

## **Part-II**

# **FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED**

## **Chapter -1**

### **GENERAL OBJECTS OF MANAGEMENT:-**

- (i) To protect, maintain and improve forests particularly on higher and steeper slopes of hills and eroded undulations to arrest soil erosion and run off. This will help in moisture conservation and regulation of water supply in rivers and streams.
- (ii) To associate the local people in protection and scientific management of forest in an increasing degree and to foster a sense of community ownership of forests
- (iii) To improve the vegetative stock of forestland by planting in blank areas by suitable species according to site factors.
- (iv) To rehabilitate the degraded forests with the active involvement of local villagers according to their choice of tree species and nature of the soil.
- v) To meet the local requirement of timber, firewood and poles by regulation of annual increment of trees of different species in a sustainable manner
- (iv) Consistent with the above, to have sustainable yield of timber, fuel wood and other forest produce in future.

### **METHOD OF TREATMENT:-**

To attain the above objectives, the forest areas have been divided into following circles according to composition, density, quality and silvicultural needs of forests and local environment.

- (1) Rehabilitation Working Circle**
- (2) Protection Working Circle.**
- (3) Selection Working Circle.**
- (4) Plantation Working Circle.**
- (5) Bamboo Overlapping Working Circle**

### **CONSTITUTION, DISTRIBUTION OF AREAS OF WORKING CIRCLE.**

**REHABILITATION WORKING CIRCLE: -** In earlier working plans, most of forests were worked under coppice with standard and coppice selection working systems. These forests have degenerated to rooted wastes and blanks due to illicit cutting, uncontrolled grazing and frequent fires. It has been resolved by Govt., to rehabilitate such areas with the active cooperation of local people. Suitable measures aimed at restoring the stock of vegetation will be resorted to. The approach will be to treat them by cutting back high stumps and fencing of area to stimulate growth of new vigorous shoots tree from grazing and trampling. The blank areas in such forests will be planted with nursery raised seedlings of preferably indigenous and local species.

**PROTECTION WORKING CIRCLE: -** Some forest areas in Bhawnathpur and Garhwa Range and small area in Nagar Range are situated on hill tops and steep slopes. Such forest lands having slopes more than 600 are included in this working circle. These areas suffer from the acute problem of regeneration and erosion. It is therefore felt necessary that such areas be given complete protection against any sort of felling, grazing and fire.

**SELECTION WORKING CIRCLE:-** Some forests of division which can be described as good forests considering site quality but due to comparatively poor soil and erosion the problem of regeneration is acute, are included in the selection working circle. The idea is to harvest the mature crops but at the same time to maintain the soil cover. No permanent gap will be allowed to be created. Only those trees which are of minimum exploitable diameter will be allowed to be removed.

**PLANTATION WORKING CIRCLE:-** Some of the forest areas have become completely blank during last few decades. Simple closure and protection will not be sufficient to bring back such areas under vegetation. It is therefore necessary and urgent to rehabilitate them by 31 regeneration. Sincere efforts should be made to raise plantation in areas but the pace of such treatments needs to be accelerated in the interest of the forest and land resources. The existing plantations and areas fit for plantation will be also included in this working circle. Protection of old) plantation appears to be a challenging job in this division as it is evident from low survival percentage and therefore emphasis will be given for their protection. Success of new plantations too will depend on effective) protection. The total areas of existing plantation and areas fit for plantation separately is given range wise as below.

<b>Sr.No</b>		<b>Existing Plantations in Ha.</b>	<b>Areas Fit For Plantation In Ha.</b>
1	Bhawnathpur Range	268.62	12091.53
2	Nagar Range	330.50	7591.75
3	Garhwa Range	Nil	12129.54

## BAMBOO OVERLAPPING WORKING CIRCLE

All the forests which were kept in part or in full under bamboo overlapping working circle in previous working plan will be allotted to this circle. The areas of circle this circle will overlap other circles. Artificial regeneration of bamboo will be resorted to restock the areas and after four years harvesting will be done and after will be shared as per JFM RESOLUTION of Jharkhand Govt

### **Rangewise distribution of areas into different circles-**

Range	Rehabilitation W.C.	Protection W.C.	Plantation W.C. Survival	Blank	Selection W.C.
Bhawnathpur	15618.60	1370.32	268.62	12235.78	4430.60
Garhwa	5683.18	1556.19	-	11755.84	1375.29
Nagar	11670.48	-	330.50	7159.97	6150.97
<b>Total</b>	<b>32972.46</b>	<b>2926.51</b>	<b>599.12</b>	<b>31051.59</b>	<b>11956.86</b>

**PERIOD OF PLAN:** - The period of plan will be ten years. It will be effective from 2003-2004 to **2012-2013**. A mid term appraisal after five years of working may be done to study effect and progress in rehabilitation and plantation working circle.

## **CHAPTER-2**

### **WORKING PLAN FOR REHABILITATION WORKING CIRCLE.** **WORKING CIRCLE AND CHARACTER OF** **VEGETATION:**

A large no. of forests was allotted to coppice selection working circle and habilitation working circle in previous working plan. Some forests included in coppice selection working circle have suffered badly due to onslaughts of biotic Areas incorporated in rehabilitation working circle could not be restocked above factors. These areas are proposed to be included in rehabilitation circle. Rooted wastes and blanks are special features of such areas. of crop is low. Intensive efforts to restock these areas are required. of village forests protection and management committees.

The forest crops generally consist of miscellaneous species throughout the division, but Sal is also present at places mostly in the valleys and depressions. In addition to valleys and depressions. Sal sporadically occurs at places mixed with miscellaneous species but their percentage is quite low and quality is extremely poor which can be categorized as rooted waste. Along with the Sal the species found are Salai, Kend, Dhauta, Piar, Pandan, Karam, Kari, Mahua, ArnIa, Khai

Galgal. Occurrence of thorny scrubs like Ber, Karauda and Dithora is common. kend occurs in gregarious form particularly in heavily grazed areas.

## **2. SPECIAL OBJECTS OF MANAGEMENT:**

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

1. To bring about improvement in the health and stocking of the forest by adopting suitable silvicultural treatments. Betterment of crops shall be object of management operation.
2. To protect rooted wastes of Sal and miscellaneous forests from illicit felling, uncontrolled grazing and fire.
3. To supplement the growing stock by sowing and planting of suitable us species in gaps and degraded lands where rooted stocks are not available.
4. To create conditions conducive to rapid growth of suppressed saplings poles. Natural regeneration of Sal and other important species will be induced.
5. To foster among local inhabitants a sense of value of forests and to win their active cooperation in protection and scientific management of forest.
6. To create employment opportunities for local people so that it may ameliorate their economic condition and reduce dependence on forests.
7. To meet bonafide domestic and agricultural requirement of local people from material obtained from silvicultural operations.

## **POCK MAPS:**

The forest has been stock mapped on 4" = 1 Mile scale. Different colors and symbols show the Sal forest, miscellaneous forest, rooted waste, crop density, age of crop and regeneration on map.

## **STATEMENT OF AREAS:**

Area allotted to this working circle is given range wise as below:

1.	Bhavnathpur	Range	:-	15618.80	ha.
2.	Nagar	Range	:-	11670.48	ha.
3.	Garhwa	Range	:-	5683.18	ha.
	<b>Total</b>		<b>:-</b>	<b>32972.46</b>	<b>ha.</b>

The detail of areas is given in Appendix — II. It is proposed to rehabilitate entire area in 30 years. Annual target of rehabilitation task will be about 1670 ha. which will be accomplished with involvement of VFMPCS.

**Method of Treatment: -**

Following measures will be adopted to treat the areas of this working circle.

- (1) All high stumps, pollarded stems shall be cut back between December and March so that full growing season may be available to shoots.
- (2) Healthy, straight, young saplings and poles of 3' g. b. h. and below whether isolated or in patches shall be left intact and allowed to form a part of the future crop.
- (3) The produce obtained from cutback operation will be given to the right holders for their bonafide requirement.
- (4) After disposal of the produce, the area shall be fenced by trench fencing . This fencing will be maintained for five years
- (5) Complete protection against fire should be provided.
- (6) The blank areas shall be restocked by sowing and planting of indigenous species.
- (7) In the areas badly affected by erosion, dry rubble check dams will be constructed. In hilly area, contour trenches may be dug up all over the areas at suitable intervals.
- (8) Areas should be protected from grazing at least for five years through the co-operation of VFMPCS.
- (9) Protection against illicit felling is very essential. This has been main cause for degradation of these forests.
- (10) Tending operations as are needed for ensuring the healthy growth of young saplings will be carried out Tending operations such as cleanings will be taken up in first year it self. In subsequent years if necessary, cleaning will be carried out. Gradual thinning will have to be carried out only after young crop is established.

## CHAPTER III

### WORKING PLAN FOR PROTECTION WORKING CIRCLE: GENERAL CONSTITUTION OF WORKING CIRCLE AND CHARACTER OF VEGETATION:

Forest on hills & steep slopes are included in this working circle .The problem of regeneration & soil erosion is serious in these areas. The crop consists of young of pole stage trees.

#### SPECIAL OBJECTS OF MANAGEMENT:

The special objects of management of this working circle are:

1. To check the soil erosion on hill tops & steep slopes.
2. To maintain forest cover of hills by complete ban on felling.
3. To conserve moisture & regulate water supply in streams & rivers.

#### STOCK MAP:-

The forests have been stock mapped on 4"= 1 mile scale.

#### Statement of Area:-

Total area this working circle is 2926.51 ha. The detail of areas can be seen in Appendix-11. The range wise distribution of area is furnished as below.

<b>Range</b>	<b>Area in ha</b>
Bhawnathpur	1370.32
Garhwa	1556.19
Nagar	-
<b>Total</b>	<b>2926.51</b>

**METHOD OF TREATMENT:** - The areas of this circle will be treated as follows.

1. Grazing will not be allowed during plan period.
2. Areas will be fully protected against fire.
3. Protection against illicit felling will be ensured.
4. Contour trenches of size 10 m. x 45. cm. x 30 cm. will be dug along contour lines for moisture conservation where site permits-70 trenches/ha

5. Gully plugging ,with dry rubble stones will be done wherever required.
6. Pucca check dams will be constructed in feeder channels of rivers for silt detention. Cost estimate- Rs6 lacs/ check dam.
7. (.No *felling will be* done. Only hygienic felling and climber cutting will be one in 10 years cycle. Materials so obtained will be utilized to meet the requirements of right holders.
8. Areas allotted to this working circle have been demarcated on the map. It is proposed to delineate the areas on the ground also.

Silvicultural System; Only hygienic felling which involves the removal dead, dying, diseased, top broken trees and also cutting of woody climbers in 10 years will be carried out.

#### **CHAPTER -IV**

#### **THE WORKING PLAN FOR SELECTION WORKING CIRCLE :- GENERAL CONSTITUTION OF WORKING CIRCLE & CHARACTER OF VEGETATION.**

In the pervious plan, a large number of forests were allotted to coppice selection circle. Some of these forests have density above. 4 There forests are proposed to be included in this working circle. The problem of natural regeneration is serious in these areas. Some areas are on slopes & undulations a coppice regeneration is bound to fail. Only miscellaneous crop such as Asan, Dhawra, Sidha, Chilbil, Salai, Ginjan are found in these forests Trees are in sapling to pole stage but some matured trees are found here & there.

#### **SPECIAL OBJECTS OF MANAGERMENTS:**

##### **The special objects of management are:-**

- (1) To improve the health & stocking of forests,
- (2) To conserve soil & moisture to the fullest extent possible
- (3) To harvest the trees of exploitable diameter without any risk of permanent gap in upper canopy.
- (4) To free advance growth by removal of over wood.
- (5) To obtain natural regeneration from seed bearers which always remain in abundance

#### **STOCK MAP:-**

Works have been carried out on scale 4"=1 mile scale map showing character of vegetation density & age of trees indifferent colors & symbols.

## STATEMENT OF AREA

Total area allotted to this working circle is 11956.86 ha. The detail of area is given in Appendix-II. However, rangewise distribution of area is given as under.

Range	Area
Bhawnathpur	4430.60
Garhwa	4430.60
Nagar	6150.97
<b>Total</b>	<b>11956.86</b>

## SILVICULTURAL SYSTEM:

The silvicultural system prescribed will be selection cum improvement. Selection system cum improvement is defined as silvicultural system in which fellings are carried out on the principles of thinning of only mature trees for maintenance of crop density & their canopy gap between the trees. In order to carry out felling on the principle of selection, exploitable diameter is fixed according to the size of & materials felling cycle is decided.

This system involves removal of silviculturally available trees. A green and tree is silviculturally available when it fulfills the following conditions.

1. It forms part of a congested crop & the principle of improvement felling warrants its removal.
2. It's removal does not create a permanent gap in the canopy.

## Exploitable Diameter:

The exploitable diameter for Sal is fixed at 12." For other species the following diameter is fixed as exploitable.

<b>SL. No.</b>	<b>SPECIES</b>	<b>SIZE.</b>
1	Assan	30c.m
2	Karam	30c.m
3	Dhawra	30c.m
4	Panjan	30c.m
5	Gamhar	30c.m
6	Jamun	30c.m

7	Kend	30c.m
8	Bhurkund	30c.m
9	Semal	30c.m
10	Salai	30c.m
11	Other Species	30c.m.

The above exploitable has been fixed on the basis of site quality and requirement of local villagers.

**Felling Cycle** The felling cycle is fixed at 20 years. This is kept short to ensure that comparatively larger area is taken up for working every year & heavy per unit area is avoided.

### **Marking Rules.-**

While marking trees for felling the following rules will be observed.

All dead, dying, diseased, top-broken or otherwise defective trees will be marked.

2. No tree shall be marked where

- (a) Crop density is low.
- (b) Established regeneration is absent.
- (c) Where the slope exceeds 60%.

3. A fairly grown stem would be preferred to a badly grown stem even if former is of inferior species and the latter is of more valuable species.

4. On the edges or blanks or partial blanks trees will not be marked.

3. All climbers shall be cut at the time of marking.

### **Subsidiary Silvicultural Operations:-**

The following subsidiary silvicultural operations will be carried out in the year after the main felling.

1. Any high stump left over during working of the coupe shall be dressed at 6" from the ground level. State trading division shall be responsible for this job.

2. If there be a number of coppice shoots from a stool, their number shall be reduced to three or four. Congestion of saplings, poles or trees wherever present.

3. Tree damaged during the coupe working shall be cut back at 6" from the ground level.

4. Climber cutting shall be done through out the coupe.

5. The coupe shall be fenced if funds are available & fencing shall be maintained for five years. This will help the natural regeneration and coppice shoots to grow free from grazing.

**Grazing:** - The annual coupes should be closed to grazing for five years. The other areas where soil erosion is a serious problem or regeneration is being destroyed by incident of grazing should also be closed.

**Fire Protection:** - The regeneration areas should be strictly protected from fires. Fire is a recurrent & big problem in these areas in summer season & causes a lot of damage to young saplings. VFMPSC wherever they have been constituted should be involved in prevention, detection and extinguishing fires.

### **Constitution of Felling Series and Annual Coupes.**

Name of Range	Name Of F.S	Name Of Forest Constituting F.S	Thana & Thana Number	Area Of Forest [Ha]	Total Area Of F.S (Ha)	Felling Cycle in years	Area Of Coupe (Ha)
Bhaunathpur	1.Kailan	Kailan	B. pur -59	1830	1830	20	91.50
"	2. Rohinian	Rohinian	" -14	471.45	471.45	20	23.57'
"	3 Barwari	Barwari	-16	798.20	798.20	20	39.91
"	4. konmandra	Konmandra	" -61	240.89	240.89	20	12.04
"	5. Boto kalan	Botokalan	" -31	219.03	219.03	20	10.95
"	6. Bansani	Bansani	" -15	871.03	871.03	20	43.55
Nagar	7. Kumbakurd	Kumba. kurd	Garhwa,-3	1994.51	1994.51	20	999.72
	8. Sakti	Sakti	"-178	407.22	472.22	20	23.61

Nagar		Dhurki.	„-179	65.00			
"	9. Libra	Libra	" - 164	574.35	574.35	20	28.71
"	10. Machpani	Machpani	" - 168	865.57	865.57	20	43.27
"	11. Murphur	Murphur	" - 165	652.68	872.24	20	43.61
"		Ambakhorea.	„-166	219.56			
"	12 .Bhumphore	Bhumphore	„-159	378.61			
"		Mandre	„-160	29.20	786.74	20	39.33
"		Samo	„-161	378.93			
"	13. Dudhi.	Dudhi	,-158	473.98	570.55	20	
"		Khutia	„-162	96.57			28.52
Garhwa,,	14. Kholra	Kholra	"255	118.53	118.53	20	5.92
"	15. Sikmi	Sikmi	"250	130.28	130.28	20	6.51
"	16. Biktam	Biktam	"-247	196.73	196.73	20	9.83
"	17. Jamua	Jamua	„-420	310.85	377.74	20	18.88
"		Baghesar.	„-421	66.89			
"	18. Bharaha	Bharaha Kusmali Amuar	„-425 „_377 „424	317.40 215.61 18.90	551.91	20	27.59

**Regulation of Yields:** - The yield of forest produce from annual coupes during cycle will be regulated by area. Smythies Safeguarding Formula will be adopted to determine the percentage of selection trees that will be felled during felling cycle.

Result of enumeration of forests of selection working circle are reproduced below:-

Sl. No.	Name of Range	Name Of Forest.	Thana And No.	Enumerated Area in (HA)	10- 17.5	17.5- 25	25- 32.
1	2	3	4	5	6	7	8
1	Bhawanathpur	Kailan	Bhawanathpur.59	74	1968	826	352
2	Bhawanathpur	Bansani	Bhawanathpur.15	24	704	121	49
3	Garhwa	Kolha.	Garhwa 255	2	92	27	7
4	Nagar	Paraspani	Garhwa 158	24	588	3328	250
5	Nagar	Dhurki	Garhwa 179	4	125	82	56
6	Nagar	Shakti	Garhwa 178	14	12	338	221
7	Nagar	Bhumphor	Garhwa 159	12	510	262	162
8	Nagar	Machpani	Garhwa 168	16	1672	651	246
9	Nagar	Pachpheri	Garhwa 165	14	1338	466	194

**Total:-            184                    7489                    3105                    1530                    1939**

As exploitable diameter has been fixed as 30 cm. The diameter Class 25 cm 32.5 cm. will be taken as class- 1 and diameter. Class 17.5-25 cm. will be treated as class-1 From the above table it is evident that the number of class 1 and above. trees are 3757 and class 11 trees are 3500. Thus we have class I trees.

**Class II Trees                                    3105**

**Felling cycle                                    =        20 years.**

From age- diameter relation it has been observed that a tree from diameter class-II takes 30 years to reach diameter class I Hence will be taken as 30 years.

Now the number of trees of diameter class II expected to reach diameter class I during felling cycle will be given by Smythies Formula as below.

$$X = F/T \text{ (II- Z\% of II)}$$

### **In Majhgaon sample plot of Garhwa North Division**

**Mortality z has been observed as 30%**

**Hence  $X = 20/30 (3105-30/100 \times 3105)$**

$$= 2/3 (3105-932) = 1449$$

**The percentage of selection trees required to be felled will be determined as follows.**

$$Y = [x/1+x/2] \times 100 + A = 1449/420 + 34.46\% + A$$

Thus rounding off above figure by adjusting A we find that 40% of selection trees which are silviculturally harvestable can be prescribed to be marked for felling during felling cycle. The yield from annual coupes may be different depending on soundness of trees and other factors.

### **Assessment of Growing Stock and Mean Annual Increment**

As per draft report of 1994 of survey of India, Dehradun on Forest Resources of Hazaribagh Munger, Palamau and Shahebganj Districts, the stock of forest of miscellaneous stratum is assessed to be 19.48 m<sup>3</sup>/ha. Majority of forest areas of This working circle come under this category of classification. The total area of L1 being 11956.86 ha, the total growing stock is assessed to be 232919.63 m<sup>3</sup>.

As regards the growth of Salai the dominant species of this circle, the observations made in Sample plot No. 7 of Garhwa North Division at Majhgaon are reproduced below

## **CHAPTER -V**

### **WORKING PLAN FOR THE PLANTATION WORKING CERCLE.**

#### **1. GENETAL CONSTITUTION AND CHARACTER OF VEGETATION: -**

This working circle comprises all areas, which are blank or semi blank. Existing plantation areas are also included in working circle. This circle covers the total area of 31650.95 ha. out of which 31051.83 ha are blank areas and th99.,1ba. are existing plantations. These areas are plain to undulating and failed to restock due to biotic factors in spite of good soil condition.

Large scale plantation had been done in past according to prescription of previous plan but they could not succeed due to problem of grazing and lack of proper protection. The area of existing plantation is 599.12 ha according to stock maps.

## **2 SPECIAL OBJECTS OF MANAGEMENT: -**

The objects of management are given separately for existing plantations and for the areas fit for plantation.

### **OBJECT OF MANAGEMENT FOR EXISTING PLANTATIONS: -**

1. To ensure soil and moisture conservation, while protecting the environment.
2. To improve the stocking and quality of forests by scientific management.
3. To meet the local requirements by exploitation of mature age plantation in scientific way.
4. To restore the vegetation by its coppice or natural regeneration over denuded cover of hills, otherwise planting according to nature of soil factor and climatic condition.
5. To meet the local demands of fire wood by silvicultural thinning in existing plantation area.

### **OBJECT OF MANAGEMENT FOR BLANK AREAS: -**

1. To bring back blank or semi blank areas under vegetation.
2. To reduce the loss of top soil and water runoff from such areas.
3. To meet the increasing public demands and wood based industries by raising economic plantation, which may be used as raw materials for wood based industries.
4. To provide employment to local people.

### **DESCRIPTION AREAS:-**

Mostly blank areas have been included in this working circle. The impact of biotic factors on the forests close to villages and town has been quite adverse. Many of forests have turned into rooted wastes and failure to regenerate after coppice felling has also converted large areas into blanks. Soil cover in these areas invariably poor and erosion has set in. Unless sincere efforts are made shortly to reforest these impoverished areas, it will not be possible to restock them. There is more probability of encroachment in such areas. The detail of an be seen in Appendix — II

## **METHODS OF TREATMENT**

The following guidelines are prescribed for the treatment of the areas included in this circle.

1. The silvicultural system will be artificial regeneration by planting with suitable indigenous species depending upon edaphic and biotic factors of the areas.

Plantation of Blank Areas will be under different schemes of central and state. Govt. Following are the major schedules:-

### **GOI Schemes :-**

#### **1. MANAGEMENT INTERVENTION**

#### **2. BAMBOO PLANTATION**

#### **3. JATROPHA PLANTATION**

### **STATE GOVT. SCHEMES.**

1. Quick Growing Species

2. Soil conservation & Afforestation

3. Development of minor forest produce ( Include Khair, Kiac host & bamboo Plantation) plantations models based on local need may be developed .Following is a general guideline for selection of species —

- i. Timber Species-20%-30%-Timber species such as shisham, rosewood, teak, gamhar, semal etc. may be sprouted from root-shoot cutting and planted.
- ii. Oil bearing species-20% Karanj may be planted as this has got market .This is one of the most economic NTFP of the State.
- iii. Medicinal plants-Aonla,Harre,Bahera may be planted up to 30%.
- iv. Bamboo plantation-At least 5% rhizome raised seedlings of bamboo will be planted at each plantation site.
- v. Other species-30-39%- will include species like asan, Karam, salai, siris, Mahua,Neem,Bakain,Champa,Kekar,BeI,Arjun,Jamun,Bear,Sarifa,Aam.lmli.Kus um,,Palas,Dhaura,Toon.
- vi. On trench berms species like Khatal, Shajan, Jamun Sharifa may be planted at 6m interval. In between Subabul, Kachnar, and Babul may be planted at 1m by 1m spacing for providing fodder and fuel to the local people.

- vii. Sabai grass at suitable places may be planted in plantation areas
- viii. Soil and moisture works may be taken on large scales . It is important to arrest rain water, so emphasis should be given on construction of checked Dams, Rahar,Ponds etc. Contour trenches and gully plugging may be done as per requirement of the site.
- ix. Thinning in plantation areas is needed for optimum growth, so plantation may be thinned in the 10th and 20th year.
- x. Species may be planted in small pure patches these will help in future management of plantation area.
- xi. It will be mandatory on part of executing DFO to give information regarding planting area to the WPO. This will help in planning
- xii. Plantation will be carried out on the basis of schedule of rates approved by CCF Development ,Jharkhand.
- xiii. More and more plants from permanent nurseries should be used for plantation.
- xiv. Grass from plantation areas may be given to VFMPCS and a record should be maintained.
- xv. Cost benefit statement of plantation should be maintained in territorial DEC office

## **2. CHOICE OF SPECIES:-**

The species should be so selected as to ensure success of the F plantation according to present condition and ph. value of soil. Preference will be give to the indigenous species such as Parari, Khair, Sidha, Ashan ,Mahua , Sisoo, Gamhar, Karanj etc. In next preference for 2nd choice, sins, Teak Neem, Bamboo etc. should be selected with the concurrence of local villagers where the work will be started. In depression of valley areas of Kalian in Bhawnathpur Range Sal seed sowing also be tried. In some blanks sowing of Khair, Sins and Sidha may also be done at suitable sites. Bomboo ,Teak and Eucalyptus hybrid may be planted on deep sandy loam soil with good drainage. On eroded and gravelly soil Khair may be tried. Khair and Sissoo also grow will on gully heads and recently exposed areas. Sidha stool wherever present should be cleaned. Bomboo seedling generally be planted at last in those areas where root stock of Bamboo exist or Bomboo are present in rooted waste condition. This is necessary because Bamboos have practically varished from the area.

3. Existing plantations mainly consist of species like Eucalyptus hybrid, Acacia auriculiformis trees which are found in diameter class 4” — 6”. This is fairly appropriate size for fuel wood and poles which are in high demand in the as. It is recommended that trees of 4” -6” diameter size should be felled to it the local requirements of villagers. The system adopted for Eucalyptus rid will be coppice system. After the area is clear felled, it shall be closed grazing for three yrs. If coppice regeneration does not come up for any

sons what so ever, it may be supplemented with artificial planting. For other species silvicultural system will be clear felling and replanting the area afresh.

<b>The felling and replanting plan is given as below.</b>				
<b>Year</b>	<b>Harvestable Area (ha)</b>	<b>Advance Work</b>	<b>Completion Work.</b>	<b>Maintenance</b>
2003-2004	330.50	-	-	-
2004-2005	268.62	330.50	-	-
2005-2006		268.62	330.50	-
2007 -2008			268.62	330.50
2008 -2009	-			268.62
2009-2010	-	-		
2010-2011	-	-	-	

Special protection against fire has to be given by clearing and burning 1 5ft. wide strip around plantation fencing line latest by February for 5 years. Fencing will be removed after 6 years or earlier when the plants attain a height beyond the reach of cattle.

4.A 30 year plantation scheme should be formulated for blank areas . Annual target should be kept 1000 ha. keeping in view the availability of fund. This task will be performed by Social Forestry Division. After 5 years plantation areas should be handed over to Garhwa Territorial Division for protection and management.

#### 5. Growing Stock and Mean Annual Increment.

To assess growing stock and mean annual increment of existing plantations a rectangular sample plot was laid out in Jangipur plantation (1989) and g.b.h. of trees was measured. The d.b.h. was calculated from these datas. The results are.

**No. of Trees 2239**  
**10.17.50**

The regression equation for volume  $N=0.0868+2.8335 D$  for Eucalyptus hybrid( Source Volume 2, General Standard Volume Tables by A. N.Chaturvedi, Mensuration Officer, F.R.I. & C.,Dehradun) will be used to calculate for mid diameter. For diameter class( 1 0cm.-1 7.50cm) the average volume per tree is calculated as below.

$$N=0.0868+2.9335x.1375 = .302$$

$$V=.09$$

Thus total growing stock aforesaid plantation is 201 .512 m3 From this, it can be inferred that mean annual increment of abovementioned plantation is .25 M3/ha. Growing Stock/ha. is 25.18M3. On this basis, total growing stock of existing plantation is assessed as 15085.84 M3. This much stock of wood is proposed to harvest in two years. Every year 1000 trucks of wood will have to be transported from the annual coupes. Garhwa State Trading Division will be able to handle this much wood volume in two year. Hence the period for harvesting is fixed 2 years.

## **CHAPTER -VI**

### **WORKING PLAN FOR THE BAMBOO OVERLAPPING WORKING CIRCLE**

#### **1. GENERAL CONSTITUTION AND CHARACTER OF VEGETATION.**

Such protected forests which were in part or in full allotted to bamboo overlapping working circle in previous plan (1974-75 to 1998-99) have been included in this circle. This working circle will be overlapping other working circles. Among these forest areas some have a few bamboo clumps on hill top with culms in twisted, interlocked and congested position and others are denuded of its bamboo forests.

During the period of last working plan, prescriptions recommended to ameliorate the condition of bamboo clumps were not implemented. Irregular and illicit cutting of bamboo culms by local people continued unabated. This resulted into further deterioration and even destruction of bamboo clumps. Clumps standing on mounds earlier are nowhere seen in these forests. Now bamboo areas are not in a position to restock on their own and badly need artificial regeneration.

#### **2. DISTRIBUTION OF AREAS.**

The range wise distribution of areas is given below.

<b>Sl. No.</b>	<b>Name of Forests range</b>	<b>Area in ha.</b>
1.	Bhawnathpur	5282.87
2.	Nagar	5372.86
3.	Garhwa	5159.09
	<b>Total:-</b>	<b>15814.82</b>

#### **3. OBJECTS OF MANAGEMENT :-**

The objects of management are :-

1. To develop the erstwhile bamboo bearing areas by artificial regeneration.
2. To meet the bonafide demand of local people.
3. To meet demand of raw material of bamboo based industries
4. To provide employment opportunities to local people with a view to reduce their dependence on forests.

#### **4. METHOD OF TREATMENT:-**

As stated earlier, the bamboo clumps are very few in number in the forests of Garhwa North Division. Most of clumps have been rooted out. Therefore the following treatments are being prescribed for rehabilitation of bamboo areas.

1. Bamboo plantation should be resorted to on spacing of 5m.x 5m. A scheme for bamboo plantation is furnished in Appendix.
2. Tending operation in such plantation areas should be maintained for 3 years.
3. After establishment of the clumps, cutting may be allowed. This period should not be less than 4 years from the year of plantation.

As stated above, non of the bamboo bearing areas are at present fit for working. Even then bamboo bearing areas have been grouped together to form 7 number\_of cutting series which, after the treatments as stated above are likely to develop into good clumps in 4 years to produce bamboos in workable quantities. The quality of bamboos too will definitely improve.  
The detail of bamboo cutting series is given below.

#### **CUTTING CYCLE:**

In Roy's plan three years cutting cycle was adopted for bamboos. The result of three years cutting cycle has been discoveraging so far and therefore a four years cutting cycle is recommended.

#### **.BAMBOO COUPES:-**

Newly raised bamboo plantations will be worked when they attain maturity after four years. The first bamboo coupe will be worked during 2008-2009.

#### **METHOD OF EXECUTING CUTTING:**

- The following cutting rules shall be observed while working the Bamboo Coupe.
- (i) Bamboo culms of previous season, commonly known as karil shall not be cut.
  - (ii) As many older, healthy, green culms, as there are Karils, subject to a minimum of eight, should be left in each clump towards the periphery so as to provide support to the Karils.
  - (iii) As clumps should be worked from inside out and all dead, dying and damaged culms shall be cut first and the rest, excluding those under
    - (i) & (ii) above, shall be cut thereafter.
  - (iv) The surrounds of each clump, after exploitation, shall be cleared at least 1 mt. round it as a measure of fire protection.
  - (v) Removal of rhizomes or roots of bamboo is strictly prohibited.
  - (vi) No clump containing less than 8 bamboos shall be worked except for the purposes of cleaning which would confine to removal of dead, dying and damaged culms.
  - (vii) Felling is not permitted from 1<sup>st</sup> July to 30<sup>th</sup> of September.
  - (viii) Should a coupe or its part remain unworked for any reason, the same shall be worked immediately after the close season is over so that it need not wait for three more years. In fact its working must be completed by November. The working in the next Coupe should not be started till the previous coupe's working is completed by November.
  - (ix) A clump in flowering shall not be cut before the seed fall.

### **SUBSIDIARY CULTURAL OPERATIONS.**

In the year following the main cutting the following operations shall be carried out.

- (i) Climbers damaging the clumps if any shall be cut at two places, one at the ground level and another one meter above the first cut.
- (ii) Cleaning around 1mt. of the clumps if not completed shall be under taken and completed.
- (iii) Method of treatment as started earlier may be applied on the discretion of the Divisional Forest Officer in such bamboo bearing areas also which are outside this working circle . Subsequent measures to protect them against grazing, theft and fire shall also be taken up while attending the area relating to other working circles.

## 1 OTHER REGULATIONS.

The Working Circle should be protected from fire and grazing. Lopping of bamboo for purposes of feeding cattle must be prohibited. The clumps which are still available in the forest, will be cleaned

and after that fertilizer application and soil working will be done. These clumps will be protected from fire and illicit felling. Turees are dependent on bamboos for their livelihood. In the micro plan of villages, provisions will be made to meet their requirements

Sharing of benefit from bamboo will be as per J F M resolution of September, 2001

## Chapter-VII

### Miscellaneous Prescriptions.

#### 1. **Kendu leaves: -**

Kendu leaves are the most important minor forest produce of Garhwa North Division. The collection and marketing of kendu leaves are being managed by Jharkhand State forest Development Corporation.

Prior to nationalization of Kendu leaves trade in year 1973, Kendu leaves were sold to the purchasers every year. Some Kendu leaf units were also leased to purchasers for three or more years. Yield of kendu leaves was pre determined for each unit and purchasers were asked to pay royalty for 75 % of the stipulated number of bags even if yield was comparatively low. In case of higher yield the purchasers had to pay royalty for additional production of kendu leaves. However, a lot of difficulties were experienced in the realization of royalty from the purchasers and also in ensuring payment of fixed minimum collection charge the laborers engaged in the collection of kendu leaves. To eliminate the above problems it was decided to nationalize its trade in 1973. since then trade of kendu leaf in Garhwa North Division is being looked after under Gov. control.

As a result of nationalization of kendu leaf trade collection and marketing came under direct control of Govt. During 1985 the entire management was transferred to State Forest Development Corporation which is taking appropriate measures to augment the production of kendu leaves and to ensure the reasonable collection charges to the laborers engaged in collection of kendu leaves.

Quality of kendu leaves of Garhwa North Division is neither poor nor excellent but of medium quality. The quality and production of kendu leaves can be improved if coppicing and pruning of kendu trees are carried out every year during February- March It is therefore prescribed that the above operations may be carried out by Corporation. This will improve the quality of kendu leaves and yield will also go up.

The collection centers of kendu leaves locally known as phanris have already been selected and notified by the Govt. and each of them is managed by a munshi or Lamps or Packs. The munshi purchases leaves from the local leaf collectors and pays them wages as per notified rate fixed by Govt. every year. One standard bag consists of 1000 standard polas of 50 leaves each. The leaves are dried and bagged at the phanris. The bags are numbered and then are transported to the central godowns under permits. Transporters are appointed by open tender. The godowns are supervised by Forest Guards. Kendu leaves are sold by open auction at General Manager's / D. M. level or at M. D. level. The sale is effected on per kg. basis and the highest bidder gets proceeds. Agreement is then signed. 10% security for big lots and 25% for small lots are deposited by the highest bidder at the time of auction. They receive the materials as per the payment of installments. The money is deposited in office of general Manager.

It is proposed that VFMPCS should be associated with the collection of leaves. kendu Jharkhand State Forest Development Corporation should purchase kendu leaves from VFMPCS and it should pass the net profit to the as per JFM resolution. VFMPCS may be involved in coppicing of kendu trees. This will help in controlling naxal activities in these areas.

#### **Other Forest Produce: -**

The Jharkhand State Forest Development Corporation exercises control. Over the collection and sale of Mahulan leaves. The procedure is almost similar to that of kendu leaves. The corporation also collects and executes sales of oil

seeds such as Sal, Kusum, Karnaj, Palas, Mahua, Harra, Bahera and Amla, these are collected at the collection centers. Sal seeds are processed and oil is extracted in Solvent Extraction Plant.

Preservation plot :- There is a preservation plot in Ghaghra P. F. about 4 miles from Nagar P. S. whose area is 10 acres. There exists a Sikargah with a beautiful forest of Q II — III Sal trees adjoining a perennial stream. It has a sloping tunnel ending in a narrow under ground room having opening out wards to a nala affording facilities to spot and watch animals passing by or drinking water in the nala It is a very beautiful spot.

The area of preservation plot will be excluded from any operation prescribed in the plan. The trees on the periphery should be white paint- ring marked at breast height and name plates fixed separately in conspicuous places.

**Roads:-** The position of roads in the division is satisfactory. A few small link roads may however be constructed as and when their need arise out of the of the budget of the division. Roads, however needs to be repaired regularly to make them useful. A list of forest roads in Garhwa North Division is given in appendix.

**Buildings:-** It is quite necessary to provide residential accommodation to each and every permanent staff of the division to enable him or her work properly and efficiently. Some of the forest guards and foresters are living in rented houses where they can not keep families due to paucity of adequate space. Priority should therefore be given

for the construction of residential accommodation of forests guards and foresters. It is good that construction of quarters for forest guards and foresters has already been taken under plan and non plan budget. A list of existing buildings in the division has been furnished in Appendix. It is strongly recommended that quarter should not be constructed in isolated places because such building remain unoccupied and later used by unsocial elements for criminal activities.

- The felling and replanting plan is given as below.

**Wells:-** A list of existing wells have been furnished in Appendix. Care should be taken to dug new wells at the site of construction of new buildings in advance so that its advantage is taken during the construction of buildings.

### Survey and Maintenance of Maps:-

The division is fully equipped with cadastral maps of 16"=1 mile scale. Topo maps of 1"=1 mile scale are available also there. Stock maps of the forests were prepared on 4"=1 mile scale. A working plans map of the division on 1"= 1 mile scale will be supplied to division by the working plans division.

Fire maps will be maintained on a scale of 1"=1 mile in the division the and in the ranges. Occurance of forest fire will be shown in the map of felling series every year by the distinctive symbols as per working plans procedure code. The fire maps of 1"=1 mile scale has to be maintained for 5 years. After 5 years they shall kept as record and next set of maps will be started with the same set of symbols. Each felling series will have one set of fire map on 4"=1 mile scale maintained for 5 years and repeated with the same symbols in the next 5 years.

### Control Forms:-

Three complete sets of control forms will be prepared in loose leaf h file. clutch file . One set will be for Divisional Forest Officer's use and office record, the other set will be for use and record in the office of the working plans officer. The third set is a flying set which will be filled up yearly and sent to working plans officer within two months of the close of the working plan year ( 1st July to 30th). Control form NO. 1,4,5 and 7 is to be maintained for following prescription of the working plans

**From no 1:-** list of deviations collected from form no.4, 5 and 7 for approval of Chief Conservator of Forests, Development, Jharkhand.

**Form no 4:-** control for area yield of selection coupes under selection working circle.

**Form no.5:-** control of thinning in areas under selection working circle.

**Form no.6:-** (a) control of exploitation of older plantation areas in plantation working circle.

(b) Control for the treatment of areas fit for plantations in the plantation working circle.

(c) Control of rehabilitation area under rehabilitation working circle.

### **Maintenance of Boundaries:-**

Forest areas in all the villages have been shown on the cadastral map of 16"=1 mile which are available in the division. Boundary pillars have not been numbered in the map.

The divisional forest officer is advised to arrange for checking up boundary lines and boundary pillars besides other survey work that may be needed from time to time. As a routine work,

Complete checking of boundary line and boundary pillars of one beat in each range of a division has to be done annually so that work is distributed uniformly to all ranges.

**Grazing:-** People living in the vicinity of forests rear cattle for milk, cowdung and sale. To provide fodder to the cattle in adequate quantity is one of basic requirement of these people. Grazing fees on buffaloes maintained for trade is payable. Grazing by goats and sheep in herd is also prevalent but only a few of these, particularly the sheep, belong to local people. Most of sheep herd are from outside district of Garhwa such as Shahabad, Gaya and Mirzapur.

The entire economy of the villagers in the vicinity of forests, as a matter of fact, is closely linked with the forests. But the effect of unrestricted is quite devastating on forests. Grazing and browsing by goats is particularly detrimental to seedlings and young saplings.

**Fire:-** Fire occurs generally from March to May mainly and occasionally even earlier when special, dry conditions prevail. Monsoon breaks in about middle of June and fire hazard vanishes. The type of fire that occurs is surface fire which scorches young seedlings, burns humus and leaf litter, hardens soil rendering it unfit for seeds to germinate and penetrate roots into the ground and as the year pass by, sheet erosion is accelerated to gully form on slopes. Timber gets affected by dry rot and unsoundness is the result.

Commonly villagers resort to fire to get a quick new flush of grass in hot weather for cattle. This is believed to stimulate such growth. Mahua collector also find it easy to burn the dry fallen leaves of mahua to clear the floor of mahua trees by setting it on fire. Besides fire, is also caused by stray travelers passing through roads and footpaths in forests who light fire for cooking at camping sites or smoking and

Leave the fire burning, the splinters from which are easily blown off into the adjoining forest and set fire to it

To prevent fire, the following prescriptions should be followed:

- (i) The existing boundary lines should be fire traced controlled burnt from Feb. to March every year.

- (ii) In the meeting of V.F.M. P.C.S the problem of fire occurrence should be discussed & villagers should be made aware of harmful effect of fire . There it should be stressed repeatedly that sweeping of floor of Mahua tree to clear Mahua leaves would eliminate the fire hazard.
- (iii) Every effort should be made to arouse consciousness among the people to save environment
- (iv) Right-holders drawing benefit from the forest should assist in the matter of clearing and burning of boundary lines. They should be made known to this responsibility. They should assist forest Department staff in putting out the fire also.
- (v) Printed handbills explaining the causes of fire, their preventive and remedial measures and the co-operation of the local population needed to protect forest from fire should be widely distributed in every village, every school, Thana, post office. The handbills should announce the various cash prizes to be awarded annually.
- (vi) The distribution of prizes shall be made in October every year during the wildlife week. The Divisional Forest Officer, on then recommendation of the Range officer, shall submit in August every ear the names of the villages, individuals deserving prizes with justificatory grounds to the Conservator of forests who will forward the same with his recommendation to the Regional Chief Conservator of forest for sanction.
- (vii) Award of prizes will be done ceremoniously on a festive occasion by such dignitaries as would enhance its publicity value.
- (viii) In case of failure on the part of individuals or villagers to discharge their responsibilities assigned to them under the prescriptions of this plan , rights may be temporarily suspended by the Government or collective fines imposes on them on the report of the Divisional Forest Officer giving instances justifying such action .However in the present political scenario it may be wishful thinking.

#### 11, Removal of Tan bark, Fruit, Leaves etc.

Mochis living in villages close to forests may remove tan-bark of Asan ( T.tomentosa) from the current coupe for their own requirement. A tannin factory has come up at Latehar. The Divisional Forest Officer may look to the possibility of commercial exploitation of tan bark of Asan (T.tomentosa), Dhauras (Anogeissus latifolia) and myrabolans and prepare a scheme for the same and also prepare scheme for plantation of species which are used for extraction of tannin and solvents. Right-holders shall have full liberties to collect fruits khajur, leaves, gethi and seeds for their own requirement free of cost. Mining operations have accelerated during the years. New industries also have come

up in the area as a result of which a large number of people from outside proper to extend the liberties of the right- holders to the non right- holders living at the same place.

### **Removal Dry Fallen Fire wood :-**

The present practice by head loaders to cut standing green poles and saplings and leave them in the forest to become dry fallen firewood has to be stopped at all cost but it is easily said than done due to political circumstances .Naturally dry fallen wood may be removed by the right holders from any part of the forests for bonafide use and not for sale or barter.

Depots:- In order to meet the demand of the local non right- holders living around Ketar, Bhawnathpur, Nagar, Ramna , Garhwa etc. which have developed into townships, opening of depots at these places is necessary to sell small sized timber, firewood and bamboos at rates to be fixed by the State Trading Organisation. These will be run on “no — profit — no —loss” basis.

### **Joint Forest Management:-**

All prescriptions suggested under different working circles will be implemented with active Co-operation of VFMPCS. VFMPCS will be motivated to discharge duties and responsibilities as delineated in JFM resolution Jharkhand Govt. Net proceeds will be shared between VFMPCS and Govt as per aforesaid resolution given in Appendix Microplan will be formulated by D.F.O. Garhwa North Division in prescribed format given in Appendix.

### **Consolidation of Boundary Pillars**

There are 26439 boundary pillars in Garhwa North Division . The range-wise distribution of boundary pillars is given below.

<b><u>Name of Range</u></b>	<b><u>No. of boundary pillars</u></b>
Garhwa	9510
Nagar	8959
Bhawnathpur	7970
<b>Total:-</b>	<b>26439</b>

Out of these boundary pillars the following no. of boundary pillars have been recently constructed and are in good conditions.

<b><u>Name of Range</u></b>	<b><u>No. of boundary pillars</u></b>
Garhwa	516
Nagar	2216
Bhawnathpur	1212
<b>Total:-</b>	<b>3944</b>

Condition of rest 22495 boundary pillars is not satisfactory and they need reconstruction. A scheme for the construction of these boundary pillars is given below. The estimate of boundary construction of pillars is furnished in Appendix —

<b>Year</b>	<b>No. of Pillars to be Constructed</b>	<b>Amount (Rs.in Lacs)</b>
2003—2004	2200	6.60
2004—2005	2200	6.60
2005—2006	2200	6.60
2006—2007	2200	6.60
2007—2008	2200	6.60
2008—2009	2200	6.60
2009—2010	2200	6.60
2010—2011	2200	6.60
2011—2012	2200	6.60
2012—2013	2695	8.08
<b>Total :-</b>	<b>22495</b>	<b>67.48</b>

## Chapter-VIII

### WILD LIFE, ITS CONSERVATION AND CONTROL:-

The famous shikargah in Ghaghra forest which belonged to the Nagar utari estate, about 4 miles from Nagar P.S. In the beautiful surround of Sal forest with a sloping tunnel ending in a narrow underground room having opening out ward to a stream affording facilities to watch the wild animals passing or drinking water in the stream, both for the sight and the shoot speaks of the aristocracy of the zamindar of the day gone by and how they valued the area from its importance of game. The Chamania Pahar of Kalian with a number of caves inside and the adjoining Arsali forest abounded with tigers and bears were the places where the VIPS used to be invited by the late zamindars for shooting. Dhurki, Pachferi and Paraspani were also famous places for games. But the beautiful wild life has reached a sorrow plight through excessive destruction both of games and of habitat, as a result of growing number of weapons and the army of potential killers and the urge for bringing more and more land under cultivation. The war and post —war years witnessed a great acceleration of these processes of destruction particularly with the advent of modern four wheeler jeep and powerful spot light which enabled happy poachers to reach distant forests hither to inaccessible to them spot out the mute denizens to shoot ruthlessly without much personal physical efforts. Revenue Department letter no. C/F -2204 /62 -665/R dated 18.4.1962 issued to all district officers and divisional commissioners would be of value to put an effective check on such unlawful activity on the part of Civil Officers and strengthen the morale of Forest Officers entrusted to exercise control. It is a fact that India has agricultural economy and so there is a demand of more and more area nearby forests for food production and there after necessitating protection of field crops against ravages of wild animals, But for that no full proof permanent barrier between forests and fields can be created nor can imposition of principles of shooting down all the crop —raiding wild animals around cultivation to wipe out the biological heritage, would be rational. It is the responsibility of the Govt. to see that the powers permitted to be enjoyed by the agriculturists in the use of crop protection gums and the licence holding population for sports are not abused for meal — hunting or for harbouring the meat — hunter and spot light shikari. The use of scare crow, thorny hedge beating of this in lieu of gun fire, were largely in vogue in the past fairly satisfactorily which should be encouraged. Wild life, an ancient heritage, has cultural, aesthetic, recreational and economic values. The Govt. of India has enacted a detailed legislation on the wild life know as Wild life (protection ) Act 1972. Govt. of Bihar also have legislated Bihar wild life (protection ) Rules 1973. Both these are effective in preserving our heritage of wild fauna.

#### **2. Wild life Sanctuaries.**

Wild life sanctuaries are areas of forests closed to shooting by rules under the wild life (protection) Act, 1972. The basic idea involved in these is preservation from interference and destruction of the fauna of the locality. The following principles are generally adopted in respect of sanctuaries; -

- (I) complete protection of fauna within the limits of sanctuaries.
- (II) There will be a core area inside a sanctuary where any type of forest working will be prohibited. In the buffer area however some forestry operation will be carried out mainly to improve the condition of forest and to get revenue from timber bamboo etc.
- (III) The area need be easily accessible and open to public to enjoy the experience of seeing wild life at close quarters in complete freedom from fear of man.
- (IV) Facilities like fully equipped forest rest houses, motorable roads and path for entering the area and means of viewing animals in contort and safety such as lookout towers and hideouts, at suitable places, needs be provided. These will directly increase tourism, interest of the public in wild life and indirectly enlist cooperation of the public in the preservation of wild life which has a great propaganda value.
- (V) Should have perennial source of drinking water for wild animals.
- (VI) Preventive inoculation of cattle in the surrounding villages of sanctuaries against epidemics of foot and mouth diseases and rinderpest as safeguard for the wild animals, is essential, or in the alternative complete exclusion of grazing by domestic cattle from sanctuaries as a precaution may be effected.

Roy's plan had proposed creation of a sanctuary which could not be materialized so far. At that time there were a few shooting blocks also in the division. At present shooting of wild lives has been prohibited throughout the state and there fore there are no shooting blocks. The divisional forest Officer is advised to work out details for the creation of a sanctuary in this division. The main point to be born in mind will be to provide a core area where no forestry operation would be carried out. He has to see if there are adequate wild animals whose protection is intended after the creation of the sanctuary. List of forests ( which is not extensive ) which could be included in the proposed sanctuary is given in Appendix . A list of fauna met with in this division are given in Appendix . The list is incomplete and so it is suggested that further information be collected in the mean time to complete the list.