

PART - II
CHAPTER – II
IMPROVEMENT WORKING CIRCLE

GENERAL CONSTITUTION

This working circle comprises such forests of Chatra North Division which have crop density more than 0.4. They are distributed throughout the district. Mainly erstwhile Coppice Working Circle forests have been grouped under this working circle.

The change from coppice system to selection-cum-improvement system has been prescribed because regeneration prescriptions of the previous plan could not be followed properly. The condition of forests deteriorated due to acute biotic pressure also the general condition of the forest could have been worse if the local people have not realized the importance of forest. People residing near these areas are active and motivated and have formed J.F.M. Committees to save the forests from further destructions. As a result the forest have developed from sapling stage to pole stage, a stage which requires a rest of at least 10 year before felling is prescribed. Also it requires proper and gradual spacing in the form of thinning. This will help in better growth of the poles and will also provide a substantial amount of timber for local need.

If the coppice system is continued the forest will deteriorate further.

This working circle contains such Sal and miscellaneous forests which can regenerate after coppicing and establish into pole crop without any special treatment.

SPECIAL OBJECTS OF MANAGEMENT

The special objects of management are stated as below:-

1. To meet the bonafide agricultural and domestic requirements of the local people specially of the N.T.F.P. without causing deterioration to the forests.
2. To improve the stocking and quality of the forests by undertaking sound silvicultural operations.
3. To maintain the vegetative cover with a view to prevent soil erosion and to conserve moisture for regulation of water supply.

4. To foster among the local inhabitants a sense of the value of forests and to win their willing a active participation in forest conservation and management.
5. To organize the management of the forests in such a way that the people living in the vicinity of the forests may find sufficient work in forestry operations so as to earn their livelihood.

AREA STATEMENT

The area covered under this working circle is 44274.65 hectare. Range wise statement is given below. The area details is given in

Sl. No.	Ranges	Demarcated Area	Improvement W.C.	Percentage
1	Hunterganj P.F. Ex. P.F. Total	25475.11 2403.48 27878.59	8604.88 1754.92 10359.80	37.16 %
2	Rajpur P.F. Ex. P.F. Total	20950.36 3278.06 24228.42	10420.66 3129.26 13549.92	55.92 %
3	Pratappur P.F. Total	24817.05 24817.05	10853.94 10853.94	43.73 %
4	Kunda P.F. Total Grand Total	17074.95 17074.95 93999.01	9510.99 9510.99 44274.65	55.70% 47.10 %

Percentage 47.10 % of Total area of Forest in the Division.

STOCK MAPS

Stock maps have been prepared by the staff of the Chatra North Territorial Division. Allotment of area under different Working Circles and the prescriptions are based on these stock maps.

DENSITY

The density varies from place to place. The density of forests allotted to this working circle varies from 0.4 to 0.6.

SILVICULTURAL SYSTEM

The crop in these forests varies in density and quality. The well stocked areas have better quality and condition of natural regeneration is also satisfactory. The growth of trees is also good. The crop is young to middle aged and so felling for improvement will be carried out. Tending of young crop will be required. In the under stocked areas tending of existing crop and artificial regeneration will be undertaken to restock the area. The best system to achieve the special objects of management will, therefore be, the improvement felling supplemented by planting and tending of natural regenerated crop. In plantation, species required by people for their domestic needs will be preferred. For coppice species the coppice crop will be future crop.

HARVESTABLE GIRTH

As a matter of fact, there is no need to fix and size of a harvestable girth for improvement felling. However felling and tending to bring normally will take place in all girth classes so as to improve the crop and induce regeneration. No regular will be done only thinning will be done and therefore surplus trees from all girth classes will be removed. Scattered matures trees will not be harvested. The small wood, poles and firewood obtained from the above felling will be utilized to meet the bonafide requirements of the local people.

THINNING CYCLE

Felling cycle should be kept at 10 years equal to the period of the plan. However due deficiency to staff it is not possible to complete the whole area in 10 years. Hence only 10,000 ha of Improvement Working Circle will be taken up for this plan.

REGULATION OF YIELD

The crop is generally young to middle aged and therefore, not much yield will be available. However, during the course of improvement felling small size timber, poles and firewood in some quantity are expected to come. These materials will be made available to the local villages and disposed off as per JFM resolution of Govt. of Jharkhand.

DEMARCATIION OF COUPE

Thinning coupes will be demarcated an year in advance of felling.

PREPARATION OF TREATMENT MAP

Soon after the demarcation of thinning coupes, a treatment map will be prepared by ROF after thoroughly inspecting the area. This map should be verified by ACF, DFO should check a few as a test case and when he is satisfied, only then next step should be taken.

The treatment map will show the following areas distinctly.

1. Protection Areas : - Those will include

(a) Steep slope above 60°.

(b) Nala banks and river courses 1 chain wide on either side.

2. Under Stocked Areas :- These will include areas with density below 0.4 including blanks.

3. Marking will be done in the same year in which demarcation will be done.

Soon after the receipt of approved treatment map, marking will be done.

The marking rules will be as follows :-

1. No marking will be done in protection areas.

2. In under stocked and well stocked areas the following trees will be marked for felling.

(a) All dead, dying, diseased and malformed trees.

(b) All but one vigorously growing coppice shoot per stool.

(c) All live high stumps. All edible fruit and flower yielding trees will be Reserved form felling.

3. As per normal stand table for quality class III site Sal the following no. of trees/ha. will retained and the rest will be marked.

Age (years)	No. of trees
10	1413
20	914
30	694

Age of the crop will be determined for Age-dia curve.

SOIL AND MOISTURE CONSERVATION WORKS

Soon after the receipt of approved treatment soil and moisture conservation works will also be taken along with marking and will be completed before onset of monsoon in the next year. These working include two main operations namely, contour trenching and nala bunding dams. Emphasis would be on rain water conservation.

Contour trenches will be taken up all over the coupe due for working. The areas above 25° slope trenches will be dug in accessible areas only. The selection of the trenches will be 45 cm to 30 cm. Soil from trenches will be heaped on the lower side of the trenches. The contour intervals between consecutive trenches will be 1.5 m. Depending upon the slope, the distances between two consecutive trenches will vary. As follows:-

Slope in degree	Distance between consecutive trenches
Upto 15	8 m
15 to 25	5 m
Above 25	3 m

Nala bunding/check dams will be constructed to reduce run off and to arrest the silt. Nala bunding will start from the top of nala downwards.

METHODS OF REGENERATION

In the year following the year of thinning, the naturally regenerated seedlings will be cleared off all under growth and will be spaced out uniformly so that no. of seedling per ha. Corresponds to no. of trees to be retained /h in the normal stand table for given site and composition of the crop. In the areas with inadequate natural regeneration, artificial regeneration will be taken in year following the year of thinning.

SUBSIDIARY SILVICULTURAL OPERATIONS

The following operations will be carried out, in the year following the year of thinning and in subsequent years.

A. Cutting back Operation:

- (i) Felling of standing trees, marked for felling but not felled.

- (ii) Felling of trees damaged during felling, which are not likely to recover.
- (iii) Climber cutting.
- (iv) Cutting of coppice shoots where natural regeneration is adequate.
- (v) Cutting of malformed regeneration above 15 cm g.b.h.
- (vi) Cutting of coppice shoots where natural regeneration is adequate.
- (vii) Cutting of malformed regeneration above 15 cm g.b.h.

B. Cleaning : In the sixth year from the year of thinning the following operations will be done.

- (i) Climber cutting.
- (ii) Cutting of all coppice shoots where naturally regenerated two planted seedlings are adequate and reducing them to per stool where regeneration is inadequate.
- (iii) Removal of undergrowth interfering or likely to interfere with the growth of seedlings.

THINNING

Thinning will include the following operations.

- (i) Climber cutting.
- (ii) Removal of dead, badly damaged trees or trees uprooted by wind or storm after leaving two dead trees/ha. for benefit of wildlife.
- (iii) Reduction of coppice shoots to two vigorously growing shoots each stool.
- (iv) Removal of inferior growth, interfering or likely to interfere with the growth of species.
- (v) Fruit trees will not be felled except if they are congested themselves.

OTHER REGULATIONS

Protection : Protection from fire and grazing is the prerequisite for the success of regeneration. Since the areas are in the proximity of the villages, special efforts will be required to protect these areas from fire, grazing and illicit cutting. The thinning coupes will be rigidly fire protected for a period of five years from the year of felling. These coupes will remain closed to grazing for a period of five years from the year of felling. Rotational grazing should be practiced. To have success in this mission, local villages should be involved right from formulation of scheme to the final implementation of rotational grazing.

PART II
CHAPTER - III
REHABILITATION WORKING CIRCLE

GENERAL CONSTITUTION

This working circle comprises all the villages containing forests which have been maltreated in the past and have been, as result of such maltreatment, reduced to scrub. Many of such forests have been reduced to what at present is designated as "Rooted Wastes". The rooted wastes of both Sal and Miscellaneous Spp. have been included in this working circle. Also included are areas in need of special treatment as a result of denudation, soil erosion etc. the density of the crop is less than 0.4.

SPECIAL OBJECTS OF MANAGEMENT

To protect the rooted wastes of Sal and Miscellaneous forests against unregulated cutting, grazing and fire and to improve them by cutting back and proper operations thereafter.

- (i) To rehabilitate the rooted waste forests by sowing and planting of suitable species in gaps and degraded land.
- (ii) To take anti-erosion measures and improve the soil and moisture conservation capacities of these lands.

ANALYSIS OF CROPS

As mentioned in paragraph above, the forests included in this working circle are of two types, namely Sal rooted wastes and Miscellaneous rooted wastes. These forests are situated in the midst of densely populated areas and as a result they have to bear biotic pressure. Most of these forests have been cut repeated as very high incidence of the stumps and pollards are visible. Heavy grazing and repeated forest fires in the areas added to the woods of the forests. Regeneration is completely absent and has affected ground flowra. The villagers nearby these forests take dry leaves, twigs & branches leaving the ground bare which becomes completely hard subsequently. Any seeds that fall generally fail to regenerate. In many areas, crop consists of sapling, sprung not from the ground but from high stumps and pollards. There are many areas where the forests have been completely

destroyed and soil washed away leaving exposed the parent rocks. Scattered trees, bushes occur here and there.

STATEMENT OF AREA

The total area allotted to this working circle is 5806.65 hectare. The details are given below:

REHABILITATION WORKING CIRCLE (AREA IN HECTARE)

Sl. No.	Ranges	Demarcated Area	Rehabilitation W.C.	Percentage
1	Hunterganj P.F. Ex. P.F. Total	25475.11 2403.48 27878.59	128.98 17.13 146.11	0.52 %
2	Rajpur P.F. Ex. P.F. Total	20950.36 3278.06 24228.42	1530.09 - 1530.09	6.31 %
3	Pratappur P.F. Total	24817.05 24817.05	2939.15 2939.15	11.84 %
4	Kunda P.F. Total Grand Total	17074.95 17074.95 93999.01	1191.30 1191.30 5806.65	6.97 % 6.17 %

Percentage 6.17 % of Total area of Forest in the Division.

METHODS OF TREATMENT

The forests consisting of Sal saplings sprung from the ground and not from high sumps or pollards need not require cut back. These forests need protection against further cutting, grazing and forest fires.

Followings are the guidelines for rehabilitation.

1. **FENCING** : Fencing is the first step of treatment for rehabilitation. Fencing will be done by cattle proof trenches, stone wall, brushwood, barbedwire or bamboo depending on site.

2. **CUT BACK** : Cut back operation would be done in the areas where roots stocks are available. All high stumps, pollars would be cut to the ground level. The guidelines issued by the C.C.F., Development, Jharkhand, will be followed.
3. **PLANTATION** : About 40% of the rehabilitated area is to be planted. The blank areas of 0.4 hectare and above will be planted with indigenous species of the area. The procedure of plantation, casualty replacement, tending operations, protection etc. will be in accordance with the Green-Book and the guidelines issued by the C.C.F., Development, Jharkhand from time to time.
4. **SOIL AND MOISTURE CONSERVATION MEASURES** : In area affected by erosion, steps are to be taken up to check it. These will consist of construction of check dams and gully plugging. Diversion channels will be constructed. Sal forests on plain land with bare floor need contour trenching at suitable intervals, ploughing up the land in between the contour trenches. These will supplement the natural regeneration of Sal.
5. **Species to be planted** : Following plantations models are suggested :-
In RDF scheme 1000 plants/ph are planted.
Following species may be planted under this scheme.
 - (i) On trenches bers, Oilenthus, Sahjan, Subabul, babul, Kachnar, Sarifa, Bei etc. may be planted in two rows. For fuel and fodder species spacing may be in 1m x 1m and for other species 2m x 2m.
 - (ii) Following may be the number of species per hectare:-
 - (a) 100 - Bamboo
 - (b) 200 - Aonla, Harra, Bahea
 - (c) 200 - Karanj
 - (d) 300 - Presprouted sisam, Kala sisam, Gamhar, Semal & Teak.
 - (e) 200 - Bei, Mahua, Neem, Argin, Kathal, Mango, Jamun, Piar, Palas, Bagod, Pipal, Imli, Asan, Karam, Champa, Sidha, Toon, Kadam, Bakain, Bel, Siris, Pakar, Salai, Dhaura, Rohar, Arjun, Pandan, Kekar, Jhingau etc.
 - (iii) 2000 cuttings/ha of Bar, Pahar, Pipal would be planted for birds.
6. **PROTECTION FROM GRAZING AND FIRE** :- It is essential to protection the treated areas from fire and grazing.

7. **Economics of plantation model** : Taking the plantation area of 50 ha as unit, following may be the output.

i) For a plantation block of 50 ha, the average perimeter taking for fencing is 250 chains at the rate of 5 chain/ha. Suppose the average length of trench fencing per ha is 3 chain, we will get 150 chains/block for plantation. That means $150 \times 20 \text{ m} = 3000 \text{ m}$ length would be available for plantation on trench brews. Two row plantation would be proposed. In the first row babul, sub-babul, oilenthus Augrest & Kachnar will be planted on 1 m x 1m spacing. In the second row Sarifa, ber and sahjan would be planted at 2m x 2 m spacing.

After one year from 3000 fodder & fuel wood trees, the villagers would get 6000 kg of fuel wood & fodder. At rate of Rs. 2/kg, the out put would be Rs. 12000/- plantations/yr.

ii) From 750 plants of Sajhan, Sarifa & Ber we may get of least 15000 kg of fruits per season. At an average of price of Rs. 4/kg the return would be Rs. 6000 per year.

iii) 5000 bamboo will be planted per block, from the 4th year on ward at least 30,000 bamboo, at the rate of 6 culms per clump, per would be harvested. Taking the price of one bamboo as Rs. 10/- the return will be Rs. 300000/per year.

iv) If we plant 10,000 myrobalans per plantations block, after 5th year of leaf 2 kg fruits per plant will be produce. That means in 5th, 6th, 7th year 20,000 kg fruits will be available for sale. If this is sold on Rs. 2/kg the returns will be Rs. 40,000/kg. From 8th year the tree would be mature and 20-25 hg/tree would be productions. If we take 20 hg/tree as the average productions of marybalons, the traf production per year would be 40,000 kg, the price of which would be Rs. 8,00,000/- at the rate of Rs. 2/kg.

v) If 10,000 Karanj plants are planted, the 8th year we will get 20,000 kg leaf of Karanj, market value of which would be at least 40,000. After 10th year, when the tree becomes mature, per tree production would be 25-30 kg. Taking average production of 25 kg/tree. The total production would be 250000 kg, valued as Rs 5,00,000 at the rate Rs. 2/kg.

vi) When we plant 15000 pre-sprouted timber species, thinning will be done in the 10th year 50% trees will be removed. That means 7500 poles will be available, market value of those will of least Rs. 75,000/- of the rate of Rs. 100/tree.

vii) We are planting 10,000 other species fruits, timber, firewood etc would also available from these plants. If we consider the production of fuelwood, fodder & NTFP or an average rate of 2 kg per plant, we will get 20,000 kg of such products after 6th year, the price of which may be Rs. 40,000/year.

Benefit may be tabulated as follows

Sl. No.	Fuel & Fodder	Bamboo	Marybolons	Timber	NTFP	Karanj
1	-	-	-	-	-	-
2	0.18	-	-	-	-	-
3	0.18	-	-	-	-	-
4	0.18	-	-	-	-	-
5	0.18	3.00	0.40	-	-	-
6	0.18	3.00	0.40	-	0.40	-
7	0.18	3.00	0.40	-	0.40	-
8	0.18	3.00	8.00	-	0.40	-
9	0.18	3.00	8.00	-	0.40	0.40
10	0.18	3.00	8.00	-	0.40	0.60
11	0.18	3.00	8.00	7.5	0.40	8.00
	1.8	21.00	32.20	7.5	2.40	73.90 lacks

From different products (Rs. In lacs)

The production will increase with time. In addition to above direct benefits many indirect benefit would also occur. The above table indicates that the next year from RDF plantations of 50 ha, we get on an average R. 4.61 lacks/ha/10 years or .46 lacks/year. This average is calculated treating plantations area as 16 ha, as only 40% area is planted under this scheme.

Above data are based on market survey & experience in the field. This model is proposed to be implemented and result may be recorded so that in the next working plan revision, we can incorporate these data. If these statistics are understood by villagers, plantations will survive for a long time.

To increase the return value addition may be encouraged.

CHAPTER – IV PLANTATION WORKING CIRCLE

GENERAL CONSTITUTION

This working circle comprise of :

- (a) Areas on which plantation have already been raised and
- (b) Areas plain to undulating with good soil condition which have become denuded and are fit for plantation.
- (c) Blank areas.

SPECIAL OBJECTS OF MANAGEMENT

In view of this working circle a single set of objects of management shall not be applicable to the whole of the working circle. The objects of management are therefore set forth separately for the planted and plantable areas.

SPECIAL OBJECTS OF THE MANAGEMENT OF EXISTING PLANTATION

- (a) To improve the stocking quality of plantations by scientific management including operations.
- (b) To meet the ever increasing demand of forest products for local people and for local wood based industries by sale of the products, if any
- (c) To ensure soil and moisture conservation.

SPECIAL OBJECTS FOR THE MANAGEMENT OF PLANTABLE AREAS

To re-vegetate blank areas with a view to increase the vegetation cover and forest productivity.

- (a) Consistent with the above to ensure soil and moisture conservation.
- (b) To plant a mixture of species so that income starts flowing after one year.

STATEMENT OF AREAS

The total areas allotted to this working circle consisting of 43602.62 hectare including existing plantations and the plantable areas. The details are given below :-

PLANTATION WORKING CIRCLE (FIT FOR PLANTATION)
(AREA IN HECTARE)

Sl. No.	Ranges	Demarcated Area	Fit for Plantation	Percentage	Exploitable plantation	Percentage
1	Hunterganj P.F. Ex. P.F. Total	25475.11 2403.48 27878.59	14383.58 631.43 15015.01	53.86 %	2357.67 - 2357.67	8.46 %
2	Rajpur P.F. Ex. P.F. Total	20950.36 3278.06 24228.42	7928.38 148.80 8077.18	33.34 %	931.35 - 931.35	3.84 %
3	Pratappur P.F. Total	24817.05 24817.05	10382.34 10382.74	41.83 %	466.41 466.41	1.88 %
4	Kunda P.F. Total Grand Total	17074.95 17074.95 93999.01	6293.74 6293.74 39768.27	36.86 % 42.31 %	78.92 78.92 3834.35	0.46 % 4.08 %

Percentage 46.39 % of Total area of Forest in the Division.

DESCRIPTION OF THE PLANTABLE AREAS

Mostly blank or semi blank areas are included in this working circle. Impact of biotic factors on the forest, especially close to habitation and towns has severally affected these areas. Due to heavy grazing illicit cutting and fires, many areas have become degraded and some are now complete blank. Failure to regenerate after felling has converted main areas into semi-blanks.

DESCRIPTION OF EXISTING PLANTATIONS

Plantations of mainly Eucalyptus, Chakundi and Accacia are existing in the division.

METHOD OF TREATMENT

As discussed in above paras the following prescriptions are laid down for guidance.

- (i) By and large the treatment would aim at filling up the intermittent blanks by planting suitable indigenous species depending on edaphic and biotic factors of the areas. The details of the method of treatment would be as per the guidelines for plantation issued by the C.C.F. Development, Jharkhand, from time to time.
- (ii) Plantation areas will be protected at least for three years.
- (iii) Cultural operations including casualty replacement should be carried out.

SILVICULTURAL SYSTEM

The silvicultural system adopted is clear felling with artificial regeneration. Species that coppice well will be regenerated by coppice growth. Natural regeneration of valuable species wherever found in blank areas would be tended and adopted as one of the planted seedlings and would be given the same treatment as that to the planted seedlings.

ROTATION

Keeping all these points in view rotation for plantation shall be 10 years.

HARVESTING OF OLD PLANTATION

A total of 3834.55 ha. plantation have been raised since 1985 till date. The success of old plantation are not very good. At the time of maturity one hardly gets 30-40% plants of the total planted. It will be in fitness of things that the mature plantations of 10 years and above should be exploited by State Trading Wing of the Forest Department. It was observed during revision of this working plan that old plantation have not regularly been harvested. Divisional Forest Officer must ensure that all such plantations which has attained the age of 10 years should be harvested on priority. Harvesting schedule is annexed as annexure.

Most of these plantations are of fast growing species like Acacia, Eucalyptus and Chakundi. Subsequent to felling replanting should be carried out in next year.

PREPARATION OF SITE MAP

A site map of the plantation area on 16"=1 mile scale shall be prepared. This map will indicate in detail the following features:

- (i) Natural and plantation species doing well with suitable rotations.
- (ii) Sal and miscellaneous rooted waste areas.
- (iii) Depth of soil and its texture.
- (iv) Blanks
- (v) Natural regeneration, if present, of valuable species.
- (vi) Length of boundary line with indication about suitability of cattle proof trench fencing and boulder fencing.
- (vii) The above map will form the basis of subsequent operations recommended.

METHOD OF EXECUTION OF FELLINGS

- (a) In addition to trees retained along the boundary line no Bamboo, Seal, Mahua, Kend, Kusum, Kaju and Karanj shall be felled.
- (b) Before starting regular working in plantation coupes a 20' wide strip shall be cleared along the boundary line inside the coupe. Felling shall start from one end and progress systematically. Haphazard and selective felling shall not be allowed. Felling will be taken up section wise and it will not proceed in the next section till the work in the preceding one has been completed.
- (c) Young, healthy and well formed saplings shall be left which would form part of the future crop.
- (d) Fellings are to be done in such a way that the retained trees are not damaged. All trees including old high stumps and pollards shall be cut with sharp tool to give a clean cut as close to the ground level as possible. The stumps shall not be more than 15 cms in height in any case and should preferably have a slight slope to discourage any accumulation of water on the top.
- (e) All climbers on the trees retained in the coupe area will be cut along with main felling.
- (f) Trees falling in Jahiras or Sarnas (sacred groves) shall not be felled.

- (g) Re-afforestation shall be immediately taken up once the plantation coupe has been worked.

TREATMENT OF AREA AND PLANTATION OPERATIONS

The treatment after main felling or clearance of site shall aim at rehabilitating the areas within the plantation coupe by fencing, plantations and by exercising rigid protection from fire, grazing and unregulated fellings. The details of the plantation technique, the cost involved etc. would be guided by the schedule of rate approved by Chief Conservator of Forests (Development) and VANROPAN PADHATHI Prosprouted Semal, Teak, Shisam, Gamhar would be planted. Toon, Ailanthus, Bakain, Bamboo, Neam would be planted. Under this working circle plantation would be done under following schemes.

Govt. of Jharkhand Scheme

1. Q.G.S.
2. Soil Conservation & Afforestation
3. Development of Minor Forest produce
4. Lac Development

Govt. of India Scheme :

1. Plantation of mixed species
2. Management Intervention

It is proposed that 1500 ha. of forestland annually would be treated under this working circle. Thinning in plantations areas would be done in 5th & 10th year. The quantum of thinning would be decided on the basis of species.

CHAPTER – V
BAMBOO OVERLAPPING WORKING CIRCLE

This Working Circle comprises of bamboo bearing forests. A separate management plan has been already prepared by the Working Plan Officer Hazaribag and it has been approved by the MOEF, Regional Office, Bhubaneswar vide letter no. 13 FCWP-BH-CHATRA NORTH-FCE dt. 29.04.2003.

CHAPTER – VI

MANAGEMENT OF NON-TIMBER FOREST PRODUCE

INTRODUCTION

The forest contains large no. of tree spp. yielding important minor Forest produce. They are Kendu leaves, Sal seed, Mahua, Amda, Sabai, Grass, Salai & other Gums etc.

Logical people have privilege to collected by JSFDC through their authorized agent from the primary collection centers, to ensure that primary collection centres, to ensure that primary collections get remunerative wage. A committee is constituted by Government which fixes the price of collections of various items every year.

It has been observed that the no. of M.F.P. yielding tree is quit less & still reducing & the yield is also less. Hence it is necessary to increase their no. in various plantation scheme, and the collection, storage, transportation & marketing of M.F.P. should be improved.

- Statistically & technically sound method of M.F.P. Collection, Storage & Processing should be documented by JSFDC/VMPC in consultation with state silviculturist & large scale distribution of information booklets should be taken up periodically.
- Training camp of local villagers, agents & local forest staff to impart technical knowledge regarding collection, storage & processing of M.F.P. should be organized by JSFDC/VMPC in co ordination with territorial Division.
- Expertise to graft high yielding variety of Amla should be imparted to local villagers & forest personnels. JSFDC/VMPC should organize training camps in co-ordination with territorial staff. At least 2 camps in every range per year should be organized.
- Leaf cups & plates making from sal leaves & basket from bamboo will generate ample employment among tribal women. 5 such centres should be developed by JSFDC/VMPC in every range.

KENDU LEAF

Kendu leaf has emerged as a big revenue earner since 1973. When kendu leaf trade was anchorless comprehensive rules have been framed under the Act to regulate the collection, storage & marketing of kendu leaves is decided from time to time on state level & there are enforced all over state.

SAL SEED

Like kendu leaf, sal seed has also gained importance from revenue point of view. Previously sal seed used to be collected by private contractors. Since 1977 this is being done departmentally through the agency BSFDC (presently by JSFDC).

SABAI GRASS

Occurrence of Sabai grass (*Eulaliopsis binata*) in the division is very poor. But some arrangement for exploitation of sabai grass should continue.

SALAI GUM

The gum of salai (*Bowellia serrata*) is used as incense. At present it is not being sold. It is quite like that it may sell if put to auction.

Salai occurs on hill tops and hill slopes in the following beats. Incidence of salai trees in other beats is rather insignificant.

Separate lot for each of the Beats mentioned above will be made. The tapping rule for salai gum as followed in Hazaribagh Circle should be followed. These are reproduce below:-

TAPPING RULES FOR SALAI GUM

- (i) Only trees of 95 cm dia or above at breast height will be tapped.
- (ii) The bark will be blazed in a 15cm broad strip at a height of 45cm from the ground level to depth of the bark.
- (iii) After three weeks another 0.5cm wide strip will be blazed to freshen the upper age of the strip. Subsequent freshening will be done in a similar manner after one week's time.

- (iv) The gum should be collected before each freshening.
- (v) During subsequent two years fresh strip of 15 cm width will be made just above the previous year's strip other operation will be same as in the first year.

KEONJI GUM

Since occurrence of keonji trees is limited to stony hill top and slope, their number in the Division is rather very small. Hence further intensification is not considered necessary. The present arrangement for exploitation of keonji gum will continue.

OTHER GUMS

Gums of other species like Dhauta (*Anogeissus latifolia*) Piar (*Buchnanian lanzan*) and Galgal (*Chocholospermum religiosum*) have also commercial importance. These should also be sold in a similar manner as keonji gum. Instead of forming separate lots for these gums, they should be sold along with keonji gum.

TAPPING RULES FOR KEONJI & OTHER GUMS

Trees of the following sizes only will be tapped.

- | | | |
|-----------|---|-------------------------|
| 1. Dhauta | - | 45 cm dia (bh) or above |
| 2. Piar | - | 45 cm dia (bh) or above |
| 3. Galgal | - | 45 cm dia (bh) or above |
| 4. Keonji | - | 95 cm dia (bh) or above |

For the purpose of tapping the stem of the trees will be divided into three zones-upto 80 cm. to 140 cm and 140 cm to 200 cm above ground level. These will be tapped during consecutive three years.

In the first year the lowest zone will be tapped. The bark will be removed in the shape of a rectangle 15 x 10 cm, at a height of 30 cm from ground level by a sharp axe to a depth of 2.5-3.0 cm only (0.6cm in case of Dhauta) so as to make a 0.5 cm deep wound in the wood. Generally only one blaze will be made, but if the girth of the tree is more than 140 cm two diametrically opposite blazes will be made.

The blazed portion will be cleared off all fibers so that the gum does not get dirty.

The lower edge of the out portion will be sloping so that rain water does not stagnate there.

The wound will be freshened along the two vertical and top edges by removing the bark and wood to the original depth. The gum will be collected every week before freshening of the wound during one tapping season the size of the wound will not be more than 47.5cm to 12.5cm. In the second year the tapping will be done in the middle zone. All operation will be same as those in the first year. The wound, however, will be made on the opposite side of the wound made in the first year leaving a 10 cm broad unbiased strip all round the stem of the tree.

In the third year the tapping will be done in the top zone. The wound will be made in the middle of the wounds made in the first and second year leaving a 10cm broad uncut strip all around the stem above the second year wound. All operations will be same as those in the first year.

In the fourth year the tapping will again be done in the bottom zone. But the wound will be made on the opposite side of the first year's wound. Similarly the tapping in the fifth and the sixth years will be done in the middle and the top zones respectively.

No tapping or collection will be done from 1st July to 15th October.

No tapping will be done from trees which are due for felling. Gum will be collected from the stump after felling.

OTHER MINOR FOREST PRODUCE

A number of minor forest produce are gaining importance due to rise in industrial demand for them. The oil seeds like Mahua, Karanj, Kusum are increasing in demand due to rise in demand for vegetable oil in the country. Different parts of a number of forests trees and plants are gaining importance for their use in industries. The Division will take care of their exploitation and marketing in accordance with further policy.

CHAPTER – VII MISCELLANEOUS REGULATIONS

MAINTENANCE OF BOUNDARY PILLARS

List of boundary pillars are given in the annexure. The boundary line & pillars are not regularly maintained. The state of boundary pillars of erstwhile PPF is not good. Though at vulnerable points the old boundary pillars have been replaced with concrete pillars, they are very few number.

The basic records showing demarcation of forest is on cadastral map on 16"=1 mile.

Boundary pillars need repairing total Boundary Pillars should be repaired in planned way during this plan.

GRAZING

Grazing causes maximum damage to the forest flora & soil. Grazing also makes the ground hard & compact by constant trampling. It is most important cause of devastation & degeneration of forest from grazing should be restricted.

- (a) Beat Guards and Foresters should be made responsible to conduct village meeting and appraise the villagers about closing the areas. Request them for co-operation to control grazing and finalize some way out for the grazing of their cattle every year after plantation season.
- (b) The R.O.F. should prepare a rotational grazing programme in consultation with the local villagers this programme should be approved by the territorial DCF and then it should be sent to every village Sarpanch, Beat guards.

Rotational grazing is more a matter of culture and has to be decided in consultation with the local people. The need of the people and different villages may be different and changes from year to year and hence it is not possible to give a programme in advance. Therefore the executive staff should design the rotational grazing programme in consultations with local villagers.

FIRE PROTECTION

List of fire protection lines are given in annexure.

Occurrence of fire is annual feature of the Division. The injury by fire is caused in different ways. It dissociates the soil. It kills the young plants out rightly It also injures grown up plant.

Fire generally occurs in late Feb or March during Mahua flower season. During Mahua cleared before Mahua season & fire watcher on daily wages should be employed against fire fighting work. Detail account has been given in the chapter improvement working circle.

FIRE TRACING

(i) Instruments for Communications

With each fire protection party the vehicle and wireless are to be provided. Watch tower should also be equipped with wireless during fire season.

(ii) Purchase of fire fighter instruments.

- (a) Air cleaner
- (b) Power Chain Saw
- (c) Fire Fighter Van
- (d) Binocular
- (e) Fire resistant tents
- (f) Fire resistant dresses

(iii) Training and Public Awareness

The necessary training for fire fighting should be given to the protective staff and the people to forest. The awards and prizes should be given to people and staff who perform well in controlling fires.

The meetings and training camps should be arranged to create awareness for controlling fires among the public.

NURSERIES

To ensure adequate supply of seedlings, stumps and bamboo rhizomes for planting, it is important that sufficient stock of good quality is available at the time of planting.

A. Permanent Nurseries

Each Range should have one or more permanent nurseries where seedlings requiring more time will be raised central nurseries should MFP species. These permanent central nurseries should be kept under control of one forester. Permanent nursery should have permanent water source. Other technicalities about nurseries are well known to territorial divisions, hence need not be elaborated.

B. Temporary Nurseries

Besides permanent nursery each range may have temporary nurseries depending upon the number and distance of plantation sites. All care should be taken to have perennial source of water. Only hardy species and species requiring large number of seedling should be raised in such nurseries, so that transportation cost could be minimized. Strees should be laid on having permanent nurseries. Nurseries techniques are well known to territorial division staff, however it is a thing of constant research and changes. It is not needed here to give in detail the nursery technique of the species.

Usually temporary nursery are raised near planting work. Permanent nursery should also raised which will be benefited to local people & planting work. Permanent nursery should also raised which will be benefited to local people & planting work. Top priority should be given for raising fruit bearing spps, fodder spps & medicinal plants for meting the demand of local people.

FOREST VILLAGE

There is no forest village in the Division. The villages that lie near the forest area or inside area are dependent on forest produce.

BUILDING

A list of Rest houses & other building of the Division is given in annexure. General maintenance should be done annually. Some forest guard & Forester quarter needs special repair. New Forester & Guard quarters are required in almost all the beats.

FOREST ROADS

A list of all forest roads of the Division is given in annexure. All fair weather roads need annual maintenance every year after rainy season. Almost all the roads require new culverts and causeways besides special repair work.

ILLICIT FELLING & ENCROACHMENT

List of encroachment cases is given in annexure I – VII.

EROSION & SOIL CONSERVATION

Erosion is very common feature all over the forest. It is very serious in a number of places where the forest are heavily grazed & ground cover is absent for most of the slopes beyond 15 degree to 20 degree. Erosion has been aggravated by frequent fires, unrestricted grazing & hilly topography. Gully erosion can be seen at foot hill & at heads of rivers & nallas. Erosion should be checked by soil conservation means like trenching, gully plugging, check dam etc. It is proposed that soil and moisture conservation works should be taken up in all the working circles as and where required.

METHODS OF SOIL CONSERVATION

There is no doubt that most of the continued degradation and the low productivity of the forests is attributed to the immense biotic pressure generated by the increase of human and cattle population, growth of civilization and industries, increase in demand for mining timber etc.

Thus the problem is not just of planting up the blanks restoring the degraded forests to good cover and treating the heavily eroded areas, it is also one of mitigating the biotic interference by the regulation of grazing, provision of non-forest produce by providing suitable substitutes, creating mass awareness, involving the fringe dwellers in the rehabilitation and management of degraded forests and above all generating sufficient employment opportunities and creation of healthy living conditions in the village through interface development.

TREATMENT MODELS

HEAVILY ERODED FOREST LAND

ADVANCE WORK

- (i) The site to be protected against grazing by trench fencing of 1.75 m x 12.5m x 1.25m size.
- (ii) Contour trenches to be dug on hill slopes and foot hills of 30 cm x 30 cm x 8 m size, 2 m apart along the contour spaced in staggered fashion against the contour, 1 m apart in case of gentle gradients.
- (iii) In case of small erosions, where gully formation is on way gullies to be plugged by small sized check dams and diversion channels to be provided.
- (iv) Ring bund or circular trenches to be provided on tops or gullies.
- (v) In case of ravines or widely gullied portions, silt detention dams to be constructed.
- (vi) The projecting ends of land enclosing the ravines or branched gullies to be joined by stone wall or masonry check dams with safe outlets.
- (vii) Raising nursery for the selected spp. of plants in 30% excess of the requirement.
- (viii) Digging of pits 30cm x 30cm x 30cm x 30cm, 3m x 3m apart.

COMPLETION

- (ix) All gully plugs check dams and silt detention dams to be vegetative reinforced by planting indigenous grasses and plants like phoenix spp. Vitex negundo Jatropa spp, Khair etc.
- (x) The whole area to be planted up with suitable spp. like Khair, shisham, Ber, Ficus spp. etc. at 3m x 3m spacing with seed or broadcast sowing of grasses like Sabai, Vetiver etc along the contours.

POST TREATMENT OPERATIONS

- (xi) Employing a cattle watcher from among the fringe villagers for protection of each 50 hectare, up to the end of the second year of completion.
- (xii) In case of the treated land falling in the forests with rights protection to be entrusted to the village forest committed, reimbursing them the wages of the cattle watchers.

CONSTRUCTION OF CHECK DAMS AND WATER HARVESTING TANKS

OBEJCTIVE

- (a) To check the surface run off of water.
- (b) To retain water for a longer period of the year.
- (c) To improve the moisture regime of the sub soil.
- (d) To provide small irrigation facilities.
- (e) To provide drinking water for the village cattle.
- (f) To encourage the culture of fishery.

ACTIVITIES

- (a) Construction of masonry check dams on streams.
- (b) Construction of earthen water retention dams and water harvesting tanks on community land.
- (c) Planting of fodder and soil binding species of trees on the raised banks.

GOOD FOREST COVER

The portions of forests enjoying a good cover of trees should also be reinforced against the slow erosion process by contour trenching on slopes contour bunding on gentle ones, the berms of the trenches or bunds being planted up preferably with the trees species naturally growing all around or to be left as such for natural regeneration of sal and its associates in predominantly sal areas of good crops.

- (i) In localities where bamboos are naturally found in the surroundings it should be planted in proportion.
- (ii) In reverain areas Sissoo, Jamun, Tamarind, Anwala etc. should be selected for planting.
- (iii) By the berms of trenches Sissoo, and Gamhar should be planted with an outer closed row of Babul or Agave.

TOURIST SPOTS

Chatra is known as the land of Buddha. It is said that Gautam Buddha traveled variedly in this area and meditated at a number of places. Some of the tourist spots in the division.

1. Kauleshwari Pahar :- Famous for Jain, Buddha Hindu temples. There is a lake at the hill top. Tourist can enjoy a 6-7 km track.
2. Tamashin : - It is in Rajpur Range famous for water fall.
3. Barnda Sharif in Pratappur is famous for pir Baba Majar.
4. Kund Pahar :- Rains of the palace kind of Chatra.
5. Kunda caves : It is believed that pandavas lived here.

CHAPTER – VIII
MAINTENANCE OF RECORDS AND CONTROL

CONTROLS AND RECORDS

Control forms are essential instruments to scrutinize the progress of true implementation of the working plans; Similarly various other records keep the continuity of management as well as throw light on the adequacy of management options. Of the control forms and records are not getting the due priority or importance and therefore it is emphasized that the territorial division will strictly maintain the following.

1. Control Book
2. Compartment History
3. Control Journal
4. Deviations Register.

The record of annual exploitation operations will be maintained in the range of division office in the control forms. A bound (strong) control book will be maintained in the office of Deputy Conservator of Forests showing very clearly the details of control forms. The copy of these control forms should be sent to D.C.F. Working Plan Hazaribagh. Thinning will also be reflected in control forms. The artificial regeneration an operation carries out annually will be recorded in control form No. 4 giving details under different working circle and maintained both at Division & Range level. A bound (strong) control book of this form showing the work off raising the plantation by felling series will be maintained as permanent record in divisional office. The posting and maintenance of control records is matter of vital importance and must always be thoroughly checked by the ACF and D.F.O. should give his personal attention.

DEVIATIONS REGISTER

A consolidated register of deviations showing every case of deviation from the prescriptions of working plan the need for the deviation and authority under which it was sanctioned should be maintained.

COMPARTMENT DESCRIPTIONS AND HISTORY FORMS

The compartment histories will be maintained for each compartment giving all relevant information regarding the compartment. Each compartment will have its own file records but will be arranged by felling series and kept in loose leaf binders.

- (a) Maps = Stock Maps and Treatment maps
- (b) Form No. 2 & 3 – Giving details of out turn Form No. 1 – It gives the details of climber cutting and cultural operation (records).
- (c) Form No. 4 – Plantation register. It gives the details of Plantation activities. Form No. 5 & 6 – 5 and 6 gives the compartment description and compartment history respectively.
- (d) Form No. 7 – It gives trees marked for felling girth wise.
- (e) Form No. 8 & 9 – It gives the idea of work done in and before the first season and work done after the season.
- (f) Forms No. 10 – It gives the record of plantation in division. Forms No. 5 and 6 give the compartment history and description. It should have entries for each year. It should have brief not of area closed under rotational grazing specifying the area and year to closure, status of regeneration, protection, tending operation etc. This form should invariably be filled by ACF. Detailed results of enumeration should also have its report along with form no. 5 Any special exercise taken up in the compartment should also have its report along with form no. 5 Conservator of Forest or Senior Office should invariably ask for such descriptions before going into the field. This will bring alertness in the staff to regularly complete the compartment history and maintain it beautiful. Any laxity on this part should not be taken lightly. Copies of total enumeration work (detailed results) will be supplied to territorial DCF. Copies of compartment histories of all compartments will also be given.

CONTROL JOURNAL

The control journal gives the details of the management of the areas. Control journal will be maintained at the division level under the direct supervision of DCF. The journal will provide objective analysis, experience sharing on all the aspects of the administration. Journal should contain the commentary on all aspect but briefly. It should especially give analysis and suggestion on the extent to which the objects of the working

plan have been realized and the extent to which the methods prescribed have been found suitable. Subjective remarks without any analytical approach should not be given in the journal. It should contain suggestion for modifications and improvements in the method of working. The DCF should take the journal along with him during camps and record the observation during and after the inspection. The Control Journal will be of great help when the plan will come up for revision. It is technical record containing experience sharing, observation and suggestion of DCF hence personal attention of DCF is required for such document. The strict maintenance of this record may be done making it compulsory to attach the copy of the pages along with the diary.

RECORD OF PLANTATIONS

Plantation Register

Only one type of Plantation registers will be maintained in all the ranges. The big size register containing columns giving detailed information on expenditure incurred, number of seedlings planted, survival at different stages, operation done etc will have to be discontinued. The register will be a small bound book scope size, which is very convenient for noting the information regarding plantations and also the inspecting officers remarks. One copy of register will be maintained in the range and the divisional forest office. Register will be maintained for each Range for different felling series. Both the register will be useful in their own way. They will be utilized for statistical data and silvicultural matters. However their usefulness depends on the method and care with which the R.F.O.s record the information and their observation. Plantation register contains the following details.

- (a) Felling series, coupe no., area, year of felling and year of regeneration.
- (b) The extent of area to be planted up and if in patches, area of each patch, the species planted the spacing, total number of plants etc.
- (c) Date of each subsequent operation and its cost etc.
- (d) Observations and suggestions of Deputy Conservator of Forests and senior officers should be noted. Observation of Range Forest Officers regarding the progress and growth of the plantation should invariably be noted. Points of special interest and importance should also be recorded.

OTHER RECORDS

A. Record of Exploitation of Bamboos

Details of area exploited in each felling series annually and the number of bamboos exploited should be recorded. Records of number of bamboos exploited in a

compartment will be easier to maintain. Bamboo exploited from the Range will be maintained at Range level and Division level. The number of bamboo exploited and price realized will be recorded. The Divisional Officer should maintain records of bamboo in the book form. Notes on every regeneration work of bamboo should be mentioned.

Record of exploitation of MFP will have to be maintained Range wise and Division wise. Range Forest Officer should gather this information from JSFDC and keep in their records. This will help in working the status of MFP species in the forests. Analysis of these data should be done at Division level during meeting and strategy should be decided to improve the status.

B. Record of Fire

Fire Register and fire map will be maintained both in Range and Division office. It should contain every incidence of fire, its type location timing and season, damage estimates, measure taken to prevent fire earlier and after incidence and those for extinguishing the fire. It should also mention the popular response if any in controlling the fire.

C. Record of Demarcation

Demarcation register and map will be maintained both in Range and Division Officers. Inspecting Officer should ask for them and check boundary during post monsoon season.

D. Record of Wildlife Sighting and Man-Animal Conflict

A register should be maintained at range level for the recording of sighting of the animals. Cases of attack of wild animals on the people and their live stock as well as incidences of attack on wild animal should be entered in such register. The register should be kept at Range level. The details should be annually compiled at Division level and kept in bound form.

E. Register of Offenders

A register containing list of history sheeter forest offenders along with the details of grave offences should be kept at round and range level. The register may contain leaf allotted separately for different villages. Officers of the rank of ACF and should inspect this register during their visits.