand grouse, Pea fowl, Grey jungle fowl, Red jungle fowl, Red spur fowl, Painted partridges, Grey partridges, Jungle bush quail, Black breasted quail, Indian Bustard quill, Common or grey quail, Pigeon, Crane, Whistling teal, Black ibis, Parakeets and yellow Legged Green pigeon

SPECIAL OBJECTS OF MANAGEMENT:-

- ✓ To conserve the wild life found in the areas and also to improve their habitat.
- ✓ To manage, protect and multiply the wild life by providing protection and shelter to them.
- ✓ To conserve the biodiversity of the area.
- ✓ To bring awareness among the people about wild life prevailing in the area.
- ✓ To reduce man animal conflict situations.
- ✓ To train the staff and to strengthen the infrastructure to handle wild life emergencies.
- ✓ For monitoring wildlife advance technology like Trap Camera suggested.

METHOD OF TREATMENT:-

- ✓ Marking of 2 dead trees / 1 ha. in any felling coupes will be done and reserved.
- ✓ Existing water holes will be maintained & new water holes will be created.
- ✓ A vigilant watch will be kept on poachers
- ✓ Estimation of the wildlife population will be carried out

5.11:- ENCROACHMENT MANAGEMENT WORKING CIRCLE

The area under this chapter comprises of all the encroachment area of the Kinwat Forest Project Division in which either offence is booked and for proceedings are pending /complete under forest Right Act, 2006. The area under encroachment area devoid of any tree growth. The reverted area of this encroachment is 364.859 ha.

The distribution of area of this working circle into various ranges is as under.

Range	Area in ha.
Kinwat	348.359
Jaldhara	16.500
Total	364.859

SPECIAL OBJECTIVES OF THE MANAGEMENT :

1. To identify and pursue the pending cases of under Forest Right Act, 2006, for handing over of area to them after survey and demarcation;
2. To evict the ineligible encroachments and demarcate the area permanently on ground
3. To rehabilitate the area by afforestation and soil moisture conservation works
4. To protect the area from encroachment and all biotic pressures with the help of local villagers.

METHOD OF TREATMENT:-


1. Encroachment regularization
2. Action for eviction of encroachments
3. Encroachment eviction measures
4. Reforestation in encroachment evicted area

5.12:- MISCELLANEOUS REGULATIONS

- Area will be protected from fire rigidly. .
- Plantation area will be closed for grazing for the period of 10 years.
- The existing system of harvesting NTFP is not scientific but destructive at same times.
- Need to provide training to staff and villagers engaged in the harvesting.

MISCELLANEOUS REGULATIONS:-

1. Demarcation of areas
2. Preparation of treatment map
3. Marking of trees
4. Harvesting
5. Irregular harvesting
6. Preparation of treatment map for plantation

- 
7. Method of plantation
 8. Nursery technique (root trainer, polytube, compost)
 9. Maintenance of boundries
 10. Fire protection
 11. Roads & cart tracks
 12. Buildings
 13. Survey and maps
 14. Establishment and labour availability
 15. Unsettled areas.

CONSTRAINTS FACED DURING WRITING OF THE PLAN:-

- Writing of Management Plan according to National Working Plan Code-2014 is new and typical task for officers. as existing field staff of this division is not well conversant to new Working Plan Code.
- As compared to forest department there is no separate wing for preparation of Management Plan.
- Lack of expertise to deal with carrying out various types of surveys, laying of sample plots, recording of data, preparation of digital gird map, GIS based mapping and handling of GPS device.
- There is no facility of GIS mapping software and trained IT staff for creating interface between field data and plotting digital data. Due to this reasons every time help from Working Plan officials was required. Because of their busy schedule, timely digitization of data was not possible.
- Typical task for laying sample plots in field and collection of enumeration data.
- Stock mapping is tedious and technical work for all field officers / staff.
- It is very tough job for all field officers / staff to record data for Management plan besides their regular work like Forest protection/conservation.