

## **Part II**

# **FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED**

## **Part II**

### **Chapter IX**

## **BASIS OF PROPOSALS**

### **9.1 General Objects of Managements.**

9.1.1 The forests of Batote Forest Division shall be managed with a view to achieve the following objects:-

- (i) Maintenance of environmental stability and conservation of biodiversity.
- (ii) Soil and water conservation.
- (iii) Securing regeneration of conifer species in previously worked forest areas through assisted natural regeneration and artificial regeneration.
- (iv) Achievement of balanced, normal structure of forests through management of forests as per silvicultural requirement of the crop.
- (v) Meeting the bonafide requirements of local population in respect of fodder, firewood, agriculture implements, constructional timber etc. to the extent possible within the bearing capacity of these forests without harming the Chir crop.
- (vi) Regulation of resin tapping in a manner that ensures sustainability of the future yield of resin from Chir forests.
- (vii) Encouraging principals and practices that reduce incidence of grazing in forests through participatory management.
- (viii) Consistent with the above, to derive the yield of timber and other forest produce on sustainable basis.
- (ix) Extending tree cover outside the forests to reduce pressure on natural forest.

### **9.2 Method of treatment to be adopted**

9.2.1 The following treatments are proposed to meet the objective listed above:

- (i) Areas that has previously been worked and in which regeneration has failed to establish shall be re-stocked by artificial regeneration and natural regeneration.
- (ii) Forest areas closed to habitation that have degraded due to heavy biotic pressure shall be rehabilitated by raising indigenous/exotic species preferred by local inhabitants to meet their requirements.
- (iii) Commercial forests on easier slopes, with adequate advance growth shall be treated suitably as per the silvicultural requirements of the crop to liberate the advance growth.
- (iv) Forests on steep and precipitous slopes shall be protected and improved.
- (v) Section of forest along the National Highways that are prone to landslides, shall be protected and treated through vegetative and mechanical methods.

- (vi) The regeneration has failed and decreased below expectation and to restock it by artificial regeneration, the chain link fencing be preferred to avoid biotic interference in such areas.
- (vii) Over exploited and mal-treated forests shall be given complete rests and concrete efforts shall be made to restore them to their normal condition of growth and stocking.
- (viii) Degraded areas covered with un-commercial bushes and shrubs shall be planted up with grasses and fodder species to meet the demand of fodder.
- (ix) In order to ensure sustained yield of resin, over worked areas shall be given rest. Chir areas shall be treated so as to secure the regeneration of Chir.
- (x) Forests around places of tourist shall not only be preserved for aesthetic purposes, but shall also be protected against degradation and encroachments owing to the ever-increasing tourist business.

### **9.3 Constitution of Working Circles, their areas and distribution**

9.3.1 In order to achieve the objects of managements, the following working circles are constituted;

1. Deodar-Kail Selection Working Circle.
2. Mixed Conifers Selection Working Circle.
3. Fir Selection Working Circle.
4. Chir Irregular Working Circle.
5. Reboisement Working Circle.
6. Protection Working Circle.

Along with these working circles following mandatory Working Circles are also proposed as per National Working Plan code;

1. Eco-Tourism (Overlapping) Working Circle.
2. Grass land Development (Overlapping) Working Circle.
3. Participatory Forest Management (Overlapping) Working Circle.
4. Non-Timber Forest Produce (Overlapping) Working Circle.
5. Wildlife Management (Overlapping) Working Circle.
6. Forest Protection (Overlapping) Working Circle.

9.3.2 The Compartment wise area allotted to each of the working circles from 1 to 6 above, have been listed under appendix V to X summarizing the species wise distribution of area under these working circles.

## 9.4 Reasons for constitution of working circles

9.4.1 There is a considerable change in the constitution of working circles and further allotment of compartments to these working circles from the previous plans by Sh.Vasu Yadav, IFS. Firstly, the working in Deodar-Kail forests has been changed from Shelterwood system to Selection system for the basic reason that the conversion hasn't been achieved in these forests through all these years of treatment. The status of regeneration of Deodar and Kail is very poor due to non-implementation of working plan prescriptions in letter and spirit besides non-technical extraction of trees from these forests. Besides during the past decade a lot of developmental activities have taken place wherein a number of road projects have been constructed through forests connecting far-off habitations. All these roads although have increased accessibility for timber extraction but have also made forests prone to various type of damages and encroachments thereby all these degraded compartments have been shifted to Reboisement Working Circle. Further the Resin (Overlapping) Working Circle has been discontinued as the resin extraction has been stopped since 2003-04 owing to the poor condition of the Chir crop because of unscientific tapping in the past. The Chir crop will continue under the period of rest in this plan till the healing of wounds is not complete. Also some Fir & Chir forests have also been shifted to Reboisement Working Circle wherein status of regeneration is very poor because of increased grazing pressure and various degradation pressures in these forests.

### (i) Deodar-Kail Selection Working Circle (DKSWC)

The working stock in the circle shall be put to work for adequate supply of Deodar and Kail timber for meeting the requirement of people and for generation of revenue. This circle is constituted of compartments that possess well stocked Deodar-Kail mixed forests besides maximum commercial area of the division pertain to this working circle. The compartments were ascertained on parameters of adequate growing stock, uniform distribution of dia-classes, good crop health, density as well as feasibility of exploitable volume and then allocated to this Working Circle. A total of 45 number of compartments having an area of 5323.28 hectare has been included in this Working Circle. The summary of range wise area of the circle is as under;

WORKING CIRCLE	RANGE	TOTAL AREA (Hectares)	COMMERCIAL AREA	UN COMMERCIAL AREA
		A=B+C+D	B	C
DKSWC	Batote	2885.15	1514.51	1370.63
	Gandhri	1795.367	1096.341	699.0256
	Marmat	1153.05	779.72	373.33
Total		5833.57	5833.57	2442.99

This will constitute the major Working Circle of this division wherein all commercial forests of Deodar and Kail with varying proportion of Fir and Spruce on higher reaches and Chir on the lower reaches occupying comparatively steeper slopes and rugged grounds. They are considered unsuitable for management under the system of concentrated regeneration felling from the point of view of soil and water conservation and reduced regeneration status.

## **(ii) Mixed Conifers Selection Working Circle (MCIWC)**

The working stock in the circle shall be put to work for adequate supply of Deodar and Kail timber for meeting the requirement of people and for generation of revenue. This circle is constituted of compartments that possess well stocked Deodar-Kail mixed forests besides maximum commercial area of the division pertain to this working circle. The compartments were ascertained on parameters of adequate growing stock, uniform distribution of dia-classes, good crop health, density as well as feasibility of exploitable volume and then allocated to this Working Circle. A total of 30 number of compartments having an area of 12,408.83 hectare has been included in this Working Circle. The summary of range wise area of the circle is as under;

<b>WORKING CIRCLE</b>	<b>RANGE</b>	<b>TOTAL AREA (Hectares)</b>	<b>COMMERCIAL AREA</b>	<b>UN COMMERCIAL AREA</b>
		<b>A=B+C+D</b>	<b>B</b>	<b>C</b>
MCIWC	Batote	286.43	178.02	108.41
	Gandhri	110.78	79.93	30.85
	Marmat	6178.06	3437.02	2741.04
<b>Total</b>		<b>6575.27</b>	<b>6575.27</b>	<b>2880.30</b>

This will constitute the major Working Circle of this division wherein all commercial forests of Deodar and Kail with varying proportion of Fir and Spruce on higher reaches and Chir on the lower reaches occupying comparatively steeper slopes and rugged grounds. They are considered unsuitable for management under the system of concentrated regeneration felling from the point of view of soil and water conservation.

## **(iii) Fir Selection Working Circle (FSWC)**

This Working Circle shall include all the commercial Fir forests, considered suitable for commercial exploitation under Selection System. These forests consist of pure Fir, or mixture of Fir with a sprinkling of Spruce, Deodar and Kail. The crop consists of predominantly mature to over mature trees with a fair proportion of middle-aged trees.

Regeneration is either absent or inadequate because of either lack of shade or heavy biotic pressure.

WORKING CIRCLE	RANGE	TOTAL AREA (Hectares)	COMMERCIAL AREA	UN COMMERCIAL AREA
		A=B+C+D	B	C
FSWC	Batote	295.35	89.47	205.88
	Gandhri	484.44	208.42	276.01
	Marmat	2831.62	1691.62	1140.01
<b>Total</b>		<b>3611.41</b>	<b>1989.51</b>	<b>1621.9</b>

#### (iv) Chir Irregular Working Circle (CIWC)

This Working Circle consists more or less pure Chir Forests of Batote and Gandhri ranges, containing mature and over mature trees. The regeneration is sufficient or absent in these forests with exception of a few compartments. Most of the Chir forests have been under excessive biotic pressure of grazing, encroachments, lopping, fire and resin tapping. The Chir forests, because of excessive biotic interference, have not responded favorably to the system of concentrated regeneration felling. Despite there being large gaps in the canopy, regeneration is conspicuous by its absence.

WORKING CIRCLE	RANGE	TOTAL AREA (Hectares)	COMMERCIAL AREA	UN COMMERCIAL AREA
		A=B+C+D	B	C
CIWC	Batote	333.14	146.6	186.54
	Gandhri	1096.56	458.17	638.39
	Marmat	0	0	0
<b>Total</b>		<b>1429.69</b>	<b>604.76</b>	<b>824.93</b>

#### (v) Reboisement Working Circle (RWC)

This Working Circle includes areas that have been degraded either due to biotic interference, or those that failed to regenerate after drastic treatment in the past. Obviously, no yield can be taken out from these forests and therefore, complete rest and rehabilitation is prescribed for this Working Circle. However, dry and decaying trees must be exploited to generate revenue instead of letting them to deteriorate subjected to the verification by the DCF/ACF.

WORKING CIRCLE	RANGE	TOTAL AREA (Hectares)	COMMERCIAL AREA	UN COMMERCIAL AREA
		A=B+C+D	B	C
RWC	Batote	5091.22	1559.97	3531.25
	Gandhri	3479.51	1028.02	2449.49
	Marmat	2635.1	972.07	1663.03
<b>Total</b>		<b>11203.83</b>	<b>3560.06</b>	<b>7643.77</b>

**(vi) Protection Working Circle (PWC)**

All those demarcated Forests of Batote Forest Division which are not covered under any of the working circles described heretofore, shall be placed under this Working Circle. These forests are highly degraded, occupy very steep slopes and need complete protection from all kinds of interference.

WORKING CIRCLE	RANGE	TOTAL AREA (Hectares)	COMMERCIAL AREA	UNCOMMERCIAL AREA
		A=B+C+D	B	C
RWC	Batote	695.87	150.28	545.6
	Gandhri	171.41	41.1	130.3
	Marmat	3789.14	1643.25	2143.89
<b>Total</b>		<b>4654.42</b>	<b>1834.63</b>	<b>2819.79</b>

**(vii) Eco-Tourism (Overlapping) Working Circle**

The State of Jammu and Kashmir enjoys the privilege of being the most preferred destination both by local as well as the foreign tourists. People used to visit the state for enjoying the nature, adventure sports as well as for pilgrimage upto 1985. Many European adventurous tourists visited this area for trekking, mountaineering and other adventure sports. This working Circle includes the compartments that are located adjacent to the places of Tourist spots and needs special attention because of excessive tourist flow. Some new areas in Gandhri and Marmat Ranges have also been brought under this circle owing to increasing road connectivity.

**(viii) Grassland Development (Overlapping) Working Circle**

This Working Circle includes the area under pasture land in the alpine and the sub-alpine zone. In addition, the prescription of this Working Circle shall be operative in those areas of the sub-tropical zone especially degraded sites and landslide prone areas that support, or have the potential to support suitable grass species. The pressure on such lands are beyond their capacities which have resulted heavy erosion. Soil Conservation treatments, are strongly recommended in these areas.

#### **(ix) Participatory Forest Management (Overlapping) Working Circle**

This Working circle includes the areas taken up/to be taken up for treatment under Forest Development Agency(FDA) with the active participation of the local peoples(VFC's) for regeneration and Eco-Development of degraded forests and other adjoining areas. The registered Village Forest Committees and the adjacent forest areas to be treated are dealt under this working circle.

#### **(x) Non- Timber Forest Produce (Overlapping ) Working Circle**

The Marmat Range besides other Ranges of Batote Forest Division are bestowed with many valuable Non Timber Forest Produces. The forest areas which harbor the NTFP's are brought under this overlapping working circle. In this Working Circle suggestion for exploring the propagation of various NTFPs and its market have been made.

#### **(xi) Wildlife Management (Overlapping) Working Circle**

The forest areas where the presence of important wild animals and their signages are being recorded and the areas which are potentially suitable for wild life are being incorporated under the overlapping working circle for the better management.

#### **(xii) Forest Protection (Overlapping) Working Circle**

The forests are prone to damage by fire, illicit felling, encroachment, etc. The protection aspects of the forests are dealt under this working circle.

### **9.5 Blocks and compartments:**

- 9.5.1 This Plan does not involve any change in the compartment boundary over the previous plan. The same is true of beats and blocks. Appendix III provides the estate area statement giving the list of compartments, Range wise, along with their respective areas and allotment.
- 9.5.2 The Range wise break up of territorial blocks and beats along with their constituent compartments is provided under appendix XI. The blocks and beats have been named after prominent village, drainage or place in the vicinity. A change has been made in the name of Block Assar to Block Bulandpur as the said change has already been made in the daily working from the year 2005.
- 9.5.3 As usual, sub-compartments are denoted by small alphabets a,b,c, after the compartment number in chronological order, usually marked by natural topographical



features such as nallah, spurs, ridges, rivers etc. or even artificial features as roads, path, canal etc. A single coal tar ring of 10 cm width, in the centre of 30 cm wide dry ring, on the trunks of suitable trees, preferably middle-aged, at breast height, inter-visible from two consecutive points, denotes compartment/sub-compartment boundary. Similarly, double coal tar rings indicate the Range boundary and three coal tar rings indicate Divisional boundary. These rings, along ridges and spurs follow the slope linearly, whereas nallahs, paths and roads, they have been put alternatively on the both sides in a staggered way, being mutually inter-visible. Compartment number and usual symbols for boundary features have been carved and painted with coal tar at breast height on suitable tree trunks at the base, middle and top of the compartments, as well as, at important location, such as, roads, paths, saddle crossing etc. Sufficient numbers of boards depicting demarcation-boundaries have been carved and painted with coal tar at short intervals. Due care has been exercised in depicting the symbols for compartment boundary and compartment number with reference to the actual position of board on the trunks. The meticulous lay out carried out at the time of previous revision of the Plan was of considerable assistance in the present revision.

## **9.6 Period of the Plan and necessity for Intermediate Revision**

- 9.6.1 This Plan shall remain in force for a period of 10 years beginning from April 2017 till March 2027. The Plan under Revision shall be deemed to have been extended from April 2011 to March 2017, the period between the expiry of the last Plan under Revision and the beginning of this Plan. Intermediate Revision is not required.

## Chapter X

# WORKING PLAN FOR THE DEODAR – KAIL SELECTION WORKING CIRCLE

## 10.1 General Constitution of the Working Circle

10.1.1 All well-stocked Deodar-Kail forests occupying easier slopes that were worked under concentrated regeneration felling system (shelterwood compartment system or system of successive regeneration felling) during the previous plan period, have been included in this working circle. The earlier system of shelterwood compartment system has been discontinued in these compartments because of poor regeneration-status, increased pressure of grazing, increased developmental activities wherein many FCA diversion cases have been sanctioned thereby adding further to the degradation of these forests. These forests are considered unfit to be managed under the system of concentrated regeneration felling because of comparatively low status of stocking and for the considerations of protection of soil and site. Out of the total area of 5833.57 ha in this circle 2885.15 ha falls in Batote Range, 1795.37 ha in Gandhri Range and rest 1153.05 ha in Marmat Range whereas the commercial area of the Working Circle is 3390.58 ha and the un commercial area 2442.99ha.

**Table 10.1 Table showing percentage area of each Range in DKSWC**

Working Circle	Range	Commercial Area (ha)	Un-commercial Area (ha)	Total Area (ha)
Deodar Kail Selection Working Circle (DKSWC)	Batote	1514.51	1370.63	2885.15
	Gandhri	1096.34	699.03	1795.37
	Marmat	779.72	373.33	1153.05
<b>Total</b>		<b>3390.58</b>	<b>2442.99</b>	<b>5833.57</b>

## 10.2 General Character of the Vegetation

10.2.1 The forests constituting this working circle consist mostly of Deodar, Kail and Fir. A few stray trees of Chir and *Taxus baccata* (yew) are encountered here and there in this zone. The crop is largely middle-aged to mature with a fair proportion of mature and over mature stock. The distribution of stems over various diameter classes is actually quite different from the distribution ideally aimed at in a selection forest, as can be observed from Table 10.2 below:

- 10.2.2 Forty nine percent of the area of this working circle falls in Batote Range, thirty one percent in Gandhri Range and twenty percent in Marmat Range. Of the total area allotted to this working circle, fifty eight percent is commercial forest area and rest forty two percent is uncommercial forest.
- 10.2.3 The forests constituting this working circle consist mainly of Kail and Deodar with some amount of Fir and Chir, which happen to be interspersed or intimately mixed up with Kail and Deodar, in higher reaches and along lower belts respectively. On the whole, Fir and Chir constitute less than 10 percent of the stocking of this working circle.
- 10.2.4 The general character of the vegetation has already been discussed in detail in Chapter II of Part I of this plan. The forests allotted this working circle conform to the Champion and Seths' Forest Types of India 12/C<sub>1c</sub>, 12/C<sub>1d</sub>, 12/C<sub>1e</sub>, 12/C<sub>1f</sub>, 12/C<sub>1a</sub> and 12/S<sub>(a,b)</sub>. The distribution of stems over various diameter classes is not quite balanced as can be observed from the perusal of the following table:

**Table 10.2 Statement showing Normal and Actual distribution of stems over different diameter-classes.**

<b>Diameter – class (cm)</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70 &lt;</b>
<b>Normal Distribution in percentage</b>	41.00%	25.00%	15.00%	9.00%	5.00%	3.00%	2.00%
<b>Actual Distribution in percentage</b>	8.95 %	15.56 %	16.73 %	18.28 %	16.73%	12.45 %	11.30 %

- 10.2.5 The distribution of stems above shows that there is a preponderance of trees in the higher diameter classes whereas the number of stems in lower diameter classes is deficient, primarily because of the failure of regeneration to establish.
- 10.2.6 The broad leaved miscellaneous species occupy sizeable area of this working circle, occurring either mixed with conifer species or pure in patches, linear strips along the streams, moist depressions and sheltered slopes. Broad-leaved species are mostly confined to the top most and the lower most areas of the hill slopes and banks of the streams. Among the broad leaved species *Alnus nepalensis*, *Juglans regia*, *Aesculus indica*, *Quercus ilex*, *Quercus leucotrichophora* and *Quercus dilatata* are quite frequent.
- 10.2.7 A detail description of these forests has already been given in Chapter II of Part I of this plan. The forests allotted to this working circle conform to Champion and Seth's forest types 12/C<sub>1c</sub>, 12/C<sub>1d</sub>, 12/C<sub>1f</sub>, 12/DS<sub>2</sub>, 12/DS<sub>3</sub>, 12/1S<sub>1</sub> and 11/2S<sub>1</sub>.

### 10.3 Area and Allotment

10.3.1 This working circle constitutes 17.51 percent of the total area of the division. Detailed statement of compartments and sub-compartments allotted to this working circle is provided under Appendix III and V. The Range wise distribution of the area under commercial and uncommercial categories, as drawn from the said Appendix, is summarized in Table 10.3 as under;

**Table 10.3 Statement showing Range wise distribution of area allotted to DKSWC**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	20	2, 3a, 3b, 4, 5, 6, 8b, 15, 16a, 16b, 17, 18a, 24, 25, 27a, 29, 33a, 38a, 39b and 44a.	2885.15
2.	Gandhri	17	46b, 47, 50b, 51a, 52b, 60a, 65, 66a, 66b, 67a, 68a, 75a, 76, 77b, 78b, 79 and 81a.	1795.37
3.	Marmat	8	11, 12a, 13a, 15a, 17b, 21b, 35a and 43b.	1153.05
Total		45		<b>5833.57</b>

### 10.4 Silvicultural System Adopted

10.4.1 The forests allotted to this working circle are located on comparatively steeper slopes. As a result, they play a key role in the soil and moisture conservation, and ecological stability of the area. Keeping in view the composition and condition of the crop, and the environmental function that these forests perform, these forests shall be managed under selection system. The objective behind the application of this system is to distribute the regeneration evenly over the entire working circle. In this system, the felling is directed towards silviculturally available trees above the exploitable diameter over a given felling cycle. Normally, it is expected that regeneration will come up in the gaps created by the trees removed. However, since the establishment of regeneration in this area is not assured, the removals will be restricted only to those areas where established regeneration is already present. In areas deficient or lacking regeneration only a conservative cut, avoiding creation of large gaps in the canopy is envisaged. In case large gaps are already present, no felling shall be carried out.

### 10.5 Exploitable Size

10.5.1 In order to achieve the objects of management and to fulfill the requirement of the area with regard to the protective functions of the forests, an exploitable size of 70 cm d.b.h. for Deodar and Kail and 80 cm d.b.h. for Fir shall be adopted.

10.5.2 Although the concept of rotation is not relevant in selection system, yet for purely academic interests, the rotation of 150 and 225 years corresponding to exploitable diameter of 70 cm d.b.h. for Deodar and Kail and 80 cm for Fir respectively is adopted.

## **10.6 Felling Cycle**

10.6.1 Felling cycle is fixed and adopted at 30 years. It is considered adequate to regulate the desired intensity of the cut/ felling. Consequently, there shall be 30 Annual coupes in this working circle.

## **10.7 Felling Series**

There shall be only one felling series identical in its constitution to that of the working circle.

## **10.8 Analysis and Valuation of the Crop**

10.8.1 For the assessment of the growing stock in this working circle, field data was collected from 46 sample points. The data was then utilized to arrive at the per hectare figures for the variables under study.

10.8.2 Mean values of two variables viz. number of stems per hectare and volume of conifers 30 cm d.b.h. and above have been computed diameter class and species wise. Results obtained on the basis of statistical analysis have been summarized in Table 10.4 overleaf. The diameter class and species wise distribution of growing stock assessed on the basis of mean values in terms of the total number of trees and volume of conifers 30 cm d.b.h. and above are summarized in Table 10.5 and 10.6 respectively.

**Table No: 10.4**  
**RESULT OF STATISTICAL ANALYSIS FOR THE DEODAR-KAIL SELECTION WORKING CIRLCE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Co-efficient of variation (%age)	95% Confidence limits (X+1.96 x S.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>Mixed Coniferous</b>	<b>No of stems</b>	<b>46</b>	<b>259.13</b>	<b>10501.45</b>	<b>102.48</b>	<b>15.11</b>	<b>39.55</b>	<b>228.7</b>	<b>289.56</b>	<b>60.86</b>	<b>88.26</b>
	<b>Volume</b>	<b>46</b>	<b>445.69</b>	<b>27401.84</b>	<b>165.54</b>	<b>24.41</b>	<b>37.14</b>	<b>396.53</b>	<b>494.85</b>	<b>98.32</b>	<b>88.97</b>

**Table No. 10.5 Tree account of Deodar-Kail Selection Working Circle.**

**Species wise stem Distribution per ha (mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	13	18	19	18	19	12	5	3	0	0	107
Fir	0	1	1	0	1	0	0	0	0	0	3
Kail	9	19	22	28	23	20	14	5	1	1	142
BL	1	2	1	1	0	0	0	0	0	0	5
<b>Total</b>	<b>23</b>	<b>40</b>	<b>43</b>	<b>47</b>	<b>43</b>	<b>32</b>	<b>19</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>257</b>

**Species wise stem Distribution over the entire commercial area of the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	44078	61030	64421	61030	64421	40687	16953	10172	0	0	362792
Fir	0	3391	3391	0	3391	0	0	0	0	0	10173
Kail	30515	64421	74593	94936	77983	67812	47468	16953	3391	3391	481463
BL	3391	6781	3391	3391	0	0	0	0	0	0	16954
<b>Total</b>	<b>77984</b>	<b>135623</b>	<b>145796</b>	<b>159357</b>	<b>145795</b>	<b>108499</b>	<b>64421</b>	<b>27125</b>	<b>3391</b>	<b>3391</b>	<b>871382</b>

**Species wise minimum available stem Distribution over entire commercial area in the working circle at Lower limit (88.26)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	38903	53865	56858	53865	56858	35910	14963	8978	0	0	320200
Fir	0	2993	2993	0	2993	0	0	0	0	0	8979
Kail	26933	56858	65836	83791	68828	59851	41895	14963	2993	2993	424941
BL	2993	5985	2993	2993	0	0	0	0	0	0	14964
<b>Total</b>	<b>68829</b>	<b>119701</b>	<b>128680</b>	<b>140649</b>	<b>128679</b>	<b>95761</b>	<b>56858</b>	<b>23941</b>	<b>2993</b>	<b>2993</b>	<b>769084</b>

**Species wise percentage of stem Distribution in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	5.06	7.00	7.39	7.00	7.39	4.67	1.95	1.17	0.00	0.00	41.63
Fir	0.00	0.39	0.39	0.00	0.39	0.00	0.00	0.00	0.00	0.00	1.17
Kail	3.50	7.39	8.56	10.89	8.95	7.78	5.45	1.95	0.39	0.39	55.25
BL	0.39	0.78	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.95
<b>Total</b>	<b>8.95</b>	<b>15.56</b>	<b>16.73</b>	<b>18.28</b>	<b>16.73</b>	<b>12.45</b>	<b>7.40</b>	<b>3.12</b>	<b>0.39</b>	<b>0.39</b>	<b>100.00</b>

**Table No 10.6 Volume account of Deodar-Kail Selection Working Circle**

<b>Species wise Volume Distribution per ha (mean value)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	1.70	2.40	14.21	24.29	39.72	37.54	21.95	14.77	2.98	1.64	161.20
Fir	0.06	0.08	0.91	0.68	1.94	2.13	2.98	0.00	0.00	2.22	11.00
Kail	1.13	2.49	17.02	38.43	51.32	66.07	60.53	27.91	4.00	4.40	273.30
<b>Total</b>	<b>2.92</b>	<b>5.03</b>	<b>32.24</b>	<b>63.40</b>	<b>92.98</b>	<b>105.74</b>	<b>85.46</b>	<b>42.68</b>	<b>6.98</b>	<b>8.26</b>	<b>445.69</b>
<b>Species wise Volume Distribution over the entire commercial area in the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	5763.99	8137.39	48180.14	82357.19	134673.84	127282.37	74423.23	50078.87	10103.93	5560.55	546561.50
Fir	203.43	271.25	3085.43	2305.59	6577.73	7221.94	10103.93	0.00	0.00	7527.09	37296.39
Kail	3831.36	8442.54	57707.67	130299.99	174004.57	224015.62	205231.81	94631.09	13562.32	14918.55	926645.52
<b>Total</b>	<b>9900.50</b>	<b>17054.61</b>	<b>109312.30</b>	<b>214962.77</b>	<b>315256.14</b>	<b>358519.93</b>	<b>289758.97</b>	<b>144709.96</b>	<b>23666.25</b>	<b>28006.19</b>	<b>1511147.62</b>
<b>Species wise minimum available Volume over the entire Commercial area in the working circle at Lower limit (88.97%)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	5128.22	7239.84	42865.87	73273.19	119819.32	113243.12	66214.35	44555.17	8989.47	4947.22	486275.77
Fir	180.99	241.33	2745.11	2051.28	5852.21	6425.36	8989.47	0.00	0.00	6696.85	33182.60
Kail	3408.76	7511.33	51342.51	115927.90	154811.87	199306.70	182594.74	84193.28	12066.40	13273.03	824436.52
<b>Total</b>	<b>8808.47</b>	<b>15173.49</b>	<b>97255.15</b>	<b>191252.37</b>	<b>280483.40</b>	<b>318975.18</b>	<b>257798.56</b>	<b>128748.45</b>	<b>21055.87</b>	<b>24917.10</b>	<b>1344468.04</b>
<b>Species wise percentage of volume Distribution in the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0.38	0.54	3.19	5.45	8.91	8.42	4.92	3.31	0.67	0.37	36.16
Fir	0.01	0.02	0.20	0.15	0.44	0.48	0.67	0.00	0.00	0.50	2.47
Kail	0.25	0.56	3.82	8.62	11.51	14.82	13.58	6.26	0.90	0.99	61.31
<b>Total</b>	<b>0.65</b>	<b>1.13</b>	<b>7.23</b>	<b>14.22</b>	<b>20.86</b>	<b>23.74</b>	<b>19.17</b>	<b>9.57</b>	<b>1.57</b>	<b>1.86</b>	<b>100.00</b>



## 10.9 Calculation of the Yield

10.9.1 The yield will be calculated in terms of number of trees and volume, which in turn shall be subject to area check. Modified Brandis Diameter-Class Method and Von Mantel's formula have been applied for calculation of the yield. The following presumptions have been made in this regard.

- Only commercial area and its growing stock have been taken into account for the purpose of yield calculation.
- The growing stock over commercial area of this working circle is classified within 10 cm diameter classes indicated by Symbols I, II, III, IV, V, VI and VII. Class I stands for trees above the exploitable diameter and the other successively below it to the youngest.
- The number of trees in all those classes being considered for the purpose of yield calculation has been computed at lower limit of confidence interval.
- It takes 121, 112 and 221 years, on an average, for trees of Deodar, Kail and Fir respectively to attain exploitable diameter of 70 cm d.b.h. in case of Deodar and Kail, and 80 cm d.b.h. in case of Fir.
- It takes 15, 13 and 25 years respectively for an average Deodar, Kail and Fir tree to pass from approach class ( 60-70 cm d.b.h) in case of Deodar and Kail and ( 70-80 cm d.b.h) in case of Fir to exploitable classes i.e. above 70 cm d.b.h in case of Deodar, Kail and 80 cm in case of Fir.
- The following *survival coefficient percentages* based on the All India Volume Tables as shown below in Table 10.7 in respect of Deodar, Kail and Fir have been used.

**Table 10.7 All India Volume Tables**

<b>Diameter-class d.b.h (cm)</b>	<b>Survival percentage of species</b>		
	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>
30	30%	45%	20%
40	60%	60%	40%
50	80%	80%	50%
60	90%	90%	60%
70	95%	95%	85%
80	--	--	95%

- In view of preponderance of mature and over-mature growing stock, and their vulnerability to rot, the yield finally arrived at shall be reduced by 30 percent. Based on these assumptions, the number of total potentially available trees, over the commercial area of this working circle, calculated at lower confidence limit of mean value after due deduction on account of mortality is tabulated under Table 10.6.

## 10.10 Yield Regulation

Modified Brandis Diameter Class Method and Von Mantel's Formula have been applied for calculating yield. The stepwise yield calculations for one felling cycle on the basis of Modified Brandis Diameter- class method and Von Mantel's Formula are tabulated under Table 10.8, Table 10.9 and Table 10.10 overleaf.

**Table 10.8 Species and diameter class wise potential availability of trees from the commercial area of DKSWC.**

### Deodar

Class	VI	V	IV	III	II	I	Total
Diameter-class	below 30	30-40	40-50	50-60	60-70	above 70	
Total No. of trees assessed at mean value	105108	64421	61030	64421	40687	27125	362792
Total No. of trees assessed at lower limit of confidence interval	92768	56858	53865	56858	35910	23941	320200
Age of entry in the class		57	71	90	110	135	
Years in class transition period		14	19	20	25		
Survival Coefficient of the class		0.3	0.6	0.8	0.9	0.95	
No. of potentially available trees		17057	32319	45486	32319	22744	149925

### Kail

Class	VI	V	IV	III	II	I	Total
Diameter-class	below 30	30-40	40-50	50-60	60-70	above 70	
Total No. of trees assessed at mean value	94936	74593	94936	77983	67812	71203	481463
Total No. of trees assessed at lower limit of confidence interval	83791	65836	83791	68828	59851	62844	424941
Age of entry in the class		42	55	72	91	115	
Years in class transition period		13	17	19	24		
Survival Coefficient of the class		0.45	0.6	0.8	0.9	0.95	
No. of potentially available trees		29626	50275	55062	53866	59702	248531

## Fir

Class	VI	V	IV	III	II	I	Total
Diameter-class	30-40	40-50	50-60	60-70	70-80	above 80	
Total No. of trees assessed at mean value	3391	0	3391	0	0	0	6782
Total No. of trees assessed at lower limit of confidence interval	2993	0	2993	0	0	0	5986
Age of entry in the class	73	96	118	139	164	194	
Years in class transition period	23	22	21	25	30		
Survival Coefficient of the class	0.2	0.4	0.5	0.6	0.85	0.95	
No. of potentially available trees	599	0	1497	0	0	0	2096

**Table 10.9      Yield Calculation for Mixed Conifers Selection Working Circle  
Using Brandis Diameter-Class Method.**

		<b>Deodar</b>	<b>KAIL</b>	<b>FIR</b>
a)	Total number of trees in class I	22744	59702	0
b)	Total number of trees likely to pass on to class I in the first felling cycle from Class II =	<b>32319</b>	<b>53866</b>	<b>1628</b>
	Total number of trees likely to pass on to class I in the first felling cycle from Class III =	<b>11372</b>	<b>17388</b>	<b>0</b>
c)	Total recruitment in class I from class II and III during first felling cycle	43691	71254	0
d)	Annual recruitment from class II and III during the first felling cycle (c / 30)	1456	2375	0
e)	Stock required to be kept as reserve i.e. half of the total recruitment in 'c' above	21846	35627	0
f)	Surplus stock of class I ( a - e)	898	24075	0
g)	Total possibility of yield in first felling cycle if all surplus stock in 'f' above is removed ( c + f)	44589	95329	0
h)	Annual yield ( g / 30)	1486	3178	0
i)	Total possibility of yield if all surplus stock in 'f' above is removed in two felling cycles ( c + f/2) (refer note below)	44140	83292	0
j)	Annual yield ( i / 30)	1471	2776	0
k)	Weighted average volume of trees above exploitable diameter as per Kullu Volume Tables in cubic metres	5.209	4.648	0.000
l)	Total annual volume yield ( m3)	7662	12903	0
m)	Deduct fifteen percent from 'l' above to account for mortality	6513	10968	0
n)	Rounded off to lower multiple of hundred	6500	10900	0
	<b>TOTAL ANNUAL YIELD FROM THE WORKING CIRCLE</b>	<b>17,400</b>	<b>cum</b>	

The yield calculated using Von Mantel's Formula is as under:

**Table 10.10 Yield calculation for MCSWC using Von Mantel's formula.**

	Deodar R = 150	Kail R = 150	Fir R = 225	Total
Total commercial volume based on mean value (m <sup>3</sup> ) Min GS	546561.50	926645.52	37296.39	1511147.62
Total commercial volume at lower confidence interval (m <sup>3</sup> )	486275.77	824436.52	33182.60	1344468.04
Annual Yield (m <sup>3</sup> ) = 2GS/R	6483.68	10992.49	294.96	17778.77
Corrected Yield	<b>6400.00</b>	<b>10900.00</b>	<b>200.00</b>	<b>17500.00</b>

The comparative statement of yield computed from the two methods is as under:

Calculation method	Annual yield in m <sup>3</sup>			
	Deodar	Kail	Fir	Total
Brandis	6400	10900	200	17500
Von Mantel	6500	10900	0	17400

Accordingly, from a conservative standpoint, the lower figures for the respective species are prescribed as yield after rounding off to nearest multiple of hundred as under:

Deodar	=	6,400 m <sup>3</sup>
Kail	=	10,900 m <sup>3</sup>
Fir	=	0 m <sup>3</sup>
<u>Total</u>	=	<u>17,300 m<sup>3</sup></u>

The intensity of cut on the basis of this volume (17,300 m<sup>3</sup>) over the commercial area of 3390.58 hectares works out to 5.10 m<sup>3</sup> per hectare. The total annual yield prescribed constitutes 1.14% of the total commercial growing stock.

### 10.11 Size of the Annual Coupe

The yield calculated on volume basis shall be controlled by an area check. The size of the annual coupe is calculated as under:

$$\text{Annual Coupe (ha)} = \frac{\text{Total commercial area of working circle}}{\text{Felling cycle}} = \frac{3390.58}{30} = 113.02 \text{ ha.}$$

### 10.12 Allowable Cut

Given the annual yield and the size of annual coupe, the allowable cut is computed as under;

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
17300	113.02	153.07	396.53	38.6

If yield is reduced by 30% the allowable cut is computed as under;

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
12110	113.02	107.15	396.53	27.02

### 10.13 Realization of the Yield

10.13.1 The yield prescribed shall include the volume of all trees of 30 cm d.b.h. and above marked for whatever purpose including concessions marking, illicit damage etc. Only two fifths of the total commercial area i.e. 1478 hectare shall be worked on during the plan period of 10 years. Thus felling in the next 10 years shall be subject to the limit of yield prescribed (10,000 m<sup>3</sup>) and area check (1478 ha), whichever is arrived at earlier. The annual yield prescribed should be strictly adhered to. Deviations in annual yield to the extent of 20 percent are permissible for certain administrative or technical reasons. Deviations beyond the above limits shall require prior sanction of the Chief Conservator of Forests. However, cumulative deviations over the entire working plan period should not exceed the prescribed yield.

#### **10.14 Sequence of Felling**

In view of the current ban on green felling, the sequence of fellings has been left to the discretion of the Divisional Forest Officer who shall exercise his judgment keeping in view the progress of regeneration.

#### **10.15 Method of Executing Felling**

Removal of over-wood standing above the advance growth and regeneration, with the object of relieving it from shade and suppression, and very light opening up of the crop where regeneration is inadequate, will constitute the general guide lines in executing the fellings. The over-wood above the regeneration must be gradually removed in order to avoid the invasion of the area by weeds which come up profusely in the gaps. The canopy needs to be manipulated with utmost care. Selection forests require elaborate management and great skill on the part of the executive staff that have to handle the crop properly. Accordingly, the following marking rules are laid down for guidance of the marking officer.

#### **10.16 Marking and Felling Rules**

- The marking officer prior to conducting the marking must acquaint himself thoroughly with the condition and composition of the crop in the compartment and its boundaries by traversing the area of the compartment.
- Marking should be done by the DCF in charge of the Division or well trained and experienced ACF. The marking should never be conducted by anybody below the rank of a well trained and experienced Range Officer, in which case, the DFO/ ACF should check at least 25% of these markings.
- No marking, except the removal of dead and diseased trees shall be done in area near and around cultivation and *behaks* within a distance of 100 meters from their periphery.
- No marking, except the removal of actually dead, diseased trees shall be done along nallah banks within a distance of at least 150 meters on either side.
- No healthy trees below the exploitable size be marked.
- No attempt shall be made to disturb the process of the succession by giving preference to one species over the others. The selection character of the crop shall be preferred over the area of this working circle and should be maintained by retaining some healthy trees of exploitable size which do not cause any suppression to the crop.
- No marking should be conducted in areas lacking regeneration.
- No marking should be done on steep and precipitous slopes.

- The over mature trees should get preference over the relatively younger and healthier ones.
- Improvement and hygienic markings in all age classes should be done.
- Marking for improvement felling shall form an integral part of the major markings. All dead and diseased trees shall be marked together with malformed and unfit trees.
- All the trees of exploitable size (70 cm d.b.h. in case of Deodar and Kail, and 80 cm d.b.h. in case of Fir), standing over adequate advance growth should be removed. Selection marking of light to very light intensity shall be carried out in area having inadequate but established regeneration.
- In dense groups of trees, of and above exploitable size, the spacing between the stems to be retained will vary from 5 to 8 meters, depending upon the status and amount of regeneration present. Selection fellings of moderate intensity shall be carried out in such groups.
- In the mixed crop, ecologically most suitable species to the locality should be favored.
- The intensity of felling over a particular compartment will largely depend upon the degree of biotic interference to which it is subject to, the amount and status of regeneration, and its topography, slope and aspect.
- Extreme care has to be exercised at the time of felling so as not to damage the regeneration below.
- Trees marked for felling should be lopped before execution of felling.

For the purposes of management planning, the growing stock can be differentiated into the following three main categories.

- (i) Mature and over-mature trees either quite dense or diffused and sporadic with scanty or no regeneration of either poles or saplings.
- (ii) Even-aged Kail and Deodar (converted) forests with predominance of young pole-sized trees with scanty, scattered or even no mature trees as over wood.
- (iii) A mixture of mature, over-mature, middle-aged trees with adequate, established or unestablished regeneration.

The broad-leaved species occupy very insignificant area under this working circle. They are confined mostly to shady and moist localities, depressions, and the banks of perennial streams found pure in patches or intermixed with conifers. The undergrowth met varies from scanty to heavy in intensity.



### **10.17 Supplementary Marking**

As soon as the felling, following major marking is over, supplementary marking of poles and trees damaged in felling or those that have died, dried or fallen subsequent to the major markings shall be done. Due caution needs to be taken to avoid large scale supplementary marking which proves dangerous to the ultimate requirement of the crop and site. Preferably these markings should be conducted by the DFO himself. Past experience has shown that in certain cases the quantity of supplementary markings did exceed the original one. Judicious discretion of the marking officer is, therefore, needed so that the provision of supplementary marking is not misused, and only such trees, as are considered definitely unfit for retention, are marked.

### **10.18 Disposal of Debris**

Felling refuse not only builds the potential reserve of combustible material but is equally bad for the hygiene of the crop. The felling refuse in Deodar- Kail forests is generally taken by the villagers for their domestic use as fuel wood etc. However, in remote areas, far away from human settlements, the felling refuse left in the forests should be collected at safer places and burnt during the safe season. This will not only clear the forest floor of felling debris but reduce the chances of fires in the forests.

### **10.19 Tending**

Tending, including cleaning and thinning of young established regeneration, is primarily needed in case of artificially regenerated crops as well as in congested patches extending naturally over a sizeable area. Tending operations under the standard prescriptions will also be needed in the plantations envisaged under this plan, to be taken up artificially to regenerate the failed areas.

### **10.20 Regeneration Programme**

The success of any silvicultural system adopted for treating the crop depends largely upon the efforts put in to regenerate the forests in due course of time. It is not much of a problem to regeneration Kail, Deodar forests naturally except in the areas near and around human settlements under heavy pressure of grazing. These forests were relatively safe from the menace of excessive grazing which, of course, is now extending over into these forests. As a result, the extent of the area requiring artificial regeneration is increasing every passing year. Measures to induce regeneration need to be applied over a large area. In the prevailing socio-economic set up, it is neither possible nor practical to close large areas for grazing. It is therefore suggested that the area for regeneration, at least equal to the size of the annual coupe, evenly distributed over the working circle should be effectively closed to grazing annually. In case regeneration is present partially, only that much area containing no regeneration, may

be in several patches, should be closed and subsidiary measures such as uprooting and cutting of shrubs, raking of top soil be taken up. In the case of the area being too refractory to respond to natural seeding, artificial regeneration by way of sowing and planting of nursery raised seedlings be resorted to. For any regeneration activity, effective closure of the area in question to biotic interference is a must.

## **10.21 Nursery and Plantation Techniques**

### ***Cedrus deodara***

Found between 2000 to 2600 meters. Young plants suffer severely from browsing and insects especially cockchafer grubs and cutworms. It is somewhat susceptible to fungal attack.

Seed: Cones ripen in October – November, should be collected by hand and dried. Seeds are threshed out and can be stored until sowing. Since the seeds are oily they do not retain viability for more than a few months. An average sample of one kilogram contains 7,000 to 8,000 seeds. Germination percent is very high, around 90 percent. Germination starts in spring but may take four to five months to complete.

Nursery Technique: Direct sowing is successful in good situations. Sowing be done in November before snowfall, and if necessary re-sowing be done in April. Sowing may be done by broadcast also, in contour lines, elongated patches across the contour or dibbled in lines 3 m apart. Individual seed may be sown in drills 10-15 cm apart, and covered with thorns. Germination begins after 2-3 months.

Planting Technique: Seedlings be pricked out in July when 10-15 cm long, or in next July when 15 to 20 cm tall and planted out in the third year when 30 to 45 cm long. Less vigorous seedlings may be pricked out and kept in the nursery for one more year. Long (20cm) seedlings may be planted out directly from the nursery beds without pricking out. Seedlings with or without earth around the roots are put out in holes on a cloudy day. Usual spacing of 2 x 2 meters or in contour lines 3 x 3 meters be used. Thorough weeding and cleaning is required for 2-3 years, early and frequent thinning also needed.

### ***Pinus wallichiana***

It is found in temperate Himalayas at 2000 to 3000 meters height, but sometimes between 1000 to 4000 meters also. It is a strong light demander but grows well on cool aspects. On hot aspects and shallow soils, shading is necessary.

Seed: Cones ripen during September to November. They should be collected from the trees, dried in the sun or kiln and seeds be extracted by shaking or beating the cones. Seeds can be stored after air drying for 12 to 18 months. A kilogram contains about 16,000 seeds. Germination capacity of the fresh seeds is upon 90 percent, which completes in one to four months.

Nursery Technique: Seed may be sown or broadcast in prepared contour lines or patches from November to June. Spacing of patches should be 2 x 2 meters. Germination occurs in rains and the seedlings be pricked out in the following rains.

Planting Technique: Two or three year old seedlings are lifted with balls of earth and are transplanted during rains. They should be 20 to 35 cm in height. Usual spacing, of 1.5 x 1.5 meters or 2 x 2 meters be kept. Weeding and cleaning is required for 2-3 years. Early, frequent and light thinnings are necessary to prevent snow damage.

### ***Quercus leucotrichophora***

Found between 1200 to 2400 meters.

Seed: They are normally attacked by insects but seed years are frequent. Seeds are large (on an average 550 per kg). They are collected in December- February and can be stored for a year in cool and dry place. Germination capacity is high, up to 95 percent but takes a month to complete germination.

Nursery Technique: Dibbling be done in winter at a spacing of 1.5 x 1.5 meters or 2 x 2 meters. Sowing drills 1-2 cm below the soil and 20-30 cm apart, can also be done during February- March. Pricking out of seedlings is not necessary but may be done in the second rains. Roots should be slightly trimmed. Seedlings be kept in the nursery for 3-4 years.

Planting Technique: Seedlings 30-40 cm tall be transplanted when 2-4 years old, in prepared pits at a spacing of 1.5 x 1.5 meters or 2 x 2 meters. Winter planting is not very successful. Weeding and cleaning is required for several years, however, thinning is not needed for a long time. It should also be protected against browsing. It is a slow growing species.

## **10.22 Control of Grazing**

Grazing is not as big a problem in Kail and Deodar forests as it is in Fir and Chir forests. However, unrestricted, uncontrolled and unregulated grazing does affect some of the pockets of these forests and has proved to be the major reason for failure of regeneration in these areas. The areas subjected to heavy pressure of grazing, are prescribed to be effectively closed to the exclusion of grazing on rotational basis and taken up for artificial regeneration by patch sowing and planting.

## Chapter XI

# WORKING PLAN FOR THE MIXED CONIFERS SELECTION WORKING CIRCLE

### 11.1 General Constitution of the Working Circle

11.1.1 This working circle contains relatively well stocked commercial forests of Deodar, Kail and Fir with sprinklings of Spruce here and there in the higher reaches and a few stray trees of Chir in the lower area, occupying comparatively steep slopes and rugged ground. These forests are considered unfit to be managed under the system of concentrated regeneration felling because of comparatively low status of stocking and for the considerations of protection of soil and site. Out of the total area of 6575.27 ha in this circle 286.43 ha falls in Batote Range, 110.78 ha in Gandhri Range and rest 6178.06 ha in Marmat Range whereas the commercial area of the Working Circle is 3694.97 ha and the un commercial area 2880.30 ha.

**Table 11.1 Table showing area of each Range in MCSWC**

Working Circle	Range	Commercial Area (ha)	Un-commercial Area (ha)	Total Area (ha)
Mixed Conifer Selection Working Circle	Batote	178.02	108.41	286.43
	Gandhri	79.93	30.85	110.78
	Marmat	3437.02	2741.04	6178.06
<b>Total</b>		<b>3694.97</b>	<b>2880.30</b>	<b>6575.27</b>

### 11.2 General Character of the Vegetation

11.2.1 The forests constituting this working circle consist mostly of Deodar, Kail and Fir, with sprinklings of Spruce. A few stray trees of Chir and *Taxus baccata* (yew) are encountered here and there in this zone. The crop is largely middle-aged to mature with a fair proportion of mature and over mature stock. The distribution of stems over various diameter classes is actually quite different from the distribution ideally aimed at in a selection forest, as can be observed from Table 11.2 below;

**Table 11.2 Normal and Actual Distribution of Stems Over Diameter Classes**

Diameter – class (cm)	10-20	20-30	30-40	40-50	50-60	60-70	70 <
Normal Distribution in percentage	41.00 %	25.00 %	15.00 %	9.00%	5.00%	3.00%	2.00%
Actual Distribution in percentage	10.78	15.69	15.55	15.01	15.69	12.96	14.32 %

11.2.2 The graph above shows that there is a preponderance of trees in the higher diameter classes whereas the number of stems in lower diameter classes is deficient, primarily because of the failure of regeneration to establish.

11.2.3 The broad leaved miscellaneous species occupy sizeable area of this working circle, occurring either mixed with conifer species or pure in patches, linear strips along the streams, moist depressions and sheltered slopes. Broad-leaved species are mostly confined to the top most and the lower most areas of the hill slopes and banks of the streams. Among the broad leaved species *Alnus nepalensis*, *Juglans regia*, *Aesculus indica*, *Quercus ilex*, *Quercus leucotrichophora* and *Quercus dilatata* are quite frequent.

11.2.4 A detail description of these forests has already been given in Chapter II of Part I of this plan. The forests allotted to this working circle conform to Champion and Seth's forest types 12/C<sub>1c</sub>, 12/C<sub>1d</sub>, 12/C<sub>1f</sub>, 12/DS<sub>2</sub>, 12/DS<sub>3</sub>, 12/1S<sub>1</sub> and 11/2S<sub>1</sub>.

### 11.3 Area and Allotment

11.3.1 This working circle constitutes 37.25 percent of the total area of the division. Detailed statement of compartments and sub-compartments allotted to this working circle is provided under Appendix III and VI. The Range wise distribution of the area under commercial and uncommercial categories, as drawn from the said Appendix, is summarized in Table 11.3 as under;

**Table 11.3 Table showing Range wise distribution in MCSWC.**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	2	8a and 18b.	286.43
2.	Gandhri	1	81b.	110.78
3.	Marmat	24	10b, 13b, 28, 29, 30, 38, 40, 41, 42, 43a, 45, 47, 50, 51, 52, 55, 60, 61, 62, 64, 65, 71, 72 and 73.	6178.06
				<b>6575.27</b>

## **11.4 Silvicultural System Adopted**

- 11.4.1 The forests allotted to this working circle are located on comparatively steeper slopes. As a result, they play a key role in the soil and moisture conservation, and ecological stability of the area. Keeping in view the composition and condition of the crop, and the environmental function that these forests perform, these forests shall be managed under selection system. The objective behind the application of this system is to distribute the regeneration evenly over the entire working circle. Secondly, because of the continuous presence of over-wood, the regeneration of shade bearers like Fir and Spruce can be secured thereby maintaining the mixed composition of these forests. In this system, the fellings are directed towards silviculturally available trees above the exploitable diameter over a given felling cycle. Normally, it is expected that regeneration will come up in the gaps created by the trees removed. However, since the establishment of regeneration in this area is not assured, the removals will be restricted only to those areas where established regeneration is already present. In areas deficient or lacking regeneration only a conservative cut, avoiding creation of large gaps in the canopy is envisaged. In case large gaps are already present, no felling shall be carried out.

## **11.5 Exploitable Size**

- 11.5.1 In order to achieve the objects of management and to fulfill the requirement of the area with regard to the protective functions of the forests, an exploitable size of 70 cm d.b.h. for Deodar and Kail and 80 cm d.b.h. for Fir shall be adopted.
- 11.5.2 Although the concept of rotation is not relevant in selection system, yet for purely academic interests, the rotation of 150 and 225 years corresponding to exploitable diameter of 70 cm d.b.h. for Deodar and Kail and 80 cm for Fir respectively is adopted.

## **11.6 Felling Cycle**

Felling cycle is fixed and adopted at 30 years. It is considered adequate to regulate the desired intensity of the cut/ felling. Consequently, there shall be 30 Annual coupes in this working circle.

## **11.7 Felling Series**

There shall be only one felling series identical in its constitution to that of the working circle.

## **11.8 Analysis and Valuation of the Crop**

- 11.8.1 For the assessment of the growing stock in this working circle, field data was collected from 30 sample points. The data was then utilized to arrive at the per hectare figures for the variables under study. The results of statistical analysis are now based on data from these 30 sample points.

11.8.2 Mean values of two variables viz. number of stems per hectare and volume of conifers 30 cm d.b.h. and above have been computed diameter class and species wise. Results obtained on the basis of statistical analysis have been summarized in Table 2.3.3 overleaf. The diameter class and species wise distribution of growing stock assessed on the basis of mean values in terms of the total number of trees and volume of conifers 30 cm d.b.h. and above are summarized in Table 2.3.4 and 2.3.5 respectively.



**Table No: 11.4      RESULT OF STATISTICAL ANALYSIS FOR THE MIXED CONIFEROUS SELECTION WORKING CIRCLE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Co-efficient of variation (%age)	95% Confidence limits (X+1.96 x S.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
1	2	3	4	5	6	7	8	9	10	11	12
Mixed Coniferous	No of stems	30	244.33	6666.78	81.65	14.91	33.42	213.84	274.82	60.98	87.52
	Volume	30	469.57	19321.73	139	25.38	27.99	444.67	548.47	103.80	89.55

**Table No 11.5 Tree account of Mixed Coniferous Selection Working Circle.**

**Species wise stem Distribution per ha (mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
<b>Deodar</b>	10	13	11	13	11	8	5	3	2	0	76
<b>Fir</b>	9	13	13	10	5	9	3	2	1	1	66
<b>Kail</b>	4	10	14	13	22	15	9	5	2	0	94
<b>BL</b>	4	3	1	0	0	0	0	0	0	0	8
<b>Total</b>	<b>27</b>	<b>39</b>	<b>39</b>	<b>36</b>	<b>38</b>	<b>32</b>	<b>17</b>	<b>10</b>	<b>5</b>	<b>1</b>	<b>244</b>

**Species wise stem Distribution over the entire commercial area of the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
<b>Deodar</b>	36950	48035	40645	48035	40645	29560	18475	11085	7390	0	280820
<b>Fir</b>	33255	48035	48035	36950	18475	33255	11085	7390	3695	3695	243870
<b>Kail</b>	14780	36950	51730	48035	81289	55425	33255	18475	7390	0	347329
<b>BL</b>	14780	11085	3695	0	0	0	0	0	0	0	29560
<b>Total</b>	<b>99765</b>	<b>144105</b>	<b>144105</b>	<b>133020</b>	<b>140409</b>	<b>118240</b>	<b>62815</b>	<b>36950</b>	<b>18475</b>	<b>3695</b>	<b>901579</b>

**Species wise minimum available stem Distribution over entire commercial area in the working circle at Lower limit (87.52%)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
<b>Deodar</b>	32339	42040	35573	42040	35573	25871	16169	9702	6468	0	245775
<b>Fir</b>	29105	42040	42040	32339	16169	29105	9702	6468	3234	3234	213436
<b>Kail</b>	12935	32339	45274	42040	71144	48508	29105	16169	6468	0	303982
<b>BL</b>	12935	9702	3234	0	0	0	0	0	0	0	25871
<b>Total</b>	<b>87314</b>	<b>126121</b>	<b>126121</b>	<b>116419</b>	<b>122886</b>	<b>103484</b>	<b>54976</b>	<b>32339</b>	<b>16170</b>	<b>3234</b>	<b>789064</b>

**Species wise percentage of stem Distribution in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
<b>Deodar</b>	4.10	5.33	4.51	5.32	4.51	3.28	2.05	1.23	0.82	0.00	31.15
<b>Fir</b>	3.69	5.32	5.33	4.10	2.05	3.69	1.22	0.82	0.41	0.40	27.03
<b>Kail</b>	1.64	4.10	5.74	5.33	9.02	6.15	3.69	2.05	0.82	0.00	38.54
<b>BL</b>	1.64	1.23	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28
<b>Total</b>	<b>11.07</b>	<b>15.98</b>	<b>15.99</b>	<b>14.75</b>	<b>15.58</b>	<b>13.12</b>	<b>6.96</b>	<b>4.10</b>	<b>2.05</b>	<b>0.40</b>	<b>100.00</b>

**Table No 11.6 Volume account of Mixed Coniferous selection Working Circle.**

**Species wise Volume Distribution per ha (mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	1.26	1.69	8.11	17.73	23.80	25.12	23.41	18.87	13.70	2.52	136.21
Fir	1.17	1.65	10.92	16.12	13.86	42.47	18.27	19.37	12.53	13.59	149.95
Kail	0.48	1.30	10.39	17.68	49.94	50.10	41.25	24.97	14.33	0.00	210.44
<b>Total</b>	<b>2.91</b>	<b>4.64</b>	<b>29.42</b>	<b>51.53</b>	<b>87.60</b>	<b>117.69</b>	<b>82.93</b>	<b>63.21</b>	<b>40.56</b>	<b>16.11</b>	<b>496.60</b>

**Species wise Volume Distribution over the entire commercial area in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	4655.66	6244.50	29966.21	65511.82	87940.29	92817.65	86499.25	69724.08	50621.09	9311.32	503291.87
Fir	4323.11	6096.70	40349.07	59562.92	51212.28	156925.38	67507.10	71571.57	46297.97	50214.64	554060.74
Kail	1773.59	4803.46	38390.74	65327.07	184526.80	185118.00	152417.51	92263.40	52948.92	0.00	777569.49
<b>Total</b>	<b>10752.36</b>	<b>17144.66</b>	<b>108706.02</b>	<b>190401.81</b>	<b>323679.37</b>	<b>434861.03</b>	<b>306423.86</b>	<b>233559.05</b>	<b>149867.98</b>	<b>59525.96</b>	<b>1834922.10</b>

**Species wise minimum available Volume over the entire Commercial area in the working circle at Lower limit (89.55%)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	4169.14	5591.95	26834.74	58665.83	78750.53	83118.21	77460.08	62437.91	45331.19	8338.29	450697.87
Fir	3871.35	5459.59	36132.59	53338.59	45860.60	140526.68	60452.61	64092.34	41459.83	44967.21	496161.39
Kail	1588.25	4301.50	34378.91	58500.39	165243.75	165773.17	136489.88	82621.87	47415.76	0.00	696313.48
<b>Total</b>	<b>9628.74</b>	<b>15353.04</b>	<b>97346.24</b>	<b>170504.81</b>	<b>289854.88</b>	<b>389418.06</b>	<b>274402.57</b>	<b>209152.12</b>	<b>134206.78</b>	<b>53305.50</b>	<b>1643172.74</b>

**Species wise percentage of volume Distribution in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Deodar	0.25	0.34	1.63	3.57	4.79	5.06	4.70	3.80	2.76	0.51	27.41
Fir	0.24	0.33	2.20	3.25	2.79	8.55	3.68	3.90	2.52	2.74	30.20
Kail	0.10	0.26	2.09	3.56	10.06	10.09	8.31	5.03	2.89	0.00	42.39
<b>Total</b>	<b>0.59</b>	<b>0.93</b>	<b>5.92</b>	<b>10.38</b>	<b>17.64</b>	<b>23.70</b>	<b>16.69</b>	<b>12.73</b>	<b>8.17</b>	<b>3.25</b>	<b>100.00</b>

## 11.9 Calculation of the Yield

11.9.1 The yield will be calculated in terms of number of trees and volume, which in turn shall be subject to area check. Modified Brandis Diameter-Class Method and Von Mantel's formula have been applied for calculation of the yield. The following presumptions have been made in this regard.

- Only commercial area and its growing stock have been taken into account for the purpose of yield calculation.
- The growing stock over commercial area of this working circle is classified within 10 cm diameter classes indicated by Symbols I, II, III, IV, V, VI and VII. Class I stands for trees above the exploitable diameter and the other successively below it to the youngest.
- The number of trees in all those classes being considered for the purpose of yield calculation has been computed at lower limit of confidence interval.
- It takes 121, 112 and 221 years, on an average, for trees of Deodar, Kail and Fir respectively to attain exploitable diameter of 70 cm d.b.h. in case of Deodar and Kail, and 80 cm d.b.h. in case of Fir.
- It takes 15, 13 and 25 years respectively for an average Deodar, Kail and Fir tree to pass from approach class ( 60-70 cm d.b.h) in case of Deodar and Kail and ( 70-80 cm d.b.h) in case of Fir to exploitable classes i.e. above 70 cm d.b.h in case of Deodar, Kail and 80 cm in case of Fir.
- The following *survival coefficient percentages* based on the All India Volume Tables in respect of Deodar, Kail and Fir have been used.

**Table 11.7 All India Volume Table**

<b>Diameter-class d.b.h (cm)</b>	<b>Survival percentage of species</b>		
	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>
30	30%	45%	20%
40	60%	60%	40%
50	80%	80%	50%
60	90%	90%	60%
70	95%	95%	85%
80	--	--	95%

- In view of preponderance of mature and over-mature growing stock, and their vulnerability to rot, the yield finally arrived at shall be reduced by 30 percent. Based on these assumptions, the number of total potentially available trees, over the commercial area of this working circle, calculated at lower confidence limit of mean value after due deduction on account of mortality is tabulated under Table 11.5.

### 11.10 Yield Regulation

Modified Brandis Diameter Class Method and Von Mantel's Formula have been applied for calculating yield. The stepwise yield calculations for one felling cycle on the basis of Modified Brandis Diameter- class method and Von Mantel's formula are tabulated under Table 11.8, Table 11.9 and Table 11.10 overleaf.

**Table 11.8 Species and diameter class wise potential availability of trees from the commercial area of DKSWC.**

#### Deodar

Class	VI	V	IV	III	II	I	Total
Diameter-class	below 30	30- 40	40- 50	50-60	60-70	above 70	
Total No. of trees assessed at mean value	84985	4064 5	4803 5	40645	29560	36950	28082 0
Total No. of trees assessed at lower limit of confidence interval	74379	3557 3	4204 0	35573	25871	32339	24577 5
Age of entry in the class		57	71	90	110	135	
Years in class transition period		14	19	20	25		
Survival Coefficient of the class		0.3	0.6	0.8	0.9	0.95	
No. of potentially available trees		1067 2	2522 4	28458	23284	30722	11836 0

**Kail**

Class	VI	V	IV	III	II	I	Total
Diameter-class	below 30	30- 40	40- 50	50-60	60-70	above 70	
Total No. of trees assessed at mean value	51730	5173 0	4803 5	81289	55425	59120	34732 9
Total No. of trees assessed at lower limit of confidence interval	45274	4527 4	4204 0	71144	48508	51742	30398 2
Age of entry in the class		42	55	72	91	115	
Years in class transition period		13	17	19	24		
Survival Coefficient of the class		0.45	0.6	0.8	0.9	0.95	
No. of potentially available trees		2037 3	2522 4	56915	43657	49155	19532 4

**Fir**

Class	VI	V	IV	III	II	I	Total
Diameter-class	30-40	40- 50	50- 60	60-70	70-80	above 80	
Total No. of trees assessed at mean value	48035	3695 0	1847 5	33255	11085	14780	16258 0
Total No. of trees assessed at lower limit of confidence interval	42040	3233 9	1616 9	29105	9702	12935	14229 0
Age of entry in the class	73	96	118	139	164	194	
Years in class transition period	23	22	21	25	30		
Survival Coefficient of the class	0.2	0.4	0.5	0.6	0.85	0.95	
No. of potentially available trees	8408	1293 6	8085	17463	8247	12288	67427

**Table 11.9 Yield Calculation for Mixed Conifers Selection Working Circle using Brandis Diameter-Class Method**

		<b>Deodar</b>	<b>KAIL</b>	<b>FIR</b>
a)	Total number of trees in class I	30722	49155	12288
b)	Total number of trees likely to pass on to class I in the first felling cycle from			
	Class II =	<b>9134</b>	<b>17092</b>	<b>1628</b>
	Class III =	<b>23284</b>	<b>43657</b>	<b>8247</b>
	=	<b>7115</b>	<b>17973</b>	<b>0</b>
c)	Total recruitment in class I from class II and III during first felling cycle	30399	61630	8247
d)	Annual recruitment from class II and III during the first felling cycle (c / 30)	1013	2054	275
e)	Stock required to be kept as reserve i.e. half of the total recruitment in 'c' above	15200	30815	4124
f)	Surplus stock of class I ( a - e)	15522	18340	8164
g)	Total possibility of yield in first felling cycle if all surplus stock in 'f' above is removed ( c + f)	45921	79970	16411
h)	Annual yield ( g / 30)	1531	2666	547
i)	Total possibility of yield if all surplus stock in 'f' above is removed in two felling cycles ( c + f/2) (refer note below)	38160	70800	12329
j)	Annual yield ( i / 30)	1272	2360	411
k)	Weighted average volume of trees above exploitable diameter as per Kullu Volume Tables in cubic metres	5.986	5.151	11.636
l)	Total annual volume yield ( m3)	7614	12156	4782
m)	Deduct fifteen percent from 'l' above to account for mortality	6472	10333	4065
n)	Rounded off to lower multiple of hundred	6400	10300	4000
	<b>TOTAL ANNUAL YIELD FROM THE WORKING CIRCLE</b>	<b>20,700</b>	<b>cum</b>	

The yield calculated using Von Mantel's Formula is as under:

**Table 11.10 Yield calculation for MCSWC using Von Mantel's formula.**

	Deodar R = 150	Kail R = 150	Fir R = 225	Total
Total commercial volume based on mean value (m <sup>3</sup> ) Min GS	503291.87	777569.49	554060.74	1834922.10
Total commercial volume at lower confidence interval ( m <sup>3</sup> )	450697.87	696313.48	496161.39	1643172.74
Annual Yield (m <sup>3</sup> ) = 2GS/R	6009.3	9284.18	4410.32	19703.80
Corrected Yield	6000.00	9200.00	4400.00	19600.00

The comparative statement of yield computed from the two methods is as under:

	Annual yield in m <sup>3</sup>			
	Deodar	Kail	Fir	Total
Brandis	6400	10300	4000	20700
Von Mantel	6000	9200	4400	19600

In the case of Deodar and Kail, since there is a heavier concentration of trees in class I, II and III, the Brandis procedure gives a higher yield. In the case of Fir however, more volume is concentrated in class III and below and therefore, Von Mantel's formula which is based on total volume, gives higher yield. Accordingly, from a conservative standpoint, the lower figures for the respective species are prescribed as yield after rounding off to nearest multiple of hundred as under:

Deodar	=	6,000 m <sup>3</sup>
Kail	=	9,200 m <sup>3</sup>
Fir	=	<u>4,000 m<sup>3</sup></u>
Total	=	<u>19,200 m<sup>3</sup></u>

The intensity of cut on the basis of this volume (19,200 m<sup>3</sup>) over the commercial area of 3694.97 hectares works out to 5.20 m<sup>3</sup> per hectare. The total annual yield prescribed constitutes 1.04% of the total commercial growing stock.



### 11.11 Size of the Annual Coupe

The yield calculated on volume basis shall be controlled by an area check. The size of the annual coupe is calculated as under;

$$\text{Annual Coupe (ha)} = \frac{\text{Total commercial area of working circle}}{\text{Felling cycle}} = \frac{3694.97}{30} = 123.16 \text{ ha.}$$

### 11.12 Allowable Cut

Given the annual yield and the size of annual coupe, the allowable cut is computed as under;

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
19,200	123.16	155.88	444.71	35.05

If yield is reduced by 30% the allowable cut is computed as under;

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
13440	123.17	109.12	444.71	24.54

### 11.13 Realization of the Yield

The yield prescribed shall include the volume of all trees of 30 cm d.b.h. and above marked for whatever purpose including concessions marking, illicit damage etc. Only two fifths of the total commercial area i.e. 1478 hectare shall be worked on during the plan period of 10 years. Thus felling in the next 10 years shall be subject to the limit of yield prescribed (10,000 m<sup>3</sup>) and area check (1478 ha), whichever is arrived at earlier. The annual yield prescribed should be strictly adhered to. Deviations in annual yield to the extent of 20 percent are permissible for certain administrative or technical reasons. Deviations beyond the above limits shall require prior sanction of the Chief Conservator of Forests. However, cumulative deviations over the entire working plan period should not exceed the prescribed yield.

### **11.14 Sequence of Felling**

In view of the current ban on green felling, the sequence of fellings has been left to the discretion of the Divisional Forest Officer who shall exercise his judgment keeping in view the progress of regeneration.

### **11.15 Method of Executing Felling**

Removal of over-wood standing above the advance growth and regeneration, with the object of relieving it from shade and suppression, and very light opening up of the crop where regeneration is inadequate, will constitute the general guide lines in executing the fellings. The over-wood above the regeneration must be gradually removed in order to avoid the invasion of the area by weeds which come up profusely in the gaps. The canopy needs to be manipulated with utmost care. Selection forests require elaborate management and great skill on the part of the executive staff that have to handle the crop properly. Accordingly, the following marking rules are laid down for guidance of the marking officer.

### **11.16 Marking and Felling Rules**

- The marking officer prior to conducting the marking, must acquaint himself thoroughly with the condition and composition of the crop in the compartment and its boundaries by traversing the area of the compartment.
- Marking should be done by the DCF in charge of the Division or well trained and experienced ACF. The marking should never be conducted by anybody below the rank of a well trained and experienced Range Officer, in which case, the DFO/ ACF should check at least 25% of these markings.
- No marking, except the removal of dead and diseased trees shall be done in area near and around cultivation and *behaks* within a distance of 100 meters from their periphery.
- No marking, except the removal of actually dead, diseased trees shall be done along nallah banks within a distance of at least 150 meters on either side.
- No healthy trees below the exploitable size be marked.
- No attempt shall be made to disturb the process of the succession by giving preference to one species over the others. The selection character of the crop shall be preferred over the area of this working circle and should be maintained by retaining some healthy trees of exploitable size which do not cause any suppression to the crop.
- No marking should be conducted in areas lacking regeneration.
- No marking should be done on steep and precipitous slopes.

- The over mature trees should get preference over the relatively younger and healthier ones.
- Improvement and hygienic markings in all age classes should be done.
- Marking for improvement felling shall form an integral part of the major markings. All dead and diseased trees shall be marked together with malformed and unfit trees.
- All the trees of exploitable size (70 cm d.b.h. in case of Deodar and Kail, and 80 cm d.b.h. in case of Fir), standing over adequate advance growth should be removed. Selection marking of light to very light intensity shall be carried out in area having inadequate but established regeneration.
- In dense groups of trees, of and above exploitable size, the spacing between the stems to be retained will vary from 5 to 8 meters, depending upon the status and amount of regeneration present. Selection fellings of moderate intensity shall be carried out in such groups.
- In the mixed crop, ecologically most suitable species to the locality should be favored.
- The intensity of felling over a particular compartment will largely depend upon the degree of biotic interference to which it is subject to, the amount and status of regeneration, and its topography, slope and aspect.
- Extreme care has to be exercised at the time of felling so as not to damage the regeneration below.
- Trees marked for felling should be lopped before execution of felling.

#### **11.17 Supplementary Marking**

As soon as the felling following major marking is over, supplementary marking of poles and trees damaged in felling or those that have died, dried or fallen off subsequent to the major markings should be done. Due caution is required to be taken to avoid large scale supplementary markings, which prove dangerous to the ultimate requirement of the crop and the site. Preferably these markings should be conducted by the DFO himself. Past experience has shown that in certain cases the quantity of supplementary markings did exceed the original one. Judicious discretion of the marking officer is therefore needed so that provision of supplementary marking is not misused, and only such trees, as are considered definitely unfit for retention, or are not likely to survive in the near future, are marked.

#### **11.18 Cultural Operations**

Felling refuse not only builds the potential reserve of combustible material but is equally bad for the hygiene of the crop. The felling refuse in Deodar- Kail forests is generally taken away by the villagers for their domestic use as firewood. However, in remote

areas, far away from human settlements the felling refuse left in the forests should be collected at safer places and burnt during the safe season. This will not only clear the forest floor of felling debris but also reduce the chances of fires in the forests.

### **11.19 Regeneration Programme**

The success of any silvicultural system adopted, and the treatment given to the crop there under, depends largely on the efforts made to regenerate the forests in due course of time. It is not much of a problem to regenerate these forests naturally except in areas near and around huge human habitations. Deodar- Kail forests are relatively saved from the menace of excessive grazing. However, it is extending over to Deodar-Kail belt also, with the result, the extent of the area deficient in regeneration are expanding every passing day. The measures to induce regeneration need to be applied over larger areas. However, it is neither practical nor feasible to close large areas to grazing because of socio-economic constraints. It is therefore suggested, that area requiring regeneration equal to the size of the annual coupe, evenly distributed over the total area of the working circle, should be effectively closed to grazing every year. All efforts should be made to induce natural regeneration and assist the establishment of natural regeneration. This involves removal of weeds, racking up of humus and closure of such areas to grazing. In case the area is too refractory to respond to natural seeding, artificial regeneration by way of sowing and planting nursery raised seedlings should be resorted to.

### **11.20 Control of Grazing**

Grazing in Deodar and Kail forests is not much of a problem except in the areas around the human habitation. However, unrestricted, uncontrolled and unregulated grazing does affect these forests adversely and is the main reason for failure of regeneration in areas subjected to heavy grazing. Large herds of migratory as well as local livestock graze these forests and trample the young seedlings and samplings. The areas highly subjected to grazing are prescribed to be effectively closed to the exclusion of grazing and taken up for artificial regeneration by patch sowing and planting.

## CHAPTER XII

### WORKING PLAN FOR THE FIR SELECTION WORKING CIRCLE

#### 12.1 General Constitution of the Working Circle

12.1.1 In this working circle are included all well stocked, commercial and exploitable Fir forests of Batote Forest Division. The forests constituting this working circle are, by and large, of excellent quality Fir. These are mostly confined to the hill slopes, varying from moderate to steep in gradient. Of the total forest area of 3611.41 ha allotted to this working circle, about 78.4 percent i.e. 2831.62 ha falls in Marmat Range, 13.4 percent i.e. 484.44 ha in Gandhri Range and 8.2 percent i.e. 295.35 ha in Batote Range.

**Table 12.1** Table showing area of each Range in FSWC

Working Circle	Range	Commercial Area (ha)	Un-commercial Area (ha)	Total Area (ha)
Fir Selection Working Circle	Batote	89.47	205.88	295.35
	Gandhri	208.42	276.01	484.43
	Marmat	1691.62	1140.01	2831.63
Total		1989.51	1621.9	3611.41

#### 12.2 General Character of the Vegetation

12.2.1 This working circle includes Fir forests occurring mostly as pure or mixed with varying proportion of Deodar-Kail, and sprinklings of Spruce and Yew (*Taxus baccata*) here and there. The crop consists of mature and over mature trees in relatively larger proportion, with inadequate amount of young regeneration. The distribution of stems over diameter classes is far from ideal, as can be seen in Table 12.2 below;

**Table 12.2** Normal and Actual Distribution of Stems Over Diameter Classes

Diameter – class (cm)	10-20	20-30	30-40	40-50	50-60	60-70	70 <
Normal Distribution in percentage	41.00%	25.00%	15.00%	9.00%	5.00%	3.00%	2.00%
Actual Distribution in percentage	1.18	1.28	6.07	7.41	13.07	13.65	57.33

- 12.2.2 Whereas there is an acute deficiency of growing stock in the younger diameter classes, the higher diameter classes are over-stocked. Fir forests are typically characterized by over-aged growing stock in various stages of decline and decay with large gaps in the canopy, thick growth of weeds on ground and total lack of regeneration. The most common associate of Fir is Kail, which occupies hotter slopes and peripheries of openings like pastures. Wherever, the Fir ecosystem has been disturbed, retrogression has set in and Kail has invaded such areas.
- 12.2.3 Broad leaved species occupy considerable area in this working circle, either mixed, or pure in small patches in moist localities, sheltered slopes and depressions, in linear strips along the banks of streams. The proportion of broad leaved species is relatively higher along the basal and top most portion of the working circle. The undergrowth in this working circle varies from scanty to heavy in intensity.
- 12.2.4 A detailed description of these forests has been given Chapter II of Part I of this plan. These forests conform to the Champion and Seth's 12/C<sub>1a</sub>, 12/C<sub>1b</sub>, 12/C<sub>1c</sub>, 12/C<sub>2b</sub>, 12/DS<sub>3</sub>, 12/1S<sub>1</sub>, 14/C<sub>1a</sub>, 15C<sub>1</sub>, 15/C<sub>2</sub>, and 15/C<sub>3</sub>.

### 12.3 Area and Allotment

- 12.3.1 Detail area statement of compartments and sub-compartments allotted to this working circle is given in appendix III and VII. The Range wise abstract of the area allotted to this working circle is reproduced in Table 12.3 as under;

**Table 12.3 Table showing Range wise distribution in Fir Selection WC.**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	2	26a and 33b.	295.35
2.	Gandhri	2	77a and 78a.	484.44
3.	Marmat	12	17a, 19b, 20a, 24a, 24b, 25a, 31, 33, 35c, 36, 37 and 39.	2831.62
				<b>3611.41</b>

- 12.3.2 This working circle constitutes 10.84 percent of the total area of the division. Out of the total area of the working circle, 55 percent is under tree cover of varying stand and crown density whereas the rest is either blank or under scrub without any tree cover.

## **12.4 Silvicultural System Adopted**

12.4.1 The forests allotted to this working circle occupy the upper most areas of catchments and perform key role in soil and water conservation. In fact, these forests are mainly responsible for control and maintenance of water regime in the catchment. Keeping in view the composition and condition of the crop, and the environmental function of these forests, they shall be managed under selection system. The objective behind the application of this system is to distribute the regeneration evenly over the entire working circle. Secondly, because of the continuous presence of overwood, the regeneration of shade bearing species like Fir and Spruce can be secured. In this system, the felling is directed towards silviculturally available trees above the exploitable diameter over a given felling cycle. Normally it is expected that regeneration will come up in the gaps created by the trees removed. However, since the establishment of regeneration in this area is not assured, the removals will be restricted only to those areas where established regeneration is already present. In areas deficient or lacking regeneration only a conservative cut, avoiding creation of large gaps in the canopy is envisaged. In case large gaps are already present, no felling shall be carried out.

## **12.5 Exploitable Size**

12.5.1 In order to achieve the objects of the management, and to fulfill the requirements of the area related to the protective function of these forests, an exploitable diameter of 70 cm d.b.h. for Deodar and Kail, and 80 cm d.b.h for Fir shall be adopted to reduce the intensity of the cut and to avoid the creation of gaps.

## **12.6 Rotation**

12.6.1 Although there is no relevance of rotation in selection system, yet for academic pursuits, the rotation for Deodar, Kail and Fir be adopted as 150, 150 and 225 years respectively corresponding to the exploitable diameter 70 cm d.b.h. in the case of Deodar and Kail and 80 cm d.b.h. in the case of Fir.

## **12.7 Felling Cycle**

The felling cycle is fixed at 25 years. It is considered appropriate to regulate the desired intensity of the cut/felling.

## **12.8 Felling Series**

12.8.1 There shall be only one felling series identical in its constitution to that of the working circle.

## **12.9 Analysis and Valuation of the Crop**

- 12.9.1 For assessment of the growing stock in this working circle, field data was collected from 17 sample points. However, given the large area of the working circle, this number is not adequate. The results of statistical analysis are now based on data from 17 points.
- 12.9.2 Mean values of two variables viz. number of stems per hectare and volume of conifers 30 cm d.b.h. and above have been computed diameter-class and species wise. Results obtained on the basis of statistical analysis are summarized in Table 12.4 overleaf.
- 12.9.3 The diameter-class and species wise distribution of growing stock assessed on the basis of mean values in terms of the total number of trees and volume of conifers 30 cm d.b.h. and above are summarized in Table 12.5 and 12.6 respectively.



**Table No:12.4 RESULT OF STATISTICAL ANALYSIS FOR THE FIR SELECTION WORKING CIRLCE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Coefficient of variation (%age)	95% Confidence limits (X+1.96 xS.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
1	2	3	4	5	6	7	8	9	10	11	12
Fir	No of stems	17	265.88	37950.74	194.81	47.25	73.27	165.71	366.05	200.34	62.33
	Volume	17	538.42	30797.31	175.49	42.56	32.59	448.19	628.65	180.46	83.24

**Table No: 12.5 Tree account of Fir Selection Working Circle**

**Species wise stem Distribution per ha (mean value).**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	1	1	1	1	0	1	0	0	0	5
Fir	41	45	34	26	22	15	10	12	9	6	220
Kail	8	7	8	2	5	2	1	2	1	1	37
BL	5	1	0	0	0	0	0	0	0	0	6
<b>Total</b>	<b>54</b>	<b>54</b>	<b>43</b>	<b>29</b>	<b>28</b>	<b>17</b>	<b>12</b>	<b>14</b>	<b>10</b>	<b>7</b>	<b>268</b>

**Species wise stem Distribution over the entire commercial area of the working circle.**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	1990	1990	1990	1990	0	1990	0	0	0	9950
Fir	81570	89528	67643	51727	43769	29843	19895	23874	17906	11937	437692
Kail	15916	13927	15916	3979	9948	3979	1990	3979	1990	1990	73614
BL	9948	1990	0	0	0	0	0	0	0	0	11938
<b>Total</b>	<b>107434</b>	<b>107435</b>	<b>85549</b>	<b>57696</b>	<b>55707</b>	<b>33822</b>	<b>23875</b>	<b>27853</b>	<b>19896</b>	<b>13927</b>	<b>533194</b>

**Species wise minimum available stem Distribution in the entire commercial area of the working circle at lower limit (62.33%).**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	655.81	655.81	655.81	655.81	0	655.81	0	0	0	3279.05
Fir	45773.18	50341.61	37269.91	28766.64	24187.1	16995.44	11115.39	13727.51	9803.78	7191.66	290945.4
Kail	8503.27	7847.47	9159.08	1956.31	5235.35	1956.31	1311.62	1956.31	1311.62	655.81	52320.16
BL	5880.04	1311.62	0	0	0	0	0	0	0	0	8503.28
<b>Total</b>	<b>60156.49</b>	<b>60156.51</b>	<b>47084.8</b>	<b>31378.76</b>	<b>30078.26</b>	<b>18951.75</b>	<b>13082.82</b>	<b>15683.82</b>	<b>11115.4</b>	<b>7847.47</b>	<b>355047.89</b>

**Species wise percentage of stem Distribution in the working circle.**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0.00	0.37	0.37	0.37	0.37	0.00	0.37	0.00	0.00	0.00	1.85
Fir	15.30	16.79	12.69	9.70	8.21	5.60	3.73	4.48	3.36	2.24	82.10
Kail	2.98	2.61	2.98	0.75	1.87	0.75	0.37	0.76	0.37	0.37	13.81
BL	1.87	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.24
<b>Total</b>	<b>20.15</b>	<b>20.14</b>	<b>16.04</b>	<b>10.82</b>	<b>10.45</b>	<b>6.35</b>	<b>4.47</b>	<b>5.24</b>	<b>3.73</b>	<b>2.61</b>	<b>100.00</b>

**Table No. 12.6 Volume account of Fir Selection Working Circle**

**Species wise vol Distribution per ha (Mean value).**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	0.08	0.45	0.78	1.24	0	2.58	0	0	0	5.13
Fir	1.53	0.92	5.44	11.93	38.44	51.88	48.35	78.12	55.29	23.98	315.88
Kail	4.82	5.89	26.82	27.2	30.71	21.61	18.2	25.18	25.28	31.72	217.43
<b>Total</b>	<b>6.35</b>	<b>6.89</b>	<b>32.71</b>	<b>39.91</b>	<b>70.39</b>	<b>73.49</b>	<b>69.13</b>	<b>103.3</b>	<b>80.57</b>	<b>55.7</b>	<b>538.44</b>

**Species wise vol Distribution over the entire commercial area of the working circle.**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	159.16	895.28	1551.82	2466.99	0	5132.94	0	0	0	10206.19
Fir	3043.95	1830.35	10822.93	23734.85	76476.76	103215.78	96192.81	155420.52	110000.01	47708.45	628446.41
Kail	9589.44	11718.21	53358.66	54114.67	61097.85	42993.31	36209.08	50095.86	50294.81	63107.26	432579.15
<b>Total</b>	<b>12633.39</b>	<b>13707.72</b>	<b>65076.87</b>	<b>79401.34</b>	<b>140041.6</b>	<b>146209.09</b>	<b>137534.83</b>	<b>205516.38</b>	<b>160294.82</b>	<b>110815.71</b>	<b>1071231.8</b>

**Species wise minimum available volume in commercial area of the working circle at lower limit (83.24%).**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0	132.48	745.23	1291.73	2053.52	0	4272.66	0	0	0	8495.62
Fir	2533.78	1523.58	9009.01	19756.89	63659.26	85916.82	80070.9	129372.04	91564.01	39712.51	523118.8
Kail	7982.25	9754.24	44415.75	45045.05	50857.85	35787.63	30140.44	41699.79	41865.4	52530.48	360078.88
<b>Total</b>	<b>10516.03</b>	<b>11410.3</b>	<b>54169.99</b>	<b>66093.67</b>	<b>116570.63</b>	<b>121704.45</b>	<b>114484</b>	<b>171071.83</b>	<b>133429.41</b>	<b>92242.99</b>	<b>891693.3</b>

**Species wise percentage of volume Distribution in the working circle.**

<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Deodar	0.00	0.01	0.08	0.14	0.23	0.00	0.48	0.00	0.00	0.00	0.94
Fir	0.28	0.17	1.01	2.22	7.14	9.64	8.98	14.51	10.27	4.45	58.67
Kail	0.90	1.09	4.98	5.05	5.70	4.01	3.38	4.68	4.71	5.89	40.39
<b>Total</b>	<b>1.18</b>	<b>1.27</b>	<b>6.07</b>	<b>7.41</b>	<b>13.07</b>	<b>13.65</b>	<b>12.84</b>	<b>19.19</b>	<b>14.98</b>	<b>10.34</b>	<b>100.00</b>

## 12.10 Calculation of the Yield

The yield will be calculated in terms of number of trees and volume, which in turn shall be controlled by area check by working out the size of the annual coupe. Modified Brandis diameter-class method and Von Mantel's formula have been applied for calculation of the volume yield. The following presumptions have been made in this regard:

- Only commercial area and its growing stocks have been taken into account for the purpose of yield calculation.
- The growing stock over commercial area of this working circle is fixed within 10 cm diameter-classes indicated by Symbols I, II, III, IV, V and VI. Class I stands for trees above the exploitable diameter and the other successively below it, to the youngest.
- The number of trees in all those classes being considered for the purposes of yield calculation have been reduced to the lower limit of confidence interval.
- It takes 121, 112 and 221 years for an average trees of Deodar, Kail and Fir respectively to attain exploitable diameter of 70 cm d.b.h. in the case of Deodar and Kail, and 80 cm d.b.h. in the case of Fir.
- It takes 15, 13 and 25 years respectively for an average Deodar, Kail and Fir trees to pass from approach class ( 60-70 cm d.b.h. in the case of Deodar and Kail, 70-80 cm d.b.h in the case of Fir ) to exploitable classes.
- In view of preponderance of mature and over mature growing stock and their vulnerability to rot, the yield finally arrived at shall be reduced by 30 %.
- The following survival coefficient percent based on the All India Volume Tables in respects of Deodar, Kail and Fir have been used in yield calculation.

**Table 12.7 All India Volume Table**

Diameter-class d.b.h (cm)	Survival percentage of species		
	Deodar	Kail	Fir
30	30%	45%	20%
40	60%	60%	40%
50	80%	80%	50%
60	90%	90%	60%
70	95%	95%	85%
80	--	--	95%

Based on the assumptions above, the number of total potentially available trees over the commercial area of this working circle, calculated at lower confidence limit of the mean value, after due deduction on account of mortality, is tabulated under Table 12.5.

### **12.11 Yield Regulation**

The stepwise calculation of yield in Fir working circle on the basis of Modified Brandis Diameter class Method and Von Mantel's formula is detailed under Table 12.8, 12.9 and Table 12.10 overleaf.

**Table 12.8 Species and diameter class wise potential availability of trees from the commercial area of DKSWC.**

**Deodar**

<b>Class</b>	<b>VI</b>	<b>V</b>	<b>IV</b>	<b>III</b>	<b>II</b>	<b>I</b>	<b>Total</b>
<b>Diameter-class</b>	<b>below 30</b>	<b>30- 40</b>	<b>40- 50</b>	<b>50-60</b>	<b>60-70</b>	<b>above 70</b>	
<b>Total No. of trees assessed at mean value</b>	1990	1990	1990	1990	0	1990	9950
<b>Total No. of trees assessed at lower limit of confidence interval</b>	1240	1240	1240	1240	0	1240	6200
<b>Age of entry in the class</b>		57	71	90	110	135	
<b>Years in class transition period</b>		14	19	20	25		
<b>Survival Coefficient of the class</b>		0.3	0.6	0.8	0.9	0.95	
<b>No. of potentially available trees</b>		372	744	992	0	1178	3286

**Kail**

<b>Class</b>	<b>VI</b>	<b>V</b>	<b>IV</b>	<b>III</b>	<b>II</b>	<b>I</b>	<b>Total</b>
<b>Diameter-class</b>	<b>below 30</b>	<b>30- 40</b>	<b>40- 50</b>	<b>50-60</b>	<b>60-70</b>	<b>above 70</b>	
<b>Total No. of trees assessed at mean value</b>	29843	1591 6	3979	9948	3979	9949	73614
<b>Total No. of trees assessed at lower limit of confidence interval</b>	18601	9920	2480	6201	2480	6201	45883
<b>Age of entry in the class</b>		42	55	72	91	115	
<b>Years in class transition period</b>		13	17	19	24		
<b>Survival Coefficient of the class</b>		0.45	0.6	0.8	0.9	0.95	
<b>No. of potentially available trees</b>		4464	1488	4961	2232	5891	19036

**Fir**

<b>Class</b>	<b>VI</b>	<b>V</b>	<b>IV</b>	<b>III</b>	<b>II</b>	<b>I</b>	<b>Total</b>
<b>Diameter-class</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>above 80</b>	
<b>Total No. of trees assessed at mean value</b>	67643	51727	43769	29843	19895	53717	266594
<b>Total No. of trees assessed at lower limit of confidence interval</b>	42162	32241	27281	18601	12401	33482	166168
<b>Age of entry in the class</b>	73	96	118	139	164	194	
<b>Years in class transition period</b>	23	22	21	25	30		
<b>Survival Coefficient of the class</b>	0.2	0.4	0.5	0.6	0.85	0.95	
<b>No. of potentially available trees</b>	8432	12896	13641	11161	10541	31808	88479

**Table 12.9 Yield Calculation for Fir Selection Working Circle using Brandis Diameter-Class Method.**

		<b>Deodar</b>	<b>KAIL</b>	<b>FIR</b>
a)	Total number of trees in class I	623	4973	29187
b)	Total number of trees likely to pass on to class I in the first felling cycle from			
	Class II	<b>9134</b>	<b>17092</b>	<b>1628</b>
	=	<b>0</b>	<b>1760</b>	<b>9448</b>
	Class III	<b>12520*(5/20)</b>	<b>16246*(6/19)</b>	<b>0</b>
	=	<b>131</b>	<b>1323</b>	<b>0</b>
c)	Total recruitment in class I from class II and III during first felling cycle	131	3083	9448
d)	Annual recruitment from class II and III during the first felling cycle (c / 30)	4	103	315
e)	Stock required to be kept as reserve i.e. half of the total recruitment in 'c' above	66	1542	4724
f)	Surplus stock of class I ( a - e)	557	3431	24463
g)	Total possibility of yield in first felling cycle if all surplus stock in 'f' above is removed ( c + f)	688	6514	33911
h)	Annual yield ( g / 30)	23	217	1130
i)	Total possibility of yield if all surplus stock in 'f' above is removed in two felling cycles ( c + f/2) (refer note below)	410	4799	21680
j)	Annual yield ( i / 30)	14	160	723
k)	Weighted average volume of trees above exploitable diameter as per Kullu Volume Tables in cubic metres	6.515	31.753	8.484
l)	Total annual volume yield ( m3)	91	5080	6134
m)	Deduct fifteen percent from 'l' above to account for mortality	77	4318	5214
n)	Rounded off to lower multiple of hundred	0	4300	5200
	<b>TOTAL ANNUAL YIELD FROM THE WORKING CIRCLE</b>	<b>9,500</b>	<b>cum</b>	



The yield as calculated by Von Mantel's formula is as under:

**Table 12.10 Yield calculation for FIR selection Working Circle using Von Mantel's formula.**

	<b>Deodar R = 150</b>	<b>Kail R = 150</b>	<b>Fir R = 225</b>	<b>Total</b>
<b>Total commercial volume based on mean value (m<sup>3</sup>)</b>	10,206.19	4,32,579.15	6,28,446.41	10,71,231.8
<b>Total commercial volume at lower confidence interval ( m<sup>3</sup> )</b>	8,495.62	3,60,078.88	5,23,118.80	8,91,693.30
<b>Annual Yield (m<sup>3</sup>) = 2(GS)/R</b>	113.27	4,801.05	4,649.94	9,564.26
<b>Rounded off to nearest multiple of 100</b>	100	4,800	4,600	9,500

The comparative statement of yield computed from the two methods is as under:

	<b>Annual yield in m<sup>3</sup></b>			
	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Total</b>
<b>Brandis</b>	0	4,300	5,200	9,500
<b>Von Mantel</b>	100	4,800	4,600	9,500

A perusal of the comparative statement above shows that due to preponderance of growing stock in higher diameter classes, the yield obtained by the application of Brandi's diameter class method is more than the yield obtained using Von Mantel's method. From a conservative stand point, therefore, the latter yield is adopted and prescribed as under:

Kail	4,300 m <sup>3</sup>
Fir	4,600 m <sup>3</sup>
<u>Total</u>	<u>8,900 m<sup>3</sup></u>

The intensity of cut on the basis of this volume (8,900 m<sup>3</sup>) over the commercial area of 1989.51 hectare works out to 2.46 m<sup>3</sup> per hectare. The annual prescribed yield constitutes 0.71 percent of the total commercial growing stock of Fir working circle.

### 12.12 Size of the Annual Coupe

The yield calculated on volume basis shall be controlled by an area check. The size of the annual coupe is calculated as under:

$$\text{Annual Coupe (ha)} = \frac{\text{Total commercial area of working circle}}{\text{Felling cycle}} = \frac{1989.5}{25} = 66.32 \text{ ha.}$$

### 12.13 Allowable Cut

Given the annual yield and the size of annual coupe, the allowable cut is computed as under:

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
8900	66.32	134.2	448.2	29.94

Reducing the yield by 30%, allowable cut is computed as under;

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha.(m <sup>3</sup> )	Allowable cut as % of Growing stock
6230	66.32	93.94	448.2	20.96

### 12.14 Realization of the Yield

The yield prescribed shall include the volume of all trees 30 cm d.b.h. and above marked for whatever purpose including concession marking, illicit damage etc. Out of a total commercial area of 1989.5 hectare only two fifths i.e. 795 hectare shall be worked on during the plan period of 10 years. Fellings in the next 10 years shall be subject to the limit of yield prescribed ( 1,06,000 m<sup>3</sup> ) and area check (1,388 hectare), whichever is arrived at earlier. The annual yield prescribed should be strictly adhered to. Deviations in annual yield to the extent of 20 percent are permissible for certain administrative or technical reasons. Deviations beyond above limits shall require prior sanction of the Chief Conservator of Forests. However, cumulative deviation over the entire working plan period should not exceed the prescribed yield.

### **12.15 Sequence of Felling**

In view of the ban on green fellings, the sequence of fellings has been left to the discretion of the Divisional Forest Officer who shall exercise his judgement keeping in view the progress of regeneration.

### **12.16 Method of Executing Felling**

Removal of over-wood standing above the advance growth and regeneration, with a view to liberate it from shade and suppression, and very light opening up of the crop where regeneration is inadequate, will constitute the general guide lines in the execution of fellings. The over-wood standing above the regeneration must be removed gradually. In order to avoid the invasion of the area by weeds, which come up profusely in the gaps, the canopy needs to be manipulated with utmost care. Selection forests require elaborate management and great skill on the part of the executive staff handle the crop. Accordingly the following marking rules are laid down for guidance of the marking officer.

### **12.17 Marking and Felling Rules**

- The marking officer, prior to conducting the marking, must acquaint himself thoroughly with the condition and composition of the crop in the compartment and its boundaries by traversing over the area of the compartment, at least once.
- Marking should done by the DCF in-charge of the Division or well trained and experienced ACF. Marking should never be conducted by anybody below the rank of a well trained and experienced Range Officer, in which case the DFO/ ACF should check at least 25% of these markings.
- No marking, except the removal of dead, dying and diseased trees, shall be done in areas near and around cultivation and *behaks* with in a distance of 100 metres from their periphery.
- No marking, except the removal of actually dead, dying diseased trees, shall be done along nalla banks within a distance of at least 100 metres on either side.
- No healthy trees below the exploitable size shall be marked.
- No attempt shall be made to disturb the process of the succession by giving preference to one species over the others. The selection character of the crop shall be preferred over the area of this working circle and should be maintained by retaining some healthy trees of exploitable size which do not cause any suppression to the crop.
- No marking should be conducted in areas lacking regeneration.
- No marking should be done on steep and precipitous slopes.

- The over-mature trees should get preference over the relatively younger and healthier ones.
- Improvement and hygienic marking in all age-classes shall be done.
- Marking for improvement felling shall form an integral part of the major marking. All dead, dying, dry and diseased trees shall be marked together with malformed and unfit trees.
- All the trees of exploitable size (70 cm d.b.h. in case of Deodar and Kail and 80 cm d.b.h. in case of Fir), standing over adequate advance growth should be removed. Advance growth includes all the trees and poles up to exploitable size. Selection markings of light to very light intensity shall be done in areas having inadequate but established regeneration.
- In dense groups of trees, of and above exploitable size, the spacing between the stems to be retained will vary from 5 to 8 metres depending upon the status and amount of regeneration present. Selection felling of moderate intensity shall be carried out in such groups.
- In the mixed crop, ecologically most suitable species to the locally should be favored.
- The intensity of felling, over a particular compartment, will largely depend upon the degree of biotic interference to which it is subjected, the amount and status of regeneration, topography, slope and aspect.
- Extreme care has to be exercised at the time of felling so as not to damage the crop below.
- Trees marked for felling should be lopped before execution of felling.

### **12.18 Supplementary Marking**

As soon as the felling following major marking is over, supplementary marking of poles and trees damaged in felling, or those that have died, dried or fallen off subsequent to the major felling, should be done. Due caution is required to be taken to avoid large scale supplementary markings which prove dangerous to the ultimate requirement of the crop and the site. Preferably, these markings should be conducted by the DFO himself. Past experience has shown that in certain cases, the quantity of supplementary marking did exceed the original one. Judicious discretion of the marking officer is, therefore, needed to ensure that provision of supplementary marking is not misused, and only such trees as are considered definitely unfit for retention, or are not likely to survive in the near future, are marked.

## 12.19 Cultural Operations

The amount of felling debris left in Fir forests considerably more compared to that in the Deodar-Kail forests. Firstly, these forests are usually far removed from habitations and off take by the villagers are negligible. Secondly, Fir forests have a much higher percentage of cull, usually in the form of rot, and considerable residue is left in the forests. This shall be disposed off during the safe season and at safer places as early as possible.

## 12.20 Regeneration Programme

The success of any silvicultural system adopted, and the treatment given to the crop thereunder, depends largely on the efforts made to regenerate the forests in due course of time. By exclusion of biotic-interference from these forests, there is practically no difficulty in regenerating these forests naturally. But unfortunately, the extent of area deficient in regeneration is expanding continuously as a result of excessive biotic-interference, especially grazing. The measures to induce regeneration need to be applied over larger areas. However, it is neither practical nor possible to close larger areas to grazing because of socio-economic constraints. It is therefore suggested, that total area requiring regeneration equal to the size of annual coupe, evenly distributed over the total area of the working circle, should be closed to grazing every year. All efforts should be made to induce natural regeneration and assist the establishment of natural regeneration. This involves removal of weeds, raking up of humus and closure of such areas to grazing. In case the area is too refractory to respond to natural seeding, artificial regeneration by way of sowing and planting nursery raised seedlings should be resorted to.

## 12.21 Nursery and Plantation Techniques

### ***Abies pindrow***

Found at an altitude of 2200 to 3400 metres but sometimes extending between 2000 metres to 3500 metres. It is a slow growing species which requires cool and moist climate. It is sensitive to drought and frost. Grows best in open sunlight.

**Seed:** Cones ripen in October- November, they should be collected in October before they break up. Should be sun/ kiln dried to split open. Seed extraction by shaking and winnowing be done. Should be stored in gunny bags or tins till sowing. Good seed year occurs normally in 6-7 years. About 25,000 seeds weight a kilogram. Germination percent normally ranges from 40 to 65. It starts after 4-5 months and completes in about one and a half months. Plant percent is about 1500 per kg of seeds.

**Nursery Technique:** Seeds be sown in November – December i.e. before snowfall, will start germination in April.

**Planting Technique:** One or one and a half year old seedlings with naked roots are transplanted at the beginning of rains or in March- April, when snow melts, spacing be kept 2 x 2 metres. Weeding and cleaning be done twice a year.

***Picea smithiana***

Found at 2100 to 3300 metres height but sometimes as less as 1500 metres.

**Seed:** Female cones ripen in October- November. They should be collected from trees, spread in the sun (or kiln) for drying and beaten to extract seeds. Seeds can be stored upto one year. They are small (50-55 thousand per kg). Germination is normally good (more than 50 percent), usually completes in 1-2 months. Good seed year is expected once in five years.

**Nursery Technique:** Fresh seeds be sown in October-November or more usually in February- March. Germination will begin in May- June, pricking out of seedlings be done every year from the second year.

**Planting Technique:** Planting out is done in 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> year. Seedlings with naked roots protected by being bundled in damp moss are planted in prepared pits 1.5 x 1.5 metres or 2 x 2 metres apart. Roots should not be injured during transplanting. Initial growth is slow and requires tending for 3 – 4 years; subsequently faster needs protection from the sun in early youth. It is fire-tender, but not much browsed.

***Quercus semecarpifolia***

It is found at 2400 to 3600 metres altitude, occasionally descending up to 2000 metres.

**Seed:** Very large, only 125 per kg, collected in June to August when fresh, 95 to 100 percent seeds are fertile.

**Nursery Technique:** Dibbling be done in July-August as soon as acorns ripen. Spacing be kept 1.5 x 1.5 metres to 2 x 2 metres in fairly open places. Sowing in drills during July-August may also be done. Seedlings be kept in the nursery for 2 years.

**Planting Technique:** Entire plants put out in prepared pits during the rains, when they are 2 years old, spacing should be 2 x 2 metres. Weeding and cleaning be done for several years.

## **12.22 Control of Grazing**

The unrestricted, uncontrolled and unregulated grazing in Fir forests of this division is the chief reason for the failure of regeneration to establish. Large herds of the migratory as well as local livestock graze in these forests and nibble the young seedlings as soon as they emerge in the spring, or early summer, after the snow melt. Unfortunately, there is not much grass available during that time and therefore, the livestock especially the goats and sheep, fall back upon the just sprouted seedlings. The ones those escape the spring wrath are consumed by the retreating livestock in autumn, when again unfortunately, grass is scanty. This cycle has been going on unfelt and unnoticed for past so many years and is mainly responsible for the degradation of forests.

Under the prevailing set of circumstances and provisions of law in hand, it is difficult to control and restrict the severity of grazing in these forests. Unless strict laws are enforced and suitable arrangements are made, for the rehabilitation of migratory graziers and fodder for their animals, this menace is likely to annihilate these forests in due course of time. It is therefore suggested that effective closures are made with efforts to encourage rotational grazing, restricted only to alpine/sub-alpine pastures. Micro planning for the improvement of pastures lands needs to be conceived and executed effectively on the ground.

## CHAPTER-XIII

### WORKING PLAN FOR THE CHIR IRREGULAR WORKING CIRCLE

#### 13.1 General Constitution of the Working Circle

This working circle is identical in constitution to the corresponding working circle of the plan under revision. Primarily, this working circle consists of Chir forests lying in the Batote and Gandhri Ranges of this Division. Out of a total of 1429.70 hectares allotted to Chir Working Circle, 333.14 ha area fall in Batote Range and 1096.56 ha in Gandhri Range. Forty two percent of the area is commercial, 58 percent un-commercial.

#### 13.2. General Character of the Vegetation

13.2.1 The forests constituting this working circle consist of more or less pure Chir forests throughout its area except at places in the higher reaches, where it is found intermixed with Deodar and Kail. These forests are generally poorly stocked, maltreated, and malformed and subject to heavy biotic pressure of grazing and fire with poor status of regeneration. The crop is generally thin, open and patchy, except a few compartments where the crop consists of mature and over mature trees with varying status of regeneration. The distribution of stems over various diameter classes is far from ideal, as can be seen from Table 13.1.

Table 13.1 Normal and Actual distribution of Stems over Diameter Classes.

Diameter – class (cm)	10-20	20-30	30-40	40-50	50-60	60-70	70 <
Normal Distribution in percentage	41.00%	25.00%	15.00%	9.00%	5.00%	3.00%	2.00%
Actual Distribution in percentage	0.74%	1.68%	8.04%	14.16%	24.66%	28.48%	22.24%

There is an acute deficiency of stems in lower diameter classes. Regeneration is conspicuous by its absence, and the majority of the crop is middle aged to mature and over-mature. Excessive biotic pressure, frequent fires and heavy resin tapping are the biggest threat to the Chir crop. Most of the Chir forests occupy young and fragile/loose geological formations, and have been under excessive biotic pressure of grazing, encroachments, lopping, fire, resin tapping etc. Therefore, they have not responded favorably to the system to concentrated regeneration fellings in the past. The common associates of Chir like *Alnus nepalenses*, *Acacia modesta*, *Pistacia integerrima*, *Olea*



*cuspidata*, *Punica granatum*, *Celtis australis* and *Rhus* are mostly confined to moist localities, depression and the banks of streams. The under growth is profuse on the cooler aspects, where as it is scanty to almost absent on southern aspects. A description of these forests has been provided in detail in Chapter II of part I of this plan. The forests of this working circle conform to Champion and Seth's 9/C<sub>1b</sub> forest type.

### 13.3. Area and Allotment

The area statement of compartments and sub-compartments allotted to this working circle is tabulated under Appendix III and VIII. Range wise abstract of the area allotted to this working circle is reproduced in Table 13.3

**Table 13.3 Range wise distribution of area allotted to Chir Irregular Working Circle.**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	4	14b, 14c, 27b and 35b.	333.14
2.	Gandhri	7	52a, 54, 55, 56, 60b, 61 and 68b.	1096.56
Total		11		<b>1429.70</b>

### 13.4 Silvicultural System Adopted

13.4.1 Ideally, Chir needs to be managed under a system of concentrated felling because of its light demanding character. Heavy openings are required to induce natural regeneration. Therefore, uniform system or its modification is generally prescribed for the management of Chir forests. Unfortunately however, all attempts to regenerate these forests under the system of concentrated fellings have met with utter failure. Excessive grazing, frequent fires and reduced seed production are primarily responsible for failure of regeneration establish. To make the matters worse, heavy and unscientific resin tapping, throwing to wind all prescriptions and norms, has been carried out in the past few years. The net result is that a large number of trees either die, or break at the base, every year creating large gaps in the canopy. The condition of Chir crop, at present, is that the canopy is already quite open and there are no sizable areas of mature and over-mature trees that require regeneration felling. Throughout the working circle the regeneration is either absent or inadequate. In view of the discussion above, the following points emerge;

- The crop is very open and patchy with large gaps in the canopy.
- Regeneration is neither adequate, nor is showing any signs of coming up.
- Mortality among mature and over mature trees is high.

Under such circumstances, felling of trees under any regular silvicultural system cannot be prescribed. All efforts have to be directed towards regenerating the failed areas before any form of commercial harvesting can be considered. Therefore, these forests shall be subjected to improvement felling only. Removals will be directed to dead trees and those mature/ over mature trees that are actually standing over established regeneration/ advance growth and actively interfering with their growth and development. Other than that, no felling is prescribed. However, since the aim of management is to achieve a normal forest, a regeneration block has been constituted where efforts to regenerate the area will be taken up on priority. This treatment shall be continued till such time the Chir forests have been rehabilitated to the extent where they can be brought under some kind of Irregular Shelter wood System.

**Table No 13.2 Range Wise distribution of area in (Ha) allotted to Chir Irregular Working of Batote Forest Division**

<b>Range</b>	<b>Area as per dot grid method (in ha)</b>				<b>Area as per GIS in (ha)</b>		
	<b>Commercial</b>	<b>Un-commercial</b>	<b>Non-wooded</b>	<b>Total</b>	<b>Commercial Area (ha)</b>	<b>Un-commercial Area (ha)</b>	<b>Total Area (ha)</b>
Batote	141	102	36	279	146.6	186.54	333.14
Gandhri	632	316	177	1125	458.17	638.39	1096.56
Marmat	0	0	0	0	0	0	0
<b>Total</b>	<b>773</b>	<b>418</b>	<b>213</b>	<b>1404</b>	<b>604.77</b>	<b>824.93</b>	<b>1429.7</b>

### **13.5. Exploitable Size**

In order to achieve the objects of management an exploitable diameter of 70 cm is prescribed.

### **13.6 Rotation and Regeneration Period**

A rotation of 150 years for Chir Working Circle is prescribed, with a regeneration period of 30 years.

### **13.7 Felling Cycle**

To reduce the intensity of cut, felling cycle is fixed at 10 years.

### **13.8 Felling Series**

There shall be only one felling series, identical to the constitution of this working circle.

### **13.9 Analysis and Valuation of the Crop**

13.9.1 The quantitative assessment of growing stock and preparations of its inventory for Chir Working Circle has been made on the basis of the data collected and analysed from 78 sample points. Mean values of two variables viz. number of stems per hectare and volume of conifers 30 cm d.b.h and above have been computed and tabulated diameter-class wise and species wise. Results obtained on the basis of statistical analysis have been summarized in Table 13.3 overleaf. The diameter-class and species wise distribution of growing stock, assessed on the basis of the mean values in terms of total number of trees and volume of conifers 30 cm d.b.h. and above, is summarized in Table 13.4 and Table 13.5 respectively.

### **13.10 Calculation of the Yield.**

The yield will be calculated in terms of number of trees and volume, which in turn shall be controlled by area check by working out the size of the annual coupe. Modified Brandis diameter-class method and Von Mantel's formula have been applied for calculation of the volume yield. The following presumptions have been made in this regard;

- (i) Only commercial area and its growing stock have been taken into account for the purpose of yield calculation.
- (ii) The growing stock over commercial area of this working circle is fixed within 10 cm diameter-classes indicated by Symbols I, II, III, IV, V, VI and VII. Class I stands for trees above the exploitable diameter and the others successively below it to the youngest.

- (iii)** The number of trees being considered for the purpose of yield calculation has been reduced to the lower limit of confident interval.
- (iv)** It takes 121, 112 and 151 years for average trees of Deodar, Kail and Chir respectively to attain exploitable diameter 70 cm d.b.h.
- (v)** It takes 15, 13 and 24 years respectively for an average tree of Deodar, Kail and Chir to pass from approach class (60 cm) on to exploitable class i.e. 70 cm d.b.h and above.

**Table No: 13.3.**

**RESULT OF STATISTICAL ANALYSIS FOR THE CHIR IRREGULAR WORKING CIRCLE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Coefficient of variation (%age)	95% Confidence limits (X+1.96 xS.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
1	2	3	4	5	6	7	8	9	10	11	12
Chir	No of stems	11	210.91	7729.09	87.92	26.51	41.69	151.85	269.97	118.12	72
	Volume	11	301.95	4877.74	69.84	21.06	23.13	255.03	348.87	93.84	84.46

**Table No: 13.4      Tree account of Chir Irregular Working Circle**

<b>Species wise stem Distribution per ha (Mean value)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	9.09	25.45	39.09	34.55	31.82	20	6.36	2.73	0.91	0	170
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	8.18	13.64	7.27	2.73	1.82	4.55	1.82	0.91	0	0	40.92
B/L	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>17.27</b>	<b>39.09</b>	<b>46.36</b>	<b>37.28</b>	<b>33.64</b>	<b>24.55</b>	<b>8.18</b>	<b>3.64</b>	<b>0.91</b>	<b>0</b>	<b>210.92</b>

<b>Species wise tree account/ stem Distribution of in the entire commercial area of working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	5497.27	15391.14	23640.07	20894.46	19243.46	12095.2	3846.27	1650.99	550.33	0	102809.19
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	4946.94	8248.93	4396.61	1650.99	1100.66	2751.66	1100.66	550.33	0	0	24746.78
B/L	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>10444.21</b>	<b>23640.07</b>	<b>28036.68</b>	<b>22545.45</b>	<b>20344.12</b>	<b>14846.86</b>	<b>4946.93</b>	<b>2201.32</b>	<b>550.33</b>	<b>0</b>	<b>127555.97</b>

<b>Species wise minimum available stem Distribution in the commercial area at lower limit in entire working circle (72%)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	3958.03	11081.62	17020.85	15044.01	13855.29	8708.54	2769.31	1188.71	396.24	0	74022.6
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	3561.8	5939.23	3165.56	1188.71	792.48	1981.2	792.48	396.24	0	0	17817.7
B/L	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>7519.83</b>	<b>17020.85</b>	<b>20186.41</b>	<b>16232.72</b>	<b>14647.77</b>	<b>10689.74</b>	<b>3561.79</b>	<b>1584.95</b>	<b>396.24</b>	<b>0</b>	<b>91840.3</b>

<b>Species wise percentage of stem Distribution in the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	4.31	12.07	18.53	16.38	15.09	9.48	3.02	1.29	0.43	0	80.6
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	3.88	6.47	3.45	1.29	0.86	2.16	0.86	0.43	0	0	19.4
B/L	0	0	0	0	0	0	0	0	0	0	0

**Table No:-13.5      Volume account of Chir Irregular Working Circle**

**Species wise Volume Distribution per ha (Mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	1.18	3.31	18.76	39.04	70.32	70.8	30.99	16.91	6.35	0	257.66
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	1.06	1.77	5.53	3.71	4.13	15.18	8.04	4.86	0	0	44.28
<b>Total</b>	<b>2.24</b>	<b>5.08</b>	<b>24.29</b>	<b>42.75</b>	<b>74.45</b>	<b>85.98</b>	<b>39.03</b>	<b>21.77</b>	<b>6.35</b>	<b>0</b>	<b>301.94</b>

**Species wise Volume Distribution in entire commercial area in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	713.62	2001.76	11345.3	23609.83	42526.72	42817.01	18741.51	10226.49	3840.23	0	155822.47
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	641.05	1070.43	3344.32	2243.66	2497.66	9180.26	4862.27	2939.13	0	0	26778.78
<b>Total</b>	<b>1354.67</b>	<b>3072.19</b>	<b>14689.62</b>	<b>25853.49</b>	<b>45024.38</b>	<b>51997.27</b>	<b>23603.78</b>	<b>13165.62</b>	<b>3840.23</b>	<b>0</b>	<b>182601.25</b>

**Species wise minimum available volume in the working circle at Lower limit (86.46%)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	513.81	1441.27	8168.62	16999.08	30619.24	30828.25	13493.89	7363.07	2764.97	0	112192.2
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	461.56	770.71	2407.91	1615.44	1798.32	6609.79	3500.83	2116.17	0	0	19280.73
<b>Total</b>	<b>975.37</b>	<b>2211.98</b>	<b>10576.53</b>	<b>18614.52</b>	<b>32417.56</b>	<b>37438.04</b>	<b>16994.72</b>	<b>9479.24</b>	<b>2764.97</b>	<b>0</b>	<b>131472.93</b>

**Species wise percentage of volume Distribution in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	0.39	1.1	6.21	12.93	23.29	23.45	10.26	5.6	2.1	0	85.33
Deodar	0	0	0	0	0	0	0	0	0	0	0
Fir/ Spruce	0	0	0	0	0	0	0	0	0	0	0
Kail	0.35	0.59	1.83	1.23	1.37	5.03	2.66	1.61	0	0	14.67
<b>Total</b>	<b>0.74</b>	<b>1.69</b>	<b>8.04</b>	<b>14.16</b>	<b>24.66</b>	<b>28.48</b>	<b>12.92</b>	<b>7.21</b>	<b>2.1</b>	<b>0</b>	<b>100</b>



The following survival coefficient, in respect of Deodar, Kail and Chir, based on All India Volume Table have been used:

**Table 13.6 All India Volume Tables**

Diameter- class d.b.h (cm)	Survival percentage of species		
	Deodar	Kail	Fir
30	30%	45%	20%
40	60%	60%	40%
50	80%	80%	50%
60	90%	90%	60%
70	95%	95%	85%
80	--	--	95%

In view of preponderance of mature and over mature growing stock and their vulnerability to rot, the yield finally arrived at shall be reduced by 15 %.The number of potentially available trees, over the commercial area of this working circle, calculated at lower confidence limit of mean value, after due deduction on account of mortality, is tabulated under Table 13.4.

### 13.11 Yield Regulation

The stepwise calculation of yield in Chir Irregular Working Circle, on the basis of Modified Brandis Diameter class Method and Von Mantel's formula is detailed under Table 13.7 and Table 13.8 overleaf.

**Table 13.7 Yield Calculation for Fir Selection Working Circle using Brandis Diameter-Class Method.**

		<b>Chir</b>	<b>KAIL</b>
a)	Total number of trees in class I	4137	1130
b)	Total number of trees likely to pass on to class I in the first felling cycle from		
	Class II	<b>12882</b>	<b>1783</b>
	=	<b>7837</b>	<b>1783</b>
	Class III	<b>19259*(6/22)</b>	<b>1042*(6/19)</b>
	=	<b>3023</b>	<b>173</b>
c)	Total recruitment in class I from class II and III during first felling cycle	10860	1956
d)	Annual recruitment from class II and III during the first felling cycle (c / 30)	362	65
e)	Stock required to be kept as reserve i.e. half of the total recruitment in 'c' above	5430	978
f)	Surplus stock of class I ( a - e)	-1293	152
g)	Total possibility of yield in first felling cycle if all surplus stock in 'f' above is removed ( c + f)	9567	2108
h)	Annual yield ( g / 30)	319	70
i)	Total possibility of yield if all surplus stock in 'f' above is removed in two felling cycles ( c + f/2) (refer note below)	10214	2032
j)	Annual yield ( i / 30)	340	68
k)	Weighted average volume of trees above exploitable diameter as per Kullu Volume Tables in cubic metres	5.425	4.725
l)	Total annual volume yield ( m3)	1845	321
m)	Deduct fifteen percent from 'l' above to account for mortality	1568	273
n)	Rounded off to lower multiple of hundred	1500	200
	<b>TOTAL ANNUAL YIELD FROM THE WORKING CIRCLE</b>	<b>1,700</b>	<b>cum</b>

The yield as calculated by Von Mantel's formula is as under;

**Table 13.8 Yield calculation for Fir Selection Working Plan Circle using Von Mantel's formula.**

	Chir R = 150	Kail R = 150	Total
Total commercial volume based on mean value (m <sup>3</sup> )	1,55,822.47	26,778.78	1,82,601.25
Total commercial volume at lower confidence interval (m <sup>3</sup> )	1,12,192.20	19,280.78	1,31,472.93
Annual Yield (m <sup>3</sup> ) = 2GS/R	1,495	257	1,752
Rounded off to the lower multiple of 100	1,400	200	1,600

The comparative statement of yield computed from the two methods is as under:

	Annual yield in m <sup>3</sup>		
	Chir	Kail	Total
Brandis	1500	200	1700
Von Mantel	1400	200	1600

A perusal of the comparative statement above, shows that due to the preponderance of growing stock in higher diameter classes, yield obtained by the application of Brandis diameter-class method is more than the yield obtained using Von Mantel's formula. From a conservative stand point therefore, the latter method is adopted.

However, the yield arrived at above is a theoretical figure, because no commercial fellings are being prescribed in this working circle. Since only improvement felling are to be carried out, for the purpose of yield regulation only one third of the yield calculated is prescribed. Therefore, the annual yield is fixed at 1400 m<sup>3</sup> of Chir. No felling except removal of dead trees is prescribed in the case of Kail. The reason being that Kail, which occurs towards the upper limits of Chir, can colonize blanks and chances are that in these areas, if Chir fails to come up, Kail may establish itself.

### 13.12 Size of the Annual Coupe

The yield calculated on volume basis shall be controlled by an area check. The size of the annual coupe is calculated as under:

$$\text{Annual Coupe (ha)} = \frac{\text{Total commercial area of working circle}}{\text{Felling cycle}} = \frac{604.76}{30} = \mathbf{20.16}$$

### 13.13 Allowable Cut

Given the annual yield and the size of annual coupe, the allowable cut is computed as under:

Total annual yield (m <sup>3</sup> )	Annual coupe (ha.)	Allowable cut per ha. (m <sup>3</sup> )	Growing stock per ha. (m <sup>3</sup> )	Allowable cut as % of Growing stock
1,600	20.16	79.37	217.4	<b>36.51</b>

If yield reduced by 30%

Annual Yield	Annual Coupe	Allowable Cut (m <sup>3</sup> )	Min GS Available (m <sup>3</sup> )	Allowable Cut as % of Min GS
1120	20.16	55.56	217.4	<b>25.56</b>

### 13.14 Realization of the Yield

No yield from green Chir trees shall be realized during the plan period. The prescribed yield is a limit that has been imposed on removals, and not an objective that has to be achieved. The removals therefore, shall be limited to extraction of dead trees by way of improvement fellings. The only exception to the above prescription shall be the instance when mature/ over-mature trees are actually standing over adequate and established regeneration/ advance growth. In such cases, the removal of over-wood to the silviculturally desired extent, shall be carried out. Such markings shall be conducted by the DCF in-charge of the Division/ ACF only. All fit trees of 30 cm d.b.h and above as and when felled for whatever purpose including concessions, illicit damage etc shall be counted towards yield.

### 13.15 Sequence of Felling

The sequence fellings has been left to the discretion of the Divisional Forest Officer who shall exercise his judgement keeping in view the progress of regeneration. Since the felling cycle is identical to the working plan period(10 years), the entire working circle shall be gone over during the working plan period. The yearly distribution of work, and therefore, the sequence of fellings should be monitored and assessed regularly at the end of each year.

### 13.16 Marking and Felling Rules

- The marking officer, prior to conducting the marking, must acquaint himself thoroughly with the condition and composition of the crop in the compartment, and its boundaries by traversing over the area of the compartment.
- Marking should be done by the DCF in-charge of the division or well trained and experience ACF. The marking should never be conducted by anybody below the rank of a well trained and experience Range Officer, in which case, the DFO/ACF should check at least 25 percent of these markings.
- No marking, except the removal of dead, dying and diseased trees, shall be done in areas near and around cultivation and *behaks* with in a distance of 100 metres from their periphery.
- No marking, except the removal of actually dead, dying, diseased trees shall be done along nalla banks within a distance of at least 100 metres on either side.
- No healthy trees below the exploitable size shall be marked.
- No marking shall be conducted in areas lacking regeneration.
- No marking shall be conducted on steep and precipitous slopes.
- Over-mature trees should get preference over the relatively younger and healthier ones.
- Marking for improvement felling is the only markings prescribed. Only dead and dry trees shall be marked.
- All the trees of exploitable size (70 cm d.b.h in case of Deodar, Kail and Chir), standing over adequate and established advance growth should be removed. Selection markings of light to very light intensity shall be done in area having inadequate but established regeneration. These markings shall be conducted by DCF in-charge of division or ACF only.
- In the mixed crop, ecologically most suitable species to the locality should be favoured.
- No healthy, fit green standing trees in the approach class ( i.e. 50-60 cm diameter class) shall normally be marked. However if odd trees of approach class occur sticking among established poles of less than 30 cm d.b.h, they should be removed in order to ensure the uniformity of the groups.
- Whenever Chir is found in mixture with broad leaved species no attempt should be made to free the main Chir crop by removal of these broad leaved trees. Retention of these broad leaved trees, especially in hill forests, is considered important for the proper conservation and regulation of soil moisture.
- Extreme care has to be exercised at the time of felling so as not to damage the crop below.
- Trees marked to be felled should be lopped before execution of felling.

### **13.17 Supplementary Felling**

The crop in Chir Working Circle is very sparse. The scope of supplementary markings is therefore minimal and hence it is prescribed that no supplementary markings shall be carried out in this working circle.

### **13.18 Subsidiary Silvicultural Operations**

The subsidiary silvicultural operations constitute an integral and most important aspect of management of Chir forests covered under this working circle. These operations include disposal of debris, Protection against fires and control of grazing etc. discussed as follows:

#### **13.18.1 Disposal of Debris**

By and large, the Chir forests occupy area near and around the human populations. The forests are being opened more and more because of development of the net work of roads and foot paths. The debris left over after felling, being highly combustible, constitutes potential source of fire in these forests. Fortunately most of the felling refuse is taken off by the local concessionists for their domestic use as fuel-wood. However, if such is not the case, the felling debris should be burnt off in heaps at safer places during the safe period of the year. In any case felling refuse should not be allowed to remain un-disposed.

#### **13.18.2 Protection Against Fire**

Frequent fires are one of the major causes responsible for failure of regeneration in these forests. Chir, though a fire hardy species, is badly damaged by frequent fires. The problems has been aggravated after the start of resin tapping in these forests. Dry needles, resinous wood and resin channels render these forests more prone to fire. Hotter aspects and areas in the vicinity of habitation are more susceptible to fires. Most of these fires are intentional. Fire has many others harmful effects on the soil and the ground flora and fauna of these forests. The following measures are recommended for effective control and protection against fires:

##### **13.18.2.1 Fire Lines**

- (i) Most of the Chir forests are broken by *chaks* and cultivation and fire lines are not needed in such areas. The net work of foot paths already existing, if extended and maintained well over the area, will serve the purpose of fire lines. Fire lines, however, are recommended in areas having continuous, unbroken stretches and belts of Chir forests. These forests also need to be separated by means of adequate fire lines from other conifer and broad leaved patches in higher reaches.

- (ii) The areas bearing young and unestablished regeneration, steep, with shallow soil cover, or where the artificial regeneration is being induced, need to be separated from rest of the area by providing internal fire lines all around the area.
- (iii) Temporary fire lines of 20 metres to 30 metres width are recommended whenever required. In temporary fire lines felling of trees need not be done to clear up the area but should be controlled burnt every year.

### **13.18.2.2 Control Burning**

While carrying out controlled burning, the following points should be kept in consideration:

- (i) It should generally be done during the period December to February (Earlier on hotter aspects).
- (ii) The worked out areas should not be control burned until they are thoroughly cleared of slash/ debris and felling refuse.
- (iii) Areas, where the fellings have been conducted and regeneration is already established, should be control burnt at an interval of every two years.
- (iv) The operations of control burning should be started from the top portion of an area, and extended downwards along the slope. Control burning proceeding upwards along the slope is injurious to the crop.
- (v) In the forests under resin tapping an area up to 1.5 metre radius around each tree under tapping is cleared of chips and other inflammable material before control burning.
- (vi) Small patches of unestablished regeneration should be strictly protected against any damage during the operation of control burning.
- (vii) Inspection / observation posts should be located at vantage points to keep a close watch over any forest fires especially during the hot season.
- (viii) Adequate number of fire watchers should be engaged to actively work for the protection of these forests from fires.

### **13.18.3 Tending**

Cleaning in congested patches of young regeneration above 2.5 meter height is beneficial to the crop. Cleaning and thinning in sapling stage of established regeneration is a must for artificially regenerated crops. There are a few compartments having congested young crop which need tending operations. Since artificial plantations are envisaged to be raised during this plan period, the follow up tending operations on the standard prescriptions are needed in the near future.

### 13.19 Regeneration Programme

13.19.1 The success of any treatment given to the crop, depends largely on the efforts put in to regenerate the forests in due course of time. It is very difficult to regenerate these forests naturally, except in a very limited area where biotic interference is either minimum or absent. Almost all the Chir forests are under heavy biotic pressure. The heavy uncontrolled and unrestricted grazing is one of the two main reasons for failure of Chir areas to regenerate. Every passing year, the areas deficient in young regeneration, are expanding.

13.19.2 Effective closure and strict fire protection, till the regeneration is established, are the two most important measures for the success of any regeneration programme. In most of the areas bearing scant crop of Chir, a mere effective closure along with adequate protection against fire will be sufficient to regenerate such area. The crop in such areas can be supplemented with artificial sowing and or planting. The areas which are unlikely to respond to the closure, should be taken up for direct sowing in patches and planting of seedling raised in polythene bags. Direct sowing is also prescribed to be done as soon as the coupe is vacated after felling. Chir is quite conveniently raised by direct sowing in any of the following manners:

- (i) In patches about 2 meters apart with soil dug up to about 30 cm depth. This technique is quite suitable when there is enough moisture in the soil.
- (ii) In contour lines 30 cm wide and spaced 2 to 3 metre apart with the dug up earth mounded on the down hill side to conserve moisture. This is useful on slopes where there is some deficiency in the soil moisture.
- (iii) Contour trenches, preferably broken. This is useful on dry and hot aspects.

### 13.20 Nursery and Plantation Techniques

#### ***Pinus roxburghii***

Found between 500 to 2300 metre height. It is a light demander, but requires protection from the sun on stiff soils on hot and dry aspects. It is a frost and drought hardy species, most fire-resistant of all the conifers. However, young seedlings are damaged by fire. It is not readily browsed except in heavily grazed areas.

**Seed;** Cones ripen in the cold weather. They should be collected in March-May, dried in sun and seeds be shaken out. Seeds can be stored in sealed tins up to 4 years. Approximately 10,000 seed weigh a kilogram. And on an average, 16 to 18 kg of cones yield 20 g of pure seed. Germination may be 70 to 100 percent, completes in a month after initiation.



**Nursery Technique;** Dibbled or broadcast sowing of seeds be done in shaded beds, during March-April at the rate of 100 g seeds per sq. metre bed area. Seedlings be pricked out 10 cm apart, in June-July.

**Inoculation with Mycorrhizae;** *Pinus* cannot grow without mycorrhizae. Mycorrhizae helps the development of roots and absorption of water and nutrients in *Pinus*. The potting mixture for raising *Pinus* seedling therefore, must be inoculated with mycorrhizae. This is done by collecting the soil around large *Pinus* trees. This soil should then be mixed with potting mixture/ nursery soil in the ratio of 1:9. The soil collected from pine forests for inoculation should not be kept under sun because the mycorrhizae may get killed.

**Planting Technique;** Seedlings be transplanted at 2 x 2 metre spacing in prepared pits during August when they are 10-15 cm in height. Much weeding and cleaning not required on dry sites. Young seedlings are damaged by grass-hoppers, birds, rats and porcupines etc.

### **13.21 Control of Grazing**

Grazing in Chir forests is a serious problem. Unrestricted, uncontrolled, unregulated and heavy grazing is responsible for the failure of Chir forests to regenerate naturally after the fellings. Large herds of migratory as well as local livestock graze these forests all round the year. As a result of heavy grazing, young seedling and saplings are trampled and destroyed. The areas highly subject to grazing are prescribed to be effectively closed to the exclusion of grazing and taken up for artificial regeneration by planting and patch sowing.

## CHAPTER XIV

# WORKING PLAN FOR THE REBOISEMENT WORKING CIRCLE

### 14.1 General Constitution of the Working Circle

This working circle includes those of the potentially productive areas which have either been degraded due to excessive biotic-interference, or failed to regenerate after drastic treatment in the past. This working circle was constituted by including areas of the Protection-cum-Improvement Working Circle, Unregulated Working Circle, and Coniferous Rehabilitation Working Circle of their respective earlier plans at the time of previous revision. Some of the compartments were taken out from Deodar- Kail Regular/ Uniform Working Circles, Mixed Coniferous Selection Working Circle, Fir Selection Working Circle and Chir Working Circle of the earlier plans, when they failed to regenerate after the removal of over wood during the past decades, and placed under this working circle. For the current plan, the constitution of this working circle in the previous plan has been retained. 5091.22 Ha area of the total area of this working circle falls in Batote Range, 3477.51 Ha area in Gandhri Range and 2635.10 Ha area in Marmat Range. Out of the total area of 11203.83 hectares, 32 percent is commercial, 68 percent is uncommercial.

### 14.2 General Character of the Vegetation

14.2.1 To this working circle are allotted the following categories of the forest areas.

- (i) Those of the potentially productive areas which have now been rendered degraded and under-stocked because of maltreatment in the past including excessive lopping, encroachment, over exploitation and biotic interference. These areas are being treated as degraded forests. The crop either has low density or is in the form of isolated trees, small patches or even without tree cover.
- (ii) The forest areas where regeneration could not keep pace with the removal of the over-wood after seeding felling/ main felling.
- (iii) Those potentially productive forest areas that have deteriorated due to natural physical calamities.
- (iv) The productive forests, though adequately stocked, yet are considered unfit for commercial exploitation, because of :
  - a. Their proximity to the large human settlements rendering them more vulnerable to the excessive pressures of ever rising population and their demand for timber, firewood, grazing etc.
  - b. their location along the National Highway, and

c. erosion in the forests and their surrounding areas.

(v) The forests occurring in and around the places of tourist interest.

(vi) Forest area mainly under broad-leaved species, blanks, or bearing shrubby growth.

14.2.2 The area allotted to this working circle is spread almost all over this division. The types of vegetation encountered varies from sub-tropical pine forests in the low lying areas to high level pasture lands at higher elevations. As such the forests of this working circle by and large conform to all the Champion and Seth's forest types as discussed in detail in Chapter II of Part I of this plan. Table 14.1 below provides the distribution of stems over various diameter classes.

**Table 14.1 Normal and actual distribution of stems over diameter-classes**

Diameter – class (cm)	10-20	20-30	30-40	40-50	50-60	60-70	Above 70
Normal Distribution in percentage	41%	25%	15%	9%	5%	3%	2%
Actual Distribution in percentage	7.53%	10.19%	15.33%	14.72%	15.94%	16.55%	18.24%

From the table above, it is obvious that the deficiency of trees in lower diameter classes is quite significant owing to the failure of regeneration to establish.

### 14.3 Area and Allotment

14.3.1 The area statement of compartments/ sub-compartments allotted to this working circle is provided in Appendix III and IX. Table 14.2 gives the range wise abstract of the area under Reboisement Working Circle. The area allotted to this working circle is 34 percent of the total area of this division.

**Table 14.2 Range wise distribution of area allotted to Reboisement Working Circle.**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	35	9, 10a, 10b, 10c, 11, 12a, 12b, 14a, 19, 20, 21, 22a, 22b, 23a, 23b, 26b, 28, 30, 31, 32a, 32b, 34, 35a, 36a, 36b, 37a, 37b, 38b, 39a, 40a, 40b, 41, 42, 43 and 44b.	5091.22
2.	Gandhri	27	45a, 45b, 46a, 48, 49, 50a, 51b, 53, 57a, 57b, 58, 59, 62, 63a, 63b, 64a, 64b, 67b, 69, 71a, 71b, 72, 73, 74, 75b, 80a and 80b.	3477.51
3.	Marmat	23	9, 10a, 14, 16, 20b, 20c, 21c, 27a, 27b, 27c, 32, 34, 35b, 46a, 46b, 48, 53, 54, 56, 57, 58, 59 and 66.	2635.10
<b>Total</b>		<b>85</b>		<b>11203.83</b>

#### **14.4 Special Objects of Management**

- (i) To rehabilitate and improve the existing forest crop by adopting strict forest protection and improvement measures.
- (ii) To develop and improve upon the forest areas of tourist attraction without altering the natural ecological status of these forests.
- (iii) To stabilize land slip and land slide areas along the National High Way.
- (iv) In consonance with the objects above, to fulfill only genuine, petty demands of the concessionists to the extent possible.

#### **14.5 Analysis and Valuation of the Crop**

The quantitative assessment of the growing stock and preparation of its inventory, in this working circle, has been made on the basis of the data collected and analysed from 115 sample points, selected at random, located, surveyed and studied in the field by means of Point Sampling Technique using wedge prism. Mean values of two variables viz. number of stems per hectare, and volume of conifers 30 cm d.b.h and above, have been computed and tabulated diameter-class wise and species wise. Statistical tests have been applied to the sampling data and the results of statistical analysis are summarized in Table 14.3. The diameter-class and species wise distribution of growing stock assessed on the basis of mean values in terms of the total number of stems, and volume of conifers 30 cm d.b.h. and above, are summarized in Table 14.4 and 14.5 respectively. The average growing stock of this working circles, in terms of the entire area of the working circle works out to 134 stems of conifer and broad leaves per hectare, and a volume of 180.37 m<sup>3</sup> per hectare of conifers only above 30 cm d.b.h.

## 14.6 Exploitable Size

No regular fellings are prescribed in the area assigned to this working circle. However, if and when trees are to be marked for special reasons like meeting the petty genuine demands of the concessionists, the exploitable diameter shall be adopted as 70 cm d.b.h for Deodar, Kail, Chir and 80 cm d.b.h for Fir.

## 14.7 Method of Treatment Prescribed

14.7.1 In view of the discussion above, and in order to achieve the special objects of management, these forests require complete rest, and strict protection from biotic interference, the most important being grazing, fire, illicit damage, encroachments and lopping. The following treatment is prescribed to be given to these forests:

- (i) There is an urgent and immediate need to rehabilitate these forests through such measures as strict closure to grazing, assisted natural regeneration and artificial regeneration by planting and sowing of most suited species among conifers.
- (ii) The selected localities, which are too difficult to be planted with conifers, shall be planted with suitable and desirable broad leaved species.
- (iii) The degraded forests near and around the huge human settlements, shall be planted with fruit, fodder and firewood yielding and soil enriching species with a view to lessen the pressure on the commercial forests. Besides, these species will help in improving the rural economy.
- (iv) Intensive soil conservation measures, including closure, planting and engineering works are necessary in areas under the grip of soil erosion.
- (v) Highly degraded and dry sites may be planted with hardy and drought resistant species like *Robinia pseudoacacia*, *Ailanthus spp*, *Prunus armeniaca* and other broad leaved species.
- (vi) The Chir bearing compartments allotted to this working circle shall not be placed under resin tapping.
- (vii) The areas of tourist attraction shall be treated suitably according to their requirement, in order to improve their sylvan beauty.

14.7.2 Rehabilitation of these areas requires an ambitious, long term plantation programme. Given a conversion period of 75 years remaining, at least 70 hectares of degraded area in this working circle needs to be taken up annually for rehabilitation.

**Table No: 14.3 RESULT OF STATISTICAL ANALYSIS FOR THE REBOISEMENT WORKING CIRCLE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Coefficient of variation (%age)	95% Confidence limits (X+1.96 xS.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
1	2	3	4	5	6	7	8	9	10	11	12
Reboisement	No of stems	86	170.00	3169.41	56.29	6.07	33.12	157.93	182.1	24.14	92.9
	Volume	86	376.44	41411.8	203.49	21.94	54.60	332.82	420.1	87.24	88.41

**Table No. 14.4 Statement showing specie and dia meter (cm) class wise tree account of Reboisement Working Circle**

**Species wise tree account stem Distribution per ha (mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	3.14	5.93	11.05	11.4	10.47	10.7	5.23	1.16	0	0	59.08
Deodar	2.09	2.67	3.02	3.84	3.95	4.19	2.56	0.81	1.28	0.23	25.22
Fir	0.7	0.58	1.4	1.51	1.51	1.28	1.16	1.16	1.4	0.58	11.28
Kail	2.21	5.58	9.53	7.91	10.93	11.86	8.95	3.95	1.74	0.7	65.34
BL	4.65	2.56	1.05	0.35	0.23	0.12	0.12	0	0	0	9.08
<b>Total</b>	<b>12.79</b>	<b>17.32</b>	<b>26.05</b>	<b>25.01</b>	<b>27.09</b>	<b>28.15</b>	<b>18.02</b>	<b>7.08</b>	<b>4.42</b>	<b>1.51</b>	<b>170</b>

**Total tree account over the entire commercial area Reboisement Working Circle working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	11178.59	21111.16	39338.66	40584.68	37273.83	38092.64	18619.11	4129.67	0	0	210328.34
Deodar	7440.53	9505.36	10751.38	13670.63	14062.24	14916.65	9113.75	2883.65	4556.88	818.81	89784.71
Fir	2492.04	2064.83	4984.08	5375.69	5375.69	4556.88	4129.67	4129.67	4984.08	2064.83	40157.46
Kail	7867.73	19865.13	33927.37	28160.07	38911.46	42222.31	31862.54	14062.24	6194.5	2492.04	232614.31
BL	16554.28	9113.75	3738.06	1246.02	818.81	427.21	427.21	0	0	0	32325.34
<b>Total</b>	<b>45533.17</b>	<b>61660.23</b>	<b>92739.55</b>	<b>89037.09</b>	<b>96442.03</b>	<b>100215.69</b>	<b>64152.28</b>	<b>25205.23</b>	<b>15735.46</b>	<b>5375.68</b>	<b>605210.16</b>

**Species wise minimum available stem Distribution in the working circle at Lower limit (92.90%)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	10384.91	19612.27	36545.62	37703.17	34627.39	35388.06	17297.15	3836.46	0	0	195395.03
Deodar	6912.25	8830.48	9988.03	12700.02	13063.82	13857.57	8466.67	2678.91	4233.34	760.67	83409.99
Fir	2315.11	1918.23	4630.21	4994.02	4994.02	4233.34	3836.46	3836.46	4630.21	1918.23	37306.29
Kail	7309.12	18454.71	31518.53	26160.71	36148.75	39224.53	29600.3	13063.82	5754.69	2315.11	216098.72
BL	15378.93	8466.67	3472.66	1157.55	760.67	396.88	396.88	0	0	0	30030.24
<b>Total</b>	<b>42300.32</b>	<b>57282.36</b>	<b>86155.05</b>	<b>82715.47</b>	<b>89594.65</b>	<b>93100.38</b>	<b>59597.46</b>	<b>23415.65</b>	<b>14618.24</b>	<b>4994.01</b>	<b>562240.27</b>

**Table No. 14.5 Volume account in Reboisement Working Circle**

**Species wise vol Distribution per ha (mean value)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	0.38	0.33	3.18	6.18	13.36	19.76	7.93	2.88	0	0	54
Deodar	0.09	0.14	1.33	3.09	4.88	8.4	5.1	1.32	2.39	1.76	28.5
Fir	0.05	0.02	0.39	1.45	2.42	4.56	7.17	7.72	12.02	5.92	41.72
Kail	0.54	1.44	12.28	21.67	40.12	62.92	62.19	29.24	17.13	4.7	252.23
<b>Total</b>	<b>1.06</b>	<b>1.93</b>	<b>17.18</b>	<b>32.39</b>	<b>60.78</b>	<b>95.64</b>	<b>82.39</b>	<b>41.16</b>	<b>31.54</b>	<b>12.38</b>	<b>376.45</b>

**Species wise vol Distribution over entire commercial area of the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	1352.82	1174.82	11320.99	22001.17	47562.4	70346.79	28231.28	10252.97	0	0	192243.24
Deodar	320.41	498.41	4734.88	11000.59	17373.09	29904.5	18156.31	4699.28	8508.54	6265.71	101461.72
Fir	178	71.2	1388.42	5162.09	8615.35	16233.87	25525.63	27483.66	42791.92	21075.56	148525.7
Kail	1922.43	5126.49	43717.54	77146.5	142829.61	223998.98	221400.13	104096.15	60983.83	16732.28	897953.94
<b>Total</b>	<b>3773.66</b>	<b>6870.92</b>	<b>61161.83</b>	<b>115310.35</b>	<b>216380.45</b>	<b>340484.14</b>	<b>293313.35</b>	<b>146532.06</b>	<b>112284.29</b>	<b>44073.55</b>	<b>1340184.6</b>

**Species wise minimum available volume over entire commercial area of the working circle at Lower limit (88.41%)**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	1196.03	1038.66	10008.89	19451.23	42049.92	62193.6	24959.27	9064.65	0	0	169962.25
Deodar	283.27	440.64	4186.11	9725.62	15359.55	26438.57	16051.99	4154.63	7522.4	5539.51	89702.29
Fir	157.37	62.95	1227.5	4563.8	7616.83	14352.36	22567.21	24298.3	37832.34	18632.9	131311.56
Kail	1699.62	4532.33	38650.68	68205.22	126275.66	198037.5	195739.85	92031.41	53915.8	14793.01	793881.08
<b>Total</b>	<b>3336.29</b>	<b>6074.58</b>	<b>54073.18</b>	<b>101945.87</b>	<b>191301.96</b>	<b>301022.03</b>	<b>259318.32</b>	<b>129548.99</b>	<b>99270.54</b>	<b>38965.42</b>	<b>1184857.2</b>

**Species wise percentage of volume Distribution in the working circle**

Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-above	Total
Chir	0.1	0.09	0.84	1.64	3.55	5.25	2.11	0.77	0	0	14.35
Deodar	0.02	0.04	0.35	0.82	1.3	2.23	1.35	0.35	0.63	0.47	7.56
Fir	0.01	0.01	0.1	0.39	0.64	1.21	1.9	2.05	3.19	1.57	11.07
Kail	0.14	0.38	3.26	5.76	10.66	16.71	16.52	7.77	4.55	1.25	67
<b>Total</b>	<b>0.27</b>	<b>0.52</b>	<b>4.55</b>	<b>8.61</b>	<b>16.15</b>	<b>25.4</b>	<b>21.88</b>	<b>10.94</b>	<b>8.37</b>	<b>3.29</b>	<b>99.98</b>



## 14.8 Regeneration Programme

14.8.1 Out of the total area of 1552 hectares allotted to the aesthetic Block, 47% is non-wooded, 26 percent is uncommercial forest area, and 27 percent is commercial forest area. The following guidelines are provided for the rehabilitation of these areas.

- Attempt should not be made to afforest natural blanks and pastures.
- Blanks created due to removal of trees in the past should be reforested with suitable conifer species. In case excessive degradation has occurred, only indigenous broad leaved species may be planted to arrest the process of degradation.
- In areas where the density of overhead canopy is sparse, only suitable conifers species should be planted.
- Planting should be done in pits not less than 45 x 45 cm in size and large sized planting stock should be used. Transplantation of wildlings from congested patches of regeneration can also be experimented.
- In Patnitop, where the density of Deodar crop has fallen below 40 percent, compact areas should be fenced off with chain link fencing on angle iron posts with two strands of barbed wire, and large sized planting stock of Deodar should be planted in pits 60 x 60 cm in size.

14.8.2 In order to achieve the above targets, well conceived schemes needs to be drawn at micro level, taking into consideration all the factors likely to affect this programme, in due course of time. Honest and sincere efforts are required to be put in at all levels in achieving the objects with success. It is suggested that areas be selected on yearly basis in order of priority, keeping in view of the over all condition of the area. Out of the 70 hectares of area prescribed for rehabilitation activities every year, 20 hectares should be devoted to the aesthetic block.

## 14.9 Nursery and Plantation Techniques

### *Aesculus indica*

Found at 1200 to 2700 metre height in moist, shady ravines and northern aspects.

**Seed:** Ripen in September-November, should be collected from the trees or ground. Can be stored in dry earth till spring. About 640 seeds weight a kilogram. Germination capacity is fairly high (70-90 percent).

**Nursery Technique:** Seed sowing be done in autumn immediately after seed collection. Patches be kept at a spacing of 2 x 2 metres in shady, cool beds. Sowing be done 5 cm below the soil in drills, 15-30 cm apart. Some watering is required.

**Planting Technique:** Seedlings (6,12 and 18 months old) with naked roots are transplanted during winter, in prepared pits at 2 x 2 metres spacing. Weeding and cleaning be done for 1-2 years. Dry exposed situations be avoided for planting work.

### ***Ailanthus excelsa***

**Seed:** Fruits ripen in May-June. They are winged and are disseminated by wind. They should be dried in sun, beaten mildly and winnowed. Seeds loose the viability quickly, and can not be stored for use in the next year even in sealed containers. Approximately 9000 to 10,000 seeds weight a kilogram. Germination capacity varies from 60 to 80 percent.

**Nursery Technique:** Seeds be sown in raised seed beds in May-June. Germination commences in about 10-12 days and completes in approximately 30 days. Seedlings be pricked out in polythene bags for the use in next year.

**Planting Technique:** One year old polybag seedlings are planted in the field in July at a spacing of 2 x 2 metres in pits of 30 cm size. Good fertile soil and about 5 kg farm yard manure be added to each pit. By the end of the first growing season, seedling may reach an average height of 10 to 20 cm only. From the second season onwards, the growth is more rapid i.e. 50 to 60 cm per season. Seedlings are subject to insect attack, particularly in their early stages of development. They are also sensitive to frost. Protection against the above two calamities be applied in advance.

### ***Alnus nepalensis***

Found between 800 to 2700 metre. It is susceptible to snow-break, frost, grazing and insect attack. Fast growing.

**Seed:** Fruits ripen in February-March. They should be collected by lopping the branches. Seeds be extracted after sun drying by beating the cones. Seeds are very minute, about 8 lakhs per kg. They should be dried before storage. Germination is about 70 percent, 4 to 6 weeks after sowing.

**Nursery Technique:** Direct or broadcast sowing be done in February-March in shaded beds; should be covered by mulch. At low elevations i.e. below 1500 metre, transplanting in May and at higher elevation planting be done in the following rains.

**Planting Technique:** Seedlings 15 cm to 75 cm long, with or without the ball of earth around the roots be planted out in prepared pits, at the beginning of first or second rains. Autumn transplanting in September and winter transplanting be done in January. It is successful in moist and humid localities, requires no tending after the third year.

### ***Bauhinia variegata***

**Seed:** The pods are dehiscent and contain 10 to 15 seeds each. Pod matures in May-June and extraction of seeds is done by drying the pod in sun when they dehisce. The seeds, which are brown, circular and flat show semi-hypogeal type of germination. Sufficient light and moisture are necessary factors for germination. 2500 to 3500 seeds weight a kilogram. Germination may be as high as 70 percent. However, storage of seeds for one month may enhance the germination capacity.

**Nursery Technique:** One year old seeds are sown in the nursery beds in April-May. Depth of sowing is very little, almost at the soil surface but seeds should not be exposed. Seeds be kept in rows 20-25 cm apart. If direct sowing is to be done, individual seeds be kept 3 metre apart. Regular watering is very necessary for germination which may start after a week. Weeding should always be done to encourage seedling growth.

**Planting Technique:** 2-3 month old seedlings are good for transplanting in the field. 30 cm is the appropriate size of pit for planting the seedlings. Spacing of the pits be kept 2.5 x 2.5 metres or 3 x 3 metres. Plants be protected from grazing.

### ***Juglans regia***

Found between 1200 to 3300 metre. It is somewhat sensitive to frost and drought. Browsed by deer and damaged by stem and shoot borers. Grows best in fairly moist localities and does not thrive in exposed windy situations. It avoids badly drained soils.

**Seed:** Fruits ripen in September-October, can be collected by beating and shaking the branches. Outer fleshy coats be removed or be rotten off and nuts be dried in the sun. Should be stored in a well ventilated room, in tins or jars or in a pit in dry ground, filled with dry earth until required for sowing. Nuts 90-100 per kg. Germination capacity is 70 to 80 percent. Gets completed in 5-7 weeks normally.

**Nursery Technique:** Nuts may be dibbled in pits 2 x 2 metres apart, during autumn, before snowfall or in January-February. Two seeds per patch 5 cm deep be sown, should be covered with thorns. Seeds may also be sown in 25 cm deep drills, in lines 10 cm apart.

**Planting Technique:** Seedlings, without or with earth ball around the roots, be transplanted in the first winter. However, second winter transplants are better for difficult sites. Transplanting during the rainy season is not so successful. Thorough weeding and soil working be done for the first/second year. It is sensitive to weed competition.

***Robinia pseudoacacia***

It is a native of North America, and can grow at an elevation of 1500 to 2000 metres. It can grow on a variety of soils but not on very sandy, very acidic or wet soils. Drainage is an important factor affecting the growth of this species.

**Seeds:** They are dried in the sun, thrashed and winnowed to obtain clean seeds. About 33 to 77 seeds weigh a gram. They can be stored in airtight containers for one year at room temperature without any appreciable loss in their viability. But, in a dry place and at low temperature (0 °C to 4 °C) seeds can be kept viable for 5 years in sealed containers. Seeds require pre-sowing treatment ( Sulphuric acid scarification of a short-while, or immersion in hot water).

**Nursery Technique:** Sowing be done in beds in lines 20 cm apart. Depth of sowing should be about 1.5 cm. Sowing in irrigated nurseries be done in March-April, but in rain-fed nurseries, in June-July. Germination starts in a week and continues up to 10 days. About 85 percent germination can be obtained if the seeds are pre-treated.

**Planting Technique:** Eight-nine month old seedlings can be planted in 30 cm<sup>3</sup> pits at a spacing of 2.5 x2.5 metres. In poor sites, 2 x 2 metres spacing can also be used. Naked rooted plants may also be used for planting. Plantation areas be closed for grazing.

## CHAPTER XV

### WORKING PLAN FOR THE PROTECTION WORKING CIRCLE

#### 15.1 General Constitution of the Working Circle

All those demarcated forests of Batote Forest Division as have not been covered under any of the working circles described heretofore shall be allotted to this working circle. This working circle is identical in constitution to the corresponding working circle of the plan under revision.

#### 15.2 General Character of the Vegetation

15.2.1 This working circle includes the following categories of forest area, most of which, formed the Unregulated Working Circle and the Protection-cum-Improvement Working Circles of the earlier plans.

- (i) All the rocky and stony forests area, mostly consisting of the steep to precipitous hill slopes, which are devoid of vegetative covering.
- (ii) All the forest areas situated at high altitude, on steep to precipitous terrain, uneconomical for commercial exploitation because of their inaccessibility and poor stocking.
- (iii) The forest areas of any description, though relatively better stocked, yet their protection and preservation is essential for soil and water conservation, preservation of wild life, and the maintenance of aesthetics of the tract.
- (iv) All the forests area as are inherently unproductive and incapable of reboisement under the prevailing set up of circumstances.

**Table 15.1          Normal and actual distribution of stems over diameter classes**

<b>Diameter – class(cm)</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70 &lt;</b>
<b>Normal Distribution in percentage</b>	41%	25%	15%	9%	5%	3%	2%
<b>Actual Distribution in percentage</b>	9.40%	13.07%	14.22%	9.63%	11.24%	13.30%	24.99%

15.2.2 As the area allotted to this working circle is spread almost all over this division, the types of vegetation encountered varies from sub-tropical pine forests in the low lying areas to high level pasture land at higher elevation. By and large, all the forest types as discussed in detail in the Chapter II of Part I of this plan, are met with in this working circle.

### 15.3 Area and Allotment

15.3.1 The detail statement of area of Compartments/ Sub-compartments allotted to this working circle is provided under Appendix III and X. The range wise abstract of the area drawn from this statement is tabulated under Table 15.2 overleaf.

**Table 15.3 Table showing Range wise distribution in Protection WC.**

S.No.	Range	No. of Compartments	Compartments	Total Area (ha)
1.	Batote	4	1, 7, 13 and 40c.	695.87
2.	Gandhri	1	70	171.41
3.	Marmat	19	12b, 13c, 15b, 18a, 18b, 19a, 21a, 22, 23, 25b, 26, 44, 49, 63, 67, 68, 69, 70 and 74.	3787.14
				<b>4654.42</b>

15.3.1 The area allotted to this working circle works out to be 14.01 percent of the total area of this division. Out of the total area of this working circle, 39 percent is commercial, and 61 percent is un-commercial under forest cover of varying density.

### 15.4. Special Objects of Management

- (i) To protect and preserve the vegetative covering of the area from further deterioration and degradation in the interest of soil and water conservation, and the aesthetic value of the hill tops and slopes.
- (ii) To improve the conditions of the existing crop by protecting these areas till they become fit for working as whole or in parts, sometimes in the future.

### 15.5 Analysis and Valuation of the Crop

15.5.1 Assessment of growing stock and preparation of inventory in this working circle has been made by the application of Point Sampling Technique. The methodology adopted for fixing the sample points, and recording of data at each of the sample point is the same as explained earlier.

15.5.2 Mean values of two variables viz. Volume, and number of trees per hectare have been calculated for this working circle by computing the arithmetic averages of all the

sample points in respect of both these variables. The statistical tests performed on the variables, and the results obtained, are provided under Table 15.3.

- 15.5.2 The diameter-class and species wise distribution of the growing stock assessed in terms of total number of trees of all species and volume of conifers 30 cm d.b.h. and above, over the respective categories of the commercial, uncommercial and the entire area of the working circle are provided under Table 15.4 and 15.5 respectively.
- 15.5.3 The average growing stock of this working circle in terms of the entire area of the working circle is 174 trees per hectare and 427.45 m<sup>3</sup> per hectare of conifers 30 cm d.b.h and above.

## **15.6 Methods of Treatment Prescribed**

- (i) No treatment, except complete rest, is prescribed for these forests.
- (ii) No felling, of what-so-ever nature, shall be allowed in these areas.
- (iii) There shall be strict control against fires illicit damage, encroachments and excessive grazing etc.
- (iv) No resin tapping of any kind shall be allowed in the Chir crop of this working circle.

**Table No: 15.3 RESULT OF STATISTICAL ANALYSIS FOR THE PROTECTION WORKING CIRLCE**

Working Circle	Variable (per ha)	Sample point (N)	Mean (x)	Variance (S <sup>2</sup> )	Standard Deviation (S)	Standard Error (SE)	Coefficient of variation (%age)	95% Confidence limits (X+1.96 xS.E.)		Confidence Interval (C.I.)	Lower Limit as % of mean %
								Lower Limit	Upper Limit		
1	2	3	4	5	6	7	8	9	10	11	12
Protection	No of stems	25	174.4	5450.67	73.83	14.77	42.33	143.91	204.89	60.98	82.52
	Volume	25	431.53	40601.32	201.50	40.3	46.69	348.38	514.74	166.36	80.73



**Table No: 15.4 Tree account of Protection Working Circle**

<b>Species wise stem Distribution per ha (mean value)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	0.8	5.2	3.6	3.6	2.4	2.4	1.6	0.8	0	0	20.4
Deodar	2.8	2.8	3.6	2.8	4	1.6	1.2	0.8	0.4	0.4	20.8
Fir	2.4	3.2	2	1.6	2.8	7.2	7.2	4.8	4.4	1.6	38
Kail	5.6	8.8	13.2	8.4	10.4	11.6	8.8	5.2	5.2	1.2	80
BL	4.8	2.8	2.4	0.4	0	0.4	0	0	0	0	15.2
<b>Total</b>	<b>16.4</b>	<b>22.8</b>	<b>24.8</b>	<b>16.8</b>	<b>19.6</b>	<b>23.2</b>	<b>18.8</b>	<b>11.6</b>	<b>10</b>	<b>3.2</b>	<b>174.40</b>
<b>Species wise stem Distribution over the entire Commercial area of the Working Circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	1467.7	9540.08	6604.67	6604.67	4403.11	4403.11	2935.41	1467.7	0	0	37426.45
Deodar	5136.96	5136.96	6604.67	5136.96	7338.52	2935.41	2201.56	1467.7	733.85	733.85	38160.29
Fir	4403.11	5870.82	3669.26	2935.41	5136.96	13209.34	13209.34	8806.22	8072.37	2935.41	69715.94
Kail	10273.93	16144.74	24217.12	15410.89	19080.15	21281.71	16144.74	9540.08	9540.08	2201.56	146770.41
BL	8806.22	5136.96	4403.11	733.85	0	733.85	0	0	0	0	27886.36
<b>Total</b>	<b>30087.92</b>	<b>41829.56</b>	<b>45498.83</b>	<b>30821.78</b>	<b>35958.74</b>	<b>42563.42</b>	<b>34491.05</b>	<b>21281.7</b>	<b>18346.3</b>	<b>5870.82</b>	<b>319959.45</b>
<b>Species wise minimum available stem Distribution over the entire Commercial area in the working circle at Lower limit (82.52%)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	1211.15	7872.47	5450.17	5450.17	3633.45	3633.45	2422.3	1211.15	0	0	30884.31
Deodar	4239.02	4239.02	5450.17	4239.02	6055.75	2422.3	1816.73	1211.15	605.57	605.57	31489.87
Fir	3633.45	4844.6	3027.87	2422.3	4239.02	10900.35	10900.35	7266.89	6661.32	2422.3	57529.6
Kail	8478.05	13322.64	19983.97	12717.07	15744.94	17561.67	13322.64	7872.47	7872.47	1816.73	121114.95
BL	7266.89	4239.02	3633.45	605.57	0	605.57	0	0	0	0	23011.82
<b>Total</b>	<b>24828.56</b>	<b>34517.75</b>	<b>37545.63</b>	<b>25434.13</b>	<b>29673.16</b>	<b>35123.34</b>	<b>28462.02</b>	<b>17561.66</b>	<b>15139.36</b>	<b>4844.6</b>	<b>264030.55</b>
<b>Species wise percentage of stem Distribution in the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	0.46	2.98	2.06	2.06	1.38	1.38	0.92	0.46	0	0	11.7
Deodar	1.61	1.61	2.06	1.61	2.29	0.92	0.69	0.46	0.23	0.23	11.94
Fir	1.38	1.83	1.15	0.92	1.61	4.13	4.13	2.75	2.52	0.92	21.8
Kail	3.21	5.05	7.57	4.82	5.96	6.65	5.05	2.98	2.98	0.69	45.88
BL	2.75	1.61	1.38	0.23	0	0.23	0	0	0	0	8.72
<b>Total</b>	<b>9.41</b>	<b>13.08</b>	<b>14.22</b>	<b>9.64</b>	<b>11.24</b>	<b>13.31</b>	<b>10.79</b>	<b>6.65</b>	<b>5.73</b>	<b>1.84</b>	<b>100.04</b>

**Table No: 15.5 Volume account of Protection Working Circle**

<b>Species wise volume Distribution per ha (Mean value)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	0.05	0.42	0.77	1.81	1.77	2.83	1.95	2.48	0	0	12.08
Deodar	0.36	0.31	1.52	2.13	8.4	5.02	5.27	4.53	2.74	3.02	33.3
Fir	0.1	0.36	0.67	1.87	4.75	21.56	35.62	23.24	22.56	8.15	118.88
Kail	0.99	1.51	13.68	16.32	29.96	53.44	53.04	40.66	44.21	13.48	267.29
<b>Total</b>	<b>1.5</b>	<b>2.6</b>	<b>16.64</b>	<b>22.13</b>	<b>44.88</b>	<b>82.85</b>	<b>95.88</b>	<b>70.91</b>	<b>69.51</b>	<b>24.65</b>	<b>431.55</b>
<b>Species wise vol Distribution over the entire Commercial area of the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	91.73	770.54	1412.67	3320.68	3247.3	5192	3577.53	4549.88	0	0	22162.33
Deodar	660.47	568.74	2788.64	3907.76	15410.89	9209.84	9668.5	8310.87	5026.89	5540.58	61093.18
Fir	183.46	660.47	1229.2	3430.76	8714.49	39554.62	65349.52	42636.8	41389.25	14952.23	218100.8
Kail	1816.28	2770.29	25097.74	29941.16	54965.51	98042.63	97308.78	74596.06	81108.99	24730.81	490378.25
<b>Total</b>	<b>2751.94</b>	<b>4770.04</b>	<b>30528.25</b>	<b>40600.36</b>	<b>82338.19</b>	<b>151999.09</b>	<b>175904.33</b>	<b>130093.61</b>	<b>127525.13</b>	<b>45223.62</b>	<b>791734.56</b>
<b>Species wise minimum available volume over the entire commercial area of the working circle (80.73%)</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	74.05	622.06	1140.45	2680.78	2621.55	4191.5	2888.14	3673.12	0	0	17891.65
Deodar	533.2	459.14	2251.27	3154.73	12441.21	7435.1	7805.38	6709.37	4058.21	4472.91	49320.52
Fir	148.11	533.2	992.33	2769.65	7035.21	31932.44	52756.67	34420.69	33413.54	12070.94	176072.78
Kail	1466.28	2236.46	20261.41	24171.5	44373.66	79149.82	78557.38	60221.4	65479.29	19965.18	395882.38
<b>Total</b>	<b>2221.64</b>	<b>3850.86</b>	<b>24645.46</b>	<b>32776.66</b>	<b>66471.63</b>	<b>122708.86</b>	<b>142007.57</b>	<b>105024.58</b>	<b>102951.04</b>	<b>36509.03</b>	<b>639167.33</b>
<b>Species wise percentage of volume Distribution in the working circle</b>											
<b>Species</b>	<b>10-20</b>	<b>20-30</b>	<b>30-40</b>	<b>40-50</b>	<b>50-60</b>	<b>60-70</b>	<b>70-80</b>	<b>80-90</b>	<b>90-100</b>	<b>100-above</b>	<b>Total</b>
Chir	0.01	0.1	0.18	0.42	0.41	0.66	0.45	0.57	0	0	2.8
Deodar	0.08	0.07	0.35	0.49	1.95	1.16	1.22	1.05	0.63	0.7	7.7
Fir	0.02	0.08	0.16	0.43	1.1	5	8.25	5.39	5.23	1.89	27.55
Kail	0.23	0.35	3.17	3.78	6.94	12.38	12.29	9.42	10.24	3.12	61.92
<b>Total</b>	<b>0.34</b>	<b>0.6</b>	<b>3.86</b>	<b>5.12</b>	<b>10.4</b>	<b>19.2</b>	<b>22.21</b>	<b>16.43</b>	<b>16.1</b>	<b>5.71</b>	<b>99.97</b>

## **CHAPTER XVI**

### **Ecotourism (Overlapping) Working Circle**

#### **16.1. Constitution of the Working Circle**

Eco-Tourism Working Circle shall comprise of the compartments that are located adjacent to the places of tourists interests. These compartments require special attention because of the crop in these compartments is subjected to excessive interference due to the pressure of tourists, road and building activities, encroachments and other related problems. Ironically, forests, which are the main source of tourists' attraction, are facing degradation due to tourism itself. If this trend is not arrested and reversed, not only these forests will degrade, but tourism would also suffer.

#### **16.2. Special Objects of Managements**

- (i) To rehabilitate these forests so that sylvan beauty of the area is preserved.
- (ii) To prevent these forests from getting damaged due to legitimate/Illegitimate developmental activities those are associated with tourism.
- (iii) To facilitate the tourist in the manner that their visit to these forests become learning experience and raises their level of awareness about environmental issues/concerned.

#### **16.3. Area and Allotment**

This being an overlapping circle the compartments located adjacent to tourist interest area to be treated under this Working Circle.

#### **16.4. Method of Treatment Prescribed**

16.4.1 In addition to the treatments prescribed for the Reboisement Working Circle in general (Under Chapter IV), the following treatment s is prescribed for this Working Circle.

- (i) Proper tourist trails/footpaths shall be laid out in these compartments so that tourists do not stray over a large area. Excessive tourist movement all over the areas cause trampling and soil compaction which not only damage generation but also accelerates erosion.
- (ii) Places where tourists are allowed to sit/relax for recreational activities shall be clearly marked. They should not be allowed to move all over the area.
- (iii) Areas where tourists tend to concentrate b should be equipped with adequate number of well placed dust bins for collection of litters. Also there should be a mechanism for regular disposal of litter.

- (iv) Prominent trees of various species, along the paths regularly so visited by tourist, shall be labeled properly giving their botanical and common names.
- (v) Display boards of small size, highlighting the importance of forests shall be created at places of tourist interest.
- (vi) Nailing or hanging of advertisement/sign boards on trees strictly prohibited. The territorial staff shall ensure that this provision is not violated and violators are penalized under relevant section of the Forest Act.
- (vii) A notice board listing activities which are prohibited/permitted should be prominently displayed at public places like bus stand/parking lots etc. Tourist should be informed that activities like littering, scraping bark of trees, engraving names on trees, not only harms the forests but also give it a shabby look.
- (viii) The territorial DFO shall maintain a constant liaison with development agencies like Public Works Department, Patnitop Development Agency etc. so that the developmental plans are initially planned in a manner to minimize the damage to forests, and unnecessary complications at later stage is avoided. In addition comprehensive sewage disposal plan needs to be worked out to arrest the decline of deodar forests in Patnitop.
- (ix) The territorial staff shall exercise extra vigilance in these areas with respect to illegal diversion of forests land for non-forestry purposes, encroachments, and illicit felling.
- (x) Establishment of small units in blank spaces at Patnitop and reroute to Sanasar in Co: 10b, 15, 17 and 19/Batote to assist the natural regeneration.
- (xi) Soil and Moisture conservation works.
- (xii) Construction of dressed stones Tree Guards to trees whose roots are exposed.
- (xiii) Construction of stone paved foot paths and wooden bridges which benefit both tourist and local inhabitants.
- (xiv) All types of markings shall be prohibited in all such compartments excepting hygienic.

## **16.5 Status of Ecotourism**

16.5.1 Areas of Patnitop and Sanasar in Batote range are a prime tourist destinations in Jammu division because of their temperate climate, conifer forests and picturesque location. Patnitop Development Authority (PDA) have developed these destinations in a significant manner by developing parks, viewpoints etc. along with construction of a number of hotels and restaurants. The Forest department however hasn't done much for the development of ecotourism in these tourist destinations except some parks etc. in collaboration with PDA. The various works taken up by the division in the forests for the attraction of the tourists are enumerated under appendix XXIX.

- 16.5.2 There is possibility of exploring the tourist spots in Marmat and Gandhri Ranges and such spots have been identified and included in this working circle for proper development under the tourism sector.
- 16.5.3 Village Dedni (Co: 15, 16/M ) and Bulandpur ( Co: 58,59/M) Co. 45a, 46b/G ( Village Phalter) and compartment 67a, 75a/G ( village Bhathni) are attractive and suitable spots for the tourism development which will also help in raising the socio-economic status of the local populace . These areas has also been linked with Khalani-Goha road (3-4 Km short of Dedni) and Koura Pani- Charota road (2-3 Km short of Bulandpur) in Marmat Range and village Phelti-Khalla ( 4 km short of Sanasar road) and Bhathni in Gandri Range ( 3 km -7 km short of Kabhi road). The method of treatment will be the same as narrated above with all restrictions and liberties.

## CHAPTER XVII

# WORKING PLAN FOR THE GRASSLAND DEVELOPMENT (OVERLAPPING) WORKING CIRCLE

### 17.1 General Description and Character of the Vegetation

17.1.1 There is a sizeable area under pasture land in the alpine and sub-alpine zones. These pastures lands are mostly devoid of tree growth and sustain a variety of medicinal herbs and shrubs, and palatable and unpalatable grasses. It will be pertinent here to define the difference between the alpine and sub-alpine blanks. The alpine blank is a tree less area occurring above the tree limit, generally beyond 3200 meters above the mean sea level. A small area of this category occurs in Marmat range only. The sub-alpine blank is a tree less blank within the woodland limit of 2000 meters to 3200 meters altitude. All the areas under these blanks cannot be considered as pasture land, as some of these includes rocky outcrops, snow bound area, glacial moraines etc. Only the area which has definite pastoral use at present can be classified as culturable pasture land. In addition, in the low lying sub-tropical areas, many blanks and freshly exposed sites are covered with grasses.

17.1.2 With reference to the classification of Grassland Types of India by Dabodghao and Shankar Narayan (1973), grasslands of Batote Forest Division fall in the following categories;

#### (i) Themeda- Arundinella Type

This type colonizes the sub-tropical regions of this division. The predominant perennial species characterizing the type are *Arundinella nepalensis*, *Cynodon dactylon*, *Eulaliopsis binata*, *Bothriochloa intermedia*, *Heteropogon contortus* and *Chrysopogon fulvus*. Important annual grass species are *Apluda mutica* and *Eragrostis unioides*.

#### (ii) Temperate Alpine Type

This type occurs in the higher reaches of this division. The principal perennial species are *Agropyron canaliculatum*, *Chrysopogon gryllus*, *Phleum alpinum*, *Agrostis canning* and *Poa pratensis*. The associated annual species include *Poa annua*, *Polypogon fugax*, *Oryzopsis lateralis* and *Poa swertiana*.

17.1.3 In the absence of adequate pasture lands, and large number of ever increasing grazing animals, most of the Chir and fir forests of this division have suffered heavily on account of unrestricted, uncontrolled and unregulated grazing. Since these grazing lands carry more than the optimum number of live stock, a pronounced depletion of the palatable grass species has taken place, accompanied by an invasion of unpalatable species and

obnoxious weeds. The grazing lands, as result of over grazing, exhibit a highly depleted and degraded look. Such kind of grazing is not only inimical to the regeneration of conifers, but is also responsible for the deterioration of pasture lands.

## 17.2 Distribution of the Area

17.2.1 The compartment wise distribution of area under high pasture land, rocky stony waste land and other blanks has been indicated in area statement of the respective working circles. However, the range wise abstract of the area under the above categories is reproduced as under in Table 17.1.

**Table 17.1 Range wise distribution of area under grasslands.**

Range	Non-wooded Area (hectares)			Total
	High pasture land	Other blank areas	Rocky and stony wasteland	
Batote	986	1213	189	23388
Gandri	114	800		914
Marmat	743	1239	829	2811
<b>Total</b>	<b>1843</b>	<b>3252</b>	<b>1018</b>	<b>6113</b>

## 17.3. Incidence of Grazing

17.3.1 The incidence of grazing in the forests of this division is roughly estimated on the basis of total number of animal units grazing in these forests vis-a-vis the area of the forests including pasture lands. For calculating the total number of animal units the following conversion factors have been applied:

1 Cattle (cow- ox)	=	1 animal unit
1 Calf (less than a year old)	=	½ animal unit
1 Horse/ Pony	=	1 animal unit
1 Buffalo	=	2 animal units
1 Sheep	=	½ animal unit
1 Goat	=	½ animal unit
1 Others	=	1 animal unit

With reference to statement given under section 1.1.14 of Chapter I, the local livestock of the division, in terms of animal units, are worked out as under in Table 17.2.

**Table 17.2 Statement showing number of animal units in Batote Forest Division.**

Category	Number	Animal Units
Cattle	45951	54951
Buffalo	5900	11800
Sheep	50845	25423
Goat	36926	18463
Others	3000	3000
Total	1,42,622	1,04,637

However, the animal census figures above seem to have under-recorded the number of livestock.

## **17.4 Migratory Graziers**

### **17.4.1 Routes of Migratory Graziers**

The migratory graziers originate from the plain areas of the State namely Reasi, Jammu and Kathua Districts during the month of April and reaches the alpine pastures by end of May every year. All along the way, they come by walk along with their livestock and move in a group. Most of the nomads who originate from plains of Jammu province and destined to reach Chenab valley and Kashmir valley cross through the Batote Forest Division to reach their respective destinations alongwith settling in the pastures of Batote Forest Division.

### **17.4.2 Major Grazier's Destinations**

There are many famous major destinations of nomadic graziers. They are named after the local villages and *nallahs*, such as Shivgarh, Truta ,Dusera, Deoli and Thadan behaks.

### **17.4.3 Sharing of Grazing lands**

Traditionally the migratory graziers 'share' the grazing lands among themselves. They treat the common property resources as their own traditional property and treat it accordingly. They use to 'sell', 'mortgage' and 'transfer to their wards'. As there are many disputes among the people in using the grazing lands. Always there are quarrels among the nomadic and locals and between the groups as well.



#### **17.4.4 Collection of Grazing fees**

The forest department collects the grazing fees *only* from the nomadic graziers. The Block forest officer and the forest guards used to reach the alpine pastures and collect the grazing fee from the migratory graziers as per the rates announced by the Government for this purpose. The grazing fees is also collected and verified in the grazing check posts. The details of revenue collected from 2000-01 to 2015-16 at 'B' and 'C' rates is reproduced under Annexure XX .

#### **17.4.5 Duration of stay in the alpine pastures**

The migratory graziers leave the plains on the onset of summer to avoid the scorching sun and reach the cool alpine meadows. Their stay in alpine pastures is determined by availability of forage in the alpine as well as in plains. During the good monsoon years in the plains, the graziers tend to scale down from the alpine pastures by early September and reach the plains by October. During drought years, they prolong their stay at alpine pastures upto mid October.

### **17.5 Grazing by Local People**

- 17.5.1 The local people are also rearing livestock sufficiently to meet the demands. They use the grazing lands located close to their hamlets. Mostly they restricted to sub alpine pastures. They used to cut the grasses from the blank areas of the forest during October and dump the grasses in their backyards to feed their animals during peak winter, as the entire area would be covered with thick blanket of snow. The grass cutting activity is causing the most deleterious effects to the regeneration of forest both directly as well as indirectly triggering soil erosion.
- 17.5.2 Excessive grazing has aggravated the problem of soil erosion, which has further degraded the grasslands. To supplement the inadequate supply of grass, leaf fodder from a number of tree species is procured by the local population for feeding their livestock. As a result, fodder trees are being mercilessly lopped for the said purpose.
- 17.6** The abstract of the survey of livestock of nomads as well as local habitants conducted in 2016 is reproduced under tables 17.3 and 17.4 respectively. Thus at the time of peak incidence of grazing, there are nearly 1,00,000 animal units of livestock grazing in the pasture and forest lands of Batote Forest Division. This figure is far beyond the carrying capacity of the existing grass lands and pastures.

**Table 17.3 STATEMENT SHOWING LIVE STOCK CENSUS DATA (CONDUCTED BY DEPARTMENT in 2016) OF NOMADS USING FOREST AREAS OF BATOTE FOREST DIVISION FOR GRAZING**

S.No.		Detail of Live Stocks grazing/Browsing in forest areas in Nos						
	Range	Goats	Sheep	Horses/ Ponies	Bufaloes	Cows	Others	Total
1	Marmat	1077	2567	214	1034	951	2310	8153
2	Gandhri	111	146	59	701	77	66	1160
3	Batote	330	431	40	4667	1118	825	7411
		<b>1518</b>	<b>3144</b>	<b>313</b>	<b>6402</b>	<b>2146</b>	<b>3201</b>	<b>16724</b>

**Table 17.4 STATEMENT SHOWING LIVE STOCK CENSUS DATA (CONDUCTED BY DEPARTMENT in 2016) OF LOCAL HABITANTS USING FOREST AREAS OF BATOTE FOREST DIVISION FOR GRAZING**

S.No.		Detail of Live Stocks grazing/Browsing in forest areas in Nos						
	Range	Goats	Sheep	Horses/ Ponies	Bufaloes	Cows	Others	Total
1	Marmat	8962	14119	745	961	9773	0	34560
2	Gandhri	2770	2519	186	680	5015	0	11170
3	Batote	3719	5038	192	817	5573	3270	18609
		<b>15451</b>	<b>21676</b>	<b>1123</b>	<b>2458</b>	<b>20361</b>	<b>3270</b>	<b>64339</b>

## 17.7 Method of Treatment

Over grazing is a major and very complicated problem, which is causing main hurdles in the successful regeneration of Chir and Fir forests. Being a socio-economic problem, it has to be tackled accordingly. It calls for the active considerations of all the agencies, government, non-government, people and politics connected directly or indirectly with this problem. Therefore, the following method of treatment is suggested:

- (i) A detailed survey of all pasture lands should be carried out with respect to their carrying capacity and actual incidence of grazing. Grazing plan for the division be prepared in consistence with the Grazing Policy of the state. Grazing should, at the

earliest be regulated and controlled on scientific lines under the proper plans required to be drawn up at micro levels.

- (ii) All efforts should be made to scale down the population of unproductive cattle by encouraging the introduction of high yielding varieties of the cattle, and castration of unproductive cattle. The departments concerned with improvement of livestock are required to be actively involved in this stupendous task.
- (iii) Till such time, a balance between the live stock population and carrying capacity of the grazing lands is struck, the live stock should be stall-fed with forage and other concentrates from various sources.
- (iv) The local population needs to be encouraged for raising grasses and fodder yielding tree species on their private lands, in order to ease the excessive grazing pressure on the forests.
- (v) The pasture lands, at present, require much intensive management on scientific lines for the overall betterment of the forests.

## **17.8 Erosion Control in Grasslands**

17.8.1 Overgrazing reduces vegetative cover and also causes compaction of soil. Both these factors contribute towards accelerated soil erosion. In Batote Forest Division, pastures are generally located in the uppermost reaches of the mountains. Thus, the phenomenon of erosion which is initiated in these pasture lands, assumes enormous proportions in the downhill areas and has devastating effect on forests, agricultural fields and National High Ways. Therefore, it is very important to initiate soil and water conservation measures in the high pasture lands. The following methods are hence prescribed.

### **(i) Contour Furrows**

Contour furrows are small channels or excavations, constructed on contours to store water and allow it to be held inside the ground level. The excavated material is put on the downstream side. Sites with long uniform and gentle slopes are found to be more suitable for constructing contour furrows. It is not recommended on steep slopes. The furrows are normally 10 to 20 cm wide and 10 to 15 cm deep and spaced 100 cm to 200 cm apart.

### **(ii) Contour Trenching**

Contour trenching is also one of the mechanical measures for conservation of soil and moisture. This involves excavation of trenches along the contour, or across the slope of the land, generally in the top portions of the catchment. Contour trenching

on very steep slopes is not practicable. Land with slope more than 20 percent is generally not contour trenched. The trenches are not more than 15 meters long and are usually staggered throughout the area. In cross sections, they are 30 cm deep and 30 cm or 60 cm wide. The trenches should run perfectly level so as not to allow the trenches to be converted into gullies. The soil excavated in trenching is used to form a bund on the downstream side leaving a berm equal to the depth of the trench.

### **(iii) Control of Gullies**

Gullies are normally formed when the rill and sheet erosion continues unchecked. It usually begins in areas with natural depressions, livestock trails etc. Overgrazing, intense rains and faulty land management practices are responsible for gully formation. The following measures are suggested for the control of gullies.

### **(iv) Construction of contour and peripheral bunds**

To check the growth of gully formation and to control soil erosion, the first thing that needs to be done is to prevent the water from entering the gully. This can be done by retaining as much water in the catchment area as possible, and to safely dispose off the excess runoff. For this purpose contour and peripheral bunds may be constructed. Excess runoff can be disposed off safely by digging diversion channel above the gully head.

### **(v) Easing of the Head of the Gully**

To prevent the water fall erosion and eating back of the gully, one of the measures is the easing of gully head. This can be done by partly cutting at the top and filling the base. The head can be sloped to the angle of repose required by the soil.

### **(vi) Gully Plugging**

Gully plugs are structures designed to halt the upstream progress of gullies by reducing the grade at the top of the slope which, when paved or protected, will allow the drainage to get from the upper to the lower level without further erosion. These are constructed to check the velocity of runoff, to increase percolation and to encourage silting. Vegetation can be established on such silted areas. Various materials can be used for construction of gully plugs such as brush wood, live hedges, earth, sandbags and boulders.

## **17.9 Pasture Improvement**

17.9.1 The best way to rehabilitate and develop the rangeland is to manage it on ecological principles. By mere closing of the area and adoption of controlled grazing, rangeland improvement is possible. Reseeding of range is resorted to only when the grass regeneration is inadequate, native vegetation has disappeared and the range is required

to be improved quickly. Some of the species suitable for different zones of Batote Forest Division are listed overleaf.

#### **Sub-tropical Species;**

*Cymbopogon coloratus*  
*Sehima nervosum*  
*Brachiaria mutica*  
*Chloris gayana*  
*Arundinella nepalensis*  
*Eulaliopsis binata*  
*Themeda anathera*  
*Heteropogon contortus*  
*Apluda mutica*

*Cymbopogon martini*  
*Themeda triandra*  
*Cenchrus ciliaris*  
*Dichanthium annulatum*  
*Arundinella bengalensis*  
*Paspalum dilatatum*  
*Panicum anidoale*  
*Chrysopogon fulvus*  
*Pennisetum pedicellatum*

#### **Temperate Species;**

Cocks foot  
*Bromus inermis*  
*Lolium multiflorum*

*Phalaris tuberosa*  
*Poa pratensis*  
*Festuca elatior*

#### **Method of Seeding**

- (i) The most economical and quickest method of sowing the seeds is by broadcasting. Broadcast sowing is suitable for light, fluffy soils, especially those which have been loosened by frost action. The cracks in the soil act as gaps for receiving the seeds. Broadcast sowing has been found to be more effective if the soil is covered by brush drag or harrows after sowing.
- (ii) Grass seeds are very small in size and light in weight. There is a risk of their being washed or blown away by the currents of water or wind. This can be avoided by sowing of palletized seeds. The seed is processed into small pellets which are easy to handle and are less vulnerable to be blown away by wind or water. A homogenous thick paste is prepared by incorporating seeds in the mixture of sand, clay, cow-dung and fertilizer in the ratio of 3:1:1:1 and using sufficient quantity of water. Pellets, or small balls of convenient size, are prepared in such a way that each pellet contains 2 or 3 seeds. The pellets are meant to give the seedling a vigorous start. The pellets are dried and stored for 4-6 months before sowing. Sowing of pellets is normally carried out just before the first monsoon or just after the pre-monsoon showers.

(iii) Vegetative Propagation. The practice of propagation through vegetative material is resorted to when sufficient quantity of seeds is not available. The practice consists of transplanting, grass seedlings raised in nursery, or rooted slips of old tussocks, on well prepared soils having optimum moisture condition. It ensures quick establishment of the grasses. It is more expensive than the direct seeding but has advantage of quick growth. In transplanting, it is easy to maintain the requisite plant population.

#### **17.10 Role of fire in Grass land management**

Traditionally the people belong to this area used to fire the grass lands just before the onset of winter to kill the unpalatable weeds and the grasses from the grazing land. The effects of fire in the grass land are not completely known to the department. Hence, it is recommended that the role of fire in grassland management may be studied by the State Forest Research Institute further for its applicability in this State.

## CHAPTER XVIII

### **Participatory Forest Management**

The Participatory/Joint Forest Management (JFM) was formally adopted in Jammu & Kashmir State by issuing a notification SRO 61 dated 19-03-1992. But the State of Jammu & Kashmir had already introduced the concept way back in 1982 in its World Bank aided Social Forestry Project.

#### **18.1 INTRODUCTION**

Degradation of forests in India is a continuing process and degraded forests account for about one-third of the total forest area. Besides very heavy pressure of human and livestock population, alienation of rural communities from forest resource protection and management is an important factor responsible for degradation of forests. In the past, local communities enjoyed free access to the forests. With the bringing of forests under government control and consequent reservation of forests permitting only specified usufruct concessions, local communities were denied access to forest resources. Forest reservation policy came in conflict with the interests of local communities dependent on these forests to meet their basic needs of forest products, the forests were managed as government property in larger national interests as provided for in the National Forest Policy, 1952 (Anon., 1952) that stated that the use of forests by village communities in their neighborhood should in no event be permitted at the cost of national interests. Such policy of managing forests only in larger national interests, overlooking the basic needs of local communities did not succeed and forests were degraded as a result of over use. Forest Department (FD) could not effectively protect the forests whose degradation continued. Forest conservation necessitated active participation of local communities. The National Forest Policy, 1988 (Anon., 1988) accordingly provided for creating a massive people's movement for the conservation of forest resources with the involvement of women who suffer the most as a result of forest degradation. Government of India accordingly issued guidelines in June 1990 to involve local communities in the protection and rehabilitation of degraded forests. This approach is commonly referred to as Joint Forest Management (JFM).

#### **18.2 JOINT FOREST MANAGEMENT (JFM) IN JAMMU & KASHMIR**

18.2.1 The State of Jammu & Kashmir lies to the extreme North of the country situated between 32°17' and 36°58' North Latitude and 72°26' and 83°30' East Longitude, comprising of an area of 2,22,236 km<sup>2</sup>. The elevation above sea level is 1660 meters and climate of the area falls under temperate climatic regimes with mean annual rainfall of

660 mm and mean temperature of 13.3°C. Maximum temperature of the area may touch to 35°C in summer and the minimum temperature may drop to -10°C in winter months. In the area generally alluvial soils dominate which generally suffer from impeded drainage.

18.2.2 The Joint Forest Management (JFM) was formally adopted in Jammu & Kashmir State by issuing a notification SRO 61 dated 19-03-1992. But the State of Jammu & Kashmir had already introduced the concept way back in 1982 in its World Bank aided Social Forestry Project. The project envisaged sharing of produce with the local communities. But the idea did not catch up then and JFM was not fully understood. The practice ended up by signing agreements with Panchayat but the exact procedure for involvement of people and their role could not be clearly defined. The system totally collapsed in the year 1984 when the Panchayat in the State were dissolved, which had till then served as a link between the people and the department. This was, therefore, replaced by Village Forest Committees (VFC's) in the year 1987-88. Consequent to the guidelines issued by Government of India in the year 1990 and the issuance of SRO 61 of 19-03-1992 and SRO 17 of 12-01-1990 by the State Government, the concept of JFM caught up in the State through formation of VFC's.

### **18.3 OBJECTIVES OF JOINT FOREST MANAGEMENT (JFM)**

#### **18.3.1 Short Terms Objectives**

- (i) Regeneration and eco development of degraded forests areas and adjoining areas.
- (ii) Augmentation of availability of fuel wood, fodder and grasses from the regenerated areas.
- (iii) Securing people participation in planning and regeneration efforts to ensure sustainability and equitable distribution of Forests Products from the regenerated areas.
- (iv) Promotion of Agro Forestry and development of Common property resources.
- (v) Promotion of fuel saving devices to encourage efficient use of firewood and to reduce the drudgery of rural women involved in the collection of wood, as also improve the environment.
- (vi) Development and extension of technologies for special problem of the area.
- (vii) Employment generation for the most needy people especially those belonging to Scheduled casts, scheduled Tribes, land less and marginal labourers inhabiting the project area.

#### **18.3.2 Long Terms Objectives**

- (i) Protection, conservation of natural resources through the active involvement of the people.



- (ii) Checking Forest degradation, deforestation and loss of bio-diversity.
- (iii) Ecological restoration, environmental conservation and eco-development.
- (iv) Evolving village level people's organization, which can manage the natural resources in and around villages in a sustainable manner.
- (v) Fulfillment of the broader objectives of productivity, equity and sustainability for the general good of the people.
- (vi) Improve quality of the life and self -sustenance aspect of people living in around forest areas.
- (vii) Capability endowment and skill enhancement for improving employability of the rural people.

18.3.3 The main objectives of JFM as stated in the resolutions issued by different State Governments (Anon., 1993) are the protection and rehabilitation of degraded forests with the involvement of local people. The National Forest Policy, 1988(Anon., 1988) provided that the requirements of forest products of the tribes and other villagers living in and near the forests are to be treated as the first charge on forest produce. It implies that meeting the requirements of the local people consistent with the productive capacity of forests should be the main objective of JFM. Besides meeting the forests products requirements of the local people, additional income generation needs to be recognized as very important to sustain the interest in JFM of the local people who are generally very poor. The JFM was introduced in this Division during the year 2001-02 under Pilot Project of FDA Doda where in 15 VFC's were formed in this Division. Subsequently FDA Batote was created during 2003-04 on five years Plan Basis and 15 VFC's were formed ,thereafter number was raised to 27 VFC's in the year 2007-08 when the Plan was continued on yearly basis. JFM is a very good scheme to make close terms of people with forest department by their involvement in different forestry programmes by which both local people and forest department gets benefited and forests get saved from degradation and denudation as local people themselves take care of forest which prevents it from harmful outer influences. Thus JFM programme becomes successful by involvement of local people, which is clearly defined by Rapid Rural Appraisal (RRA).

18.3.4 The JFM is a sharing of responsibility, authority and usufructs between the village committee and the forest department on the basis of an agreement between the two. The management of the jointly managed forests is done through the provision of a micro plan prepared by the community on PRA basis and with the technical help of the official of the forest department. Since the micro plans prepared with the technical guidance of the Forest department there is little chances of any conflict between the Working Plan and the Micro Plan prescriptions. Micro Plans must be covered by the micro level prescriptions of Working Plan of the Division.

## 18.4 IMPLEMENTING AGENCIES

The scheme is implemented by the following state agencies.

- (1) Forest Development Agencies (FDA's)
- (2) Village Forest Committees (VFC's).

## 18.5 Constitution of Joint Forest Management (FDA's)

18.5.1 Initially the Pilot Project (FDA Doda) was introduced at District Level in the State by the Govt. of India in year 2001-02 and 15 VFC's were formulated for the implementation of the Programme. The detail of the VFC's is tabulated as below under table 18.1.

**Table 18.1 Statement showing details of VFCs initiated under Pilot Basis in the year 2001-02.**

S.No	Name of VFC	S.No	Name of VFC	S.No	Name of VFC
<b>PILOT PROJECT FDA DODA(Batote Forest Division )</b>					
1	Sanasar Co.20/Btt	6	Bhathni 75,76/G	11	Dedni 16/M
2	Balout	7	Gandhri 59/G	12	Humble 14/M
3	Batote Co.11/Btt	8	Khellani 09,10/M	13	Marmat 22/M
4	Dharamkund Co.57ab/G	9	Malhori 13ab/M	14	Mangota 26/M
5	Kanga Co.55/G	10	Hud 12ab/M	15	Blundpur 59/M

18.5.2 Under the Pilot project the detail of various activities executed during 2001-02 and 2002-03 are appended as given below under table 18.2.

**Table 18.2 Statement showing details of activities executed during 2001-02 and 2002-03.**

Item	Achievements	Expenditure
Area Covered	278Ha	20.388 lacs
Plantation	1.377 lac Plants	
Sowing	1.658 lac patches	
Soil Conservation Works ( DRSM)	1009 cum	
Entry Point Activities ( EPA)	02 bridges,02 bowlies and 11 paths	

18.5.3 Thereafter, FDA Batote was created and following Village Forest Committees was formed and got registered vide Pr. CCF's registration Certificate dated:- 27-12-2001 for the implementation of the NAP schemes.

**Table 18.3 Statement showing details of new VFCs created in FDA, Batote in 2001.**

S.No	Name of VFC	S.No	Name of VFC	S.No	Name of VFC
1	Dantally	6	Chaklwa	11	Khatter
2	Baggar	7	Chilla	12	Phalti
3	Dragree-Sugetar	8	Dhalwas	13	Parnot
4	Charota	9	Khandal	14	Baggarh
5	Thopal	10	Karma	15	Kabbi

18.5.4 During the year 2007-08 (27) and 2009-10 (8) more VFC's were constituted for the implementation of the Schemes on the yearly basis and the list the VFC's formed is tabulated as under:-

**Table 18.4 Statement showing details of new VFCs created in FDA, Batote in 2007-08- and 2009-10.**

VFC's of FDA Batote formed during 2007-08 and 2009-10					
S.No	Name of VFC	S.No	Name of VFC	S.No	Name of VFC
1	Failthy	14	Papriya	27	Upper Behota
2	Kanga	15	Sawani	28	Kansar
3	Dharamkun	16	Sanna	29	Sewat
4	Sharore	17	Dharmound	30	Garhori
5	Kabbi	18	Moulsi	31	Mangota
6	Kothi	19	Batwa	32	Rote
7	Dhuthan	20	Ranji	33	Jattar
8	Badhole	21	Ladhwai	34	Mari
9	Badsar	22	Thopal	35	Hirni
10	Dera	23	Killota		
11	Balout	24	Moothi		
12	Shopyal	25	Labbar		
13	Tatrsoo	26	Bargran		

## 18.6 Intervention

18.6.1 During the Project period, Villages/village clusters were taken up for development in the FDA Batote Forest Division. The object of the intervention was primarily to re-habilitate the forests with active cooperation of the locals. The object was achievable when providing them sufficient opportunities to uplift their economic status and at the same time people required to be educated about the importance of the forests. By involving people in the planning and developmental activities related to the forestry the project aims to achieve the twin objects of providing employment and raising the level of

awareness about environmental issues. In order to meet the objectives of the Project, the following activities were to be under taken.

**(i) Natural Regeneration:**

- Demarcation of Forests.
- Creation of effective closures with plantation of natural growing species/nurse crop @200 plants per hectares.
- Drainage line treatment.
- Control burning and fire protection.
- Creation of favorable edaphic conditions for establishment of Natural regeneration.
- Patch sowing of the Natural Growing species of the area.
- Tending of existing natural regeneration.

**(ii) Management Intervention;**

- Demarcation of Forests.
- Creation of effective closures with plantation of 1100 plants per hectares of economically valuable and suitable species.
- Tending and cultural operation for establishment of regeneration.

**(iii) Pasture Development:**

- The Forests and grass land in the FDA are burden with heavy grazing by locals and migratory livestock. This has resulted in degradation of forests on one hand and scarcity of fodder on the other hand. This warrants development of pasture lands and plantation of fodder yielding species, under silvi-pasture development component that will include the following:
- Sowing/Planting of leguminous and non- leguminous grass species.
- Planting of trees /shrubs having fodder value which can provide support during drought period.

## **18.7 Method of Treatment**

**(1) Nursery Formation:**

Nurseries are the back bone of any afforestation Project. In this project *Kisaan Nurseries* were to be created in the Project area with assistance of the villagers. Coniferous and broad leaved species were to be raised in these Nurseries as per the requirement of plantation targets.

**(2) Plantation Model**

Component	Pit size	No. of plants per hectares
NR	45 cm cube	200
Management Intervention	45 cm cube	1100
SPD	45 cm cube	200

**(3) Choice of Species**

Component	Specie
NR	<i>Pinus roxburghii</i> , <i>Pinus wallichiana</i> , <i>Cedrus deodara</i> , <i>Quercus spp.</i> <i>Alnus nepalensis</i> , <i>Ulmus wallichiana</i> , <i>Rubinia pseudoacacacia</i> (nurse crop)
Management Intervention	<i>Rubinia pseudoacacacia</i> , <i>Ailanthus excelsa</i> , <i>Alnus nepalensis</i> , <i>Punica grantum</i> , <i>Toona spp.</i> <i>Aesculus indica</i> , <i>Olea cuspidata</i> , <i>Quercus spp.</i>
SPD	<i>Panicum spp.</i> <i>Cechrus ciliaris</i> , <i>Apluda mutica</i> , <i>Chloris gayan</i> , <i>Bromus inermis</i> , <i>Lolium mutiflorum</i> , <i>Phalaris tuberosa</i> , <i>Poa partens</i> , <i>Festuca elatior</i> , <i>Trifolium spp.</i>

**(4) Patch Sowing**

The plantation activities shall be supplemented by patch sowing the seeds of conifer and broad leaved species at 700 patches per hectares. Patch sowing supposed to be carried out in accordance with the silvicultural requirements of the species being sown.

**(5) Protection and Maintenance**

The area shall have to be protected effectively against stray/migratory cattle by raising vegetative barrier in addition, beating up operations (Beating up of casualties) were to be carried out throughout the currency of the Project period.

**(6) Soil and Moisture Conservation Measures:**

In order to prevent accelerated soil erosion in the forests, agricultural and pasture lands, the following soil and Moisture Conservation measures were to be undertaken:

- Construction of check dams, retaining walls and breast walls by using rubble stone masonry in Nallas and other areas prone to erosion.
- Treatment of landslides through construction of Gabion structures T-Wire crates in severely eroded areas.
- Gully plugging.
- Bench Terracing.

**(7) Entry Point Activity:**

As a confidence measure to facilitate the locals entry point activities includes:

- Water harvesting/storage structures like check dams.
- Constructing water storage tanks near the natural springs and streams to ensure continued supply of clean water to rural population.
- Farm ponds for storage of water for livestock.
- Installation of energy saving devices and promotion of non-conventional energy sources.
- Rural Electrification through use of solar power.
- Construction of public toilet. Construction of village paths/small wooden foot bridges to facilitate smooth crossing of the locals inhabitants.

**18.8 Financial Implications:-**

18.8.1 The government of India provided the Assistance liberally for carrying out the Project and the year wise funds allotted and expenditure incurred under the FDA is tabulated as under:

Year	FDA	No of VFC's	Area Covered (Creation)	Expenditure
2001-02	Doda (Pilot Project)	15	278	20.388
2002-03	Doda (Pilot Project)			
2003-04	FDA Batote	15	460	30.31
2004-05	FDA Batote	15	340	52.33
2005-06	FDA Batote	15	230	25.00
2006-07	FDA Batote	15	0	18.36
2007-08	FDA Batote	27	660	118.56
2008-09	FDA Batote	27	510	66.43
2009-10	FDA Batote	27	600	135.51
2010-11	FDA Batote	27	-	34.88
2011-12	FDA Batote	-	-	55.89
2012-13	FDA Batote	-	-	56.50
2013-14	FDA Batote	-	-	73.39
2014-15	FDA Batote	-	-	0.00
2015-16	FDA Batote	-	-	15.68

18.8.2 The various works has been executed by the VFC's from the implementation of the programme and the details of the same are appended vide appendix XXV to XXVII.

**Results**

From the perusal of the above table and the appendixes, it appears that a good area has been treated under the project but the results on grounds are much below the expectation because of in certain areas approved social fencing is not much successful.

## CHAPTER XIX

### **NON-TIMBER FOREST PRODUCTS (OVERLAPPING) WORKING CIRCLE**

#### **19.1 INTRODUCTION**

The Non-Wood Forest Products (NWFP) are important elements of modern day practice of forestry. Although the threat of climate change and the advent of synthetic products had caused a drastic reduction in the use of wood for manufacturing industry, it had not led to any reduction on the pressures on forest trees and forest land. Now, as slowly the use of wood shall pick up again, the NTFP shall be a major source of revenue for Forest Departments and the people dependent on forests as well. The planting of multipurpose tree species, shrubs and grasses in fragile eco-systems is desirable as NWFP can be extracted without cutting down the trees. This shall also help in maintaining vegetation cover in ecologically sensitive areas (like Batote Forest Division) to mitigate the ill effects of climate change and unplanned urbanization. NTFPs also have the advantage of cultivable in private and agricultural lands.

#### **19.2 Definitions**

- 19.2.1 Some definitions also include small animals and insects. A few examples of the many thousands of different kinds of NTFPs include mushrooms, huckleberries, ferns, tree boughs, transplants, cones, pine seed, and Brazil nuts , moss, maple, and resin.
- 19.2.2 Products are commonly grouped into categories such as floral greens, decorative, medicinal plants, foods, flavors and fragrances, fibers, and saps and resins.
- 19.2.3 Other terms synonymous with non-timber forest products include special forest product, non- wood forest products, minor forest products, alternative forest products and secondary forest products. These terms are useful because they help highlight forest product that are of value to local people and communities, but that have often been overlooked in the wake of forest management priority such as timber production and animal forage. In recent decades, interest has grown in using Non Timber Forest Produce (NTFPs) as an alternative or supplement to forest management practices such as clear cut logging. In some forest types and under the right Political and Social conditions forests could be managed to increase NTFP diversity, and consequently biodiversity and economic diversity.

### **19.3 Uses.**

19.3.1 Since pre-history, human around the world have relied on products derived from forest species for their survival and well-being. NTFP harvesting remained widespread throughout the World. People from diverse income levels, age groups, and cultural backgrounds harvest NTFPs for household subsistence, maintaining cultural and family traditions, obtaining spiritual fulfillment, maintaining physical and emotional well being, scientific learning and earning income.

19.3.2 NTFPs serve as raw materials for industries ranging from large scale floral green suppliers and pharmaceutical Companies to micro-enterprises centered around basket-making, woodcarving, medicinal plants harvesting and processing, and a variety of other activities.

### **19.4 Economic importance:**

19.4.1 Estimating the contribution of NTFPs to national or regional economies is difficult due to the lack of broad based systems for tracking the combined value of the hundred products to make up the various NTFP industries. While these high value species may grab the most attention, a diversity of NTFPs can be found in most forests of the World. In tropical forests, NTFPs can be important source of income that can supplement farming or other activities. A value analysis of Amazonian rainforests in Peru found that exploitation of NTFPs could actually yield higher net revenues per hectare than timber harvest of the same area, while still conserving vital ecological services. Their economic, cultural, and ecological value when considered in aggregate makes managing for NTFPs an important component of sustainable forest management and the conservation of biological and cultural diversity.

19.4.2 Its research helps Policy makers and development project manager make more decisions that are informed. The result is positive impact on rural livelihood by helping to identify potential successful NTFPs for trade and determining the most promising avenues for Policy reforms.



## 19.5 Future Management:

19.5.1 The various medicinal plants (NTFPs (MFPs) found in Batote Forest Division has been enlisted under Appendix XXIV. Some of the species remained under extraction up to 2003-04, when the extraction of such MFPs was banned by the J&K Government except *Morchella esculenta* ( *Morels-Guchhies*).

19.5.2 These NTFPs are present in the forests of this Division at this stage which are banned for commercial purposes, their pilferage to meager extent cannot be ruled out by the locals for their local use. It seems that the extraction has not been done in a scientific way maintaining the sustainability of the products by the exploiters resulting in their gradual extinction.

19.5.3 The following suggestions are made for the propagation of NTFPs and exploring the feasibility of its marketing.

- (i) The marketing feasibility of various NTFPs needs to be explored.
- (ii) Peoples in the rural areas needs to be made aware through organizing the camps about the propagation/benefits of raising NTFPs in their private lands as well to improve their economic conditions and the department should provide necessary technical know-how
- (iii) The department should also make long-term projects for the propagation of various NTFPs in their natural habitats.
- (iv) The schemes launched by the department needs to be implemented at ground level with a responsibility on the implementing agency for harvesting the out turn of the propagated species within a stipulated period.
- (v) While collecting rhizome the sustainability of the species should be maintained properly.
- (vi) Herbal Gardens may be established in each Range/Block, which will serve as a demonstration for the villagers.
- (vii) Forest area rich in medicinal plants (NTFPs) should be identified and management plan be formulated for their intensive and sustainable harvesting. Some of the compartments suggested for taking up for propagation of various NTFPs are reportedly rich in these species:-

Compartment	Species
28,30,31,34,36,37/Marmat	<i>Saussurea lappa</i> (Kuth), <i>Jurinea</i> spp. (Dhoop) <i>Aconitum</i> spp. (Pitis), <i>Pichrorhiza</i> spp., <i>Trillium govanianum</i> (Nagchatri),
28,29,30/Batote	<i>Ephedra</i> spp.
17/Btt	<i>Dioscorea deltoidea</i>

Similarly other areas be also identified where other NTFPs are present and properly propagated for their protection.

- (viii) Establishment of a net work of nurseries and seed centers for supplying genuine planting material and germplasm to meet the needs of the commercial and non-commercial user groups and plant breeders.
- (ix) Raising of plantations of indigenous medicinal plants in degraded forest areas.
- (x) Involve local forest committees in conservation and sustainable utilization of medicinal plant resources.
- (xi) To identify and organize local communities around the selected sites wherever present, with the purpose of involving them in long term protection and management of Medicinal Plants Conservation Areas on the long terms basis and where feasible to involve communities and self help groups of women in
  - a. Nursery Development.
  - b. Plantation activities.
  - c. Sustainable collection of medicinal plants.
  - d. Value addition activities.
- (xii) Some initiatives have been taken up in this regard in the recent past but all these initiatives remained in papers only. However, under FDA in various VFCs some NTFPs have been sown/planted and the results of which needs to be monitored which will help in taking up further initiatives keeping in view the results of the works already carried out in the past years

## **19.6 USES OF SOME OF THE MEDICINAL PLANTS AVAILABLE IN THE DIVISION.**

### ***Aconitum heterophyllum* (Patis)**

It is considered an astringent stomachic and aphrodisiac. It is also a valuable febrifuge and used in place of quinine. It is an excellent tonic for combating debility after malarial and other fevers and diseases. In case of diarrhoea / dysentery and chronic enteritis this has efficacious use. The active principle is Atisine, an amorphous alkaloid of intensely bitter taste, but non-poisonous. Drug is extracted from roots and underground parts. The propagation is done by root and seeds.

### ***Podophyllum hexandrum* (Bankakri)**

This is a small herbaceous plant with a perennial rhizome, found in the higher reaches. The rhizome and roots are the source of Podophyllum resin which is used as Cholagogur

<sup>1</sup>purative. It has been found to be effective in controlling skin diseases and recently attracted attention for use in certain form of cancer. Propagation of the species is done through tuber.

### ***Viola* spp (Banafsha)**

English name is sweet violet. It is herbaceous perennial herb, found mostly in the temperate pastures. Flowers are used in perfumery and are also used medicinally as demulcent and biliousness and lungs troubles. It is used for several other uses in Ayurveda and Unani system.

### ***Saussurea lappa* (Kuth)**

This is an important name among the medicinal plants. It is perennial herb, the roots are commonly known as Kuth. Roots are collected in the month of September, October. Its uses are somewhat obscure. In the Indian medicine, kuth is described as an aromatic and stimulant. It is said to be useful in cough, asthma and fever. It is also used to keep insects out of cloths. The active principle in the drug are (1) and essential oil (2) a glucoside (3) and alkaoid. The oil possesses strong antiseptic properties, the glucoside causes a slight rise in blood pressure. The oil extracted from the roots is called costus oil, which is an essential oil. The powdered roots and alcohol extracts are beneficial in asthma, lessening severity of attacks and reducing their frequency.

### ***Dioscorea deltoidea* (Kins)**

Local name is Kans. This is an extensive climber, distributed in north-western Himalayas. The tubers yield Diosgenin, which is used to synthesize sex hormones and corisone, Cortisone is extensively used in rheumatism and allergic conditions. Propagation of the species is through rhizome.

### ***Jurinea Macrocephala* (Dhoop)**

A quite prostrate perennial. The extract of the root is used as an incense.

## **OTHER NON-TIMBER FOREST PRODUCTS**

- a. Anardana (*Punica granatum*)
- b. Guchhian (*Morchella esculenta*)
- c. Cedar Oil (Deodar Wood Oil)
- d. Resin.

## **19.6 IMPORTANCE OF THE NON-TIMBER FOREST PRODUCTS**

### **A. Anardana (*Punica Granatum*)**

This is usually deciduous shrub, occasionally a small tree. It does fruiting in the month of July-September. The fruits contain juicy seeds of red or pink colour. Fruit is edible. The wild variety has sour taste. Seed are dried and sold in the market.

**B. Guchhies (Morels)**

These are found in the forest after a good rainfall. It is said that lightening helps the formation of Guchhies. They are difficult to be located inside the forest. It is considered to be delicious. Price in the market varies from Rs. 5000/- to Rs. 7000/Per Kg.

**C. Cedar Oil (Deodar Wood Oil)**

This is an essential oil obtained by steam distillation of the chips or saw-dust of Cedrus deodara stump and large-sized waste pieces are converted into chips and then used for steam distillation. This oil is used in perfumery and soap industries.

**D. Resin.**

This is a secretion from special cavities of Chir pine bark. It is brittle, amorphous and more or less transparent. Resin is found from many trees of Pinaceae family. However, the occurrence is more in Chir pine, from which it is extracted commercially. It is used for medicine and pharmacy, sizing paper, preparation of wax. Rosin and Turpentine are the major product of resin industry.

## Chapter XX

# **WORKING PLAN FOR THE WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE**

### **20.1 General description and present condition of wildlife**

20.1.1 Because of consideration variations in the climatic conditions prevailing all over the area covered by this Division, ranging from sub-tropical to alpine, a variety of wildlife is met with over this tract. The important species of the wildlife found in this division have already been enlisted and described in detail in chapter II of part I of this plan. There has been a continuous decline in the food and habitat of wild animals because of increased interference by human beings, even in the far-flung areas. As result, the wildlife population is diminishing at a very fast space. Many rare species have reached the stage of extinction. In this regard the following facts are worth consideration;

- (i) There is no control over the hunting of wild animals in this division. The activities of the Wildlife department do not seem to have reached the areas of this division. The local population kills wildlife ruthlessly. Most of the local people are equipped with the fire arms. They managed to get gun licenses easily under the grab of self protection.
- (ii) The area has been opened up, for various development activities. The increasing pace of development works and increased movement of human being and livestock in the area have already affected the wildlife habitat.
- (iii) For protection, and control of wildlife in the State of Jammu and Kashmir, rules and regulations were passed in the form of the Jammu and Kashmir Preservation Act 1998 (1942 AD), Act No: XXIV of 1998. Thereafter, with a view to protect and preserve the wildlife, the Jammu and Kashmir Wild Life (Protection) Act 1978 was passed by the State Legislature. This Act is now being amended to incorporate changes that have been made in the wildlife related laws nationally and internationally and to meet the challenges thrown up by the spurt in wildlife offence.

### **20.2 Objects and Management.**

To preserve and protect the wildlife of the tract.

## 20.3 Method of treatment.

20.3.1 For proper protection and management of wildlife in the division, following suggestions should be considered.

- (i) In order to manage and conserve the wildlife on scientific lines, it is essential to assess the number, and study the distribution, habits and habitat of various species of wildlife found in this tract. For this purpose, census of wildlife should be carried out in the area with the help of the latest technique.
- (ii) The activities of the wild life department of the State should be extended to this area and the provisions of the Wildlife (Protection) Act 1972 should be enforced in letter and spirit. Forest and Wildlife Protection Committees should be constituted at the Divisional and Range level and responsible citizens of the area, along with the Officers of the related departments, be made the members of such committees. The committees should review the progress of measures taken for the protection of wildlife, especially the rare species which are fast approaching the threshold of extinction. The administration of area should be persuaded to issue only the rare minimum number of firearm licenses to genuine persons and to take stern actions against those who misuse these firearms.
- (iii) A general awareness of the Wildlife Protection Act and rules needs to be inculcated among the common masses through much wider communication and extension services.
- (iv) The State as well the Central Governments Issued policy guidelines for Human-Leopard Conflicts management, circulated vide Chief Life Warden J&K's letter No: WLP/Plan\759-89/2011 Dated: 27.05.2011. These guidelines needs to be followed strictly and proper coordination between the Forest, Wild life and other Departments is the Key for the proper management of the Man-Animal conflicts.
- (v) Provisions for water holes and salt licks should be made in the Forests for the benefits of the wild animals.
- (vi) Propagation of Wild fruit bearing species in Forests and areas around habitation to feed the Wild animals such as ;

*Viburnum spp. ( Teolda), Prunus armenica ( Hardy ), Wild pear ( kainth ), Pomegranate ( Punica granatum), Hezalnute ( Corylus jacquemontee ), Aconitum heterophyllum (Akhay), Picrorhizza spp. , Aesculus indica ( Bankhor), Ficus spp (fagwara ), Morus spp ( toot), Zizyphus spp. ( Ber), and Melia spp. ( Draink) etc.*

## CHAPTER XXI

### **WORKING PLAN FOR THE FOREST PROTECTION (OVERLAPPING) WORKING CIRCLE**

#### **21.1 GENERAL CONSTITUTION**

- 21.1.1 As discussed in Chapter-I the area under this Division is characterized by mountainous terrain and steep slopes. Most people thus still to a great extent depend on timber and firewood from forests to meet their requirements of construction timber and heating. Non-availability of any agreeable alternative renders the situation inescapable. As such in the interior areas it is a sine qua non that the local people have to source timber and firewood from forests. And when not made available as per extant provisions, people have no option but to illegally remove them from forests. It is also a fact that forest department has looked at the issue of damages primarily from the point of view of gap in policing and strived to strengthen the lacunae thereof. However, it would be necessary to take a relook at the issue from the mitigating circumstances point of view.
- 21.1.2 The Batote Forest Division forms an important division through which the main highway connecting Jammu with Kashmir passes (NH44) alongwith the highway to the Chenab valley (NH244) also passes through Batote. Since the Kashmir alongwith Chenab valley are the main sources of forest-produce both timber and non-timber the division becomes more important strategically as almost all the vehicles have to pass through the division. Further the vehicles coming from across the border through border trade. Therefore the division occupies significance with respect to forest protection.
- 21.1.3 Over the years, with the increase in human population, there has been an increase in the demand for the forest products alongwith increased grazing pressure on forests due to shrinking grazing lands. Besides, there are various uses of forest products which was noticed in the mushrooming of stone-crusher units, furniture/joinery units, sawmills etc. in the past in this Division. Due to ecological fragility the forest protection is of immense importance both ecologically and economically.
- 21.1.4 The general principle followed in constitution of this working circle has been explained above. This working circle has been formed for protection of forest wealth by way of regular patrolling in the forest as well as non-forest areas of the division.
- 21.1.5 The pressure on the forests is also very high as there is increase in population and because of the easy money it brings through illegal activity. The working circle extends over the whole of the Batote Forest Division as the whole of the forests is under severe biotic especially human pressure. The protection can also be from other stresses like fire, soil erosion, and medicinal herbs and firewood collection.

## 21.2 SPECIAL OBJECTS OF MANAGEMENT

- (i) To provide protection of the valuable forests of Batote Forest Division.
- (ii) To prevent free flow of illegal timber.
- (iii) To protect the forests against fire.
- (iv) To prevent encroachment on forest land.
- (v) To prevent poaching of wildlife.
- (vi) Increase social fencing measures through effective JFM programmes.

## 21.3 PROTECTION ENFORCEMENT SYSTEM

- 21.3.1 The DFO is in overall charge of the protection of forests in the division. The Range Officer is entrusted with the responsibilities of enforcing protection measures in the range by way of patrolling and detecting forest offences. He is required to draw damage reports and send them to the DFO to get it sanctioned either for compounding of offence or for prosecution which has to be decided by the DFO. The Block Officer is entrusted with the responsibility of enforcing protection measures in the Block area by way of patrolling and detecting the forest offences. Foresters (Block Officer) are directly assisted by the Forest Guards posted under him. The Forest Guards posted in the beats are entrusted with the power of detecting forest offences and they are required to report to the Block Officers under whom their services have been placed.
- 21.3.2 The Forest Protection Force has been created by J & K Government in 1996 with a view to provide maximum protection to natural forests. The gamma unit looks after the areas assigned to them usually 1-3 forest divisions which is headed by Deputy Director. The Dy. Director is assisted by Assistant Directors and Inspectors.
- 21.3.3 The new concept of JFM has provisions for formation of Self Help Groups, Forest Protection Committees or Village Forest Committees which are given the responsibility of protection in lieu of the usufructs that they receive from those areas.

## 21.4 LEGAL PROVISIONS

Forest is a renewable resource and its management cannot be successful without its protection. So there are legal provisions for protection of forests in **Jammu & Kashmir Forests Act 1930 A.D.** and its amendments and Forest Rules. All the forest personnel engaged in the management of forests have been duly empowered for protection of forests. The Divisional Forest Officer is in overall charge for protection of forests in the division and the Range Officers, Block Officers and Forest guards in their respective protection Units to assist him.



## **21.5 AGENCIES OF FOREST DAMAGE**

The major factors responsible for Forest damage in Batote are:

- (i) Grazing and Browsing
- (ii) Encroachments
- (iii) Illicit felling and transportation
- (iv) Forest fire
- (v) Pests and Diseases

These factors are discussed below in brief.

### **21.6 Grazing and Browsing**

21.6.1 The problem of grazing and browsing has been dealt in detail under Grazing Working Circle. Grazing is the major reason for forest degradation and is a formidable challenge to the entire ecosystem. It has grown into a socio-economic and political problem. Apart from usual damages from overgrazing the following problems are cropping up.

- (i) Encroachment of forest area by Gujjars and Bakerwals who have established semi-permanent structures in forest area.
- (ii) The local landlords are also encouraged to encroach forest land.
- (iii) The heavy lopping of forest trees and over grazing of grasses is inhibiting seed production and thereby natural regeneration is hampered.

21.6.2 The measures to regulate grazing are prescribed in the Grazing Working Circle. The other aspects of damage associated with grazing occurs mainly due to negligence of forest staff. The J&K Forest Act provide sufficient powers to the DFO and the staff to prevent these offences. The legal provisions should be implemented sincerely. The required socio-political environment for such action should be provided by the Government.

### **21.7 Encroachments**

21.7.1 Among all the forest offences the encroachment forms the most serious type as in this case the forest land is permanently lost.

21.7.2 The forests of this division are under a great pressure of encroachments. The encroachment is heavy near habitations and around the 'Chaks'. While increase in population is the basic cause of this, the problem manifests itself due to low productivity of agriculture and land hunger for commercial or agricultural purposes. This is accomplished singly by one family or collectively by a group of families. In the latter case a number of villagers collectively and in open defiance of law, encroach upon some treeless and/or even land with scattered trees in forest area and start cultivating it and make their huts on it. It has been observed that this collective encroachment is usually done with the direct or indirect connivance or even under patronage of politically influential persons. Like in other divisions this problem is

existing in Batote Forest division also. The following are the reasons for encroachment problems in Batote.

- (i) The lack of proper boundary inspection and thus delay in detection of cases of encroachment.
- (ii) Incomplete Demarcation records and poor state of Demarcation line and boundary pillars.
- (iii) Discrepancies in revenue and forest records.
- (iv) Absence of alternative employment opportunities for the landless or the people with very less land.
- (v) The policy of allotment of compartments for grazing to Gujjars and Bakerwals.
- (vi) Negligence/connivance on part of Forest staff and revenue staff.

21.7.3 The absence of clear policy of Government and other legal difficulties also present a way to unscrupulous persons to indulge in encroachment. The Government of J & K had decided that anybody who has the 'Girdawari' of 1971 AD for any land shall be treated as legitimate owner. This resulted in forest land encroachers obtaining certificates in connivance with Girdawars and Patwaris to the effect that land in question was occupied before 1971, even if the land (forest land) has been occupied recently.

21.7.4 The Jammu & Kashmir Forest Act provides adequate legal powers to DFO to control encroachments. The J&K Public premises (Eviction of Unauthorised Occupants) Act. 1959 provides for summary eviction of encroachers by DFO. The notification SRO-403 of 1962 appoints DFO as an Estate Officer for exercising this power.

21.7.5 The under utilization of legal powers by DFO (mainly due to existing Socio-political environment) delay in reporting on the part of lower staff, non-cooperation of revenue staff, incomplete demarcation records and sorry state of demarcation line have contributed to the growth of this problem.

The following steps are suggested to minimise the problem of encroachments.

- (i) The renovation of demarcation line of the Division should be carried out at an earliest.
- (ii) The Gujjars and Bakerwals should not be allowed to construct semi permanent/permanent structures in areas allotted for grazing.
- (iii) Along the boundaries of chaks existing in the middle of compartments, 1 to 2 feet high bunds with locally available boulders should be constructed. This is also necessary along the boundaries of villages and forests.
- (iv) Closures and plantations should be carried out in areas of high biotic interference and fencing should start right from the forest boundary.
- (v) Regular patrolling and early reporting by the Forest staff is of immense importance. However due to cumulative effect over the years the encroachment

problem has grown enormously and an intensified campaign at the state level by the Department is necessary. The required congenial socio-political environment should be created.

## **21.8 Illicit Damage and Smuggling**

21.8.1 A major proportion of the rural population live adjacent to the forests. Villages are located at more than 1000 meters altitude and receive moderate to heavy snowfall. The roofs of houses have to be sloping and have an under lying truss structure made of wood. Conservatively one household would need at least 200 cft. of timber for constructional requirement in every 7 years.

21.8.2 The economically important species occurring in Batote Forest Division are Deodar, Kail, Chir, *Quercus spp* and other broadleaved species. The industrial use of wood was largely for Sawmills and Furniture or joinery making units. The establishment of sawmills was brought under regulation with the issuance of SRO-103 of 2012 Sawmill Regulation Rules. In most of the cases, illicit damage takes place domestic use by local people, most commonly for timber and firewood. . The statement showing Range wise number of cases registered for breach of the J&K Forest Act during the previous working plan period is given in Table 2.7 Chapter II.

To prevent the illicit damage the following measures are suggested.

- (i) Intensive patrolling of the area.
- (ii) Whenever cases are registered they should be pursued vigorously till a logical conclusion is reached in the court.
- (iii) Periodic checking of saw mills and other wood based industries.
- (iv) Creation of mobile check posts along vulnerable points during the main smuggling season. Temporary huts may be constructed at these points with 2-4 guards on duty.
- (v) The combing of forest compartments by specially formed squads composed of forest officers and personnel from Forest Protection Force periodically is necessary.

## **21.9 Forest Fire**

21.9.1 In Batote Forest Division the forest fire incidents mostly in the Chir areas are a regular phenomenon. The forest fire causes substantial loss by destroying regeneration, burning of chir trees, reducing moisture content of soil and affecting other vegetation and wild life. Repeated fires arrest progressions of vegetation by process of degradation. They also denude soil paving way for massive soil erosion and siltation of dams, besides causing atmospheric pollution. Timely prevention and suppression is the key to fire control. Guidelines for prevention and control of forest fires have been issued by Government of India in letter no 9-6/99-FPD of Ministry of Environment and Forests.

#### 21.9.2 The major causes of forest fire in Batote Forests are:

1. Deliberate- local people put fire to the forests for collection of small timber and in order to encourage the growth of grasses in next season. Fires started by occupants adjacent to forests when they burn slash for land clearing. Incendiaries willfully set fire for burning vegetation either for collection of NWFP or for hunting lesser animals or by the graziers for getting new flush of grass. Fires caused by the unemployed youth seeking employment as firewatchers are also common.
2. Unintentional- usually due to negligence on part of villagers and other travelers in forest area, fire incidents occur. Fires caused by trespassers and forest users by careless flinging of burning cigarette butts and matches on to the forest floor. Fires caused by campers in forests who do not put out campfires and fires lit for cooking, before leaving.

21.9.3 The surface and ground fires are common types but occasionally crown fires are reported in chir forests. The statement of area burnt due to forest fires in the previous working plan period is given in Table 2.9 in chapter II.

#### 21.9.4 Fire management

The objectives of formulating a fire management strategy are as follows:

- (i) To promote conservation of biodiversity and arrest the degradation of forest lands.
- (ii) To improve the sustainable production of timber and non timber forest produces in forest lands.
- (iii) To maintain soil cover and prevent soil erosion.

21.9.4.1 Forest fire management assumes great significance as forest fires have a profound impact on biodiversity and productivity of forest lands. Considering the permanent damage a forest fire makes to the forest and environment, even if it is on a smaller intensity, ecological and social impacts of it are hard to quantify. Often forest fires are not reported and even when reported, the losses are underestimated as the responsibility of making good the losses are imposed on the forest officer in the field position and they are neither adequately trained to perform fire prevention and fire fighting activities professionally, nor do they have the knowledge of procedural issues in reporting fire cases. Forest Department often fails to project the actual losses due to forest fire and hence the Government is not giving sufficient funds to prevent loss due to forest fire. This, in turn, affects the efficiency of the system.

21.9.4.2 In view of the issues presented above, the Forest Department has now formulated Fire Management Plan prescribing essential components required for the plan, based on which Division level plans have been drawn up for the project period. This working plan describes briefly the salient features of a fire plan and recommends implementing it successfully.

### **21.9.5 Time and Source**

Fires in the forests start from October continuing up to arrival of western disturbances to this tract every year. The interface of the forests with the human interests in enclosures and among the peripheral dwellers has increased with the increase in boundary length and these are the sources of fire. Farming, rehabilitation, Gujjar and Bakarwal settlements and encroachment areas in and around the forests are the sources of most of the forest fires.

### **21.9.6 Fire Management planning**

- (i) Fire management plans are prepared for each Division. The Range should be treated as the unit for planning with support maps at 1:50000 or larger showing details of relief and features which are having a bearing on fire, details of which are enumerated in the standard format supplied.
- (ii) Annual action plan should be prepared based on the strategic plan for protecting the forests from fire. Planning should be prophylactic rather than curative, the concern should be for preventing fire. More emphasis should be given to development of a preventive strategy rather than control.
- (iii) Planning should be location specific, identifying clear, measurable, cost effective and achievable goals for each, specifying responsibilities as regard to detection, communication, organisation and control of fire. Planning should be done after prioritization having due regard to the resources available. Planning should be more intensive for areas, which are more fire prone.
- (iv) Wherever possible, participatory fire management strategy should be evolved based on the broader guidelines issued on this aspect. No plans will be approved without this component in future. For prevention of fire and for minimizing fire damage, 'preventive burning' should be planned and strategy laid out. Undue and unwise rigidity regarding the width of fire lines should be dispensed with and a need based strategy for this prescribed for different areas. Use fire as a management tool in protection and habitat management for wildlife.
- (v) Command structure with unity of command should be specified for each strategy. Illustration of this and positioning of equipment should be annexed to the plan for quick, efficient and on the spot organisation of fire fighting

teams. Data should be gathered on the sources of secondary support such as the voluntary fire fighters, NGOs, organisation etc.

- (vi) Details of the resources like man power, vehicles, wireless etc available with other wings of Forest Department and also those with other departments like Fire force, Meteorology etc. should be tapped during fire season.
- (vii) Fire safety measures should be described in the plan and briefing on fire should essentially include briefing on fire safety also. Unsafe and careless fire fighting strategy will not only be hazardous or even fatal to the men at the fire front, but also will impede their efficiency in fire situations resulting in more areas being destroyed by fire.

### **21.9.7 Fire Protection Strategies**

21.9.7.1 The Batote Forests are protected from forest fires by Law. Although the J&K Forest Act prohibits certain activities responsible for forest fires and makes it binding on the local people to co-operate in case of forest fire occurrence, practically the legal protection is found to be inadequate in controlling forest fires. This is mainly because of lack of awareness among people and lack of resources on the part of Forest Department.

21.9.7.2 In this plan the areas are prioritised based on economic importance of species and vulnerability to fire for taking fire protection measures. The order of priority is shown below:-

1. The entire Chir area.
2. The compartments adjacent to roads.
3. The compartments adjacent to villages.
4. All other compartments.

Apart from this the plantations within each compartments should be protected from fire on priority basis.

21.9.7.3 The following are the measures suggested for forest fire control:

#### **1. Preventive Measures**

- (i) Educating the local people and securing their co-operation as forest fire prevention is not possible without the co-operation of local people. Forest Department should create public awareness through radio, TV programmes and public meetings in villages etc.
- (ii) Along with prevention the legislative measures including punitive steps should be taken wherever co-operation is not received or mischief is done by the local communities.
- (iii) Incentives and awards should be given to villages or persons helping the Forest Department.

- (iv) In susceptible areas preliminary training can be given regarding fire fighting operations to the selected villages.

## **2. Controlled Burning**

The highly vulnerable compartments (with high amount of debris) and road side areas should be burnt to reduce the quantity of inflammable material before the fire season, the following are the prescribed areas for this purpose.

- (i) Resin tapped areas.
- (ii) Plantations and closures.
- (iii) Bamboo areas.
- (iv) Naturally regenerated areas.
- (v) Areas adjoining villages and roads paths.

## **3. Permanent Structures to Control Fire**

In economically important compartments, plantations, bamboo areas and in those areas where fire incidences are noticed regularly permanent fire breaking green belts should be raised.

- (i) In plain areas trenches (2 to 4 feet) may be dug with planting of fire resistant species like *Agave sisalana* on the bunds. This is recommended specially for valuable plantations, sanctuary areas and biodiversity rich compartments.
- (ii) In other areas the planting of *Agave sisalana* should be taken up along the borders

## **4. Fire lines**

- (i) Fire lines of 2 to 4 meters in width are recommended for all the forest areas. The fire lines should be completed before March 31 St every year.
- (ii) Remedial measures. The remedial measures have following three steps: Pre-suppression, Actual suppression and Post suppression.

**A. Pre-suppression:-** This has following steps;

**(a) Fire Detection:-** The early detection of fire helps in controlling it in the initial stages. The early detection is possible by following methods.

- (i) Co-operation by the public who can report fire occurrence to the authorities. In each Range selected villagers should be cultivated as informers.
- (ii) Ground Patrolling:- During the months of August to December, regular ground patrolling should be conducted. For this purpose patrolling parties should be constituted and provided with vehicle and communication equipments.
- (iii) In important areas fire watches should be engaged for at least the period from August to December on casual labour basis.

(iv) Look Out System:- The construction of low cost watcher huts towers at strategic locations are suggested. Each hut should be provided space for 2 forest guards. The guards should be provided binoculars and if possible wireless equipments.

(b) **Communication:-** Once the fire is detected the information should be sent to the fire fighting squad through Runners, Telephones or Wireless network.

### **Fire Fighting Squad and Materials**

- (i) At the Range Office or Divisional Office the fire fighting squad should be formulated during the fire season. The squad should be headed by a RFO. The team should be in such a situation to organise itself within a short period.
- (ii) The fire fighting equipments like tools, water (Drinking and for extinguishing fire) food and lighting arrangements should be ready. The vehicles like Tractors, Jeeps, Trucks can be used for carrying men and material.

**B. Actual Suppression:-** The actual suppression of fire can be done by following methods.

- (i) In case of small areas, spraying water, throwing soil and beating with green branches can be practiced.
- (ii) The fuel-breaks can be created at a distance from the fire so that spreading is prevented.
- (iii) Counter Fire. It is a process of encircling the advancing fire by a burnt strip. When the fire is fierce and men can't stand near the fire this method is suitable. It is also suited to hilly terrain. Usually a cleared line is used as a base to counter fire.

### **C. Post Suppression**

- (i) After suppression of the fire the fire from smouldering materials should be extinguished with the help of water or earth. Alternatively, such sites should be isolated by cleaning surrounding areas.
- (ii) The survey and reporting of area burnt and damages caused is very important from the point of drawing attention of the Government towards fire protection. The reporting should be delinked from liability so that staff reports actual damage sincerely.

## **21.10 PESTS AND DISEASES**

21.10.1 The pests and diseases form an important part of biotic factors affecting forest tree species. They cause damage to forest trees and also to the seedlings in nursery.

21.10.2 Usually forest managers ignore the pests and disease. But the recent epidemics of Sal borer in Madhya Pradesh and Deodar defoliator in Himachal Pradesh are stern warnings to forest managers. It is very important to monitor forest pests and diseases in each division.



21.10.3 In nurseries and plantations the insect pests causes serious damage and is a common occurrence every season. The negligence leads to loss of precious resources and time. In forest and in plantations due to high cost and environmental pollution the chemical control measures should not be adopted on routine basis. Only if the problem is serious should chemical control be resorted to. However, the cultural measures can be practiced on regular basis.

#### **21.11.4 Diseases**

In case of Kail and Deodar, Fomespini the destructive fungi which can cause heart rot disease was prevalent in some pockets of the division. Similarly, other diseases like Armillarea root rot caused by *Armillarea mellea*, root and butt rot in conifers by *Hetreobasidium annosum* is also very rare and uncommon besides Root rot of chir Pine caused by *Helicobasidium* and *Polyporus schweintzii*.

#### **Disease Management Practices**

The disease management is nothing but the selection and use of appropriate techniques to suppress diseases to a tolerable limit. The management aims at increasing productivity and reducing cost of production. The main management practices employed for the control of forest diseases are. Quarantine regulations, choice of species. choice of planting site, sanitation, removal of alternate hosts, silvicultural and other cultural practices, solarisation, chemical control measures and use of resistant plant material.

Long rotation periods and low value per unit area of forest species make the use of chemicals and rotation in disease management difficult options. However in forest nurseries and plantations the intensive management practices can he adopted.

## CHAPTER XXII

### MISCELLANEOUS REGULATIONS

#### 22.1 Buildings

22.1.1 The buildings that are presently being maintained by the Batote Forest Division have been enlisted under appendix XV. Out of the six buildings proposed to be constructed under the previous plan, only one viz Range Office-cum Range Quarter Gandhri was constructed. All the buildings have suffered because of neglect due to non-availability of funds for maintenance. The following building needs to be taken up for immediate repairs and renovation on priority; Clerical Quarters at Batote, old Divisional quarters Batote and Range Quarters Soil Range Batote. The following proposals for new buildings from the previous Plan are retained in this plan:

Range	Buildings	Location.
Marmat	BO Hut at Bulandpur	Chelan
	BO's Quarter	Dedni & Loga
Batote	BO Hut	Paddar (Ballout) Co.36/Btt
	Modification of store and stock room	Batote
Gandhri	BO Hut	Kanga

22.1.2 In additions to these buildings Guard Huts and residential accommodation for Block Foresters should also be constructed for each of the beat and Block head quarters. The location and beat and block headquarters also needs to be fixed. Adequate accommodation is suggested to be built for clerical staff both, at Divisional and Range level.

#### 22.2 Roads and Paths

22.2.1 There is a good network of forests inspection paths almost all the forests areas, although some of them not have been repaired for many years for want of adequate funds. The list of roads and footpaths constructed and maintained by this Division is appended as Appendix XVI. The existing roads needs to be repaired yearly and maintained properly. A few more inspection paths required to be constructed in this Division well maintained inspection paths also serve as fire lines, especially in Chir Forests.

22.2.2 With the introduction of FDA in this Division VFC's were formed and in each VFC under entry point activities various inspection paths were created. The detail of which is appended as Appendix XXVI under chapter XXVIII (Participatory Forest Management).

### **22.3 Bridges**

22.3.1 Bridges constructed by the PWD and Boarder road organization exists in this Division. However, attention should be paid towards the construction of few wooden foot bridges by the territorial Division in Marmat and Gandhri Ranges, where these are lacking. However with the introduction of FDA, PDA and BRGF schemes various bridges have been, constructed, detail of which is appended as appendix XXVIII.

### **22.4 Forest Demarcation and Consolidation**

22.4.1 As already discussed in detail under section 1.1.12 of this plan, demarcation boundaries are almost non-existent, except in the areas where renovation of boundary pillars was carried out in the past. This, coupled with the fact that little attention is being paid towards this very important aspect, makes forest extremely vulnerable to encroachments. Large areas have already been encroached upon and the condition in the field at many places is so bad that it is virtually impossible to locate and identify the boundary lines in these forests. The list of forests where the work of renovation of boundary pillars was carried out in the past is provided under appendix II.

22.4.2 For effective control of encroachments, it is essential that the beat guards should be thoroughly aware of the boundaries of the forests in their respective beats. Each Guard should be in the possession of a beat map, which also indicates the location of boundary pillars. The demarcation record should be consolidated and authenticated in collaboration with revenue authorities in a time bond manner. Records should be maintained in a manner that their validity is not doubted in the court of law. The system of demarcation needs to be modernized. In the field existing boundary pillars be strengthened and their location recorded by using GPS and other technologies to avoid their re-location by the encroachers, and demarcation record be maintained in digital formats.

### **22.5 Fire Protection**

22.5.1 Fire protection is an important aspect of forest management. Chir forests falling in the sub-tropical zone are highly susceptible to fire, especially during the long dry spell in summer as well in autumn. For this purpose, various measures include construction of fire-lines and control burning, as already recommended under chapter XXI of this plan' should be implemented vigorously.

## **22.6 Management of Berune Line Forests and Uncultivated Wasteland**

- 22.6.1 In addition to the blank scrub area, pasture, and stony waste lands of this division there is a sizeable area available outside the demarcated forests which is neither cultivated nor properly managed. Practically no investment is being made on these resources as compared to the intensity of use to which they are put. There are the compelling reasons to formulate policies for this category of land to realize its productive potential to best possible extent. A multi-disciplinary approach is needed for its proper and comprehensive management.
- 22.6.2 In order to arrest their further deterioration, the Berune line forests, as ordered by the Government of Jammu and Kashmir, are to be taken over from the charge of the Revenue Department immediately, and managed on scientific lines.

## **22.7 Social Forestry**

- 22.7.1 In order to lessen the ever increasing pressure of human and animal population on the conventional forests, an integrated use of non-forest land for agricultural and forestry in manner that maximizes production of goods and services is the only answer. The term social forestry is used for various programmes of extending tree cover to the non-forest areas including agricultural lands, wastelands and strips along the roads etc. Social forestry schemes are already under implementation in this division and non-forest areas are being taken up for plantation however their implementation needs to be reviewed for reducing the pressure from natural forests.
- 22.7.2 In order to realize the full benefit of social forestry, a comprehensive package of technology needs to be developed for various agro-climatic zones after taking into consideration the needs and customs of the local population. It requires a multi-disciplinary approach, and research efforts of specialists from various disciplines like agronomy, extension, soil science, forestry, horticulture, economics and social sciences.. For improving the economic condition of the local population, watershed approach to development needs to be adopted.

## **22.8 Cultivation of Non-timber Produce**

- 22.8.1 The forests of this division are rich in non-timber forests produce and medicinal plants. The quantity of various non-timber forest produce collected from the forests of this division has been tabulated under appendix XXIII of this plan. Unfortunately, little attention has been paid towards propagation, harvesting, and collection and storage of the non-timber forest produce and drugs. Owing to heavy pressure of grazing, some of the medicinal plants have become rare in this tract. The following suggestions are

therefore made, besides the NTFP has been also been discussed under Chapter XIX separately.

22.8.2 Proper schemes need to be drawn up for artificial as well as natural propagation of non-timber forest produce and medicinal plants. Suitable sites for artificial regeneration of the non-timber forest produce and medicinal plants should be identified. The techniques for cultivation, harvesting and storage of the non-timber forests produced and many medicinal plants need to be developed, standardized and implemented. There is an urgent need for amending the Kuth Act, to promote the private cultivation of medicinal plants covered under the Kuth Act.

## **22.9 Illicit Damage**

22.9.1 The problem of damage to forest is quite acute in the Batote Forest Division. The proximity of National Highway to well stocked forests makes it extremely difficult to check this menace. However, with a ban on the operation of the Saw mills in the Division, this problem has been tackled to a significant extent. Nevertheless, it is recommended the Division needs to be equipped with vehicles to R.Os and wireless for effective communication. The protection of forests has been dealt separately under chapter XXI.

## **22.10 Timber and Firewood Requirement of Local Population**

22.10.1 The timber and firewood requirement of the local population have been estimated under section 3.2 and 3.3 of this plan. It is recommended that timber for concessionists should be granted, to the extent possible, from the nearest area subject to availability. The requirement should be made good out of the dry and dead trees. The local population should be allowed to fulfill their requirements for firewood, as usual, from the available dead and dry material having least timber value, till they built up their own resources from their private lands under various social forestry programmes.

22.10.2 With the opening the new Timber Sale Depots in “ A” and ‘ B” zones, the pressure on forest must reduce and the issue of timber in such zones to concessionists from forests needs to be looked into by the DFO so as to avoid double benefits and misuse.

## **22.11 Forest Nurseries**

22.11.1 Forest Nurseries are the paramount importance in any artificial regeneration programme. Unfortunately, for the want of adequate funds and planning, little attention has been paid towards the creation and maintenance of the forest nurseries

in this division. The details of existing nurseries in the Division have been listed in Appendix XIV.

22.11.2 In order to make concerted efforts towards the reforestation of conifers species, a comprehensive, long terms efforts is required. Adoption of modern techniques like root trainers, glass houses, sprinklers etc. will go a long way in providing the necessary planting stock required for meeting the plantation targets set under this plan. Seed for genetically superior trees should be used for raising good quality planting stock in the nurseries. However, the nurseries should be established keeping in view the future availability of funds required for such plantations. Raising of planting stock in the nursery is of no use if it is not planted in time in the field for want of funds and proper planning.

## **22.12 Beats and Blocks**

22.12.1 A statement showing compartment wise break up of Beats, Blocks and Ranges is provide under Appendix XI, the summary of the same is tabulated as under:-

<b>Range</b>	<b>Compartments</b>
Batote	1 to 44
Gandhri	45 to 81
Marmat	9 to 74

Compartments 1 to 8 of Marmat Range were transferred to Bhaderwah Forest Division, whereas compartments 82 onwards of erstwhile Lander range were transferred to Udhampur Forest Division at the time of constitution of this Division i.e. on 01-01-1982.

22.12.3 The Headquarter of Batote, Gandhri and Marmat Ranges are located at Batote, Gandhri and Khelani respectively. The headquarter of Gandhri Range has been shifted from Maitra to Gandhri on the construction of Range Office-cum –Range Quarter at Gandhri.

22.12.4 In view of the vast area of Marmat Range, it is again recommended that it should be bifurcated into two Ranges viz Marmat ( Co: 9/M to 43/M ) and Bulandpur( Co 44/M to 74/M) with Head quarters at Goha and Bulandpur respectively. These recommendations have already made in the last three previous revisions of the plan also, but nothing was done in this regard.

## **22.13 Maps**

The maps prepared in the previous revision of the working Plan were revived and have been digitalized both compartment and the Divisional wise.

## **22.14 Compartment Description**

The compartment description form filled in are enclosed in quadruplicate.

## **22.15 Draft Plan**

22.15.1 Copies of the draft working Plan for Batote Forest Division for the period 2017-18 to 2027-28 being submitted in duplicate.

## CHAPTER XXIII

### STAFF AND LABOUR SUPPLY

#### **23.1 Establishment**

- 23.1.1 The staff of Batote Forest Division has registered an increase since the inception of the previous plan. Though the additional staff has been sanctioned but the working strength is inadequate to cope with the ever increasing work load. The fact that a significant number of field functionaries are untrained makes the matter even worse. Although the territorial Divisional Forest Officers have been conferred additional powers under the amended Forest Act, no corresponding efforts has been made to augment the establishment and infrastructure of the Division so that the DFO can effectively discharge his duties as Authorized Officer. The details of establishment, as it exists on 31-03-2017, has been discussed under Chapter VI of Part I.

#### **23.2 Labour supply**

- 23.2.1 The availability of skilled and unskilled labour is not much of a difficulty in this Division, excepting the period of sowing and harvesting of the agriculture crops, which also does not last for more than two to three weeks owing to the small size of holdings. There has been a trend of importing labour from adjoining districts and other States because of a change in the Govt. policy, as well as decrease in the volume of extraction.



## CHAPTER XXIV

# C O N T R O L

### 24.1 Control Forms.

As per the standard procedure, the following control forms are prescribed to be maintained;

**(i) Control Form A.**

It shall be maintained at the standard format in use, for recording the major markings (felling) and other subsidiary markings (felling) carried out in Deodar- Kail selection working circle, Mixed Conifers Selection Working Circle, Fir Selection Working Circle, and Chir Irregular Working Circle, separately for each of the four working circles. As usual, a deviation statement indicating specie wise plus and minus account of the actual removal ( felling) vis-à-vis the prescribed yield , will be compiled at the close of every year and the same brought forward in the subsequent year and summed up (plus or minus) with the prescribed yield for the year. Control shall be exercised on the volume extracted with an area check.

**(ii) Control Form B.**

This control Form shall be maintained on the standard forms in use for recording the yield realized from the Deodar Kail Selection Working Circle. It shall be maintained in the same way as Control Form – A, except that the excess removals, if any, during the year are to be adjusted in the subsequent year but the deficit shall lapse to the forests.

**(iii) Control Form C.**

It will be maintained to record and monitor the progress of the generation work in the areas taken up for artificial regeneration. Such areas are to be written off from this form only after they carry adequate and established regeneration.

**(iv) Control Form D.**

This control form shall indicate the proposals of the territorial DFOs for marking of coupes during the next three years. It is required to be submitted well in time, to the Conservator of Forests, Working Plan Circle , through the

concerned territorial Conservator of Forests, who will convey his approval after due scrutiny of the proposals in consultation with the Chief Conservator of Forests. The arrears in respects of Control Forms need to be completed at once and their future maintenance ensured and made purposeful.

**(v) Coupe Control Form.**

For the control of all silvicultural operations such as felling, subsidiary cultural operations, cleanings, thinning, burning, etc which may be prescribed or suggested to be carried out in given coupe for the duration of the Working Plan should be maintained in the following proforma and submitted to the Conservator of Forests, Working Plan Circle and Territorial Conservator of Forests annually.

Working Circle Periodic Block		Felling- Series- Cutting- Section	Localities prescribed Localities suggested				Coupe Control Form		
Prescrip tion in brief	W.P. para	Year due	As carried out				Coupe No		Page
							Excess (+) or Deficit (-)		Remarks and sanction
			Year	Block/ Comptt.	Area	Vol	Area	Vol	
1	2	3	4	5	6	7	8	9	10

**(vi) Felling Control Form.**

For controlling and maintaining, a record of all trees marked for felling and trees retained as seed bearers are to safe guard future yield. The feeling control form should be maintained as under;

Working Circle Periodic Block		Felling Series-Cutting-Section		Localities prescribed Localities suggested		Coupe Control Form			
Block & Comptt	Area	Spp	Dia-Class	Trees marked	Unit factor	Volume marked	Trees retained	Coupe No %age trees retained	Page Remarks
1	2	3	4	5	6	7	8	9	10

**(vii) Deviation Statement.**

**STATEMENT SHOWING DEVIATIONS FROM WORKING PLAN PRESCRIPTIONS**

Serial No. of the Deviation	Control, Book name, form no. & Page	Reference to <i>Working Plan</i>		Nature of deviation requiring PCCF's Sanction
		Paragraph	Nature of prescriptions	

The DFO will forward through the Territorial Conservator of Forests typed copies of this Form in triplicate yearly with his copies of control forms. One copy of the statement will be returned to the DFO and another to the territorial Conservator of Forests after the deviations have been sanctioned by the PCCF. If the PCCF or the Working Plan Conservator's sanction has been obtained in advance, the sanction number and date should be quoted in the last columns.

All deviations, which permanently alter the basis of management laid down in the Working Plan, will require prior sanction of the PCCF. All deviations, which do not permanently alter the basis of management and with the necessity of which he agrees, may be approved and sanction by the Working Plan Conservator on behalf of PCCF. In case where there is difference of opinion between the Working Plan Conservator and

territorial Conservator, the former will refer to them to the PCCF for instructions. The PCCF/CFWP as the case may be, will countersign the deviation statement.

Minor deviations can be sanctioned at the level of the Working Plan Conservator or the PCCF as the case may be; but the PCCF before sanctioning the major deviation of following nature, will necessarily take prior approval of the Regional CCF of the Ministry of Environment and Forests:

- (i) Change in Silvicultural System,
- (ii) Clear felling of natural forests,
- (iii) Formation of new felling series and
- (iv) Large scale felling due to natural calamities, which cannot be adjusted against future yield.

## **24.2 Compartment Histories**

These are, in fact, the most important record of happening in the forests but has not been maintained. They must be objectively maintained and updated, both at range as well as Divisional level. Entries regarding marking, extraction, resin extraction and development works, fire, encroachments, land transfer any other significant event that happened in a compartment must be made in the compartment history file at the earliest possible dispatch. In addition, the touring Officer should note their observations and instructions on compartment history files, for the purpose of control and record. (See Para 79-84 of National Working Plan Code)

## **24.3 Divisional Journals**

This document, though very important, has not been maintained in the division. It is of immense use to the DFO and must be maintained and updated regularly. It should contain detail information on subject, like regeneration, plantation, soil conservation works, seed years, disease/ insects attacks, statistics, outturn of timber and fuel wood, abstract of information on past/current leases, contracts, road, buildings and meteorological data. On the analogy of the Divisional Journal, record must be maintained at Range and block level.

## **24.4 Guard Books**

By and large, the maintenance of Guard books has remained neglected. In certain cases The Guard Books have been found lacking even the elementary data regarding description of boundaries of the beat, number and name of the compartments, beat maps, number of boundary Pillars and *Chaks*. The guard books must be maintained properly and checked frequently by the Range Officers at least once in a month and by the DFO at least once in six months.

## Chapter XXV

# FINANCIAL FORECAST AND COST OF THE PLAN

## 25.1 Future Yield and Revenue

25.1.1 Most of the revenue shall occur from the sale of timber through the State Forest Corporation and the Timber Sale Depots. The total volume of timber prescribed to be extracted from the forests of this Division annually from various working circle's is as under;

Working Circle	Annual Yield (cum)				
	Deodar	Kail	Fir	Chir	Total
<b>Deodar Kail Selection</b>	6400	10900	0	0	<b>17300</b>
<b>Mixed Conifer Selection</b>	6000	9200	4000	0	<b>19200</b>
<b>Fir Selection</b>	0	4300	4600	0	<b>8900</b>
<b>Chir Selection</b>	0	200	0	1400	<b>1600</b>
<b>Total</b>	<b>12400</b>	<b>24600</b>	<b>8600</b>	<b>1400</b>	<b>47000</b>
<b>On the basis of the average rates (1989-90) chargeable from the SFC for the above species, the total annual revenue from the timber harvest is worked as under;</b>					
<b>Species</b>	<b>Volume (Cum)</b>		<b>Rate (Rs/cum)</b>		<b>Revenue (Rs)</b>
<b>Deodar</b>	12400		3327.64		<b>41,262,736.00</b>
<b>Kail</b>	24600		1581.00		<b>38,892,600.00</b>
<b>Fir</b>	8600		1236.70		<b>10,635,620.00</b>
<b>Chir</b>	1400		1306.26		<b>1,828,764.00</b>
<b>Total</b>					<b>92,619,720.00</b>

25.1.2 In addition the source of revenue was Resin-tapping which has been stopped since 2004-05. So, the total average annual revenue on account of timber and other miscellaneous receipts, over the next ten years is estimated to the tune of **Rs 93,500,000.00**.

25.1.3 However, in view of the ban on green felling of trees, the expected removals from the forests are not likely to exceed 10-15 % ( dry standing/fallen only) of the prescribed yield, so the yearly revenue receipts can be put hardly up to Rs 10 crore.

## 25.2 Anticipated expenditure

The expenditure anticipated to be incurred giving effect to the prescriptions of the Working Plan under various Working Circle is enumerated below and eventually

summed to arrive at an estimate of total expenditure expected to be incurred during the Working Plan period.

### 25.2.1 Plan expenditures

#### (a) Deodar-Kail Selection Working Circle

For Deodar-Kail Irregular Working Circle (60% of the total area of 5833.57 ha. to be treated in 20 years)

Component	Area in hectares	Average expenditure per hectare (in Lacs)	Amount required (in Lacs)
Artificial Regeneration (AR) @ 20% of the working circle's area	1167	1.00	1167
Aided Natural Regeneration (ANR) @ 20% of the working circle's area	1167	0.45	525
Silvicultural Operation @ 20% of the working circle's area	1167	0.25	292
<b>Total (60% of the total area)</b>	<b>5834</b>		<b>1983</b>

The anticipated annual expenditure would be **Rs. 99.17 lacs.**

#### (b) Mixed Conifer Selection Working Circle

For Mixed Conifer Selection Working Circle (60% of the total area of 6575 ha. to be treated in 20 years)

Component	Area in hectares	Average expenditure per hectare (in Lacs)	Amount required (in Lacs)
Artificial Regeneration (AR) @ 20% of the working circle's area	1315	1.00	1315
Aided Natural Regeneration (ANR) @ 20% of the working circle's area	1315	0.45	592
Silvicultural Operation @ 20% of the working circle's area	1315	0.25	329
<b>Total (60% of the total area)</b>	<b>6575</b>		<b>2236</b>

The anticipated annual expenditure would be **Rs. 111.78 lacs.**

**(c) Fir Selection Working Circle**

**For Fir Working Circle (60% of the total area of 3611.41 ha. to be treated in 20 years)**

<b>Component</b>	<b>Area in hectares</b>	<b>Average expenditure per hectare (in Lacs)</b>	<b>Amount required (in Lacs)</b>
Artificial Regeneration (AR) @ 20% of the working circle's area	<b>722</b>	<b>1.00</b>	<b>722</b>
Aided Natural Regeneration (ANR) @ 20% of the working circle's area	<b>722</b>	<b>0.45</b>	<b>325</b>
Silvicultural Operation @ 20% of the working circle's area	<b>722</b>	<b>0.25</b>	<b>181</b>
<b>Total (60% of the total area)</b>	<b>2167</b>		<b>1228</b>

The anticipated annual expenditure would be **Rs. 61.39 lacs.**

**(d) Chir Irregular Working Circle**

**For Chir Irregular Working Circle (60% of the total area of 1429.69 ha. to be treated in 20 years)**

<b>Component</b>	<b>Area in hectares</b>	<b>Average expenditure per hectare (in Lacs)</b>	<b>Amount required (in Lacs)</b>
Artificial Regeneration (AR) @ 20% of the working circle's area	<b>286</b>	<b>1.00</b>	<b>286</b>
Aided Natural Regeneration (ANR) @ 20% of the working circle's area	<b>286</b>	<b>0.45</b>	<b>129</b>
Silvicultural Operation @ 20% of the working circle's area	<b>286</b>	<b>0.25</b>	<b>71</b>
<b>Total (60% of the total area)</b>	<b>858</b>		<b>486</b>

The anticipated annual expenditure would be **Rs. 24.30 lacs.**

**(e) Reboisement and Protection Working Circle**

**For Reboisement and Protection Working Circles (60% of the total area of 15858 ha. to be treated in 20 years)**

<b>Component</b>	<b>Area in hectares</b>	<b>Average expenditure per hectare (in Lacs)</b>	<b>Amount required (in Lacs)</b>
<b>Artificial Regeneration (AR) @ 20% of the working circle's area</b>	<b>3172</b>	<b>1.00</b>	<b>3172</b>
<b>Aided Natural Regeneration (ANR) @ 20% of the working circle's area</b>	<b>3172</b>	<b>0.45</b>	<b>1427</b>
<b>Silvicultural Operation @ 20% of the working circle's area</b>	<b>3172</b>	<b>0.25</b>	<b>793</b>
<b>Total (60% of the total area)</b>	<b>9515</b>		<b>5392</b>

The anticipated annual expenditure would be **Rs. 270.00 lacs.**

**(f) Forest Protection Working Circle**

**The protection works would involve the following activities.**

<b>S.No.</b>	<b>Activity</b>	<b>Annual fund requirement (in Lacs.)</b>
<b>1</b>	Construction and maintenance of Check Posts, engagement of fire watchers, purchase of fire fighting tools and gathering of intelligence.	<b>10</b>
<b>2</b>	Erection of B.Ps. 2800 B.Ps. in mainline and 4200 B.Ps. in Chaks have to be erected in next 10 years. Annually 700 Boundary Pillars have to be erected at an average cost of Rs. 6000 per Boundary Pillar.	<b>42</b>
<b>3</b>	Construction of infrastructures for housing of field staff.	<b>50</b>
	<b>Total</b>	<b>102</b>

**(g) NTFP Working Circle**

To give effect to the prescriptions of this Working Circle upfront payment by the FDA to the VFC's and the beneficiaries might to required. Also some funds would be needed for capacity building and training of VFC members. Revolving funds of **1 Crore** would need to be allocated as credit to the FDA on returnable basis.



**(h) JFM Working Circle**

An amount of **Rs. 10 lacs.** is to be allocated for training and capacity building of JFM members annually. Based on the availability of funds credit can be extended to the VFCs for establishment of revenue generating enterprises.

**Hence the annual fund requirement for executing the plan works would be Rs. 778.23 lacs.**

**25.3 Non-Plan expenditures**

**(a) Staff**

The annual salary to staff of all the three wings i.e; Forest Department, SFC & F.P.F together would account for about **8 Crores** per annum.

**(b) Over head**

The over head cost is kept as **Rs. 1 Crore** lump sum per annum.

Hence the annual fund requirement for meeting the non-plan expenditure would be **Rs. 900.00 lacs.**

Based on the above proposed expenditure, the annual total expenditure works out to be **1678.23 lacs.** and for the next 10 years would be **Rs. 16780 lacs. (Rs. 167.80 Crores).**

**25.4 Cost of the Plan**

The expenditure incurred on the revision of the working plan for Batote Forest Division is as under (up to ending 03/2017)

S.No.	Year	Allotment	Expenditure	Item wise expenditure	
				Item of Work	Financial
1	2010-11	11.15	11.15	Survey material	6.37
				Office Expenses	0.33
				Other works	4.45
		<b>11.15</b>	<b>11.15</b>		<b>11.15</b>
2	2011-12	13.00	13.00	Layout	1.52
				Sample Plots	1.74
				Regeneration Survey	3.48
				Office Expenses	0.96
				Other works	5.30
		<b>13.00</b>	<b>13.00</b>		<b>13.00</b>
3	2016-17	0.30	0.30	Typing, Printing of Draft Working Plan	0.30
		<b>0.30</b>	<b>0.30</b>		<b>0.30</b>
	<b>Total</b>	<b>24.45</b>	<b>24.45</b>		<b>24.45</b>

The expenditure above is inclusive of the amount spent on the purchase computer and computer peripherals, paint, cartographic material, stationery and stock items. In terms of field work, the expenditure under the Plan head for the revision of the Working Plan for Batote Forest Division, works out to Rs.20.4 per hectare. This is inclusive of the assets that have been created in the Working Plan Division.

## CHAPTER XXVI

### SUMMARY OF PRESCRIPTIONS

26.1 A summary of the important prescriptions of the plan is given as under:

Prescription	Section	Page
Constitution of the Working Circles	9.3	154
<ul style="list-style-type: none"> <li>Deodar – Kail Selection Working Circle</li> <li>Mixed Conifers Selection Working Circle</li> <li>Fir Selection Working Circle</li> <li>Chir Irregular Working Circle</li> <li>Reboisement Working Circle</li> <li>Protection Working Circle</li> <li>Grassland Development (Overlapping) Working Circle</li> <li>Participatory Forest Management (Overlapping) Working Circle</li> <li>Non-Timber Forest Products(Overlapping) Working Circle</li> <li>Wildlife Management (Overlapping) Working Circle</li> </ul>		
<b>Period of the Plan: Ten years, 2017-18 to 2027-28</b>	9.6	160
<b>Deodar – Kail Selection Working Circle</b>	10	161-179
<ul style="list-style-type: none"> <li>Total area of the Working Circle = 5833.57 hectares</li> <li>Silvicultural System : Selection System</li> <li>Rotation = 150 years</li> <li>Regeneration Period = 30 years</li> <li>Felling Series = One</li> <li>Size of the Annual Coupe=113.02 ha</li> <li>Annual yield from the entire Working Circle</li> </ul>	10.3 10.4 10.5 10.6 10.7 10.11	163 163 163 164 164 173
Deodar = 6400 m <sup>3</sup> Kail = 10900 m <sup>3</sup> <u>Total = 17300 m<sup>3</sup></u>	10.10	172
Intensity of the annual cut per hectare of the commercial area = 5.2 m <sup>3</sup>	10.12	173
<b>Mixed Conifers Selection Working Circle</b>	11	180-195
<ul style="list-style-type: none"> <li>Total area of the Working Circle = 6575.27 hectares.</li> <li>Silvicultural System: Selection System</li> <li>Exploitable Size</li> </ul>	11.4 11.5.1	182 182
Deodar and Kail = 70 cm d.b.h Fir = 80 cm d.b.h		
<ul style="list-style-type: none"> <li>Rotation</li> </ul>	11.5.2	182
Deodar and Kail = 150 years Fir = 225 years		
<ul style="list-style-type: none"> <li>Felling Cycle = 25 years</li> <li>Felling Series = one</li> <li>Annual yield from the Working Circle</li> </ul>	11.6 11.7 11.10	182 182 191
Deodar = 6000 m <sup>3</sup> Kail = 9200 m <sup>3</sup>		

<p>Fir = 4000 m<sup>3</sup></p> <p>Total = 19200 m<sup>3</sup></p> <ul style="list-style-type: none"> <li>Size of the Annual Coupe = 163 hectares</li> <li>Allowable cut per hectare of the Annual Coupe = 109.12 m<sup>3</sup> per annum</li> </ul>	11.11	192
	11.12	192
<b>Prescription</b>	<b>Section</b>	<b>Page</b>
<b>Fir Selection Working Circle</b>	12	196-214
<ul style="list-style-type: none"> <li>Total area of the Working Circle = 3611.41 hectares.</li> <li>Silvicultural System: Selection System</li> <li>Exploitable Size</li> </ul> <p>Deodar and Kail = 70 cm d.b.h</p> <p>Fir = 80 cm d.b.h</p> <ul style="list-style-type: none"> <li>Rotation</li> </ul> <p>Deodar and Kail = 150 years</p> <p>Fir = 225 years</p> <ul style="list-style-type: none"> <li>Felling Cycle = 25 years</li> <li>Felling Series = one</li> <li>Annual yield from the Working Circle</li> </ul> <p>Kail = 4300 m<sup>3</sup></p> <p>Fir = 4600 m<sup>3</sup></p> <p>Total = 8,900 m<sup>3</sup></p> <p>Intensity of cut per hectare of the commercial area of the working circle = 2.46 m<sup>3</sup> per annum</p> <ul style="list-style-type: none"> <li>Size of the Annual Coupe = 66.32 hectares</li> <li>Allowable cut per hectare of the Annual Coupe = 76.26 m<sup>3</sup> per annum</li> </ul>	12.3	197
	12.4	197
	12.5	198
	12.6	198
	12.7	198
	12.8	198
	12.11	208
	12.11	209
	12.12	209
	12.13	209
<b>Chir Irregular Working Circle</b>	13	215-232
<ul style="list-style-type: none"> <li>Total area of the Working Circle = 1429.70 hectares</li> <li>Silvicultural System: Indian Irregular Shelterwood System</li> <li>Exploitable Size = 70 cm d.b.h</li> <li>Rotation = 150 years</li> <li>Regeneration Period = 30 years</li> <li>Felling Cycle = 10 years</li> <li>Felling Series = one</li> <li>Annual yield from the Working Circle</li> </ul> <p>Chir = 1600 m<sup>3</sup></p> <ul style="list-style-type: none"> <li>Size of the Annual Coupe = 20.16 hectares</li> <li>Allowable cut per hectare of the Annual Coupe = 1.11 m<sup>3</sup> per annum</li> </ul>	13.3	216
	13.4	216
	13.5	219
	13.6	219
	13.6	219
	13.7	219
	13.8	219
	13.11	226
	13.12	226
	12.13	227
<b>Reboisement Working Circle</b>	14	233-243
<ul style="list-style-type: none"> <li>Total Area of the Working Circle = 11203.83 hectares</li> <li>Special Objects of Management: rehabilitation, protection and tourism promotion</li> <li>Method of treatment Prescribed</li> </ul>	14.3	176
	14.4	176
	14.7	181

<b>Prescription</b>		<b>Section</b>	<b>Page</b>
<b>Protection Working Circle</b>		15	244-249
• Total area of the Working Circle = 4654.42 hectares		15.3	245
• Special Objects of Management: complete rest and protection		15.4	245
• Method of Treatment Prescribed		15.6	246
<b>Ecotourism (Overlapping) Working Circle</b>		16	250-252
<b>Grassland Development (Overlapping) Working Circle</b>		17	253-261
<b>Participatory Forest Management (Overlapping) Working Circle</b>		18	226-269
<b>Non-Timber Forest Produce (Overlapping) Working Circle</b>		19	270-275
<b>Wildlife Protection (Overlapping) Working Circle</b>		20	276-277
<b>Forest Protection (Overlapping) Working Circle</b>		21	278-288
<b>Financial Forecast</b>		25	300-305
• Projected Annual Revenue	(Rupees)	25.1	300
Timber =	92,619,720.00		
Miscellaneous receipts =	8,80,280.00		
Total =	9,35,00,000.00		
• Projected Expenditure			
Plan =	7,78,23,000.00	25.2	303
Normal =	9,00,00,000.00	25.3	304
Total =	16,78,00,000.00		
• Cost of the Plan	24,45,000.00	25.4	304

# APPENDICES



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**APPENDIX I****STATEMENT OF DETAILS OF DEMARCATED FORESTS AS PER FORM-1**

<b>S.No.</b>	<b>Name of Forests</b>	<b>Village</b>	<b>COMPARTMENT</b>	<b>FOREST AREA Hectares</b>	<b>Total Number of Main Line BP's</b>	<b>Boundary in Length Kms</b>	<b>Number of Chaks</b>	<b>Area of Chaks (Hect)</b>	<b>B.P's of each Chak</b>	<b>Boundary Length of Chaks (Miles)</b>
<b>1</b>	Sawani Papriya	Sawani	29/Btt, 30/Btt, 32/Btt and 33/Btt.	848.23	156	27.125	18	117.38	221	13.723
<b>2</b>	Ansi Patni	Tringla, Champa, Chakwa, Ludhwal, Dhralta, Bandhera, Kothri and Thopal	2/Btt, 03/Btt, 04/Btt, 05/Btt, 06/Btt, 07/Btt, 08/Btt, 09/Btt, 10a/Btt and 10b/Btt	1303.10	448	42.771	44	176.49	659	19.181
<b>3</b>	Ballout Maitra	Maitra, Govindpura, Ballout and Kabbi	35/Btt, 36a/Btt, 6b/Btt, 37a/Btt, 37b/Btt and 38/Btt	1813	105	29.751	24	520.90	327	22.209
<b>4</b>	Sanna Papriya	Sanna	22/Btt, 24/Btt, 27a/Btt and 27b/Btt	796.83	98	18.456	9	20.89	100	4.038
<b>5</b>	Dhalwas	Dhalwas	23a/Btt and 23b/Btt	63.94	16	4.225	Nil	Nil	Nil	Nil
<b>6</b>	Danga Batote	Batote Champa & Tringla	11/Btt	189.39	192	12.440	9	32.47	135	4.279
<b>7</b>	Jarog Dharmound	Dharmound	12/Btt, 13/Btt, 14a/Btt 14b/Btt and 14c/Btt	789.15	182	25.759	11	55.03	91	6.143
<b>8</b>	Nashiri Dhalwas	Batote	22/Btt to 26/Btt	116.95	35	8.247	3	7.54	19	1.136
<b>9</b>	Chanderkote	Chanderkote	31/Btt	307.96	12	7.774	1	5.31	7	0.560
<b>10</b>	Peerah	Peerah	28/Btt	167.13	20	6.437	2	3.53	11	0.674

<b>11</b>	Sanna Karma	Sanna, Sanasar, Papriya & Ladhaddhar	20/Btt, 21/Btt, 25/Btt and 26/Btt	1150.13	91	24.844	10	203.35	167	9.181
<b>S.No.</b>	<b>Name of Forests</b>	<b>Village</b>	<b>COMPARTMENT</b>	<b>FOREST AREA Hectares</b>	<b>Total Number of Main Line BP's</b>	<b>Boundary in Length Kms</b>	<b>Number of Chaks</b>	<b>Area of Chaks (Hect)</b>	<b>B.P's of each Chak</b>	<b>Boundary Length of Chaks (Miles)</b>
<b>12</b>	Chilla Sawan Pani	Dharmound, Champa and Sanna	15/Btt, 16/Btt, 17/Btt, 18a/Btt, 18b/Btt and 19/Btt	1605.40	166	30.577	22	162.08	475	16.744
<b>13</b>	Maitra Nursery Kahu Bagg	Maitra	40/Btt	15.38	37	1.83	Nil	Nil	Nil	Nil
<b>14</b>	Marmat	Saras	3/M, 4/M, 5/M, 8/M and 9/M	774.58	23	14.484	27	85.89	479	9.33
<b>15</b>	Dedni	Marmat	15/M to 20/M	916.23	42	21.726	32	112.99	410	14.15
<b>16</b>	Sarak Prabble	Marmat	24/M, 25/M and 26/M	1885.45	75	27.358	6	30.15	42	2.027
<b>17</b>	Humbal	Marmat	12/M, 13/M and 14/M	156.21	66	5.633	Nil	Nil	Nil	Nil
<b>18</b>	Hud Malhori	Marmat	01/M and 02/M	383.85	174	15.289	5	3.84	55	1.11
<b>19</b>	Muhori	Marmat	01/M and 02/M	99.95	31	8.47	Nil	Nil	Nil	Nil
<b>20</b>	Pourshan Aroda	Marmat	44/M to 47/M	822.74	86	16.93	16	11.33	99	6.887
<b>21</b>	Behota Marta	Marmat	31/M to 35/M	1257.38	68	19.312	7	7.69	41	2.108
<b>22</b>	Kalmoth Mundal	Marmat	27/M to 30/M	2437.7	42	29.97	7	29.74	37	2.867
<b>23</b>	Logaramani	Marmat	41/M to 43/M	1904.88	55	22.53	25	14.16	142	8.245
<b>24</b>	Puran Rui	Marmat	34/M	54.63	100	5.33	Nil	Nil	Nil	Nil
<b>25</b>	Gugruta Bhata	Marmat	06/M to 07/M	175.21	128	10.451	6	42.88	219	1.84



<b>26</b>	Magor Padernal	Marmat	35/M Part	86.80	103	6.437	2	0.81	11	0.28
<b>S.No.</b>	<b>Name of Forests</b>	<b>Village</b>	<b>COMPARTMENT</b>	<b>FOREST AREA Hectares</b>	<b>Total Number of Main Line BP's</b>	<b>Boundary in Length Kms</b>	<b>Number of Chaks</b>	<b>Area of Chaks (Hect)</b>	<b>B.P's of each Chak</b>	<b>Boundary Length of Chaks (Miles)</b>
<b>27</b>	Roat Pain	Marmat	47/M Part, 48/M Part	83.16	47	4.828	3	3.24	30	0.87
<b>28</b>	Ranka	Marmat	05/Ch and 06/Ch	125.86	191	11.67	Nil	Nil	Nil	Nil
<b>29</b>	Gudser	Marmat	05/Ch and 06/Ch	6.88	45	1.810	Nil	Nil	Nil	Nil
<b>30</b>	Assar	Marmat	19/Ch	107.41	26	8.470	Nil	Nil	Nil	Nil
<b>31</b>	Bachater Ban	Marmat	19/Ch	65.96	14	5.633	Nil	Nil	Nil	Nil
<b>32</b>	Shibghoor	Marmat	09/Ch to 18/Ch	3056.22	334	53.309	69	253.74	705	24.78
<b>33</b>	Ladha Dhar Western	Lander/ Gandhri	77/G to 81/G and 101/ L to 104/L	2376.74	157	61.759	26	163.89	265	9.89
<b>34</b>	SurniKund	Gandhri	76/G	1874.11	219	33.796	17	100.36	282	6.81
<b>35</b>	Kothi Badhole	Lander/Gandhri	67/G,68/G and 74/G	684.73	148	26.433	6	41.72	61	3.96
<b>36</b>	Kothi Tangar	Lander Gandhri	72/G and 73/G	966.85	119	22.027	6	58.48	106	6.63

#### ABSTRACT OF FORM-1

<b>Range</b>	<b>No. of Forests</b>	<b>Forest area as per Form1 (Ha)</b>	<b>No. of Main line BPs</b>	<b>Length of main line (Kms)</b>	<b>No. of Chaks</b>	<b>Area of Chaks (Ha)</b>	<b>No. of BPs in Chaks</b>	<b>Length of Chak line (Kms)</b>
<b>Batote</b>	13	9166.59	1558	240.24	153	1304.97	2212	168.3
<b>Gandhri</b>	4	5902.43	643	144.01	55	364.45	714	56.38
<b>Marmat</b>	19	14401.04	1650	289.63	205	596.49	2270	133.93

<b>Total</b>	<b>36</b>	<b>29470.06</b>	<b>3851</b>	<b>673.88</b>	<b>413</b>	<b>2265.91</b>	<b>5196</b>	<b>358.61</b>
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**APPENDIX II STATEMENT OF RENOVATION WORK OF DEMARCATION LINE FROM 2000-01 TO 2016-17**

Year	Forest	Range	Comptt.	Main line		Chak			Total BPs (Nos)	Area of the Forests (ha)
				BPs (Nos)	Length (kms)	No	BPs (No)	Length (km)		
2000-01	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2001-02	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2002-03	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2003-04	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2004-05	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2005-06	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2006-07	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2007-08	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2008-09	Dedni	Marmat	15-20/M	42	0	32	410	0	0	916.623
	Humble	Marmat	12-14/M	66	0	0	0	0	0	156.209
	Kothi Tangar	Gandhri	72,74 & 77/G	225	0	0	0	0	0	166.24
2009-10	Hud- Malohari	Marmat	13-14/M	174	9.467 miles	0	55	9.40 Miles	0	445.946
	Ranka	Marmat	58-63 & 68-69/M	191	7.379 Miles	0	0	0	0	311.00
2010-11	Kothi Badhol	Gandhri	67,68 & 74/G	148		0	61	0	0	0
2011-12	Surnikund	Gandhri	64,66,74,75,78,& 79/G						400 BPs fixed out of 502 BPs	

2011-12	Denga-Batote	Batote	11-15/Btt	192	11.86Km	9	135	7.65	327	213.659
2012-13	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Year	Forest	Range	Comptt.	Main line		Chak			Total BPs (Nos)	Area of the Forests (ha)
				BPs (Nos)	Length (kms)	No	BPs (No)	Length (km)		
2013-14	Sanna	Batote	20,21,24-26/Btt							
2014-15	karma									
2015-16	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2016-17	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

**APPENDIX III      ESTATE AREA STATEMENT (estimation as per GIS) AND WORKING CIRCLES OF BATOTE FOREST  
DIVISION**

<b>S.No.</b>	<b>Division</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non- Forest area (Ha)</b>	<b>Total Area (Ha)</b>	<b>Working Circle Previous</b>	<b>Working Circle proposed</b>
<b>1</b>	Batote	Batote	Shivgarh	Chakwa	1	57.48	194.71	252.18	Protection WC	Protection WC
<b>2</b>	Batote	Batote	Shivgarh	Chakwa	2	147.55	84.80	232.35	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>3</b>	Batote	Batote	Shivgarh	Chakwa	3a	31.48	51.16	82.64	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>4</b>	Batote	Batote	Shivgarh	Chakwa	3b	78.67	46.86	125.53	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>5</b>	Batote	Batote	Shivgarh	Chakwa	4	64.58	33.34	97.91	Deodar-Kail Conversion	Deodar Kail selection WC
<b>6</b>	Batote	Batote	Shivgarh	Chakwa	5	52.54	39.10	91.64	Deodar-Kail Conversion	Deodar Kail selection WC
<b>7</b>	Batote	Batote	Shivgarh	Shivgarh	6	92.31	80.37	172.68	Deodar-Kail Converted	Deodar Kail selection WC
<b>8</b>	Batote	Batote	Shivgarh	Shivgarh	7	66.85	53.25	120.10	Protection WC	Protection WC
<b>9</b>	Batote	Batote	Shivgarh	Shivgarh	8a	67.79	19.99	87.77	Mixed Conifers Selection	Mixed Conifer selection WC
<b>10</b>	Batote	Batote	Shivgarh	Shivgarh	8b	34.48	15.45	49.93	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>11</b>	Batote	Batote	Shivgarh	Patnitop	9	56.85	23.19	80.05	Reboisement WC	Reboisement WC
<b>12</b>	Batote	Batote	Shivgarh	Patnitop	10a	53.20	26.00	79.21	Reboisement WC	Reboisement WC
<b>13</b>	Batote	Batote	Shivgarh	Patnitop	10b	70.44	30.72	101.16	Reboisement WC	Reboisement WC
<b>14</b>	Batote	Batote	Shivgarh	Patnitop	10c	11.24	12.45	23.69	Reboisement WC	Reboisement WC
<b>15</b>	Batote	Batote	Batote	Batote	11	93.26	109.70	202.96	Deodar-Kail Unallotted	Reboisement WC
<b>16</b>	Batote	Batote	Batote	Batote	12a	23.73	58.22	81.96	Reboisement WC	Reboisement WC
<b>17</b>	Batote	Batote	Batote	Batote	12b	23.05	86.74	109.79	Reboisement WC	Reboisement WC
<b>18</b>	Batote	Batote	Batote	Champa	13	23.75	292.19	315.94	Protection WC	Protection WC
<b>19</b>	Batote	Batote	Batote	Champa	14a	33.98	69.10	103.08	Reboisement WC	Reboisement WC
<b>20</b>	Batote	Batote	Batote	Champa	14b	25.67	26.34	52.01	Chir Irregular WC	Chir Irregular WC
<b>21</b>	Batote	Batote	Batote	Champa	14c	55.70	43.33	99.02	Chir Irregular WC	Chir Irregular WC
<b>22</b>	Batote	Batote	Batote	Gami	15	70.64	91.68	162.32	Deodar-Kail Conversion	Deodar Kail selection WC

<b>S.No.</b>	<b>Division</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non-Forest area (Ha)</b>	<b>Total Area (Ha)</b>	<b>Working Circle Previous</b>	<b>Working Circle proposed</b>
23	Batote	Batote	Batote	Gami	16a	56.75	26.11	82.86	Deodar-Kail Converted	Deodar Kail selection WC
24	Batote	Batote	Batote	Gami	16b	32.22	20.58	52.80	Deodar-Kail Unallotted	Deodar Kail selection WC
25	Batote	Batote	Sanasar	Sanasar	17	143.67	213.33	357.00	Deodar-Kail Conversion	Deodar Kail selection WC
26	Batote	Batote	Sanasar	Sanasar	18a	66.82	57.84	124.66	Deodar-Kail Converted	Deodar Kail selection WC
27	Batote	Batote	Sanasar	Sanasar	18b	110.24	88.42	198.66	Mixed Conifers Selection	Mixed Conifer selection WC
28	Batote	Batote	Sanasar	Sanasar	19	72.35	404.86	477.22	Reboisement WC	Reboisement WC
29	Batote	Batote	Sanasar	Sanasar	20	91.01	555.96	646.98	Reboisement WC	Reboisement WC
30	Batote	Batote	Sanasar	Sanasar	21	21.72	143.98	165.69	Deodar-Kail Conversion	Reboisement WC
31	Batote	Batote	Sanasar	Dhalwas	22a	24.09	24.18	48.27	Deodar-Kail Unallotted	Reboisement WC
32	Batote	Batote	Sanasar	Dhalwas	22b	79.89	191.71	271.60	Reboisement WC	Reboisement WC
33	Batote	Batote	Sanasar	Dhalwas	23a	28.08	69.68	97.76	Chir Irregular WC	Reboisement WC
34	Batote	Batote	Sanasar	Dhalwas	23b	43.84	182.39	226.22	Reboisement WC	Reboisement WC
35	Batote	Batote	Sanasar	Dhalwas	24	176.44	91.96	268.39	Deodar-Kail Unallotted	Deodar Kail selection WC
36	Batote	Batote	Sanasar	Dhalwas	25	129.05	107.01	236.06	Deodar-Kail Converted	Deodar Kail selection WC
37	Batote	Batote	Sanasar	Sawani	26a	37.76	118.23	156.00	Fir Selection WC	Fir Selection WC
38	Batote	Batote	Sanasar	Sawani	26b	32.51	52.31	84.82	Deodar-Kail Unallotted	Reboisement WC
39	Batote	Batote	Sanasar	Sawani	27a	52.16	81.12	133.29	Deodar-Kail Converted	Deodar Kail selection WC
40	Batote	Batote	Sanasar	Sawani	27b	33.75	51.37	85.12	Chir Irregular WC	Chir Irregular WC
41	Batote	Batote	Sanasar	Sawani	28	9.11	133.44	142.55	Reboisement WC	Reboisement WC
42	Batote	Batote	Sanasar	Sawani	29	109.78	104.33	214.11	Deodar-Kail Unallotted	Deodar Kail selection WC
43	Batote	Batote	Sanasar	Chanderkot	30	62.57	101.85	164.41	Deodar-Kail Unallotted	Reboisement WC
44	Batote	Batote	Sanasar	Chanderkot	31	52.89	139.35	192.24	Reboisement WC	Reboisement WC
45	Batote	Batote	Sanasar	Chanderkot	32a	45.14	30.31	75.44	Deodar-Kail Unallotted	Reboisement WC
46	Batote	Batote	Sanasar	Chanderkot	32b	92.54	128.07	220.61	Chir Irregular WC	Reboisement WC
47	Batote	Batote	Sanasar	Chanderkot	33a	50.98	60.17	111.15	Deodar-Kail Conversion	Deodar Kail selection WC

<b>S.No.</b>	<b>Division</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non-Forest area (Ha)</b>	<b>Total Area (Ha)</b>	<b>Working Circle Previous</b>	<b>Working Circle proposed</b>
48	Batote	Batote	Sanasar	Chanderkot	33b	51.70	87.65	139.35	Fir Selection WC	Fir Selection WC
49	Batote	Batote	Balout	Tatarsoo	34	10.10	224.67	234.77	Reboisement WC	Reboisement WC
50	Batote	Batote	Balout	Tatarsoo	35a	18.17	102.99	121.16	Deodar-Kail Unallotted	Reboisement WC
51	Batote	Batote	Balout	Tatarsoo	35b	31.49	65.50	96.99	Chir Irregular WC	Chir Irregular WC
52	Batote	Batote	Balout	Tatarsoo	36a	58.64	50.69	109.33	Chir Irregular WC	Reboisement WC
53	Batote	Batote	Balout	Tatarsoo	36b	10.41	18.04	28.45	Reboisement WC	Reboisement WC
54	Batote	Batote	Balout	Tatarsoo	37a	45.96	66.16	112.12	Chir Irregular WC	Reboisement WC
55	Batote	Batote	Balout	Tatarsoo	37b	11.92	24.16	36.08	Reboisement WC	Reboisement WC
56	Batote	Batote	Balout	Tatarsoo	38a	34.57	31.51	66.08	Deodar-Kail Unallotted	Deodar Kail selection WC
57	Batote	Batote	Balout	Tatarsoo	38b	28.32	78.03	106.35	Reboisement WC	Reboisement WC
58	Batote	Batote	Balout	Balout	39a	75.98	34.38	110.36	Reboisement WC	Reboisement WC
59	Batote	Batote	Balout	Balout	39b	36.49	83.47	119.96	Deodar-Kail Unallotted	Deodar Kail selection WC
60	Batote	Batote	Balout	Balout	40a	21.88	49.79	71.67	Reboisement WC	Reboisement WC
61	Batote	Batote	Balout	Balout	40b	44.69	90.75	135.44	Chir Irregular WC	Reboisement WC
62	Batote	Batote	Balout	Balout	40c	2.20	5.45	7.66	Protection WC	Protection WC
63	Batote	Batote	Balout	Balout	41	96.17	114.44	210.61	Chir Irregular WC	Reboisement WC
64	Batote	Batote	Balout	Balout	42	38.02	20.03	58.05	Reboisement WC	Reboisement WC
65	Batote	Batote	Balout	Balout	43	59.58	48.36	107.94	Chir Irregular WC	Reboisement WC
66	Batote	Batote	Balout	Balout	44a	53.32	50.45	103.77	Deodar-Kail Unallotted	Deodar Kail selection WC
67	Batote	Batote	Balout	Balout	44b	18.66	34.53	53.19	Reboisement WC	Reboisement WC
68	Batote	Gandhri	Kanga	Kugwal	45a	27.00	51.57	78.57	Reboisement WC	Reboisement WC
69	Batote	Gandhri	Kanga	Kugwal	45b	16.08	11.44	27.53	Reboisement WC	Reboisement WC
70	Batote	Gandhri	Kanga	Kugwal	46a	28.87	38.29	67.17	Reboisement WC	Reboisement WC
71	Batote	Gandhri	Kanga	Kugwal	46b	60.47	35.31	95.78	Deodar-Kail Converted	Deodar Kail selection WC
72	Batote	Gandhri	Kanga	Kugwal	47	115.44	91.13	206.58	Deodar-Kail Converted	Deodar Kail selection WC

S.No.	Division	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area (Ha)	Total Area (Ha)	Working Circle Previous	Working Circle proposed
73	Batote	Gandhri	Kanga	Kugwal	48	41.30	82.38	123.68	Chir Irregular WC	Reboisement WC
74	Batote	Gandhri	Kanga	Kugwal	49	22.10	108.36	130.46	Reboisement WC	Reboisement WC
75	Batote	Gandhri	Kanga	Parnot	50a	24.85	62.96	87.82	Chir Irregular WC	Reboisement WC
76	Batote	Gandhri	Kanga	Parnot	50b	103.57	39.84	143.41	Deodar-Kail Conversion	Deodar Kail selection WC
77	Batote	Gandhri	Kanga	Parnot	51a	68.44	36.51	104.95	Deodar-Kail Unallotted	Deodar Kail selection WC
78	Batote	Gandhri	Kanga	Parnot	51b	30.03	104.00	134.03	Chir Irregular WC	Reboisement WC
79	Batote	Gandhri	Kanga	Parnot	52a	49.24	156.65	205.89	Chir Irregular WC	Chir Irregular WC
80	Batote	Gandhri	Kanga	Parnot	52b	10.44	18.47	28.91	Deodar-Kail Conversion	Deodar Kail selection WC
81	Batote	Gandhri	Kanga	Parnot	53	49.55	185.63	235.18	Chir Irregular WC	Reboisement WC
82	Batote	Gandhri	Kanga	Kanga	54	24.33	47.26	71.59	Chir Irregular WC	Chir Irregular WC
83	Batote	Gandhri	Kanga	Kanga	55	72.96	92.83	165.80	Chir Irregular WC	Chir Irregular WC
84	Batote	Gandhri	Kanga	Kanga	56	110.23	155.45	265.69	Chir Irregular WC	Chir Irregular WC
85	Batote	Gandhri	Kanga	Kanga	57a	25.89	66.42	92.31	Reboisement WC	Reboisement WC
86	Batote	Gandhri	Kanga	Kanga	57b	88.45	168.74	257.19	Chir Irregular WC	Reboisement WC
87	Batote	Gandhri	Bhatni	Gandhri	58	57.08	123.40	180.47	Reboisement WC	Reboisement WC
88	Batote	Gandhri	Bhatni	Gandhri	59	38.04	60.59	98.63	Reboisement WC	Reboisement WC
89	Batote	Gandhri	Bhatni	Gandhri	60a	33.80	31.23	65.03	Deodar-Kail Converted	Deodar Kail selection WC
90	Batote	Gandhri	Bhatni	Gandhri	60b	61.14	34.51	95.64	Chir Irregular WC	Chir Irregular WC
91	Batote	Gandhri	Bhatni	Gandhri	61	91.69	93.02	184.71	Chir Irregular WC	Chir Irregular WC
92	Batote	Gandhri	Bhatni	Gandhri	62	34.70	129.99	164.69	Chir Irregular WC	Reboisement WC
93	Batote	Gandhri	Bhatni	Gandhri	63a	10.79	28.19	38.98	Chir Irregular WC	Reboisement WC
94	Batote	Gandhri	Bhatni	Gandhri	63b	37.11	80.49	117.60	Chir Irregular WC	Reboisement WC
95	Batote	Gandhri	Bhatni	Bhathni	64a	54.61	54.59	109.19	Deodar-Kail Conversion	Reboisement WC
96	Batote	Gandhri	Bhatni	Bhathni	64b	31.49	64.74	96.23	Chir Irregular WC	Reboisement WC
97	Batote	Gandhri	Bhatni	Bhathni	65	93.28	43.40	136.68	Deodar-Kail Conversion	Deodar Kail selection WC

<b>S.No.</b>	<b>Division</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non-Forest area (Ha)</b>	<b>Total Area (Ha)</b>	<b>Working Circle Previous</b>	<b>Working Circle proposed</b>
<b>98</b>	Batote	Gandhri	Bhatni	Bhathni	66a	41.05	22.34	63.39	Deodar-Kail Converted	Deodar Kail selection WC
<b>99</b>	Batote	Gandhri	Bhatni	Bhathni	66b	90.88	51.70	142.57	Deodar-Kail Conversion	Deodar Kail selection WC
<b>100</b>	Batote	Gandhri	Bhatni	Bhathni	67a	42.99	30.15	73.13	Deodar-Kail Conversion	Deodar Kail selection WC
<b>101</b>	Batote	Gandhri	Bhatni	Bhathni	67b	5.65	12.92	18.57	Reboisement WC	Reboisement WC
<b>102</b>	Batote	Gandhri	Bhatni	Bhathni	68a	26.90	24.32	51.21	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>103</b>	Batote	Gandhri	Bhatni	Bhathni	68b	48.57	58.67	107.25	Chir Irregular WC	Chir Irregular WC
<b>104</b>	Batote	Gandhri	Bhatni	Bhathni	69	59.18	88.42	147.60	Reboisement WC	Reboisement WC
<b>105</b>	Batote	Gandhri	Bhatni	Tangar	70	41.10	130.30	171.41	Reboisement WC	Protection WC
<b>106</b>	Batote	Gandhri	Bhatni	Tangar	71a	74.47	97.71	172.18	Deodar-Kail Unallotted	Reboisement WC
<b>107</b>	Batote	Gandhri	Bhatni	Tangar	71b	6.82	80.06	86.88	Chir Irregular WC	Reboisement WC
<b>108</b>	Batote	Gandhri	Bhatni	Tangar	72	78.07	109.68	187.75	Chir Irregular WC	Reboisement WC
<b>109</b>	Batote	Gandhri	Bhatni	Tangar	73	48.15	301.70	349.85	Reboisement WC	Reboisement WC
<b>110</b>	Batote	Gandhri	Bhatni	Tangar	74	79.18	190.33	269.51	Reboisement WC	Reboisement WC
<b>111</b>	Batote	Gandhri	Bhatni	Tangar	75a	37.94	31.69	69.62	Deodar-Kail Conversion	Deodar Kail selection WC
<b>112</b>	Batote	Gandhri	Bhatni	Tangar	75b	5.16	14.43	19.59	Reboisement WC	Reboisement WC
<b>113</b>	Batote	Gandhri	Bhatni	Dhuthan	76	97.21	65.06	162.27	Deodar-Kail Converted	Deodar Kail selection WC
<b>114</b>	Batote	Gandhri	Bhatni	Dhuthan	77a	150.51	197.22	347.73	Fir Selection WC	Fir Selection WC
<b>115</b>	Batote	Gandhri	Bhatni	Dhuthan	77b	51.42	30.10	81.52	Deodar-Kail Converted	Deodar Kail selection WC
<b>116</b>	Batote	Gandhri	Bhatni	Dhuthan	78a	57.91	78.79	136.70	Fir Selection WC	Fir Selection WC
<b>117</b>	Batote	Gandhri	Bhatni	Dhuthan	78b	75.36	25.53	100.89	Deodar-Kail Converted	Deodar Kail selection WC
<b>118</b>	Batote	Gandhri	Bhatni	Dhuthan	79	101.08	80.33	181.41	Deodar-Kail Unallotted	Deodar Kail selection WC
<b>119</b>	Batote	Gandhri	Bhatni	Dhuthan	80a	32.30	53.15	85.45	Deodar-Kail Unallotted	Reboisement WC
<b>120</b>	Batote	Gandhri	Bhatni	Dhuthan	80b	21.12	79.30	100.42	Protection WC	Reboisement WC
<b>121</b>	Batote	Gandhri	Bhatni	Dhuthan	81a	46.09	41.91	88.01	Deodar-Kail Converted	Deodar Kail selection WC
<b>122</b>	Batote	Gandhri	Bhatni	Dhuthan	81b	79.93	30.85	110.78	Mixed Conifers Selection	Mixed Conifer selection WC



S.No.	Division	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area (Ha)	Total Area (Ha)	Working Circle Previous	Working Circle proposed
123	Batote	Marmat	Dedni	Khellani	9	19.33	58.28	77.61	Reboisement WC	Reboisement WC
124	Batote	Marmat	Dedni	Khellani	10a	35.91	67.45	103.36	Reboisement WC	Reboisement WC
125	Batote	Marmat	Dedni	Khellani	10b	47.84	39.75	87.58	Mixed Conifers Selection	Mixed Conifer selection WC
126	Batote	Marmat	Dedni	Khellani	11	117.91	28.41	146.32	Deodar-Kail Converted	Deodar Kail selection WC
127	Batote	Marmat	Dedni	Khellani	12a	196.65	56.13	252.78	Deodar-Kail Converted	Deodar Kail selection WC
128	Batote	Marmat	Dedni	Khellani	12b	27.97	29.09	57.06	Protection WC	Protection WC
129	Batote	Marmat	Dedni	Khellani	13a	49.61	16.98	66.58	Deodar-Kail Converted	Deodar Kail selection WC
130	Batote	Marmat	Dedni	Khellani	13b	35.67	24.74	60.41	Mixed Conifers Selection	Mixed Conifer selection WC
131	Batote	Marmat	Dedni	Khellani	13c	35.16	54.46	89.62	Protection WC	Protection WC
132	Batote	Marmat	Dedni	Humble	14	76.01	49.22	125.23	Deodar-Kail Unallotted	Reboisement WC
133	Batote	Marmat	Dedni	Humble	15a	137.09	59.69	196.78	Deodar-Kail Converted	Deodar Kail selection WC
134	Batote	Marmat	Dedni	Humble	15b	63.08	91.33	154.41	Protection WC	Protection WC
135	Batote	Marmat	Dedni	Humble	16	54.79	133.67	188.46	Reboisement WC	Reboisement WC
136	Batote	Marmat	Dedni	Humble	17a	37.59	50.76	88.34	Fir Selection WC	Fir Selection WC
137	Batote	Marmat	Dedni	Humble	17b	112.64	64.05	176.70	Deodar-Kail Converted	Deodar Kail selection WC
138	Batote	Marmat	Dedni	Humble	18a	29.53	49.46	78.99	Fir Selection WC	Protection WC
139	Batote	Marmat	Dedni	Humble	18b	49.37	47.41	96.78	Protection WC	Protection WC
140	Batote	Marmat	Dedni	Goha	19a	88.86	59.75	148.61	Protection WC	Protection WC
141	Batote	Marmat	Dedni	Goha	19b	39.42	19.56	58.99	Fir Selection WC	Fir Selection WC
142	Batote	Marmat	Dedni	Goha	20a	57.61	31.24	88.85	Fir Selection WC	Fir Selection WC
143	Batote	Marmat	Dedni	Goha	20b	16.22	23.92	40.15	Deodar-Kail Converted	Reboisement WC
144	Batote	Marmat	Dedni	Goha	20c	33.18	26.33	59.51	Mixed Conifers Selection	Reboisement WC
145	Batote	Marmat	Dedni	Goha	21a	75.88	51.41	127.30	Protection WC	Protection WC
146	Batote	Marmat	Dedni	Goha	21b	62.42	49.36	111.78	Deodar-Kail Converted	Deodar Kail selection WC
147	Batote	Marmat	Dedni	Goha	21c	24.85	28.64	53.49	Reboisement WC	Reboisement WC

<b>S.No.</b>	<b>Division</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non-Forest area (Ha)</b>	<b>Total Area (Ha)</b>	<b>Working Circle Previous</b>	<b>Working Circle proposed</b>
148	Batote	Marmat	Dedni	Goha	22	63.96	71.68	135.64	Protection WC	Protection WC
149	Batote	Marmat	Dedni	Goha	23	228.07	309.77	537.84	Fir Selection WC	Protection WC
150	Batote	Marmat	Dedni	Goha	24a	266.07	128.37	394.44	Fir Selection WC	Fir Selection WC
151	Batote	Marmat	Dedni	Goha	24b	134.76	57.83	192.59	Fir Selection WC	Fir Selection WC
152	Batote	Marmat	Behota	Mangota	25a	108.58	71.31	179.89	Fir Selection WC	Fir Selection WC
153	Batote	Marmat	Behota	Mangota	25b	203.29	189.41	392.70	Fir Selection WC	Protection WC
154	Batote	Marmat	Behota	Mangota	26	108.99	171.00	279.99	Protection WC	Protection WC
155	Batote	Marmat	Behota	Mangota	27a	12.60	34.97	47.57	Fir Selection WC	Reboisement WC
156	Batote	Marmat	Behota	Mangota	27b	28.58	25.18	53.76	Deodar-Kail Unallotted	Reboisement WC
157	Batote	Marmat	Behota	Mangota	27c	18.58	13.03	31.60	Fir Selection WC	Reboisement WC
158	Batote	Marmat	Behota	Mangota	28	224.18	124.82	349.00	Reboisement WC	Mixed Conifer selection WC
159	Batote	Marmat	Behota	Mangota	29	280.42	254.41	534.83	Mixed Conifers Selection	Mixed Conifer selection WC
160	Batote	Marmat	Behota	Mangota	30	328.81	307.48	636.29	Fir Selection WC	Mixed Conifer selection WC
161	Batote	Marmat	Behota	Behota	31	261.91	228.25	490.16	Fir Selection WC	Fir Selection WC
162	Batote	Marmat	Behota	Behota	32	80.49	96.79	177.28	Reboisement WC	Reboisement WC
163	Batote	Marmat	Behota	Behota	33	100.96	91.74	192.69	Fir Selection WC	Fir Selection WC
164	Batote	Marmat	Behota	Behota	34	24.37	34.23	58.60	Deodar-Kail Converted	Reboisement WC
165	Batote	Marmat	Behota	Behota	35a	46.15	64.19	110.34	Deodar-Kail Converted	Deodar Kail selection WC
166	Batote	Marmat	Behota	Behota	35b	25.77	46.17	71.94	Mixed Conifers Selection	Reboisement WC
167	Batote	Marmat	Behota	Behota	35c	134.78	176.93	311.70	Fir Selection WC	Fir Selection WC
168	Batote	Marmat	Behota	Behota	36	219.27	92.38	311.65	Fir Selection WC	Fir Selection WC
169	Batote	Marmat	Behota	Behota	37	226.01	139.63	365.65	Fir Selection WC	Fir Selection WC
170	Batote	Marmat	Behota	Loga	38	112.15	45.43	157.57	Mixed Conifers Selection	Mixed Conifer selection WC
171	Batote	Marmat	Behota	Loga	39	104.67	52.00	156.67	Fir Selection WC	Fir Selection WC
172	Batote	Marmat	Behota	Loga	40	187.41	110.06	297.47	Mixed Conifers Selection	Mixed Conifer selection WC

S.No.	Division	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area (Ha)	Total Area (Ha)	Working Circle Previous	Working Circle proposed
173	Batote	Marmat	Behota	Loga	41	165.89	107.15	273.04	Mixed Conifers Selection	Mixed Conifer selection WC
174	Batote	Marmat	Behota	Loga	42	217.53	151.00	368.53	Mixed Conifers Selection	Mixed Conifer selection WC
175	Batote	Marmat	Behota	Loga	43a	117.98	134.56	252.54	Mixed Conifers Selection	Mixed Conifer selection WC
176	Batote	Marmat	Behota	Loga	43b	57.25	34.53	91.78	Deodar-Kail Converted	Deodar Kail selection WC
177	Batote	Marmat	Roat	Roat	44	110.68	65.62	176.29	Protection WC	Protection WC
178	Batote	Marmat	Roat	Roat	45	157.74	64.35	222.09	Fir Selection WC	Mixed Conifer selection WC
179	Batote	Marmat	Roat	Roat	46a	48.33	61.54	109.87	Deodar-Kail Unallotted	Reboisement WC
180	Batote	Marmat	Roat	Roat	46b	38.61	48.80	87.41	Reboisement WC	Reboisement WC
181	Batote	Marmat	Roat	Roat	47	121.44	68.24	189.68	Mixed Conifers Selection	Mixed Conifer selection WC
182	Batote	Marmat	Roat	Roat	48	28.18	64.71	92.89	Reboisement WC	Reboisement WC
183	Batote	Marmat	Roat	Roat	49	113.72	146.44	260.17	Protection WC	Protection WC
184	Batote	Marmat	Roat	Sewat	50	81.06	48.22	129.28	Mixed Conifers Selection	Mixed Conifer selection WC
185	Batote	Marmat	Roat	Sewat	51	90.84	88.10	178.94	Mixed Conifers Selection	Mixed Conifer selection WC
186	Batote	Marmat	Roat	Sewat	52	39.62	57.47	97.09	Mixed Conifers Selection	Mixed Conifer selection WC
187	Batote	Marmat	Roat	Sewat	53	30.64	33.06	63.69	Mixed Conifers Selection	Reboisement WC
188	Batote	Marmat	Roat	Sewat	54	62.66	81.74	144.40	Reboisement WC	Reboisement WC
189	Batote	Marmat	Roat	Khrounhi	55	34.49	48.00	82.49	Fir Selection WC	Mixed Conifer selection WC
190	Batote	Marmat	Roat	Khrounhi	56	19.21	24.51	43.72	Reboisement WC	Reboisement WC
191	Batote	Marmat	Roat	Khrounhi	57	82.81	158.39	241.20	Reboisement WC	Reboisement WC
192	Batote	Marmat	Roat	Khrounhi	58	45.24	269.67	314.91	Deodar-Kail Unallotted	Reboisement WC
193	Batote	Marmat	Bulandpur	Bulandpur	59	72.80	200.48	273.28	Reboisement WC	Reboisement WC
194	Batote	Marmat	Bulandpur	Bulandpur	60	154.20	275.66	429.86	Mixed Conifers Selection	Mixed Conifer selection WC
195	Batote	Marmat	Bulandpur	Bulandpur	61	147.03	102.65	249.69	Mixed Conifers Selection	Mixed Conifer selection WC
196	Batote	Marmat	Bulandpur	Bulandpur	62	65.46	58.68	124.14	Mixed Conifers Selection	Mixed Conifer selection WC
197	Batote	Marmat	Bulandpur	Bulandpur	63	122.80	88.83	211.63	Protection WC	Protection WC

S.No.	Division	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area (Ha)	Total Area (Ha)	Working Circle Previous	Working Circle proposed
198	Batote	Marmat	Bulandpur	Assar	64	104.99	61.10	166.09	Mixed Conifers Selection	Mixed Conifer selection WC
199	Batote	Marmat	Bulandpur	Assar	65	289.81	283.25	573.06	Mixed Conifers Selection	Mixed Conifer selection WC
200	Batote	Marmat	Bulandpur	Assar	66	92.90	82.26	175.16	Mixed Conifers Selection	Reboisement WC
201	Batote	Marmat	Bulandpur	Assar	67	73.23	156.84	230.07	Protection WC	Protection WC
202	Batote	Marmat	Bulandpur	Assar	68	68.22	164.17	232.39	Protection WC	Protection WC
203	Batote	Marmat	Bulandpur	Assar	69	82.57	50.78	133.36	Protection WC	Protection WC
204	Batote	Marmat	Bulandpur	Assar	70	89.18	261.10	350.28	Protection WC	Protection WC
205	Batote	Marmat	Bulandpur	Baggar	71	123.91	89.44	213.35	Mixed Conifers Selection	Mixed Conifer selection WC
206	Batote	Marmat	Bulandpur	Baggar	72	233.07	137.60	370.67	Mixed Conifers Selection	Mixed Conifer selection WC
207	Batote	Marmat	Bulandpur	Baggar	73	75.48	58.89	134.37	Mixed Conifers Selection	Mixed Conifer selection WC
208	Batote	Marmat	Bulandpur	Baggar	74	8.68	85.34	94.02	Protection WC	Protection WC
						15074.51	18233.67	33308.18		

#### ABSTRACT

RANGE	DEODAR-KAIL SELECTION WC	MIXED CONIFER SELECTION WC	FIR SELECTION WC	CHIR IRREGULAR WC	REBOISEMENT WC	PROTECTION WC	TOTAL
BATOTE	2885.15	286.43	295.35	333.14	5091.22	695.87	9587.16
GANDHRI	1795.37	110.78	484.44	1096.56	3477.50	171.40	7136.05
MARMAT	1153.05	6178.06	2831.62	0	2635.10	3787.14	16584.97
TOTAL	5833.57	6575.27	3611.41	1429.70	11203.82	4654.41	33308.18

# **APPENDIX IV      COMPARISON OF AREA ESTIMATION IN PREVIOUS AND CURRENT WORKING PLAN**

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
<b>1</b>	Batote	1	0	65	154	219	57.48	194.71	252.18
<b>2</b>	Batote	2	232	0	18	250	147.55	84.80	232.35
<b>3</b>	Batote	3a	99	0	32	131	31.48	51.16	82.64
<b>4</b>	Batote	3b	65	0	9	74	78.67	46.86	125.53
<b>5</b>	Batote	4	85	0	12	97	64.58	33.34	97.91
<b>6</b>	Batote	5	75	3	12	90	52.54	39.10	91.64
<b>7</b>	Batote	6	145	0	27	172	92.31	80.37	172.68
<b>8</b>	Batote	7	65	19	41	125	66.85	53.25	120.10
<b>9</b>	Batote	8a	56	0	8	64	67.79	19.99	87.77
<b>10</b>	Batote	8b	69	0	4	73	34.48	15.45	49.93
<b>11</b>	Batote	9	65	24	7	96	56.85	23.19	80.05
<b>12</b>	Batote	10a	30	58	7	95	53.20	26.00	79.21
<b>13</b>	Batote	10b	0	58	20	78	70.44	30.72	101.16
<b>14</b>	Batote	10c	0	27	9	36	11.24	12.45	23.69
<b>15</b>	Batote	11	125	50	20	195	93.26	109.70	202.96
<b>16</b>	Batote	12a	40	20	20	80	23.73	58.22	81.96
<b>17</b>	Batote	12b	0	38	77	115	23.05	86.74	109.79
<b>18</b>	Batote	13	0	207	98	305	23.75	292.19	315.94
<b>19</b>	Batote	14a	75	54	55	184	33.98	69.10	103.08
<b>20</b>	Batote	14b	34	20	4	58	25.67	26.34	52.01
<b>21</b>	Batote	14c	22	52	8	82	55.70	43.33	99.02
<b>22</b>	Batote	15	100	35	33	168	70.64	91.68	162.32

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
23	Batote	16a	42	16	4	62	56.75	26.11	82.86
24	Batote	16b	45	15	8	68	32.22	20.58	52.80
25	Batote	17	123	40	190	353	143.67	213.33	357.00
26	Batote	18a	87	27	2	116	66.82	57.84	124.66
27	Batote	18b	116	19	6	141	110.24	88.42	198.66
28	Batote	19	87	139	296	522	72.35	404.86	477.22
29	Batote	20	120	29	312	461	91.01	555.96	646.98
30	Batote	21	50	26	107	183	21.72	143.98	165.69
31	Batote	22a	46	14	21	81	24.09	24.18	48.27
32	Batote	22b	165	35	35	235	79.89	191.71	271.60
33	Batote	23a	53	10	25	88	28.08	69.68	97.76
34	Batote	23b	50	26	54	130	43.84	182.39	226.22
35	Batote	24	207	34	13	254	176.44	91.96	268.39
36	Batote	25	152	13	42	207	129.05	107.01	236.06
37	Batote	26a	82	0	53	135	37.76	118.23	156.00
38	Batote	26b	88	7	15	110	32.51	52.31	84.82
39	Batote	27a	107	8	17	132	52.16	81.12	133.29
40	Batote	27b	30	18	8	56	33.75	51.37	85.12
41	Batote	28	75	8	50	133	9.11	133.44	142.55
42	Batote	29	188	23	10	221	109.78	104.33	214.11
43	Batote	30	141	9	40	190	62.57	101.85	164.41
44	Batote	31	100	20	65	185	52.89	139.35	192.24
45	Batote	32a	54	15	21	90	45.14	30.31	75.44
46	Batote	32b	129	26	30	185	92.54	128.07	220.61
47	Batote	33a	67	9	40	116	50.98	60.17	111.15

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
48	Batote	33b	76	10	48	134	51.70	87.65	139.35
49	Batote	34	102	48	78	228	10.10	224.67	234.77
50	Batote	35a	60	0	8	68	18.17	102.99	121.16
51	Batote	35b	55	12	16	83	31.49	65.50	96.99
52	Batote	36a	75	0	10	85	58.64	50.69	109.33
53	Batote	36b	0	7	9	16	10.41	18.04	28.45
54	Batote	37a	67	8	14	89	45.96	66.16	112.12
55	Batote	37b	11	0	17	28	11.92	24.16	36.08
56	Batote	38a	108	0	10	118	34.57	31.51	66.08
57	Batote	38b	15	0	42	57	28.32	78.03	106.35
58	Batote	39a	92	7	21	120	75.98	34.38	110.36
59	Batote	39b	69	0	26	95	36.49	83.47	119.96
60	Batote	40a	53	7	16	76	21.88	49.79	71.67
61	Batote	40b	130	12	40	182	44.69	90.75	135.44
62	Batote	40c	12	10	0	22	2.20	5.45	7.66
63	Batote	41	163	15	32	210	96.17	114.44	210.61
64	Batote	42	38	12	12	62	38.02	20.03	58.05
65	Batote	43	82	22	9	113	59.58	48.36	107.94
66	Batote	44a	74	10	23	107	53.32	50.45	103.77
67	Batote	44b	19	7	18	44	18.66	34.53	53.19
68	Gandhri	45a	27	7	13	47	27.00	51.57	78.57
69	Gandhri	45b	19	0	10	29	16.08	11.44	27.53
70	Gandhri	46a	65	0	24	89	28.87	38.29	67.17
71	Gandhri	46b	135	0	5	140	60.47	35.31	95.78
72	Gandhri	47	122	12	6	140	115.44	91.13	206.58

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
73	Gandhri	48	124	26	40	190	41.30	82.38	123.68
74	Gandhri	49	128	0	42	170	22.10	108.36	130.46
75	Gandhri	50a	50	0	7	57	24.85	62.96	87.82
76	Gandhri	50b	96	20	5	121	103.57	39.84	143.41
77	Gandhri	51a	98	0	6	104	68.44	36.51	104.95
78	Gandhri	51b	85	24	10	119	30.03	104.00	134.03
79	Gandhri	52a	100	78	39	217	49.24	156.65	205.89
80	Gandhri	52b	32	0	3	35	10.44	18.47	28.91
81	Gandhri	53	126	30	52	208	49.55	185.63	235.18
82	Gandhri	54	55	24	5	84	24.33	47.26	71.59
83	Gandhri	55	129	36	23	188	72.96	92.83	165.80
84	Gandhri	56	104	120	40	264	110.23	155.45	265.69
85	Gandhri	57a	9	84	13	106	25.89	66.42	92.31
86	Gandhri	57b	78	144	35	257	88.45	168.74	257.19
87	Gandhri	58	53	88	30	171	57.08	123.40	180.47
88	Gandhri	59	71	15	5	91	38.04	60.59	98.63
89	Gandhri	60a	66	0	11	77	33.80	31.23	65.03
90	Gandhri	60b	73	25	13	111	61.14	34.51	95.64
91	Gandhri	61	100	24	33	157	91.69	93.02	184.71
92	Gandhri	62	35	109	12	156	34.70	129.99	164.69
93	Gandhri	63a	41	6	7	54	10.79	28.19	38.98
94	Gandhri	63b	50	8	9	67	37.11	80.49	117.60
95	Gandhri	64a	81	8	4	93	54.61	54.59	109.19
96	Gandhri	64b	70	20	20	110	31.49	64.74	96.23
97	Gandhri	65	120	5	8	133	93.28	43.40	136.68



S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
98	Gandhri	66a	52	5	8	65	41.05	22.34	63.39
99	Gandhri	66b	90	29	6	125	90.88	51.70	142.57
100	Gandhri	67a	74	0	3	77	42.99	30.15	73.13
101	Gandhri	67b	13	0	6	19	5.65	12.92	18.57
102	Gandhri	68a	57	0	8	65	26.90	24.32	51.21
103	Gandhri	68b	71	9	24	104	48.57	58.67	107.25
104	Gandhri	69	43	31	13	87	59.18	88.42	147.60
105	Gandhri	70	70	40	24	134	41.10	130.30	171.41
106	Gandhri	71a	45	0	12	57	74.47	97.71	172.18
107	Gandhri	71b	78	19	24	121	6.82	80.06	86.88
108	Gandhri	72	55	21	17	93	78.07	109.68	187.75
109	Gandhri	73	100	123	87	310	48.15	301.70	349.85
110	Gandhri	74	130	84	40	254	79.18	190.33	269.51
111	Gandhri	75a	61	0	15	76	37.94	31.69	69.62
112	Gandhri	75b	19	0	2	21	5.16	14.43	19.59
113	Gandhri	76	123	0	22	145	97.21	65.06	162.27
114	Gandhri	77a	171	0	69	240	150.51	197.22	347.73
115	Gandhri	77b	123	31	14	168	51.42	30.10	81.52
116	Gandhri	78a	109	0	27	136	57.91	78.79	136.70
117	Gandhri	78b	62	24	14	100	75.36	25.53	100.89
118	Gandhri	79	88	53	24	165	101.08	80.33	181.41
119	Gandhri	80a	50	18	7	75	32.30	53.15	85.45
120	Gandhri	80b	44	15	23	82	21.12	79.30	100.42
121	Gandhri	81a	60	26	13	99	46.09	41.91	88.01
122	Gandhri	81b	69	21	21	111	79.93	30.85	110.78

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
123	Marmat	9	46	72	10	128	19.33	58.28	77.61
124	Marmat	10a	45	15	12	72	35.91	67.45	103.36
125	Marmat	10b	82	28	73	183	47.84	39.75	87.58
126	Marmat	11	113	35	10	158	117.91	28.41	146.32
127	Marmat	12a	171	56	8	235	196.65	56.13	252.78
128	Marmat	12b	0	29	8	37	27.97	29.09	57.06
129	Marmat	13a	61	0	6	67	49.61	16.98	66.58
130	Marmat	13b	35	26	4	65	35.67	24.74	60.41
131	Marmat	13c	0	108	14	122	35.16	54.46	89.62
132	Marmat	14	68	38	24	130	76.01	49.22	125.23
133	Marmat	15a	117	47	22	186	137.09	59.69	196.78
134	Marmat	15b	56	40	64	160	63.08	91.33	154.41
135	Marmat	16	108	0	63	171	54.79	133.67	188.46
136	Marmat	17a	80	0	6	86	37.59	50.76	88.34
137	Marmat	17b	142	7	11	160	112.64	64.05	176.70
138	Marmat	18a	45	5	31	81	29.53	49.46	78.99
139	Marmat	18b	30	37	29	96	49.37	47.41	96.78
140	Marmat	19a	60	64	25	149	88.86	59.75	148.61
141	Marmat	19b	46	14	8	68	39.42	19.56	58.99
142	Marmat	20a	94	0	4	98	57.61	31.24	88.85
143	Marmat	20b	46	0	4	50	16.22	23.92	40.15
144	Marmat	20c	37	0	3	40	33.18	26.33	59.51
145	Marmat	21a	75	7	7	89	75.88	51.41	127.30
146	Marmat	21b	85	47	37	169	62.42	49.36	111.78
147	Marmat	21c	38	7	5	50	24.85	28.64	53.49

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
148	Marmat	22	81	52	8	141	63.96	71.68	135.64
149	Marmat	23	249	121	148	518	228.07	309.77	537.84
150	Marmat	24a	308	0	51	359	266.07	128.37	394.44
151	Marmat	24b	165	25	20	210	134.76	57.83	192.59
152	Marmat	25a	104	30	30	164	108.58	71.31	179.89
153	Marmat	25b	188	30	157	375	203.29	189.41	392.70
154	Marmat	26	81	95	90	266	108.99	171.00	279.99
155	Marmat	27a	36	0	15	51	12.60	34.97	47.57
156	Marmat	27b	45	0	8	53	28.58	25.18	53.76
157	Marmat	27c	25	0	8	33	18.58	13.03	31.60
158	Marmat	28	279	25	52	356	224.18	124.82	349.00
159	Marmat	29	327	40	173	540	280.42	254.41	534.83
160	Marmat	30	381	100	150	631	328.81	307.48	636.29
161	Marmat	31	329	55	102	486	261.91	228.25	490.16
162	Marmat	32	136	0	30	166	80.49	96.79	177.28
163	Marmat	33	187	0	35	222	100.96	91.74	192.69
164	Marmat	34	56	0	14	70	24.37	34.23	58.60
165	Marmat	35a	88	0	15	103	46.15	64.19	110.34
166	Marmat	35b	138	0	15	153	25.77	46.17	71.94
167	Marmat	35c	76	6	4	86	134.78	176.93	311.70
168	Marmat	36	139	58	15	212	219.27	92.38	311.65
169	Marmat	37	279	50	175	504	226.01	139.63	365.65
170	Marmat	38	91	32	5	128	112.15	45.43	157.57
171	Marmat	39	122	0	25	147	104.67	52.00	156.67
172	Marmat	40	225	0	30	255	187.41	110.06	297.47

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
173	Marmat	41	182	50	21	253	165.89	107.15	273.04
174	Marmat	42	276	34	60	370	217.53	151.00	368.53
175	Marmat	43a	188	25	36	249	117.98	134.56	252.54
176	Marmat	43b	65	0	31	96	57.25	34.53	91.78
177	Marmat	44	118	47	20	185	110.68	65.62	176.29
178	Marmat	45	119	67	45	231	157.74	64.35	222.09
179	Marmat	46a	91	0	27	118	48.33	61.54	109.87
180	Marmat	46b	0	98	4	102	38.61	48.80	87.41
181	Marmat	47	140	0	47	187	121.44	68.24	189.68
182	Marmat	48	0	81	15	96	28.18	64.71	92.89
183	Marmat	49	59	174	33	266	113.72	146.44	260.17
184	Marmat	50	133	0	10	143	81.06	48.22	129.28
185	Marmat	51	145	0	45	190	90.84	88.10	178.94
186	Marmat	52	65	0	17	82	39.62	57.47	97.09
187	Marmat	53	53	0	20	73	30.64	33.06	63.69
188	Marmat	54	80	64	25	169	62.66	81.74	144.40
189	Marmat	55	59	0	5	64	34.49	48.00	82.49
190	Marmat	56	56	0	5	61	19.21	24.51	43.72
191	Marmat	57	185	25	20	230	82.81	158.39	241.20
192	Marmat	58	59	0	6	65	45.24	269.67	314.91
193	Marmat	59	0	124	80	204	72.80	200.48	273.28
194	Marmat	60	177	150	60	387	154.20	275.66	429.86
195	Marmat	61	225	0	15	240	147.03	102.65	249.69
196	Marmat	62	128	0	12	140	65.46	58.68	124.14
197	Marmat	63	79	111	15	205	122.80	88.83	211.63

S.No.	Range	Comp.	Area estimated in previous Working Plan (Ha)				Area estimated using GIS in current Working Plan (Ha)		
			Commercial	Uncommercial	Non-wooded	Total	Forest Area	Non-Forest area	Total Area
<b>198</b>	Marmat	64	144	0	26	170	104.99	61.10	166.09
<b>199</b>	Marmat	65	410	0	80	490	289.81	283.25	573.06
<b>200</b>	Marmat	66	150	0	25	175	92.90	82.26	175.16
<b>201</b>	Marmat	67	71	129	70	270	73.23	156.84	230.07
<b>202</b>	Marmat	68	93	0	58	151	68.22	164.17	232.39
<b>203</b>	Marmat	69	105	0	25	130	82.57	50.78	133.36
<b>204</b>	Marmat	70	65	40	10	115	89.18	261.10	350.28
<b>205</b>	Marmat	71	111	23	35	169	123.91	89.44	213.35
<b>206</b>	Marmat	72	267	15	73	355	233.07	137.60	370.67
<b>207</b>	Marmat	73	103	0	40	143	75.48	58.89	134.37
<b>208</b>	Marmat	74	0	52	20	72	8.68	85.34	94.02
			<b>19302</b>	<b>5675</b>	<b>6640</b>	<b>31617</b>	<b>15074.51</b>	<b>18233.67</b>	<b>33308.18</b>

**APPENDIX V**
**AREA STATEMENT OF DEODAR-KAIL SELECTION  
WORKING CIRCLE**

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
1	Batote	Shivgarh	Chakwa	2	147.55	84.80	232.35
2	Batote	Shivgarh	Chakwa	3a	31.48	51.16	82.64
3	Batote	Shivgarh	Chakwa	3b	78.67	46.86	125.53
4	Batote	Shivgarh	Chakwa	4	64.58	33.34	97.91
5	Batote	Shivgarh	Chakwa	5	52.54	39.10	91.64
6	Batote	Shivgarh	Shivgarh	6	92.31	80.37	172.68
7	Batote	Shivgarh	Shivgarh	8b	34.48	15.45	49.93
8	Batote	Batote	Gami	15	70.64	91.68	162.32
9	Batote	Batote	Gami	16a	56.75	26.11	82.86
10	Batote	Batote	Gami	16b	32.22	20.58	52.80
11	Batote	Sanasar	Sanasar	17	143.67	213.33	357.00
12	Batote	Sanasar	Sanasar	18a	66.82	57.84	124.66
13	Batote	Sanasar	Dhalwas	24	176.44	91.96	268.39
14	Batote	Sanasar	Dhalwas	25	129.05	107.01	236.06
15	Batote	Sanasar	Sawani	27a	52.16	81.12	133.29
16	Batote	Sanasar	Sawani	29	109.78	104.33	214.11
17	Batote	Sanasar	Chanderkot	33a	50.98	60.17	111.15
18	Batote	Balout	Tatarsoo	38a	34.57	31.51	66.08
19	Batote	Balout	Balout	39b	36.49	83.47	119.96
20	Batote	Balout	Balout	44a	53.32	50.45	103.77
Range Total					<b>1514.51</b>	<b>1370.63</b>	<b>2885.15</b>
21	Gandhri	Kanga	Kugwal	46b	60.47	35.31	95.78
22	Gandhri	Kanga	Kugwal	47	115.44	91.13	206.58
23	Gandhri	Kanga	Parnote	50b	103.57	39.84	143.41
24	Gandhri	Kanga	Parnote	51a	68.44	36.51	104.95
25	Gandhri	Kanga	Parnote	52b	10.44	18.47	28.91
26	Gandhri	Bhatni	Gandhri	60a	33.80	31.23	65.03
27	Gandhri	Bhatni	Bhathni	65	93.28	43.40	136.68
28	Gandhri	Bhatni	Bhathni	66a	41.05	22.34	63.39
29	Gandhri	Bhatni	Bhathni	66b	90.88	51.70	142.57
30	Gandhri	Bhatni	Bhathni	67a	42.99	30.15	73.13
31	Gandhri	Bhatni	Bhathni	68a	26.90	24.32	51.21
32	Gandhri	Bhatni	Tangar	75a	37.94	31.69	69.62
33	Gandhri	Bhatni	Dhuthan	76	97.21	65.06	162.27
34	Gandhri	Bhatni	Dhuthan	77b	51.42	30.10	81.52
35	Gandhri	Bhatni	Dhuthan	78b	75.36	25.53	100.89
36	Gandhri	Bhatni	Dhuthan	79	101.08	80.33	181.41
37	Gandhri	Bhatni	Dhuthan	81a	46.09	41.91	88.01
Range Total					<b>1096.34</b>	<b>699.03</b>	<b>1795.37</b>

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
38	Marmat	Dedni	Khellani	11	117.91	28.41	146.32
39	Marmat	Dedni	Khellani	12a	196.65	56.13	252.78
40	Marmat	Dedni	Khellani	13a	49.61	16.98	66.58
41	Marmat	Dedni	Humble	15a	137.09	59.69	196.78
42	Marmat	Dedni	Humble	17b	112.64	64.05	176.70
43	Marmat	Dedni	Goha	21b	62.42	49.36	111.78
44	Marmat	Behota	Behota	35a	46.15	64.19	110.34
45	Marmat	Behota	Loga	43b	57.25	34.53	91.78
Range Total					<b>779.72</b>	<b>373.33</b>	<b>1153.05</b>
<b>Grand Total</b>					<b>3390.58</b>	<b>2442.99</b>	<b>5833.57</b>

**APPENDIX VI AREA STATEMENT OF MIXED CONIFER SELECTION WORKING CIRCLE**

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
1	Batote	Shivgarh	Shivgarh	8a	67.79	19.99	87.77
2	Batote	Sanasar	Sanasar	18b	110.24	88.42	198.66
Range Total					<b>178.02</b>	<b>108.41</b>	<b>286.43</b>
3	Gandhri	Bhatni	Dhuthan	81b	79.93	30.85	110.78
Range Total					<b>79.93</b>	<b>30.85</b>	<b>110.78</b>
4	Marmat	Dedni	Khellani	10b	47.84	39.75	87.58
5	Marmat	Dedni	Khellani	13b	35.67	24.74	60.41
6	Marmat	Behota	Mangota	28	224.18	124.82	349.00
7	Marmat	Behota	Mangota	29	280.42	254.41	534.83
8	Marmat	Behota	Mangota	30	328.81	307.48	636.29
9	Marmat	Behota	Loga	38	112.15	45.43	157.57
10	Marmat	Behota	Loga	40	187.41	110.06	297.47
11	Marmat	Behota	Loga	41	165.89	107.15	273.04
12	Marmat	Behota	Loga	42	217.53	151.00	368.53
13	Marmat	Behota	Loga	43a	117.98	134.56	252.54
14	Marmat	Roat	Roat	45	157.74	64.35	222.09
15	Marmat	Roat	Roat	47	121.44	68.24	189.68
16	Marmat	Roat	Sewat	50	81.06	48.22	129.28
17	Marmat	Roat	Sewat	51	90.84	88.10	178.94
18	Marmat	Roat	Sewat	52	39.62	57.47	97.09
19	Marmat	Roat	Khrounathi	55	34.49	48.00	82.49
20	Marmat	Bulandpur	Bulandpur	60	154.20	275.66	429.86
21	Marmat	Bulandpur	Bulandpur	61	147.03	102.65	249.69
22	Marmat	Bulandpur	Bulandpur	62	65.46	58.68	124.14
23	Marmat	Bulandpur	Assar	64	104.99	61.10	166.09
24	Marmat	Bulandpur	Assar	65	289.81	283.25	573.06
25	Marmat	Bulandpur	Baggar	71	123.91	89.44	213.35
26	Marmat	Bulandpur	Baggar	72	233.07	137.60	370.67
27	Marmat	Bulandpur	Baggar	73	75.48	58.89	134.37
Range Total					<b>3437.02</b>	<b>2741.04</b>	<b>6178.06</b>
<b>Grand Total</b>					<b>3694.97</b>	<b>2880.30</b>	<b>6575.27</b>



**APPENDIX VII      AREA STATEMENT OF FIR SELECTION WORKING  
CIRCLE**

<b>S.No.</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non- Forest area(Ha)</b>	<b>Total Area(Ha)</b>
<b>1</b>	Batote	Sanasar	Sawani	26a	37.76	118.23	156.00
<b>2</b>	Batote	Sanasar	Chanderkot	33b	51.70	87.65	139.35
<b>Range Total</b>					<b>89.47</b>	<b>205.88</b>	<b>295.35</b>
<b>3</b>	Gandhri	Bhatni	Dhuthan	77a	150.51	197.22	347.73
<b>4</b>	Gandhri	Bhatni	Dhuthan	78a	57.91	78.79	136.70
<b>Range Total</b>					<b>208.42</b>	<b>276.01</b>	<b>484.44</b>
<b>5</b>	Marmat	Dedni	Humble	17a	37.59	50.76	88.34
<b>6</b>	Marmat	Dedni	Goha	19b	39.42	19.56	58.99
<b>7</b>	Marmat	Dedni	Goha	20a	57.61	31.24	88.85
<b>8</b>	Marmat	Dedni	Goha	24a	266.07	128.37	394.44
<b>9</b>	Marmat	Dedni	Goha	24b	134.76	57.83	192.59
<b>10</b>	Marmat	Behota	Mangota	25a	108.58	71.31	179.89
<b>11</b>	Marmat	Behota	Behota	31	261.91	228.25	490.16
<b>12</b>	Marmat	Behota	Behota	33	100.96	91.74	192.69
<b>13</b>	Marmat	Behota	Behota	35c	134.78	176.93	311.70
<b>14</b>	Marmat	Behota	Behota	36	219.27	92.38	311.65
<b>15</b>	Marmat	Behota	Behota	37	226.01	139.63	365.65
<b>16</b>	Marmat	Behota	Loga	39	104.67	52.00	156.67
<b>Range Total</b>					<b>1691.62</b>	<b>1140.01</b>	<b>2831.62</b>
<b>Grand Total</b>					<b>1989.51</b>	<b>1621.90</b>	<b>3611.41</b>

**APPENDIX VIII      AREA STATEMENT OF CHIR IRREGULAR WORKING  
CIRCLE**

<b>S.No.</b>	<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Comp.</b>	<b>Forest Area (Ha)</b>	<b>Non-Forest area(Ha)</b>	<b>Total Area(Ha)</b>
<b>1</b>	Batote	Batote	Champa	14b	25.67	26.34	52.01
<b>2</b>	Batote	Batote	Champa	14c	55.70	43.33	99.02
<b>3</b>	Batote	Sanasar	Sawani	27b	33.75	51.37	85.12
<b>4</b>	Batote	Balout	Tatarsoo	35b	31.49	65.50	96.99
Range Total					<b>146.60</b>	<b>186.54</b>	<b>333.14</b>
<b>5</b>	Gandhri	Kanga	Parnotee	52a	49.24	156.65	205.89
<b>6</b>	Gandhri	Kanga	Kanga	54	24.33	47.26	71.59
<b>7</b>	Gandhri	Kanga	Kanga	55	72.96	92.83	165.80
<b>8</b>	Gandhri	Kanga	Kanga	56	110.23	155.45	265.69
<b>9</b>	Gandhri	Bhatni	Gandhri	60b	61.14	34.51	95.64
<b>10</b>	Gandhri	Bhatni	Gandhri	61	91.69	93.02	184.71
<b>11</b>	Gandhri	Bhatni	Bhathni	68b	48.57	58.67	107.25
Range Total					458.17	638.39	1096.56
<b>Grand Total</b>					<b>604.76</b>	<b>824.93</b>	<b>1429.69</b>

# APPENDIX IX AREA STATEMENT OF REBOISEMENT WORKING CIRCLE

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
1	Batote	Shivgarh	Patnitop	9	56.85	23.19	80.05
2	Batote	Shivgarh	Patnitop	10a	53.20	26.00	79.21
3	Batote	Shivgarh	Patnitop	10b	70.44	30.72	101.16
4	Batote	Shivgarh	Patnitop	10c	11.24	12.45	23.69
5	Batote	Batote	Batote	11	93.26	109.70	202.96
6	Batote	Batote	Batote	12a	23.73	58.22	81.96
7	Batote	Batote	Batote	12b	23.05	86.74	109.79
8	Batote	Batote	Champa	14a	33.98	69.10	103.08
9	Batote	Sanasar	Sanasar	19	72.35	404.86	477.22
10	Batote	Sanasar	Sanasar	20	91.01	555.96	646.98
11	Batote	Sanasar	Sanasar	21	21.72	143.98	165.69
12	Batote	Sanasar	Dhalwas	22a	24.09	24.18	48.27
13	Batote	Sanasar	Dhalwas	22b	79.89	191.71	271.60
14	Batote	Sanasar	Dhalwas	23a	28.08	69.68	97.76
15	Batote	Sanasar	Dhalwas	23b	43.84	182.39	226.22
16	Batote	Sanasar	Sawani	26b	32.51	52.31	84.82
17	Batote	Sanasar	Sawani	28	9.11	133.44	142.55
18	Batote	Sanasar	Chanderkot	30	62.57	101.85	164.41
19	Batote	Sanasar	Chanderkot	31	52.89	139.35	192.24
20	Batote	Sanasar	Chanderkot	32a	45.14	30.31	75.44
21	Batote	Sanasar	Chanderkot	32b	92.54	128.07	220.61
22	Batote	Balout	Tatarsoo	34	10.10	224.67	234.77
23	Batote	Balout	Tatarsoo	35a	18.17	102.99	121.16
24	Batote	Balout	Tatarsoo	36a	58.64	50.69	109.33
25	Batote	Balout	Tatarsoo	36b	10.41	18.04	28.45
26	Batote	Balout	Tatarsoo	37a	45.96	66.16	112.12
27	Batote	Balout	Tatarsoo	37b	11.92	24.16	36.08
28	Batote	Balout	Tatarsoo	38b	28.32	78.03	106.35
29	Batote	Balout	Balout	39a	75.98	34.38	110.36
30	Batote	Balout	Balout	40a	21.88	49.79	71.67
31	Batote	Balout	Balout	40b	44.69	90.75	135.44
32	Batote	Balout	Balout	41	96.17	114.44	210.61
33	Batote	Balout	Balout	42	38.02	20.03	58.05
34	Batote	Balout	Balout	43	59.58	48.36	107.94
35	Batote	Balout	Balout	44b	18.66	34.53	53.19
Range Total					<b>1559.97</b>	<b>3531.25</b>	<b>5091.22</b>
36	Gandhri	Kanga	Kugwal	45a	27.00	51.57	78.57
37	Gandhri	Kanga	Kugwal	45b	16.08	11.44	27.53
38	Gandhri	Kanga	Kugwal	46a	28.87	38.29	67.17
39	Gandhri	Kanga	Kugwal	48	41.30	82.38	123.68

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
40	Gandhri	Kanga	Kugwal	49	22.10	108.36	130.46
41	Gandhri	Kanga	Parnote	50a	24.85	62.96	87.82
42	Gandhri	Kanga	Parnote	51b	30.03	104.00	134.03
43	Gandhri	Kanga	Parnote	53	49.55	185.63	235.18
44	Gandhri	Kanga	Kanga	57a	25.89	66.42	92.31
45	Gandhri	Kanga	Kanga	57b	88.45	168.74	257.19
46	Gandhri	Bhatni	Gandhri	58	57.08	123.40	180.47
47	Gandhri	Bhatni	Gandhri	59	38.04	60.59	98.63
48	Gandhri	Bhatni	Gandhri	62	34.70	129.99	164.69
49	Gandhri	Bhatni	Gandhri	63a	10.79	28.19	38.98
50	Gandhri	Bhatni	Gandhri	63b	37.11	80.49	117.60
51	Gandhri	Bhatni	Bhathni	64a	54.61	54.59	109.19
52	Gandhri	Bhatni	Bhathni	64b	31.49	64.74	96.23
53	Gandhri	Bhatni	Bhathni	67b	5.65	12.92	18.57
54	Gandhri	Bhatni	Bhathni	69	59.18	88.42	147.60
55	Gandhri	Bhatni	Tangar	71a	74.47	97.71	172.18
56	Gandhri	Bhatni	Tangar	71b	6.82	80.06	86.88
57	Gandhri	Bhatni	Tangar	72	78.07	109.68	187.75
58	Gandhri	Bhatni	Tangar	73	48.15	301.70	349.85
59	Gandhri	Bhatni	Tangar	74	79.18	190.33	269.51
60	Gandhri	Bhatni	Tangar	75b	5.16	14.43	19.59
61	Gandhri	Bhatni	Dhuthan	80a	32.30	53.15	85.45
62	Gandhri	Bhatni	Dhuthan	80b	21.12	79.30	100.42
Range Total					<b>1028.02</b>	<b>2449.49</b>	<b>3477.51</b>
63	Marmat	Dedni	Khellani	9	19.33	58.28	77.61
64	Marmat	Dedni	Khellani	10a	35.91	67.45	103.36
65	Marmat	Dedni	Humble	14	76.01	49.22	125.23
66	Marmat	Dedni	Humble	16	54.79	133.67	188.46
67	Marmat	Dedni	Goha	20b	16.22	23.92	40.15
68	Marmat	Dedni	Goha	20c	33.18	26.33	59.51
69	Marmat	Dedni	Goha	21c	24.85	28.64	53.49
70	Marmat	Behota	Mangota	27a	12.60	34.97	47.57
71	Marmat	Behota	Mangota	27b	28.58	25.18	53.76
72	Marmat	Behota	Mangota	27c	18.58	13.03	31.60
73	Marmat	Behota	Behota	32	80.49	96.79	177.28
74	Marmat	Behota	Behota	34	24.37	34.23	58.60
75	Marmat	Behota	Behota	35b	25.77	46.17	71.94
76	Marmat	Roat	Roat	46a	48.33	61.54	109.87
77	Marmat	Roat	Roat	46b	38.61	48.80	87.41
78	Marmat	Roat	Roat	48	28.18	64.71	92.89
79	Marmat	Roat	Sewat	53	30.64	33.06	63.69
80	Marmat	Roat	Sewat	54	62.66	81.74	144.40

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
81	Marmat	Roat	Khrounhi	56	19.21	24.51	43.72
82	Marmat	Roat	Khrounhi	57	82.81	158.39	241.20
83	Marmat	Roat	Khrounhi	58	45.24	269.67	314.91
84	Marmat	Bulandpur	Bulandpur	59	72.80	200.48	273.28
85	Marmat	Bulandpur	Assar	66	92.90	82.26	175.16
Range Total					<b>972.07</b>	<b>1663.03</b>	<b>2635.10</b>
<b>Grand Total</b>					<b>3560.06</b>	<b>7643.77</b>	<b>11203.83</b>

**APPENDIX X**
**AREA STATEMENT OF PROTECTION WORKING CIRCLE**

S.No.	Range	Block	Beat	Comp.	Forest Area (Ha)	Non-Forest area(Ha)	Total Area(Ha)
1	Batote	Shivgarh	Chakwa	1	57.48	194.71	252.18
2	Batote	Shivgarh	Shivgarh	7	66.85	53.25	120.10
3	Batote	Batote	Champa	13	23.75	292.19	315.94
4	Batote	Balout	Balout	40c	2.20	5.45	7.66
Range Total					<b>150.28</b>	<b>545.60</b>	<b>695.87</b>
5	Gandhri	Bhatni	Tangar	70	41.10	130.30	171.41
Range Total					<b>41.10</b>	<b>130.30</b>	<b>171.41</b>
6	Marmat	Dedni	Khellani	12b	27.97	29.09	57.06
7	Marmat	Dedni	Khellani	13c	35.16	54.46	89.62
8	Marmat	Dedni	Humble	15b	63.08	91.33	154.41
9	Marmat	Dedni	Humble	18a	29.53	49.46	78.99
10	Marmat	Dedni	Humble	18b	49.37	47.41	96.78
11	Marmat	Dedni	Goha	19a	88.86	59.75	148.61
12	Marmat	Dedni	Goha	21a	75.88	51.41	127.30
13	Marmat	Dedni	Goha	22	63.96	71.68	135.64
14	Marmat	Dedni	Goha	23	228.07	309.77	537.84
15	Marmat	Behota	Mangota	25b	203.29	189.41	392.70
16	Marmat	Behota	Mangota	26	108.99	171.00	279.99
17	Marmat	Roat	Roat	44	110.68	65.62	176.29
18	Marmat	Roat	Roat	49	113.72	146.44	260.17
19	Marmat	Bulandpur	Bulandpur	63	122.80	88.83	211.63
20	Marmat	Bulandpur	Assar	67	73.23	156.84	230.07
21	Marmat	Bulandpur	Assar	68	68.22	164.17	232.39
22	Marmat	Bulandpur	Assar	69	82.57	50.78	133.36
23	Marmat	Bulandpur	Assar	70	89.18	261.10	350.28
24	Marmat	Bulandpur	Baggar	74	8.68	85.34	94.02
Range Total					<b>1643.25</b>	<b>2143.89</b>	<b>3787.14</b>
<b>Grand Total</b>					<b>1834.63</b>	<b>2819.79</b>	<b>4654.42</b>

**APPENDIX XI      COMPARTMENT-WISE COMPOSITION OF RANGES,  
BLOCKS AND BEATS IN BATOTE FOREST DIVISION**

<b>Range</b>	<b>Block</b>	<b>Beat</b>	<b>Compartment</b>
Marmat	1. Dedni	1. Khelani	9-13
		2. Hamble	14-18
		3. Goha	19-24
	2. Behota	1. Mangota	25-30
		2. Behota	31-37
		3. Loga	38-43
	3. Roat	1. Roat	44-49
		2. Seout	50-54
		3. Kharunti	55-58
	4. Bulandpur	1. Bulandpur	59-63
		2. Assar	64-70
		3. Baggar	71-74
Batote	1. Shivgarh	1. Chakwa	1-5
		2. Shivgarh	6-8
		3. Patnitop	9-10
	2. Batote	1. Batote	11-12
		2. Champa	13-14
		3. Gami	15-16
	3. Sanasar	1. Sanasar	17-21
		2. Dhalwas	22-25
		3. Soni	26-29
		4. Chandrakote	30-33
	4. Balout	1. Tatarsu	34-38
		2. Balout	39-44
Gandhri	1. Maitra	1. Kagwal	45-49
		2. Parnote	50-53
		3. Kanga	54-57
	2. Bhatni	1. Gandhri	58-63
		2. Bhatni	64-69
		3. Tanger	70-75
		4. Duthan	76-81

**APPENDIX XII STATEMENT OF AFFORESTATION/SOIL CONSERVATION  
WORKS CONDUCTED IN BATOTE FOREST DIVISION**

Year of establishment	Range	Name of closure with comptts	Scheme	Area (Ha)	Fencing ( in Rft)	Plantation done	Sowing/ Dibbling	DRSM
<b>2000-01</b>	Gandhri	53/G	District	35	10000	15600	6100	23
	Marmat	22/M	District	15	4000	6200	5400	17
	Batote	20/Btt	District	15	4500	7800	8000	31
<b>2001-02</b>	Gandhri	63/G	District	15	5000	7000	7000	20
	Gandhri	72/G	District	14	4700	7300	3000	29
	Gandhri	52a/G	District	15	5000	7500	2300	28
	Gandhri	56/G	State	20	7000	11000	11000	72
	Marmat	16/M	District	17	5500	6000	4000	38
	Batote	11/Btt	State	26	7000	11000	11000	84
	Marmat	10/M	State	20	7000	11000	11000	80
<b>2002-03</b>	Batote	23a/Btt	District	20	7000	7000	10000	0
	Gandhri	57a/G	District	20	7000	7000	10000	0
	Marmat	11/M	District	15	5250	6300	5000	40
	Batote	1/Btt	State	20	7000	12000	11500	50
	Gandhri	55/G	State	20	7000	12000	11000	50
	Marmat	14/M	State	20	7000	12000	10000	50
<b>2003-04</b>	Batote	31/Btt	District	20	7000	8500	0	0
	Gandhri	72/G	District	20	7000	10000	0	0
	Gandhri	71b/G	State	20	7000	10000	0	64
	Marmat	58/M	District	16	6000	7000	0	0
	Marmat	61/M	State	20	7000	11160	0	122
	Marmat	60/M	State	20	7000	12000	6500	0
	Batote	1/Btt	State	20	7000	10000	0	64
<b>2004-05</b>	Batote	11/Btt	District	20	7000	15000	10400	6 crates
	Gandhri	54/G	District	18	6000	15000	8000	15
	Gandhri	72/G	CMPAP	25	7500	0	15750	5 crates
	Marmat	53-54/M	State	30	9000	12000	6000	14
	Marmat	57/M	State	0	0	10500	6000	0
	Marmat	57/M	S & P	43	12000	0	0	0
	Marmat	61/M	State	0	0	8088	6000	0
	Marmat	61/M	S & P	27	8000	0	0	0
<b>2005-06</b>	Marmat	34-35/M	District	20	6000	12000	2600	0
	Marmat	12a/M	State	20	6500	10000	8000	0
	Marmat	34/M	12th FC	15	5000	0	7000	0
	Marmat	53-54/M	State	20	6500	15000	8000	200
	Marmat	59/M	12th FC	15	5000	0	7000	0
	Marmat	39/M	State	24	7730	12000	14000	0
	Batote	43/Btt	District	28	8237	11942	2600	0



Year of establishment	Range	Name of closure with comptts	Scheme	Area (Ha)	Fencing ( in Rft)	Plantation done	Sowing/ Dibbling	DRSM
2005-06	Gandhri	52/G	State	18	6000	10000	8000	0
	Gandhri	70,71,72/G	CMPAP	25	7500	17500	13000	0
	Batote	23b/Btt	12th FC	15	5000	0	7000	0
2006-07	Gandhri	56/G	District	22	6500	10000	4300	85
	Gandhri	70,71,72/G	CMPAP	25	7500	14480	0	430
	Batote	23a/Bt	Dev.Conifer	20	2000	4541	15000	0
	Marmat	23/M	District	20	6000	10000	2300	50
	Batote	28/Btt	District	20	6000	10000	2300	50
2007-08	Marmat	61/M	District	14	4000	7500	7600	100
	Marmat	58/M	State	20	6000	15000	7500	190
	Gandhri	57b/G	District	28	8500	10000	15000	200
	Gandhri	71-72/G	CMPAP	17	5000	20000	0	150
	Gandhri	63b/G	12th FC	12	3600	0	0	0
	Batote	17/Btt	12th FC	12	3600	0	18000	240
2008-09	Marmat	13c/M	District	14	4100	8000	2450	81
	Gandhri	58/G	District	30	8300	16000	7000	133
	Marmat	48/M	CMPAP	23	7000	0	5700	155
	Gandhri	71-72/G	CMPAP	23	0	10000	4000	0
	Batote	15/Btt	State	30	8600	15000	11600	115
2009-10	Marmat	34/M	District	11	3300	5000	5700	107
	Batote	13/Btt	State	25	7500	13000	7000	250
	Marmat	49/M	CMPAP	20	6000	0	5000	100
	Batote	13/Btt	CAMPA	20	6000	0	0	170
	Gandhri	58/G	District	20	6000	14000	2000	135
	Marmat	48/M	CMPAP	12	0	10000	0	0
	Batote	12a/Btt	12th FC	12	4700	9500	0	0
	Batote	31/Btt	CAMPA	20	6000	0	0	170
	Gandhri	55/G	12th FC	20	3600	8500	0	157
	Gandhri	62/G	CAMPA	20	6000	0	0	170
	Marmat	72/M	CAMPA	20	6000	0	0	170
2010-11	Batote	23/M	13th FC	17	0	10000	5200	94
	Marmat	41/M	13th FC	0	0	7000	0	300
	Marmat	72/M	CAMPA	20	6000	16000	8600	170
	Marmat	61/M	13th FC	0	0	1000	0	100
	Marmat	59/M	13th FC	17	0	8500	5200	0
	Marmat	59/M	MFP	0	0	0	9200	0
	Marmat	48/M	MFP	0	0		9200	0
	Gandhri	59/G	Distt Rmbn	20	6000	0	14500	118
	Marmat	10a/M	CAMPA	20	6000	16000	8600	170
	Batote	19/Btt	PDA	0	1500	1200	0	0
	Batote	20/Btt	PDA	0	2200	0	0	40

Year of establishment	Range	Name of closure with comptts	Scheme	Area (Ha)	Fencing ( in Rft)	Plantation done	Sowing/ Dibbling	DRSM
2010-11	Batote	9/Btt	PDA	0	900	0	0	0
	Batote	10a/Btt	PDA	0	4670	0	0	35
	Batote	31/Btt	CAMPA	20	6000	16000	8600	170
	Marmat	68/M	MFP	0	0	0	5750	0
	Marmat	49/M	CMPAP	18	5400	10000	10000	165
	Batote	13/Btt	CAMPA	20	6000	16000	8600	170
	Batote	01/Btt	CAMPA	20	6000	16000	8600	170
	Marmat	34,35/M	13th FC	0	0	1000	0	200
	Batote	15/Btt	S&P	10	2500	12000	8000	224
	Batote	15/Btt	12th FC	20	6000	16500	27200	530
	Marmat	34/M	District	11	3300	500	6000	74
	Marmat	34/M	Dev of conifers	0	0	7000	0	0
	Batote	23a/Btt	State RDF	17	5000	13000	7000	200/20
	Gandhri	51a/G	CAMPA	20	6000	16000	8600	170
	Gandhri	62/G	CAMPA	20	6000	16000	8600	170
	Gandhri	54/G	13th FC	20	6000	16000	8600	170
	Gandhri	71/G	13th FC	0	0	6425	0	200
	Batote	23a/Btt	CAMPA	20	6000	16000	8600	170
	Gandhri	63a/G	CAMPA	4	1000	1155	0	40
	Batote	11/Btt	BRGF Rmbn	25	3500	15000	3000	221
	Batote	11/Btt	PDA	2	600	0	0	0
2011-12	Batote	01/Btt	N.PLAN	0	0	2600	0	106
	Marmat	63/M	N.PLAN	0	3500	0	0	68
	Marmat	23/M	N.Plan	0	2500	7000	8400	140
	Gandhri	51/G	CAMPA	23	7360	22750	6300	380
	Gandhri	62/G	CAMPA	23	7360	26750	6300	380
	Marmat	10/M	CAMPA	23	7360	25750	6300	380
	Marmat	72/M	CAMPA	23	7360	22750	6300	380
	Batote	1/B	CAMPA	23	7360	26750	6300	380
	Batote	13/B	CAMPA	15	4800	19150	3500	357
	Batote	23a/B	CAMPA	14	4480	18200	3500	340
	Batote	29/Btt	CAMPA	13	4160	12350	3500	330
	Batote	31/B	CAMPA	13	4160	17200	3500	330
2012-13	Gandhri	51/G	CAMPA	0	0	5660	0	0
	Gandhri	55/G	CAMPA	15	4500	11050	2250	250
	Gandhri	56/G	CAMPA	20	6000	14300	3000	330
	Gandhri	62/G	CAMPA	20	6000	19907	3000	340
	Marmat	10/M	CAMPA	0	0	5500	0	0
	Marmat	13/M	CAMPA	20	6000	14300	3000	340
	Marmat	58/M	CAMPA	20	6000	14300	3750	340
	Marmat	72/M	CAMPA	0	0	5500	0	0

Year of establishment	Range	Name of closure with comptts	Scheme	Area (Ha)	Fencing ( in Rft)	Plantation done	Sowing/ Dibbling	DRSM
2012-13	Marmat	74/M	CAMPA	20	6000	14300	3000	320
	Batote	01/Btt	CAMPA	0	0	5500	0	0
	Batote	12/B	CAMPA	15	4200	11050	2250	320
	Batote	13/B	CAMPA	0	0	5200	0	0
	Batote	23a/B	CAMPA	20	6000	20393	3000	320
	Batote	27b/B	CAMPA	20	6000	15300	3000	320
	Batote	29/B	CAMPA	0	0	2593	0	0
	Batote	31/Btt	CAMPA	20	6000	16000	3162	307
	Marmat	46/M	CMPAP(SP)	15	4500	5500	0	0
	Marmat	16/M	State	25	7500	26500	15000	200
	Gandhri	60/G	District	15		4500	20000	190
	Marmat	34/M	District	12	3600	6000	4000	137
	Gandhri	71/G	State	15	4500	8000	6000	150
	Marmat	16/M		15	4500	12000	6000	0
	Batote	23/Btt		0	0	1522	0	0
	Gandhri	63a/G	Distt	15	4500	18000	5000	160
	Batote	17/Btt	STATE(DOC)	0	0	8300	0	0
2013-14	Batote	30/Btt	CAMPA	20	6000	10000	2000	100
	Gandhri	53/G	CAMPA	20	6000	10000	2000	100
	Gandhri	63/G	CAMPA	20	6000	10000	2000	100
	Marmat	74/M	CAMPA	20	6000	10000	2000	125
	Marmat	10c/M	CAMPA	20	6000	10000	2000	100
	Batote	27b/Btt	CAMPA	20	6000	10000	2000	150
	Batote	10c/Btt	CAMPA	15	4500	10000	2000	100
	Batote	22b/Btt	13th FCA	15	4500	5000	6000	100
	Gandhri	57/G	13th FCA	0	0	2000	0	0
	Gandhri	58/G	13th FCA	0	0	3000	0	0
	Gandhri	59/G	13th FCA	0	0	2000	0	0
	Gandhri	62/G	13th FCA	15	4500	10000	2000	150
	Batote	23a/Btt	13th FCA	20	6000	10000	2000	125
	Marmat	16/M	State	12	3600	10000	0	60
	Marmat	15/M	State	12	3600	10000	0	70
	Gandhri	63a/G	District	10	3000	10000	0	175
	Marmat	36/M	District	10	3000	6000	0	40
	Marmat	46a/M	State	10	3000	4000	1200	0
2014-15	Gandhri	54/g	CAMPA	20	6000	12500	3000	150
	Marmat	48/M	CAMPA	20	6000	10000	3000	200
	Batote	14a/Btt	CAMPA	20	6000	13500	5000	175
	Batote	23b/Btt	CAMPA	20	6000	12500	4000	200
	Batote	11/Btt	CAMPA	20	6000	10000	3000	150
	Batote	20/Btt	State(DC)	0	0	4700	0	0

Year of establishment	Range	Name of closure with comptts	Scheme	Area (Ha)	Fencing ( in Rft)	Plantation done	Sowing/ Dibbling	DRSM
2014-15	Marmat	35aM	District	10	3000	6000	0	50
	Gandhri	61/G	District	10	3000	10000	0	175
	Marmat	14/M	STATE	20	6000	20000	7000	150
	Batote	40/Btt	CMPA	8	2400	10000	0	0
	Batote	17/Btt	13th FCA	0	0	250	2000	0
	Batote	10b/Btt	13th FCA	0	0	250	2000	0
	Batote	10c/Btt	13th FCA	0	0	250	2000	0
	Batote	11/Btt	13th FCA	0	0	250	2000	0
	Batote	22/Bt	13th FCA	0	0	2000	2000	0
	Batote	23/Btt	13th FCA	0	0	2000	2000	0
	Gandhri	55/G	13th FCA	0	0	500	2000	0
	Gandhri	56/G	13th FCA	0	0	500	2000	0
	Gandhri	58/G	13th FCA	0	0	500	2000	0
	Gandhri	59/G	13th FCA	0	0	1000	2000	0
	Marmat	49/M	13th FCA	0	0	500	2000	0
	Batote	12/Btt	13th FCA	0	1230	1020	2000	0
2015-16	Gandhri	56/G	CAMPA	20	6000	11500	0	50
	Gandhri	59/G	CAMPA	20	6000	9500	0	50
	Gandhri	74/G	CAMPA	20	6000	11500	1000	100
	Marmat	68/M	CAMPA	25	7500	10000	1500	70
	Gandhri	49/G	CAMPA	20	6000	10000	0	70
	Batote	13b/Btt	CAMPA	20	6000	9500	0	50
	Batote	40a/Btt	CAMPA	25	7500	13500	0	100
	Batote	10c/Btt	CAMPA	20	6000	9000	1000	50
	Batote	11/Btt	CAMPA	20	6000	8000	0	50
	Batote	23a/Btt	CAMPA	20	6000	9000	0	50
	Batote	Dhalwas	CAMPA	0	0	4000	0	0
	Gandhri	59/G	Distt Ramban	14	4200	10000	2000	50
	Marmat	35a/M	Distt Doda	10	3000	6000	0	50
	Batote	40a/Btt	CMPAP	20	6000	18000	3000	150
	Gandhri	64/G	CAMPA(Ev area)	0	1500	0	0	0
	Gandhri	48/G	CAMPA(Ev area)	0	1500	0	0	0
	Batote	36/Btt	CAMPA(Ev area)	0	2000	0	0	0
	Batote	11/Btt	CAMPA(Ev area)	0	500	0	0	0
	Marmat	16/M	CAMPA(Ev area)	0	1500	0	0	0
	Marmat	59/M	CAMPA(Ev area)	0	1500	0	0	0
	Batote	41/Btt	CAMPA(Ev area)	0	1500	0	0	0

**APPENDIX XIII      STATEMENT OF ALLOCATION OF FUNDS UNDER PLAN AND NON-PLANNED SCHEMES IN BATOTE  
FOREST DIVISION FROM 2000-01 TO 2015-16**

PLAN		ALLOCATION (Rs in Lakh)														
Head	10th Plan		11th Five year Plan					12th Five year Plan					13th Five year Plan			
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Distt. Plan (Doda Distt)	0.00	0.00	0.00	0.00	0.00	0.00	9.17	2.00	2.00	2.30	2.30	3.30	3.30	2.30	2.30	2.30
Distt. Plan (Ramban Distt)	5.00	5.74	6.00	6.00	6.00	0.00	0.00	6.84	6.84	7.89	7.89	7.89	7.89	5.92	5.92	5.92
RDF (State Plan)	7.00	7.00	7.00	7.00	7.00	0.00	7.20	4.00	5.00	7.00	6.32	9.20	8.21	6.85	6.85	0.00
HCMPAP (State Plan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	4.00	0.00	3.79	4.21	1.89	2.00	2.00	10.00
Dev. Of conifer (State)	2.00	4.00	2.50	3.00	3.50	0.00	1.20	0.60	0.70	2.00	2.00	0.94	1.80	1.00	2.50	0.00
Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99	9.00	2.50	2.40	0.00	0.00	0.00	0.00
CAMPA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.57	47.63	103.58	98.27	79.53	60.29	100.54
SDRF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
Publicity etc	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest Protection	0.00	8.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eco-fuelwood	1.00	0.52	1.50	1.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CENTRALLY SPONSORED SCHEMES																
12th FCA	0.00	0.00	0.00	0.00	0.00	0.00	4.69	12.27	0.00	23.52	10.00	0.00	0.00	0.00	0.00	0.00
13th FCA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.49	13.00	0.00	13.00	53.00	0.00
IFM	0.00	0.00	0.00	0.00	0.00	0.00	4.27	0.50	0.44	0.00	0.91	4.40	3.48	0.00	0.00	6.28
BRGF (Doda Distt)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.00	2.50	0.00	2.00	3.00	0.00
BRGF (Ramban Distt)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	12.01	21.30	0.00
FDA	0.00	0.00	20.39	30.31	52.33	25.00	16.36	118.56	66.43	135.51	34.88	55.89	76.56	73.39	0	15.68
Grand Total	15.00	27.06	37.39	47.31	70.03	25.00	42.89	148.52	93.40	204.66	156.71	207.31	201.40	198.00	172.16	140.72

**APPENDIX XIV      RANGE-WISE STATEMENT OF NURSERIES IN BATOTE  
FOREST DIVISION**

<b>Range</b>	<b>Name</b>	<b>Area ( Hact)</b>
Batote	Batote Co. 12/Btt	0.6
	Sarga	1.00
	Sanasar	0.25
	Patnitop	1.00
Gandhri	Tangar	1.00
	Borka	0.30
Marmat	Khellani	0.15
	Behota	0.05
	Richoo (Pvt)	0.50
	<b>Total</b>	<b>3.85</b>

**APPENDIX XV      RANGE-WISE STATEMENT OF GOVERNMENT BUILDINGS  
EXISTING IN BATOTE FOREST DIVISION**

<b>S.No.</b>	<b>Name of building.</b>	<b>Location</b>	<b>Accommodation</b>	<b>Purpose of the use of the building</b>	<b>Plinth area (Sqft)</b>	<b>Year of construction</b>
<b>1</b>	Divisional Cum-Range Office	Batote	14 rooms + 2 rooms for chowkidar.	Official use	2015	1954-55
<b>2</b>	ACF quarter.	Batote	3 rooms with bath rooms	Official use	1013	1954-55
<b>3</b>	R.O's residential quarter	Batote	2 bed room with bath rooms	Official use	1600	1989-90
<b>4</b>	Clerical Qtrs. 7 Nos.	Batote	Each quarter double set.	Official use	283	1958-59
<b>5</b>	Guard Hut near BMCP	Batote	3 rooms with kitchen	Official use	812	1958-59
<b>6</b>	Check post (BMC)	Batote	2 rooms with bath rooms with kitchen	Official use	630	1972
<b>7</b>	Inspection Hut Batote.	Batote	3 rooms, 2 bath room, kitchen, Chowkidar room.	Official use	1023	1970
<b>8</b>	Thrust Nest Hut Batote	Batote	2 rooms, kitchen, bathrooms & chowkidar rooms	Official use	755	1971
<b>9</b>	DFO's residential quarter new.	Batote	4 rooms, bath rooms, Kitchn and Chowkidar room.	Official use	1888	1983
<b>10</b>	Patnitop Hut.	Patnitop	2 rooms with kitchen & bathroom	Official use	1162	1967
<b>11</b>	Annaxi Patnitop	Patnitop	2 rooms with kitchen & bathroom	Official use	1163	1970
<b>12</b>	Check Post Patnitop.	Patnitop	1 room with kitchen & bathroom.	Official use	812	1990
<b>13</b>	Check Post Maghunallah	Maghunallah	3 rooms with kitchen & bathroom.	Official use	545	1988-89
<b>14</b>	FRH Sanasar	Sanasar	3 rooms,bath room & passage.	Official use	1520	1991-92
<b>15</b>	R.O. Camp Office	Maitra	4 room,bath, kitchen, store and Varandah	Official use	1120	1992-93
<b>16</b>	Range Office	Khellani	2 rooms, Kitchen, Bath Room (Double story)	Official use	915	2008-09
<b>17</b>	Mali Hut Sarga	Sarga	1 room store and kitchen	Official use	305	1989-90
<b>18</b>	Fgd. Hut Bulandpur	Bulandpur	One room	Official use	225	2005-06
<b>19</b>	FRH Bhathni	Bhathni	2 rooms Kitchen & bathroom	Official use	960	Very Old
<b>20</b>	Inspection Hut Dharamkund	Dharamkund	2 rooms & bath room, Kitchen and varanda	Official use	739	1978-79
<b>21</b>	Check Post Dharamkund	Dharamkund	1 room and kitchen	Official use	423	0
<b>22</b>	FRH Gandhri	Gandhri	3 rooms, Store, Bath Room, Varanda	Official use	735	1984-85

<b>S.No.</b>	<b>Name of building.</b>	<b>Location</b>	<b>Accommodation</b>	<b>Purpose of the use of the building</b>	<b>Plinth area (Sqft)</b>	<b>Year of construction</b>
<b>23</b>	Maitra Check Post	Maitra	2 room, Kitchen, bath room and varanda	Official use	500	1983-84
<b>24</b>	Mali Hut Tangar	Tanger	1 room, Kitchen and bath room	Official use	160	1978-79
<b>25</b>	Office cum-Range quarter	Gandhri	4 rooms, kitchen & 3 bath room (Double Story)	Official use	1075	2009-10
<b>26</b>	Range quarter Soil Batote	Batote	3 rooms, kitchen & bath room	Official use	1062	1964-65
<b>27</b>	Ranges SC Range Store	Batote	2 rooms with kitchen	Official use	500	1964-65
<b>28</b>	Cattle Pond Sarga	Sarga	1 rooms & one store	Official use	223	1999-2000
<b>29</b>	Protection Hut Khellani	Khellani	2 rooms, kitchen & bathroom	Official use	409	1999-2000
<b>30</b>	Forest Check Post	Khellani	1 rooms, and bath	Official use	546	2010-11
<b>31</b>	Guard Hut Gandhri	Gandhri	1 room, Kitchen, bathroom & Verandah	Official use	399	2006-07
<b>32</b>	Guard Hut Nashri	Nashri	1 room	Official use	?	2009-10
<b>33</b>	FRH Goha	Goha	2 room, Store, Kitchen, Bath Room	Official use	658	2009-10and 2011-12
<b>34</b>	Meeting Hall	Batote	1 Hall, 1 room, & Bath room.	Official use	1000	2010-11& 2011-12
<b>35</b>	Chowkidar Hut TSD(double story)	Batote	1 room,bath and kitchen in each story	Officialuse	525	2011-12
<b>36</b>	Watch Tower at Sanasar	Batote	Room with Bath	Official use	240	2011-12
<b>37</b>	B.O Hut Behota	Marmat	1 room, bath and varanda	official use	715	2013-14 & 2014-15
<b>38</b>	DFOs QuarterBatote (double story)	Batote	4 room, lobby, two store, 2 bath, varanda and kitchen	Officiaal use	1936	2014-15 & 2015-16
<b>39</b>	BO Hut at Kunghai (Roat Block)	Marmat	1 room, bath and Kitchen	Official use	458	2012-13 & 2013-14
<b>40</b>	BO Hut at Batote	Batote	1 room, and bath	Official use	376	2012-13
<b>41</b>	BO Hut Bhatni	Gandhri	1 room, bath and varanda	office use	405	2014-15 & 2015-16



**APPENDIX XVI RANGE-WISE STATEMENT OF ROADS, PATHS AND  
BRIDLE PATHS IN BATOTE FOREST DIVISION**

S.No.	Range	Name of the road /Path	Length (km)
1	<b>Gandhri</b>	Maitra to Dharmkund road	22
2		Kanga to Kabbi road	12
3		Kabbi to Kothi road	0
4		Maitra to Failty road	3
5		Parnote to Thalwa	4
6		Zero Morh Dharmkund to Sadu nallah Swalakot	-
7		Maitra-Bhathni	30
8		Bhatni-Surankind	5
9		Surnikund- Dharamkind	20
10		Folia-Bokhara nalla	30
11		Maitra -Sadoo	35
12		Lander-Bhane Road	1.7
13		Gandhri Sanasar Foot Road	9.26
14		Mandial to Tangar	7
15	<b>Marmat</b>	Khellani-Goha road	35
16		Bhargarah-Rote road	0
17		Bhargarah-Mangota road	0
18		Kora Pani-Khasal road	0
19		Assar-Bray road	2
20		Panchari Nallah-Shree road	0
21		Sheek Pani-Hud road	0
22		NH 244 KM-9 to Khellani	38
23		Khalani-Dedni	27
24		Dedni-Goha-Mangota	16
25		Goha Mandoli	14
26		Blandpur-Dehratop	27
27		Goha-Loga	8
28		Khalani-Dehratop	40
29		Pul Doda-Raggi Nalla (Mahan Path)	-
30		Khalani-Saras-Trowan	10.25
31		Loga-Behota-Gurh	8
32		Loga-Derahtop	10
33		Kandari-Co69/M	3

S.No.	Range	Name of the road /Path	Length (km)
34	Marmat	Baggar-Branceri	35
35		Khalani-Siri	9.5
36		Seri -Dedni	13
37		Hambal-Dedni Road	4.7
38		Behota to Co.37/M B/PRoad	4
39		Behota to Co.31/m B/P	8
40		Dhara top to Co.43/M B/P	8
41		Dhara top to Co.43/M B/P	6
42		Co.59/m to 64/M B/P	9
43		Kalota Dedni	5
44	Batote	Chilla-Sanasar B/Path	4.5
45		Peera to Co.27/Btt B/Path	1.22
46		Co.41/Btt Inspection Path	0
47		Co. 01 to 08/Btt I. Path	15.5
48		Sanasar to Surnikund	5
49		Patnitop to Jaswal Bridge NHIA	40
50		Batote Doda road NHIB	12
51		Patnitop to Sanasar road	18
52		Circular road Patnitop	5
53		Batote Boon Bari road	2.75
54		Batote Chakwa	6
55		Rakhjarog to Dhamtal	5
56		Nashiri Bye Pass road	15
57		Champa Dhianoo road	14
58		Dhalwas Sawani road	13
59		Maitra Ballout road	13
60		Amritchashma to Sanasar	3
61		Ludhwal Morh to Kothri	2

**APPENDIX XVII    YEAR WISE TIMBER VOLUME MARKED FAVOURING SFC AND EXTRACTION THEREOF FROM  
2000-01 TO 2015-16 IN BATOTE FOREST DIVISION**

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2000-01	33a/Btt	83	22621	6602	0	29306	19	23409	1200	0	24628
2000-01	33b/Btt	0	469	10071	0	10540	0	0	1886	0	1886
2000-01	51ab/G	0	0	0	8065	8065	0	0	0	2422	2422
2000-01	52ab/G	0	208	0	14995	15203	0	55	0	3152	3207
2000-01	53/G	0	0	0	41789	41789	0	0	0	13119	13119
2000-01	54/G	0	0	0	22531	22531	0	0	0	7735	7735
2000-01	55/G	0	0	0	45797	45797	0	0	0	14239	14239
2000-01	56/G	0	0	0	37182	37182	0	0	0	2186	2186
2000-01	57ab/G	0	0	0	18462	18462	0	0	0	1000	1000
2000-01	58/G	0	0	0	4623	4623	0		0	2275	2275
2000-01	75a/G	16116	10655	0	0	26771	8902	5784	0	0	14686
2000-01	76/G	22110	28965	0	0	51075	18224	20408	161	0	38793
2000-01	79/G	7890	28765	475	431	37561	10450	23869	45	0	34364
	<b>Total</b>	<b>46199</b>	<b>91683</b>	<b>17148</b>	<b>193875</b>	<b>348905</b>	<b>37595</b>	<b>73525</b>	<b>3292</b>	<b>46128</b>	<b>160540</b>
2001-02	11/M	14926	22187	0	0	37113	12484	18068	0	0	30552
2001-02	13/M	1314	10334	0	0	11648	902	8014	0	0	8916
2001-02	14/M	2601	37551	0	0	40152	1919	32834	0	0	34753
2001-02	61/M	3935	27705	5203	0	36843	2719	20186	2812	0	25717
2001-02	65/M	3990	19508	575	0	24073	2314	11654	238	0	14206
2001-02	66/M	10169	23126	0	0	33295	7155	16264	0	0	23419
2001-02	71/M	9580	12356	4812	0	26748	2595	6477	606	0	9678
2001-02	73/M	4393	2396	0	0	6789	2626	1800	0	0	4426

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2001-02	2/Btt	8113	450	0	0	8563	4088	227	0	0	4315
2001-02	03a/Btt	7672	1132	195	0	8999	3800	550	0	0	4350
2001-02	03b/Btt	6378	675	7053	0	14106	3221	361	0	0	3582
2001-02	4/Btt	2330	1354	30	0	3714	1167	639	16	0	1822
2001-02	6/Btt	883	2178	0	0	3061	329	776	0	0	1105
2001-02	08a/Btt	6106	633	1041	0	7780	3602	334	340	0	4276
2001-02	8b/Btt	1744	1216	1798	0	4758	1029	600	378	0	2007
2001-02	11/Btt	1625	19071	0	0	20696	1046	8183	0	0	9229
2001-02	15/Btt	1739	19526	0	620	21885	756	7903	152	0	8811
2001-02	22a/Btt	121	166	0	18233	18520	98	80	0	6325	6503
2001-02	23a/Btt	0	508	0	13515	14023	0	195	0	2389	2584
2001-02	38a/Btt	0	15753	625	247	16625	0	8796	308	102	9206
2001-02	39b/Btt	229	14922	676	1265	17092	109	7634	346	421	8510
2001-02	40b/Btt	0	908	0	36091	36999	0	163	0	9602	9765
2001-02	41/Btt	0	0	0	47381	47381	0	0	0	8900	8900
2001-02	43/Btt	0	0	0	11569	11569	0	0	0	2416	2416
2001-02	44a/Btt	0	10547	1144	823	12514	0	4493	466	410	5369
2001-02	64a/G	81	21644	0	3570	25295	40	6944	0	698	7682
2001-02	64b/G	1473	7558	0	9265	18296	450	2446	0	0	2896
2001-02	65/G	1560	18441	9502	0	29503	428	6748	926	0	8102
2001-02	66a/G	2263	10996	744	0	14003	969	4728	85	0	5782
2001-02	66b/G	0	8665	0	250	8915	0	3698	0	0	3698
2001-02	67a/G	812	16236	0	490	17538	297	6642	0	83	7022
<b>Sub-total</b>		<b>94037</b>	<b>327742</b>	<b>33398</b>	<b>143319</b>	<b>598496</b>	<b>54143</b>	<b>187437</b>	<b>6673</b>	<b>31346</b>	<b>279599</b>
2002-03	64a/G	47	25317	0	1018	26382	27	12700	0	350	13077

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2002-03	64b/G	0	3538	0	1958	5496		1531	0	599	2130
2002-03	65/G	2207	11918	0	977	15102	1265	7346	389	0	9000
2002-03	66a/G	649	3841	0	0	4490	299	2074	0	0	2373
2002-03	66b/G	27	4823	0	0	4850	0	2532	0	0	2532
2002-03	67/G	54	3759	0	0	3813	26	2191	0	0	2217
2002-03	60/M	11224	34729	2363	0	48316	6479	18404	1473	0	26356
2002-03	64/M	5120	19391	48093	0	72604	5724	19624	7885	0	33233
<b>Sub-total</b>		<b>19328</b>	<b>107316</b>	<b>50456</b>	<b>3953</b>	<b>181053</b>	<b>13820</b>	<b>66402</b>	<b>9747</b>	<b>949</b>	<b>90918</b>
2003-04	51/M	4206	22476	29299	0	55981	844	3300	5194	0	9338
2003-04	52/M	13385	85900	7016	0	106301	3696	30279	1830	0	35805
2003-04	60/M	202	9019	1874	0	11095	87	5429	819	0	6335
2003-04	65/M	14528	20197	2090	0	36815	8456	12064	862	0	21382
2003-04	66/M	19947	18656	1635	0	40238	14035	13122	856	0	28013
<b>Sub-total</b>		<b>52268</b>	<b>156248</b>	<b>41914</b>	<b>0</b>	<b>250430</b>	<b>27118</b>	<b>64194</b>	<b>9561</b>	<b>0</b>	<b>100873</b>
2004-05	32a/Btt	148	14472	0	4755	19375	78	5600	0	300	5978
2004-05	32b/Btt	0	5622	0	11096	16718	0	2436	0	1060	3496
2004-05	35a/Btt	0	14829	0	158	14987	0	5680	0	60	5740
2004-05	35b/Btt	0	20467	0	10222	30689		10724		80	10804
2004-05	46b/Btt	5051	49555	2749	0	57355	2620	21314	95	0	24029
2004-05	47/G	1300	28241	0	1132	30673	599	12116	0	46	12761
2004-05	57/G	0	0	0	0	0	0	0	0	0	0
2004-05	58/G	0	0	0	672	672	0	0	0	190	190
2004-05	61/G	0	0	0	4971	4971	0	0	0	1660	1660
2004-05	62/G	0	0	0	6124	6124	0	0	0	1960	1960
2004-05	77a/G	155	335	79767	0	80257	12	1067	0	0	1079

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2004-05	77b/G	2442	6470	25134	0	34046	805	54	0	0	859
2004-05	78a/G	1038	1372	5118	0	7528	303	363	72	0	738
2004-05	78b/G	13357	10456	3470	0	27283	3339	2718	100	0	6157
2004-05	51/M	7370	16664	9090	0	33124	1474	2448	1612	0	5534
2004-05	52/M	7857	25131	1693	0	34681	2168	8856	441	0	11465
2004-05	64/M	8089	32455	51140	0	91684	5724	19624	7885	0	33233
<b>Sub-total</b>		<b>46807</b>	<b>226069</b>	<b>178161</b>	<b>39130</b>	<b>490167</b>	<b>17122</b>	<b>93000</b>	<b>10205</b>	<b>5356</b>	<b>125683</b>
2005-06	11/Btt	2153	86216	78	0	88447	2233	65800	0	0	68033
2005-06	19/Btt	0	7928	52467	0	60395	0	3724	8655	0	12379
2005-06	20/Btt	0	7563	0	0	7563		3570	0	0	3570
2005-06	22a/Btt	0	1404	70	0	1474	0	721	0	44	765
2005-06	23/Btt	0	0	2090	0	2090	0	0	0	824	824
2005-06	24	1597	10846	78	0	12521	1009	6139	0	39	7187
2005-06	27b	0	0	0	2271	2271	0	0	0	889	889
2005-06	29	0	2185	0	518	2703	0	1086	0	252	1338
2005-06	31	0	345	0	2363	2708	0	121	0	627	748
2005-06	32a	0	690	0	15550	16240	0	181	0	4572	4753
2005-06	36a	0	0	0	1781	1781	0	0		554	554
2005-06	37a	0	0	0	6629	6629	0	0	0	1961	1961
2005-06	41	0	0	0	2171	2171	0	0	0	870	870
2005-06	43	0	0	0	4401	4401	0	0	0	1799	1799
2005-06	49/G	0	0	0	1767	1767	0	0	0	654	654
2005-06	51b	0	0	0	983	983	0	0	0	617	617
2005-06	52a	0	0	0	8677	8677	0	0	0	3000	3000
2005-06	70	0	0	0	10245	10245	0	0	0	928	928

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2005-06	71b	0	0	0	3015	3015	0	0	0	504	504
2005-06	73	0	0	0	12682	12682	0	0	0	7634	7634
2005-06	72/M	39680	13174	1892	0	54746	17565	3997	167	0	21729
<b>Sub-total</b>		<b>43430</b>	<b>130351</b>	<b>56675</b>	<b>73053</b>	<b>303509</b>	<b>20807</b>	<b>85339</b>	<b>8822</b>	<b>25768</b>	<b>140736</b>
2006-07	3b/Btt	17620	1077	0	0	18697	8706	662	0	0	9368
2006-07	8b	2531	677	297	0	3505	1351	406	76	0	1833
2006-07	20	0	9140	4713	0	13853	0	5650	1535	0	7185
2006-07	22a	2623	1223	189	10436	14471	0	0	0	5839	5839
2006-07	23a	0	0	0	9197	9197	0	0	0	3321	3321
2006-07	28	0	0	0	6000	6000	0	0	0	2143	2143
2006-07	40a	0	0	0	1198	1198	0	0	0	500	500
2006-07	40b/Btt	0	0	0	9972	9972	0	0	0	3927	3927
<b>Sub-total</b>		<b>22774</b>	<b>12117</b>	<b>5199</b>	<b>36803</b>	<b>76893</b>	<b>10057</b>	<b>6718</b>	<b>1611</b>	<b>15730</b>	<b>34116</b>
2008-09	62/M	9577	53259	7132	0	69968	3869	30240	789	0	34898
<b>Sub-total</b>		<b>9577</b>	<b>53259</b>	<b>7132</b>	<b>0</b>	<b>69968</b>	<b>3869</b>	<b>30240</b>	<b>789</b>	<b>0</b>	<b>34898</b>
2009-10	75a/G	12582	16705	0	0	29287	3579	4119	0	0	7698
2009-10	76	25130	18764	0	0	43894	8649	5921	0	0	14570
2009-10	79/G	13860	24088	0	0	37948	5413	12122	0	0	17535
2009-10	22b/Btt	0	0	0	12497	12497	0	0	0	7462	7462
2009-10	23a	0	0	0	9951	9951	0	0	0	5941	5941
2009-10	28	0	0	0	1322	1322	0	0	0	789	789
2009-10	31/Btt	0	0	0	867	867	0	0	0	517	517
2009-10	20b/M	1840	24512	13595	0	39947	1427	15889	4482	0	21798
<b>Sub-total</b>		<b>53412</b>	<b>84069</b>	<b>13595</b>	<b>24637</b>	<b>175713</b>	<b>19068</b>	<b>38051</b>	<b>4482</b>	<b>14709</b>	<b>76310</b>
2010-11	17a/M	4415	52641	5898	0	62954	2000	22540	800	0	25340

Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2010-11	17b/M	17165	28451	2947	0	48563	9731	5775	727	0	16233
2010-11	40/M	12783	21609	4601	0	38993	6077	8096	119	0	14292
2010-11	42/M	42322	52263	5010	0	99595	18841	24513	706	0	44060
<b>Sub-total</b>		<b>76685</b>	<b>154964</b>	<b>18456</b>	<b>0</b>	<b>250105</b>	<b>36649</b>	<b>60924</b>	<b>2352</b>	<b>0</b>	<b>99925</b>
2011-12	14b/Btt	0	183	0	1007	<b>1190</b>	0	91	0	891	982
2011-12	14c/Btt	27	246	0	58	<b>331</b>	18	148	0	0	166
2011-12	22ab/Btt	0	102	0	9304	<b>9406</b>	0	47	0	6504	6551
<b>Sub-total</b>		<b>27</b>	<b>531</b>	<b>0</b>	<b>10369</b>	<b>10927</b>	<b>18</b>	<b>286</b>	<b>0</b>	<b>7395</b>	<b>7699</b>
2012-13	66a/G	3079	7157	0	0	<b>10236</b>	1340	3097	0	0	4437
2012-13	67a/G	821	20656	0	0	<b>21477</b>	561	8468	0	0	9029
<b>Sub-total</b>		<b>3900</b>	<b>27813</b>	<b>0</b>	<b>0</b>	<b>31713</b>	<b>1901</b>	<b>11565</b>	<b>0</b>	<b>0</b>	<b>13466</b>
2013-14	25/Btt	0	17275	6587	0	<b>23862</b>	0	10018	841	0	10859
2013-14	26a/Btt	0	12933	6343	0	<b>19276</b>	0	7962	1582	0	9544
2013-14	66/M	28866	59043	0	0	<b>87909</b>	14027	26406	0	0	40433
<b>Sub-total</b>		<b>28866</b>	<b>89251</b>	<b>12930</b>	<b>0</b>	<b>131047</b>	<b>14027</b>	<b>44386</b>	<b>2423</b>	<b>0</b>	<b>60836</b>
2014-15	41/M	9370	29731	3427		<b>42528</b>	6162	16806	449	0	23417
2014-15	43a/M	8761	129324	975		<b>139060</b>	3832	64628	281	0	68741
2014-15	11/M	33951	45003	0	0	<b>78954</b>	0	0	0	0	0
<b>Sub-total</b>		<b>52082</b>	<b>204058</b>	<b>4402</b>	<b>0</b>	<b>260542</b>	<b>9994</b>	<b>81434</b>	<b>730</b>	<b>0</b>	<b>92158</b>
2015-16	20/Btt	0	360	0	0	<b>360</b>	0	178	0	0	178
2015-16	21/Btt	0	1285	0	0	<b>1285</b>	0	637	0	0	637
2015-16	24/Btt	111	10097	0	1350	<b>11558</b>	105	5829	0	424	6358
2015-16	27b/Btt	0	0	0	2675	<b>2675</b>	0	0	0	569	569
2015-16	29/Btt	202	7676	0	514	<b>8392</b>	0	920	0	292	1212
2015-16	30/Btt	0	5783	0	1264	<b>7047</b>	0	2314	0	449	2763



Year	Comptt	Marking (cft)					Extraction (cft)				
		Deo	Kail	Fir	Chir	Total	Deo	Kail	Fir	Chir	Total
2015-16	31/Btt	0	6068	0	1940	<b>8008</b>	0	2619	0	72	2691
2015-16	36a/btt	0	0	0	7480	<b>7480</b>	0	0	0	4089	4089
2015-16	37a/Btt	0	0	0	2811	<b>2811</b>	0	0	0	1400	1400
2015-16	40a/Btt	0	0	0	2490	<b>2490</b>	0	0	0	1047	1047
2015-16	40b/Btt	0	0	0	10728	<b>10728</b>	0	0	0	3731	3731
2015-16	41/Btt	0	0	0	3880	<b>3880</b>	0	0	0	1359	1359
2015-16	43/Btt	0	0	0	3028	<b>3028</b>	0	0	0	1059	1059
2015-16	48/G	0	0	0	1302	<b>1302</b>	0	0	0	358	358
2015-16	49/G	0	0	0	2482	<b>2482</b>	0	0	0	734	734
2015-16	52a/G	0	0	0	3966	<b>3966</b>	0	0	0	950	950
2015-16	8b/Btt	18843	2115	0	6250	<b>27208</b>	0	0	0	0	0
2015-16	25/Btt	249	5931	2962	0	<b>9142</b>	0	0	0	0	0
2015-16	26b/Btt	0	4721	2588	0	<b>7309</b>	0	0	0	0	0
<b>Sub-total</b>		<b>19405</b>	<b>44036</b>	<b>5550</b>	<b>52160</b>	<b>121151</b>	<b>105</b>	<b>12497</b>	<b>0</b>	<b>16533</b>	<b>29135</b>
<b>Grand Total</b>		<b>568797</b>	<b>1709507</b>	<b>445016</b>	<b>577299</b>	<b>3300619</b>	<b>266293</b>	<b>855998</b>	<b>60687</b>	<b>163914</b>	<b>1346892</b>

**APPENDIX XVIII WORKING CIRCLE WISE TIMBER VOLUME MARKED FAVOURING SFC AND EXTRACTION  
THEREOF FROM 2000-01 TO 2015-16 IN BATOTE FOREST DIVISION**

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
33a/Btt	DK Conversion	83	22621	6602	0	29306	19	23409	1200	0	24628
75a/G	DK Conversion	16116	10655	0	0	26771	8902	5784	0	0	14686
4/Btt	DK Conversion	2330	1354	30	0	3714	1167	639	16	0	1822
15/Btt	DK Conversion	1739	19526	0	620	21885	756	7903	152	0	8811
64a/G	DK Conversion	81	21644	0	3570	25295	40	6944	0	698	7682
65/G	DK Conversion	1560	18441	9502	0	29503	428	6748	926	0	8102
66b/G	DK Conversion	0	8665	0	250	8915	0	3698	0	0	3698
64a/G	DK Conversion	47	25317	0	1018	26382	27	12700	0	350	13077
65/G	DK Conversion	2207	11918	0	977	15102	1265	7346	389	0	9000
66b/G	DK Conversion	27	4823	0	0	4850	0	2532	0	0	2532
67a/G	DK Conversion	54	3759	0	0	3813	26	2191			2217
75a/G	DK Conversion	12582	16705	0	0	29287	3579	4119	0	0	7698
66a/G	DK Conversion	3079	7157	0	0	10236	1340	3097	0	0	4437
67a/G	DK Conversion	821	20656	0	0	21477	561	8468	0	0	9029
21/Btt	DK Conversion	0	1285	0	0	1285	0	637	0	0	637
67a/G	DKCon	812	16236	0	490	17538	297	6642	0	83	7022
	<b>Total</b>	<b>41538</b>	<b>210762</b>	<b>16134</b>	<b>6925</b>	<b>275359</b>	<b>18407</b>	<b>102857</b>	<b>2683</b>	<b>1131</b>	<b>125078</b>
76/G	DK Converted	22110	28965	0	0	51075	18224	20408	161	0	38793
6/Btt	DK Converted	883	2178	0	0	3061	329	776	0	0	1105
66a/G	DK Converted	2263	10996	744	0	14003	969	4728	85	0	5782
66a/G	DK Converted	649	3841	0	0	4490	299	2074	0	0	2373
46b/Btt	DK Converted	5051	49555	2749	0	57355	2620	21314	95	0	24029

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
78b/G	DK Converted	13357	10456	3470	0	27283	3339	2718	100	0	6157
76/G	DK Converted	25130	18764	0	0	43894	8649	5921	0	0	14570
25/Btt	DK Converted	0	17275	6587	0	23862	0	10018	841	0	10859
11/M	DK Converted	14926	22187	0	0	37113	12484	18068	0	0	30552
13a/M	DK Converted	1314	10334	0	0	11648	902	8014	0	0	8916
20b/M	DK Converted	1840	24512	13595	0	39947	1427	15889	4482	0	21798
17b/M	DK Converted	17165	28451	2947	0	48563	9731	5775	727	0	16233
11/M	DK Converted	33951	45003	0	0	78954	0	0	0	0	0
47/G	DK Converted	1300	28241	0	1132	30673	599	12116	0	46	12761
77b/G	DK Converted	2442	6470	25134	0	34046	805	54	0	0	859
25/Btt	DK Converted	249	5931	2962	0	9142	0	0	0	0	0
	<b>Total</b>	<b>142630</b>	<b>313159</b>	<b>58188</b>	<b>1132</b>	<b>515109</b>	<b>60377</b>	<b>127873</b>	<b>6491</b>	<b>46</b>	<b>194787</b>
51ab/G	DK Unalloted	0	0	0	8065	8065	0	0	0	2422	2422
79/G	DK Unalloted	7890	28765	475	431	37561	10450	23869	45	0	34364
2/Btt	DK Unalloted	8113	450	0	0	8563	4088	227	0	0	4315
03a/Btt	DK Unalloted	7672	1132	195	0	8999	3800	550	0	0	4350
03b/Btt	DK Unalloted	6378	675	7053	0	14106	3221	361	0	0	3582
8b/Btt	DK Unalloted	1744	1216	1798	0	4758	1029	600	378	0	2007
11/Btt	DK Unalloted	1625	19071	0	0	20696	1046	8183	0	0	9229
22a/Btt	DK Unalloted	121	166	0	18233	18520	98	80	0	6325	6503
38a/Btt	DK Unalloted	0	15753	625	247	16625	0	8796	308	102	9206
44a/Btt	DK Unalloted	0	10547	1144	823	12514	0	4493	466	410	5369
32a/Btt	DK Unalloted	148	14472	0	4755	19375	78	5600	0	300	5978
35a/Btt	DK Unalloted	0	14829	0	158	14987	0	5680	0	60	5740
11/Btt	DK Unalloted	2153	86216	78	0	88447	2233	65800	0	0	68033

Comptt.	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
22a/Btt	DK Unalloted	0	1404	70	0	1474	0	721	0	44	765
24/Btt	DK Unalloted	1597	10846	78	0	12521	1009	6139	0	39	7187
29/Btt	DK Unalloted	0	2185	0	518	2703	0	1086	0	252	1338
32a/Btt	DK Unalloted	0	690	0	15550	16240	0	181	0	4572	4753
3b/Btt	DK Unalloted	17620	1077	0	0	18697	8706	662	0	0	9368
8b/Btt	DK Unalloted	2531	677	297	0	3505	1351	406	76	0	1833
22a/Btt	DK Unalloted	2623	1223	189	10436	14471	0	0	0	5839	5839
79/G	DK Unalloted	13860	24088	0	0	37948	5413	12122	0	0	17535
22ab/Btt	DK Unalloted	0	102	0	9304	9406	0	47	0	6504	6551
24/Btt	DK Unalloted	111	10097	0	1350	11558	105	5829	0	424	6358
29/Btt	DK Unalloted	202	7676	0	514	8392	0	920	0	292	1212
30/Btt	DK Unalloted	0	5783	0	1264	7047	0	2314	0	449	2763
8b/Btt	DK Unalloted	18843	2115	0	6250	27208	0	0	0	0	0
26b/Btt	DK Unalloted	0	4721	2588	0	7309	0	0	0	0	0
14/M	DK Unalloted	2601	37551	0	0	40152	1919	32834	0	0	34753
	<b>Total</b>	<b>95832</b>	<b>303527</b>	<b>14590</b>	<b>77898</b>	<b>491847</b>	<b>44546</b>	<b>187500</b>	<b>1273</b>	<b>28034</b>	<b>261353</b>
33b/Btt	Fir Selection	0	469	10071	0	10540	0	0	1886	0	1886
77a/G	Fir Selection	155	335	79767	0	80257	12	1067	0	0	1079
78a/G	Fir Selection	1038	1372	5118	0	7528	303	363	72	0	738
17a/M	Fir Selection	4415	52641	5898	0	62954	2000	22540	800	0	25340
26a/Btt	Fir Selection	0	12933	6343	0	19276	0	7962	1582	0	9544
	<b>Total</b>	<b>5608</b>	<b>67750</b>	<b>107197</b>	<b>0</b>	<b>180555</b>	<b>2315</b>	<b>31932</b>	<b>4340</b>	<b>0</b>	<b>38587</b>
52ab/G	Chir Irregular	0	208	0	14995	15203	0	55	0	3152	3207
53/G	Chir Irregular	0	0	0	41789	41789	0	0	0	13119	13119
54/G	Chir Irregular	0	0	0	22531	22531	0	0	0	7735	7735

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
55/G	Chir Irregular	0	0	0	45797	45797	0	0	0	14239	14239
56/G	Chir Irregular	0	0	0	37182	37182	0	0	0	2186	2186
23a/Btt	Chir Irregular	0	508	0	13515	14023	0	195	0	2389	2584
40b/Btt	Chir Irregular	0	908	0	36091	36999	0	163	0	9602	9765
41/Btt	Chir Irregular	0	0	0	47381	47381	0	0	0	8900	8900
43/Btt	Chir Irregular	0	0	0	11569	11569	0	0	0	2416	2416
64b/G	Chir Irregular	1473	7558	0	9265	18296	450	2446	0	0	2896
64b/G	Chir Irregular	0	3538	0	1958	5496		1531	0	599	2130
32b/Btt	Chir Irregular	0	5622	0	11096	16718	0	2436	0	1060	3496
35b/Btt	Chir Irregular	0	20467	0	10222	30689		10724		80	10804
61/G	Chir Irregular	0	0	0	4971	4971	0	0	0	1660	1660
62/G	Chir Irregular	0	0	0	6124	6124	0	0	0	1960	1960
23/Btt	Chir Irregular	0	0	2090	0	2090	0	0	0	824	824
27b/Btt	Chir Irregular	0	0	0	2271	2271	0	0	0	889	889
36a/Btt	Chir Irregular	0	0	0	1781	1781	0	0		554	554
37a/Btt	Chir Irregular	0	0	0	6629	6629	0	0	0	1961	1961
41/Btt	Chir Irregular	0	0	0	2171	2171	0	0	0	870	870
43/Btt	Chir Irregular	0	0	0	4401	4401	0	0	0	1799	1799
51b/G	Chir Irregular	0	0	0	983	983	0	0	0	617	617
52a/G	Chir Irregular	0	0	0	8677	8677	0	0	0	3000	3000
71b/G	Chir Irregular	0	0	0	3015	3015	0	0	0	504	504
23a/Btt	Chir Irregular	0	0	0	9197	9197	0	0	0	3321	3321
40b/Btt	Chir Irregular	0	0	0	9972	9972	0	0	0	3927	3927
23a/Btt	Chir Irregular	0	0	0	9951	9951	0	0	0	5941	5941

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
14b/Btt	Chir Irregular	0	183	0	1007	1190	0	91	0	891	982
14c/Btt	Chir Irregular	27	246	0	58	331	18	148	0	0	166
27b/Btt	Chir Irregular	0	0	0	2675	2675	0	0	0	569	569
36a/btt	Chir Irregular	0	0	0	7480	7480	0	0	0	4089	4089
37a/Btt	Chir Irregular	0	0	0	2811	2811	0	0	0	1400	1400
40b/Btt	Chir Irregular	0	0	0	10728	10728	0	0	0	3731	3731
41/Btt	Chir Irregular	0	0	0	3880	3880	0	0	0	1359	1359
43/Btt	Chir Irregular	0	0	0	3028	3028	0	0	0	1059	1059
48/G	Chir Irregular	0	0	0	1302	1302	0	0	0	358	358
52a/G	Chir Irregular	0	0	0	3966	3966	0	0	0	950	950
	<b>Total</b>	<b>1500</b>	<b>39238</b>	<b>2090</b>	<b>410469</b>	<b>453297</b>	<b>468</b>	<b>17789</b>	<b>0</b>	<b>107710</b>	<b>125967</b>
57ab/G	Reboisement	0	0	0	18462	18462	0	0	0	1000	1000
58/G	Reboisement	0	0	0	4623	4623	0		0	2275	2275
39b/Btt	Reboisement	229	14922	676	1265	17092	109	7634	346	421	8510
57/G	Reboisement	0	0	0	0	0	0	0	0	0	0
58/G	Reboisement	0	0	0	672	672	0	0	0	190	190
19/Btt	Reboisement	0	7928	52467	0	60395	0	3724	8655	0	12379
20/Btt	Reboisement	0	7563	0	0	7563		3570	0	0	3570
31/Btt	Reboisement	0	345	0	2363	2708	0	121	0	627	748
49/G	Reboisement	0	0	0	1767	1767	0	0	0	654	654
70/G	Reboisement	0	0	0	10245	10245	0	0	0	928	928
73/G	Reboisement	0	0	0	12682	12682	0	0	0	7634	7634
20/Btt	Reboisement	0	9140	4713	0	13853	0	5650	1535	0	7185
28/Btt	Reboisement	0	0	0	6000	6000	0	0	0	2143	2143
40a/Btt	Reboisement	0	0	0	1198	1198	0	0	0	500	500

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
22b/Btt	Reboisement	0	0	0	12497	12497	0	0	0	7462	7462
28/Btt	Reboisement	0	0	0	1322	1322	0	0	0	789	789
31/Btt	Reboisement	0	0	0	867	867	0	0	0	517	517
20/Btt	Reboisement	0	360	0	0	360	0	178	0	0	178
31/Btt	Reboisement	0	6068	0	1940	8008	0	2619	0	72	2691
40a/Btt	Reboisement	0	0	0	2490	2490	0	0	0	1047	1047
49/G	Reboisement	0	0	0	2482	2482	0	0	0	734	734
	<b>Total</b>	<b>229</b>	<b>46326</b>	<b>57856</b>	<b>80875</b>	<b>185286</b>	<b>109</b>	<b>23496</b>	<b>10536</b>	<b>26993</b>	<b>61134</b>
08a/Btt	Mixed Conifer Selection	6106	633	1041	0	7780	3602	334	340	0	4276
61/M	Mixed Conifer Selection	3935	27705	5203	0	36843	2719	20186	2812	0	25717
65/M	Mixed Conifer Selection	3990	19508	575	0	24073	2314	11654	238	0	14206
66/M	Mixed Conifer Selection	10169	23126	0	0	33295	7155	16264	0	0	23419
71/M	Mixed Conifer Selection	9580	12356	4812	0	26748	2595	6477	606	0	9678
73/M	Mixed Conifer Selection	4393	2396	0	0	6789	2626	1800	0	0	4426
60/M	Mixed Conifer Selection	11224	34729	2363	0	48316	6479	18404	1473	0	26356
64/M	Mixed Conifer Selection	5120	19391	48093	0	72604	5724	19624	7885	0	33233
51/M	Mixed Conifer Selection	4206	22476	29299	0	55981	844	3300	5194	0	9338
52/M	Mixed Conifer Selection	13385	85900	7016	0	106301	3696	30279	1830	0	35805
60/M	Mixed Conifer Selection	202	9019	1874	0	11095	87	5429	819	0	6335
65/M	Mixed Conifer Selection	14528	20197	2090	0	36815	8456	12064	862	0	21382
66/M	Mixed Conifer Selection	19947	18656	1635	0	40238	14035	13122	856	0	28013
51/M	Mixed Conifer Selection	7370	16664	9090	0	33124	1474	2448	1612	0	5534
52/M	Mixed Conifer Selection	7857	25131	1693	0	34681	2168	8856	441	0	11465
64/M	Mixed Conifer Selection	8089	32455	51140	0	91684	5724	19624	7885	0	33233
72/M	Mixed Conifer Selection	39680	13174	1892	0	54746	17565	3997	167	0	21729

<b>Comptt.</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
62/M	Mixed Conifer Selection	9577	53259	7132	0	69968	3869	30240	789	0	34898
40/M	Mixed Conifer Selection	12783	21609	4601	0	38993	6077	8096	119	0	14292
42/M	Mixed Conifer Selection	42322	52263	5010	0	99595	18841	24513	706	0	44060
66/M	Mixed Conifer Selection	28866	59043	0	0	87909	14027	26406	0	0	40433
41/M	Mixed Conifer Selection	9370	29731	3427	0	42528	6162	16806	449	0	23417
43a/M	Mixed Conifer Selection	8761	129324	975	0	139060	3832	64628	281	0	68741
<b>Sub-Total</b>		<b>281460</b>	<b>728745</b>	<b>188961</b>	<b>0</b>	<b>1199166</b>	<b>140071</b>	<b>364551</b>	<b>35364</b>	<b>0</b>	<b>539986</b>
<b>Total</b>		<b>568797</b>	<b>1709507</b>	<b>445016</b>	<b>577299</b>	<b>3300619</b>	<b>266293</b>	<b>855998</b>	<b>60687</b>	<b>163914</b>	<b>1346892</b>



**APPENDIX XIX      YEAR WISE TIMBER VOLUME MARKED DEPARTMENTALLY AND EXTRACTION THEREOF FROM  
2000-01 TO 2015-16 IN BATOTE FOREST DIVISION**

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2001-02	3a/Btt	382	0	0	0	382	225	0	0	0	225
2001-02	8a/Btt	829	356	0	0	1185	418	226	0	0	644
2001-02	8b/Btt	0	1095	0		1095	0	727	0	0	727
2001-02	9/Btt	158	0	0	0	158	95	0	0	0	95
2001-02	10a/Btt	74	0	0	0	74	64	0	0	0	64
2001-02	11/Btt	0	992	0	0	992	0	555	0	0	555
2001-02	12a/Btt	222	48	0	0	270	118	32	0	0	150
2001-02	14c/Btt	0	80	0	0	80	0	45	0	0	45
2001-02	15/Btt	0	182	0	0	182	0	117	0	0	117
2001-02	18a/Btt	0	632	0	0	632	0	325	0	0	325
<b>Sub-Total</b>		<b>1665</b>	<b>3385</b>	<b>0</b>	<b>0</b>	<b>5050</b>	<b>920</b>	<b>2027</b>	<b>0</b>	<b>0</b>	<b>2947</b>
2002-03	8b/Btt	1268	815	0	0	2083	761	551	0	0	1312
2002-03	9/Btt	0	199	0	0	199	0	106	0	0	106
2002-03	10b/Btt	269		0	0	269	151	0	0	0	151
2002-03	10a/Btt	47	486	0	0	533	27	285	0	0	312
2002-03	11/Btt	0	3395	0	0	3395	0	1138	0	0	1138
2002-03	15/Btt	0	4007	0	0	4007	0	2120	0	0	2120
2002-03	11/Btt	708	1964	0	0	2672	589	1295	0	0	1884
2002-03	12a/Btt	230	0	0	0	230	117	0	0	0	117
2002-03	9/Btt	74	0	0	0	74	31	0	0	0	31
2002-03	10b/Btt	0	354	0	0	354	0	31	0	0	31
2002-03	23b/Btt	0	0	0	3076	3076	0	0		1278	1278
2002-03	23a/Btt	0	18	1067		1085	0	8	0	534	542
2002-03	18b/Btt	74	0	0	0	74	52	0	0	0	52
2002-03	9/Btt	1481	0	0	0	1481	0	0	0	0	0

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2002-03	10a/Btt	5340	600	30		5970	1394	598	19	0	2011
2002-03	10b/Btt	1523	591	0	0	2114	392	0	0	0	392
2002-03	11/Btt	0	615	0	0	615		381	0	0	381
2002-03	15/Btt	74	304	0	0	378	36	134	0	0	170
<b>Sub-Total</b>		<b>11088</b>	<b>13348</b>	<b>1097</b>	<b>3076</b>	<b>28609</b>	<b>3550</b>	<b>6647</b>	<b>19</b>	<b>1812</b>	<b>12028</b>
2003-04	2/Btt	2379	0	0	0	2379	1549	0	0	0	1549
2003-04	3a/Btt	3532	0	0	0	3532	2138	0	0	0	2138
2003-04	3b/Btt	4553	401	0	0	4954	2627	220	0	0	2847
2003-04	9/Btt	1486	0	0	0	1486	932	0	0	0	932
2003-04	10a/Btt	2420	456	0	0	2876	1399	201	0	0	1600
2003-04	10b/Btt	1109	591	0	0	1700	665	115	0	0	780
2003-04	11/Btt	0	4934	0	0	4934	0	2737	0	0	2737
2003-04	64a/G	0	354	0	0	354	0	238	0	0	238
<b>Sub-Total</b>		<b>15479</b>	<b>6736</b>	<b>0</b>	<b>0</b>	<b>22215</b>	<b>9310</b>	<b>3511</b>	<b>0</b>	<b>0</b>	<b>12821</b>
2004-05	10b/Btt	0	0	0	0	0	680	1786	0	0	2466
2004-05	11/Btt	0	0	0	0	0	1178	88	0	0	1266
2004-05	12a/Btt	0	0	0	0	0	238	227	0	0	465
2004-05	15/Btt	118	0	0	0	118	57	0	0	0	57
<b>Sub-Total</b>		<b>118</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>118</b>	<b>2153</b>	<b>2101</b>	<b>0</b>	<b>0</b>	<b>4254</b>
2005-06	3a/Btt	6215	0	0	0	6215	2778	836	0	0	3614
2005-06	8a/Btt	5565	0	0	0	5565	2074	122	365	0	2561
2005-06	11/Btt	105	0	0	0	105	0	67	0	0	67
<b>Sub-Total</b>		<b>11885</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11885</b>	<b>4852</b>	<b>1025</b>	<b>365</b>	<b>0</b>	<b>6242</b>
2006-07	12a/M	8979	12491	0	0	21470	4478	4355	0	0	8833
<b>Sub-Total</b>		<b>8979</b>	<b>12491</b>	<b>0</b>	<b>0</b>	<b>21470</b>	<b>4478</b>	<b>4355</b>	<b>0</b>	<b>0</b>	<b>8833</b>
2007-08	65/G	27	509	0	0	536	15	305	0	0	320
2007-08	66a/G	236	5547			5783	176	3326	0	0	3502
2007-08	67a/G	710	1223			1933	535	790	0	0	1325

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2007-08	09/Btt	1300	0	0	0	1300	525	0	0	0	525
2007-08	10a/Btt	202	0	0	0	202	121	0	0	0	121
2007-08	10b/Btt	175	0	0	0	175	116	0	0	0	116
2007-08	11/Btt	0	118	0	0	118	0	64	0	0	64
2007-08	12/Btt	854	118	0	0	972	427	52	0	0	479
2007-08	15/Btt	1639	0	0		1639	983	0	0	0	983
2007-08	9/BM	259	0	0	0	259	105	0	0	0	105
2007-08	10/M	0	198	0	0	198	0	82	0	0	82
2007-08	20/Btt	0	177	0	0	177	0	66	0	0	66
2007-08	22a/Btt	185	0	0	0	185	122	0	0	0	122
2007-08	22a/Btt	585	0	0	0	585	347	0	0	0	347
2007-08	23a/Btt	0	166	0	0	166	116	0	0	0	116
<b>Sub-Total</b>		<b>6172</b>	<b>8056</b>	<b>0</b>	<b>0</b>	<b>14228</b>	<b>3588</b>	<b>4685</b>	<b>0</b>	<b>0</b>	<b>8273</b>
2008-09	2/Btt	16509	0	0	0	16509	12712	0	0	0	12712
2008-09	15/Btt	2404	401	0	0	2805	1203	116	0	0	1319
<b>Sub-Total</b>		<b>18913</b>	<b>401</b>	<b>0</b>	<b>0</b>	<b>19314</b>	<b>13915</b>	<b>116</b>	<b>0</b>	<b>0</b>	<b>14031</b>
2008-09	11/Btt	0	316	0	0	316	0	150	0	0	150
2008-09	12b/Btt	3559	0	0	0	3559	1671	0	0	0	1671
2008-09	13/Btt	0	0	0	463	463	0	0	0	310	310
2008-09	40b/Btt	0	0	0	8556	8556	0	0	0	3593	3593
2008-09	41/Btt	0	0	0	283	283	0	0	0	155	155
2008-09	58/M	1260	0	0	0	1260	650	0	0	0	650
2008-09	65/M	274	274	0	0	548	166	166	0	0	332
2008-09	10/M	274	0	0	0	274	110	0	0	0	110
2008-09	15/M	468	0	0	0	468	190	0	0	0	190
<b>Sub-Total</b>		<b>5835</b>	<b>590</b>	<b>0</b>	<b>9302</b>	<b>15727</b>	<b>2787</b>	<b>316</b>	<b>0</b>	<b>4058</b>	<b>7161</b>
2010-11	38a/Btt	242	9433	0	0	9675	0	5009	0	0	5009
2010-11	40a/Btt	0	0	0	9405	9405	0	0	0	664	664

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2010-11	40b/Btt	0	0		5099	5099	0	0		1243	1243
2010-11	11/Btt	0	1075	0	0	1075	0	724	0	0	724
2010-11	9/Btt	0	70	0	0	70	55	0	0	0	55
2010-11	23a/Btt	0	0	0	3598	3598	0	0	0	1185	1185
2010-11	12a/Btt	495	0	0	0	495	258	0	0	0	258
2010-11	55/G	0	0	0	1408	1408	0	0	0	209	209
2010-11	10b/M	710	0	0	0	710	290	0	0	0	290
2010-11	46a/M	155	0	0	0	155	55	0	0	0	55
2010-11	73/M	1803	534	0	0	2337	1030	270	0	0	1300
2010-11	42/Btt	0	0	0	404	404	0	0	0	296	296
<b>Sub-Total</b>		<b>3405</b>	<b>11112</b>	<b>0</b>	<b>19914</b>	<b>34431</b>	<b>1688</b>	<b>6003</b>	<b>0</b>	<b>3597</b>	<b>11288</b>
2011-12	15/Btt	0	2423	0	0	2423	0	2014	0	0	2014
2011-12	11/Btt	3574	43946	0	0	47520	2600	15999	0	0	18599
2011-12	11/Btt	0	440	0	0	440	0	186	0	0	186
2011-12	72/M	14090	2323	0	0	16413	7200	1300	0	0	8500
2011-12	20/Btt	0	1829	0	0	1829	0	1120	0	0	1120
2011-12	12/Btt	787	0	0	0	787	153	0	0	0	153
2011-12	9/Btt	306	0	0	0	306	269	0	0	0	269
2011-12	10a/Btt	200	0	0	0	200	116	0	0	0	116
2011-12	10b/Btt	222	0	0	0	222	63	0	0	0	63
2011-12	15/Btt	0	278	0	0	278	0	152	0	0	152
2011-12	42/Btt	222	0	0	0	222	89	0	0	0	89
<b>Sub-Total</b>		<b>19401</b>	<b>51239</b>	<b>0</b>	<b>0</b>	<b>70640</b>	<b>10490</b>	<b>20771</b>	<b>0</b>	<b>0</b>	<b>31261</b>
2012-13	11/Btt	0	9158	0	0	9158	0	4696	0	0	4696
2012-13	40b/Btt	0	0	0	8193	8193	0	0	0	3923	3923
2012-13	22b/Btt	0	0	0	2772	2772	0	0	0	702	702
2012-13	42/Btt	333	0	0	0	333	166	0	0	0	166
2012-13	44a/Btt	266	0	0	0	266	135	0	0	0	135

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2012-13	11/Btt	0	1300	0	0	1300	0	275	0	0	275
<b>Sub-Total</b>		<b>599</b>	<b>10458</b>	<b>0</b>	<b>10965</b>	<b>22022</b>	<b>301</b>	<b>4971</b>	<b>0</b>	<b>4625</b>	<b>9897</b>
2013-14	9/Btt	121	0	0	0	121	73	0	0	0	73
2013-14	10/Btt	957	118	0	0	1075	413	63	0	0	476
2013-14	17/Btt	852	470	0	0	1322	521	297	0	0	818
2013-14	14c/Btt	873	374	0	0	1247	525	231	0	0	756
2013-14	16a/Btt	1006	48	0	0	1054	643	38	0	0	681
2013-14	12/Btt	306	0	0	0	306	168	0	0	0	168
2013-14	29/Btt	0	2155	0	0	2155	0	993	0	0	993
2013-14	30/Btt	0	236	0	127	363	0	147	0	82	229
2013-14	17/Btt	185	810	0	0	995	139	685	0	0	824
2013-14	11/Btt	0	336	0	0	336	0	157	0	0	157
2013-14	12/B	242	0	0	0	242	0	140	0	0	140
2013-14	17/Btt	155	798	0	0	953	96	281	0	0	377
2013-14	10a/Btt	511	0	0	0	511	327	0	0	0	327
2013-14	10b/Btt	432	0	0	0	432	75	0	0	0	75
2013-14	10c/Btt	121	0	0	0	121	75	0	0	0	75
2013-14	31/Btt	0	156	0	0	156	0	66	0	0	66
2013-14	15a/M	14641	9549	1816	0	26006	4171	4533	0	0	8704
<b>Sub-Total</b>		<b>20402</b>	<b>15050</b>	<b>1816</b>	<b>127</b>	<b>37395</b>	<b>7226</b>	<b>7631</b>	<b>0</b>	<b>82</b>	<b>14939</b>
2014-15	2/Btt	607	0	0	0	607	406	0	0	0	406
2014-15	3a/Btt	306	0	0	0	306	201	0	0	0	201
2014-15	3b/Btt	2180	0	0	0	2180	1513	0	0	0	1513
2014-15	6/Btt	1271	0	0	0	1271	780	0	0	0	780
2014-15	7/Btt	1695	0	0	0	1695	864	0	0	0	864
2014-15	9/Btt	478	0	0	0	478	314	0	0	0	314
2014-15	10b/Btt	553	0	0	0	553	385	0	0	0	385
2014-15	11/Btt	996	0	0	0	996	655	0	0	0	655

Year	Compt.	Marking (cft)					Extraction (cft)				
		Deodar	Kail	Fir	Chir	Total Marking	Deodar	Kail	Fir	Chir	Total Extraction
2014-15	22a/Btt	802	0	0	516	1318	491	0	0	0	491
2014-15	66/G	0	0	0	430	430		266	0	0	266
2014-15	17/Btt	266	860	0	0	1126	233	776	0	0	1009
2014-15	12a/Btt	452	0	0	0	452	304	0	0	0	304
2014-15	11/Btt	0	552	0	0	552	0	278		0	278
2014-15	10b/Btt	200	0	0	0	200	115	0	0	0	115
2014-15	12a/Btt	74	0	0	0	74	50	0	0		50
2014-15	15a/M	5896	4821			10717	8957	6412	0	0	15369
<b>Sub-Total</b>		<b>15776</b>	<b>6233</b>	<b>0</b>	<b>946</b>	<b>22955</b>	<b>15268</b>	<b>7732</b>	<b>0</b>	<b>0</b>	<b>23000</b>
2015-16	9/Btt	1361	0	0	0	1361	922	0	0	0	922
2015-16	10a/Btt	316	0	0	0	316	239	0	0	0	239
2015-16	10b/Btt	1547	0	0	0	1547	1053	0	0	0	1053
2015-16	11/Btt	451	4505	0	0	4956	250	2442	0	0	2692
2015-16	12a/Btt	459	0	0	0	459	284	0	0	0	284
2015-16	13/Btt	0	0	0	486	486	0	0	0	307	307
2015-16	15/Btt	0	594	0	0	594	0	359	0	0	359
2015-16	20/Btt	0	2285	0	0	2285	0	1583	0	0	1583
2015-16	2/Btt	2811	371	0	40	3222	1524	257	0	18	1799
2015-16	3a/Btt	306	0	0	0	306	204	0	0	0	204
2015-16	5/Btt	1519	0	0	0	1519	1089	0	0	0	1089
2015-16	6/Btt	3408	9	0	0	3417	1508	0	0	0	1508
2015-16	8a/Btt	259	0	0	0	259	151	0	0	0	151
2015-16	8b/Btt	5224	3660	0	0	8884	2719	197	0	0	2916
2015-16	22a/Btt	0	2251	0	0	2251	0	659	0	0	659
2015-16	16a/M	1355	14707	0	0	16062	900	9500	0	0	10400
2015-16	66/G	195	11306	0	0	11501	143	6644	0	0	6787
2015-16	47/G	185		0	0	185	112	0	0	0	112
<b>Sub-Total</b>		<b>19396</b>	<b>39688</b>	<b>0</b>	<b>526</b>	<b>59610</b>	<b>11098</b>	<b>21641</b>	<b>0</b>	<b>325</b>	<b>33064</b>
<b>Grand Total</b>		<b>159113</b>	<b>178787</b>	<b>2913</b>	<b>44856</b>	<b>385669</b>	<b>91624</b>	<b>93532</b>	<b>384</b>	<b>14499</b>	<b>200039</b>

**APPENDIX XX      WORKING CIRCLE WISE TIMBER VOLUME MARKED DEPARTMENTALLY AND EXTRACTION  
THEREOF FROM    2000-01 TO 2015-16 IN BATOTE FOREST DIVISION**

<b>Comptt</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
3a/Btt	DK Ualloted	382	0	0	0	382	225	0	0	0	225
8b/Btt	DK Ualloted	0	1095	0		1095	0	727	0	0	727
11/Btt	DK Ualloted	0	992	0	0	992	0	555	0	0	555
8b/Btt	DK Ualloted	1268	815	0	0	2083	761	551	0	0	1312
11/Btt	DK Ualloted	0	3395	0	0	3395	0	1138	0	0	1138
11/Btt	DK Ualloted	708	1964	0	0	2672	589	1295	0	0	1884
11/Btt	DK Ualloted	0	615	0	0	615		381	0	0	381
2/Btt	DK Ualloted	2379	0	0	0	2379	1549	0	0	0	1549
3a/Btt	DK Ualloted	3532	0	0	0	3532	2138	0	0	0	2138
3b/Btt	DK Ualloted	4553	401	0	0	4954	2627	220	0	0	2847
11/Btt	DK Ualloted	0	4934	0	0	4934	0	2737	0	0	2737
11/Btt	DK Ualloted	0	0	0	0	0	1178	88	0	0	1266
3a/Btt	DK Ualloted	6215	0	0	0	6215	2778	836	0	0	3614
11/Btt	DK Ualloted	105	0	0	0	105	0	67	0	0	67
11/Btt	DK Ualloted	0	118	0	0	118	0	64	0	0	64
22a/Btt	DK Ualloted	185	0	0	0	185	122	0	0	0	122
22a/Btt	DK Ualloted	585	0	0	0	585	347	0	0	0	347
2/Btt	DK Ualloted	16509	0	0	0	16509	12712	0	0	0	12712
11/Btt	DK Ualloted	0	316	0	0	316	0	150	0	0	150
58/M	DK Ualloted	1260	0	0	0	1260	650	0	0	0	650
38a/Btt	DK Ualloted	242	9433	0	0	9675	0	5009	0	0	5009

Comptt	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
11/Btt	DK Ualloted	0	1075	0	0	1075	0	724	0	0	724
46a/M	DK Ualloted	155	0	0	0	155	55	0	0	0	55
11/Btt	DK Ualloted	3574	43946	0	0	47520	2600	15999	0	0	18599
11/Btt	DK Ualloted	0	440	0	0	440	0	186	0	0	186
11/Btt	DK Ualloted	0	9158	0	0	9158	0	4696	0	0	4696
44a/Btt	DK Ualloted	266	0	0	0	266	135	0	0	0	135
11/Btt	DK Ualloted	0	1300	0	0	1300	0	275	0	0	275
16a/Btt	DK Ualloted	1006	48	0	0	1054	643	38	0	0	681
29/Btt	DK Ualloted	0	2155	0	0	2155	0	993	0	0	993
30/Btt	DK Ualloted	0	236	0	127	363	0	147	0	82	229
11/Btt	DK Ualloted	0	336	0	0	336	0	157	0	0	157
2/Btt	DK Ualloted	607	0	0	0	607	406	0	0	0	406
3a/Btt	DK Ualloted	306	0	0	0	306	201	0	0	0	201
3b/Btt	DK Ualloted	2180	0	0	0	2180	1513	0	0	0	1513
11/Btt	DK Ualloted	996	0	0	0	996	655	0	0	0	655
22a/Btt	DK Ualloted	802	0	0	516	1318	491	0	0	0	491
11/Btt	DK Ualloted	0	552	0	0	552	0	278		0	278
11/Btt	DK Ualloted	451	4505	0	0	4956	250	2442	0	0	2692
2/Btt	DK Ualloted	2811	371	0	40	3222	1524	257	0	18	1799
3a/Btt	DK Ualloted	306	0	0	0	306	204	0	0	0	204
8b/Btt	DK Ualloted	5224	3660	0	0	8884	2719	197	0	0	2916
22a/Btt	DK Ualloted	0	2251	0	0	2251	0	659	0	0	659
<b>Sub-Total</b>		<b>56607</b>	<b>94111</b>	<b>0</b>	<b>683</b>	<b>151401</b>	<b>37072</b>	<b>40866</b>	<b>0</b>	<b>100</b>	<b>78038</b>
8a/Btt	Mixed Conifer Selection	829	356	0	0	1185	418	226	0	0	644
18b/Btt	Mixed Conifer Selection	74	0	0	0	74	52	0	0	0	52



Comptt	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
8a/Btt	Mixed Conifer Selection	5565	0	0	0	5565	2074	122	365	0	2561
10/M	Mixed Conifer Selection	0	198	0	0	198	0	82	0	0	82
65/M	Mixed Conifer Selection	274	274	0	0	548	166	166	0	0	332
10/M	Mixed Conifer Selection	274	0	0	0	274	110	0	0	0	110
10b/M	Mixed Conifer Selection	710	0	0	0	710	290	0	0	0	290
73/M	Mixed Conifer Selection	1803	534	0	0	2337	1030	270	0	0	1300
72/M	Mixed Conifer Selection	14090	2323	0	0	16413	7200	1300	0	0	8500
8a/Btt	Mixed Conifer Selection	259	0	0	0	259	151	0	0	0	151
<b>Sub-Total</b>		<b>23878</b>	<b>3685</b>	<b>0</b>	<b>0</b>	<b>27563</b>	<b>11491</b>	<b>2166</b>	<b>365</b>	<b>0</b>	<b>14022</b>
9/Btt	Reboisement	158	0	0	0	158	95	0	0	0	95
10a/Btt	Reboisement	74	0	0	0	74	64	0	0	0	64
12a/Btt	Reboisement	222	48	0	0	270	118	32	0	0	150
9/Btt	Reboisement	0	199	0	0	199	0	106	0	0	106
10b/Btt	Reboisement	269		0	0	269	151	0	0	0	151
10a/Btt	Reboisement	47	486	0	0	533	27	285	0	0	312
12a/Btt	Reboisement	230	0	0	0	230	117	0	0	0	117
9/Btt	Reboisement	74	0	0	0	74	31	0	0	0	31
10b/Btt	Reboisement	0	354	0	0	354	0	31	0	0	31
23b/Btt	Reboisement	0	0	0	3076	3076	0	0		1278	1278
9/Btt	Reboisement	1481	0	0	0	1481	0	0	0	0	0
10a/Btt	Reboisement	5340	600	30		5970	1394	598	19	0	2011
10b/Btt	Reboisement	1523	591	0	0	2114	392	0	0	0	392
9/Btt	Reboisement	1486	0	0	0	1486	932	0	0	0	932
10a/Btt	Reboisement	2420	456	0	0	2876	1399	201	0	0	1600
10b/Btt	Reboisement	1109	591	0	0	1700	665	115	0	0	780

<b>Comptt</b>	<b>Working Circle</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Marking (Cft)</b>	<b>Deodar</b>	<b>Kail</b>	<b>Fir</b>	<b>Chir</b>	<b>Total Extraction (Cft)</b>
10b/Btt	Reboisement	0	0	0	0	0	680	1786	0	0	2466
12a/Btt	Reboisement	0	0	0	0	0	238	227	0	0	465
09/Btt	Reboisement	1300	0	0	0	1300	525	0	0	0	525
10a/Btt	Reboisement	202	0	0	0	202	121	0	0	0	121
10b/Btt	Reboisement	175	0	0	0	175	116	0	0	0	116
12/Btt	Reboisement	854	118	0	0	972	427	52	0	0	479
9/BM	Reboisement	259	0	0	0	259	105	0	0	0	105
20/Btt	Reboisement	0	177	0	0	177	0	66	0	0	66
12b/Btt	Reboisement	3559	0	0	0	3559	1671	0	0	0	1671
40a/Btt	Reboisement	0	0	0	9405	9405	0	0	0	664	664
9/Btt	Reboisement	0	70	0	0	70	55	0	0	0	55
12a/Btt	Reboisement	495	0	0	0	495	258	0	0	0	258
42/Btt	Reboisement	0	0	0	404	404	0	0	0	296	296
20/Btt	Reboisement	0	1829	0	0	1829	0	1120	0	0	1120
12/Btt	Reboisement	787	0	0	0	787	153	0	0	0	153
9/Btt	Reboisement	306	0	0	0	306	269	0	0	0	269
10a/Btt	Reboisement	200	0	0	0	200	116	0	0	0	116
10b/Btt	Reboisement	222	0	0	0	222	63	0	0	0	63
42/Btt	Reboisement	222	0	0	0	222	89	0	0	0	89
22b/Btt	Reboisement	0	0	0	2772	2772	0	0	0	702	702
42/Btt	Reboisement	333	0	0	0	333	166	0	0	0	166
9/Btt	Reboisement	121	0	0	0	121	73	0	0	0	73
10/Btt	Reboisement	957	118	0	0	1075	413	63	0	0	476
12/Btt	Reboisement	306	0	0	0	306	168	0	0	0	168

Comptt	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
12/B	Reboisement	242	0	0	0	242	0	140	0	0	140
10a/Btt	Reboisement	511	0	0	0	511	327	0	0	0	327
10b/Btt	Reboisement	432	0	0	0	432	75	0	0	0	75
10c/Btt	Reboisement	121	0	0	0	121	75	0	0	0	75
31/Btt	Reboisement	0	156	0	0	156	0	66	0	0	66
9/Btt	Reboisement	478	0	0	0	478	314	0	0	0	314
10b/Btt	Reboisement	553	0	0	0	553	385	0	0	0	385
12a/Btt	Reboisement	452	0	0	0	452	304	0	0	0	304
10b/Btt	Reboisement	200	0	0	0	200	115	0	0	0	115
12a/Btt	Reboisement	74	0	0	0	74	50	0	0		50
9/Btt	Reboisement	1361	0	0	0	1361	922	0	0	0	922
10a/Btt	Reboisement	316	0	0	0	316	239	0	0	0	239
10b/Btt	Reboisement	1547	0	0	0	1547	1053	0	0	0	1053
12a/Btt	Reboisement	459	0	0	0	459	284	0	0	0	284
20/Btt	Reboisement	0	2285	0	0	2285	0	1583	0	0	1583
16a/M	Reboisement	1355	14707	0	0	16062	900	9500	0	0	10400
<b>Sub-Total</b>		<b>32832</b>	<b>22785</b>	<b>30</b>	<b>15657</b>	<b>71304</b>	<b>16134</b>	<b>15971</b>	<b>19</b>	<b>2940</b>	<b>35064</b>
14c/Btt	Chir Irregular	0	80	0	0	80	0	45	0	0	45
23a/Btt	Chir Irregular	0	18	1067		1085	0	8	0	534	542
23a/Btt	Chir Irregular	0	166	0	0	166	116	0	0	0	116
40b/Btt	Chir Irregular	0	0	0	8556	8556	0	0	0	3593	3593
41/Btt	Chir Irregular	0	0	0	283	283	0	0	0	155	155
40b/Btt	Chir Irregular	0	0		5099	5099	0	0		1243	1243
23a/Btt	Chir Irregular	0	0	0	3598	3598	0	0	0	1185	1185
55/G	Chir Irregular	0	0	0	1408	1408	0	0	0	209	209

Comptt	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
40b/Btt	Chir Irregular	0	0	0	8193	8193	0	0	0	3923	3923
14c/Btt	Chir Irregular	873	374	0	0	1247	525	231	0	0	756
<b>Sub-Total</b>		<b>873</b>	<b>638</b>	<b>1067</b>	<b>27137</b>	<b>29715</b>	<b>641</b>	<b>284</b>	<b>0</b>	<b>10842</b>	<b>11767</b>
15/Btt	DK Conversion	0	182	0	0	182	0	117	0	0	117
15/Btt	DK Conversion	0	4007	0	0	4007	0	2120	0	0	2120
15/Btt	DK Conversion	74	304	0	0	378	36	134	0	0	170
64a/G	DK Conversion	0	354	0	0	354	0	238	0	0	238
15/Btt	DK Conversion	118	0	0	0	118	57	0	0	0	57
65/G	DK Conversion	27	509	0	0	536	15	305	0	0	320
67a/G	DK Conversion	710	1223			1933	535	790	0	0	1325
15/Btt	DK Conversion	1639	0	0		1639	983	0	0	0	983
15/Btt	DK Conversion	2404	401	0	0	2805	1203	116	0	0	1319
17/Btt	DK Conversion	852	470	0	0	1322	521	297	0	0	818
17/Btt	DK Conversion	185	810	0	0	995	139	685	0	0	824
17/Btt	DK Conversion	155	798	0	0	953	96	281	0	0	377
17/Btt	DK Conversion	266	860	0	0	1126	233	776	0	0	1009
15/Btt	DK Conversion	0	594	0	0	594	0	359	0	0	359
5/Btt	DK Conversion	1519	0	0	0	1519	1089	0	0	0	1089
66/G	DK Conversion	195	11306	0	0	11501	143	6644	0	0	6787
<b>Sub-Total</b>		<b>8144</b>	<b>21818</b>	<b>0</b>	<b>0</b>	<b>29962</b>	<b>5050</b>	<b>12862</b>	<b>0</b>	<b>0</b>	<b>17912</b>
18a/Btt	DK Converted	0	632	0	0	632	0	325	0	0	325
12a/M	DK Converted	8979	12491	0	0	21470	4478	4355	0	0	8833
66a/G	DK Converted	236	5547			5783	176	3326	0	0	3502
15b/M	DK Converted	468	0	0	0	468	190	0	0	0	190
15/Btt	DK Converted	0	2423	0	0	2423	0	2014	0	0	2014

Comptt	Working Circle	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total Extraction (Cft)
15/Btt	DK Converted	0	278	0	0	278	0	152	0	0	152
15a/M	DK Converted	14641	9549	1816	0	26006	4171	4533	0	0	8704
6/Btt	DK Converted	1271	0	0	0	1271	780	0	0	0	780
66/G	DK Converted	0	0	0	430	430		266	0	0	266
15a/M	DK Converted	5896	4821			10717	8957	6412	0	0	15369
6/Btt	DK Converted	3408	9	0	0	3417	1508	0	0	0	1508
47/G	DK Converted	185		0	0	185	112	0	0	0	112
<b>Sub-Total</b>		<b>35084</b>	<b>35750</b>	<b>1816</b>	<b>430</b>	<b>73080</b>	<b>20372</b>	<b>21383</b>	<b>0</b>	<b>0</b>	<b>41755</b>
13/Btt	Protection	0	0	0	463	463	0	0	0	310	310
7/Btt	Protection	1695	0	0	0	1695	864	0	0	0	864
13/Btt	Protection	0	0	0	486	486	0	0	0	307	307
<b>Sub-Total</b>		<b>1695</b>	<b>0</b>	<b>0</b>	<b>949</b>	<b>2644</b>	<b>864</b>	<b>0</b>	<b>0</b>	<b>617</b>	<b>1481</b>
	<b>G.Total</b>	<b>159113</b>	<b>178787</b>	<b>2913</b>	<b>44856</b>	<b>385669</b>	<b>91624</b>	<b>93532</b>	<b>384</b>	<b>14499</b>	<b>200039</b>

**APPENDIX XXI      ABSTRACT SHOWING WORKING CIRCLE WISE TIMBER VOLUME MARKED  
DEPARTMENTALLY/SFC AND EXTRACTION THEREOF FROM   2000-01 TO 2015-16 IN BATOTE  
FOREST DIVISION**

Deptt./SFC	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total (Outturn) Extraction(Cft)
<b>Deodar Kail Conversion</b>										
SFC	41538	210762	16134	6925	275359	18407	102857	2683	1131	125078
Deptt	8144	21818	0	0	29962	5050	12862	0	0	17912
<b>Sub-Total</b>	<b>49682</b>	<b>232580</b>	<b>16134</b>	<b>6925</b>	<b>305321</b>	<b>23457</b>	<b>115719</b>	<b>2683</b>	<b>1131</b>	<b>142990</b>
<b>Deodar Kail Converted</b>										
SFC	142630	313159	58188	1132	515109	60377	127873	6491	46	194787
Deptt	35084	35750	1816	430	73080	20372	21383	0	0	41755
<b>Sub-Total</b>	<b>177714</b>	<b>348909</b>	<b>60004</b>	<b>1562</b>	<b>588189</b>	<b>80749</b>	<b>149256</b>	<b>6491</b>	<b>46</b>	<b>236542</b>
<b>Deodar Kail Unallotted</b>										
SFC	95832	303527	14590	77898	491847	44546	187500	1273	28034	261353
Deptt	56607	94111	0	683	151401	37072	40866	0	100	78038
<b>Sub-Total</b>	<b>152439</b>	<b>397638</b>	<b>14590</b>	<b>78581</b>	<b>643248</b>	<b>81618</b>	<b>228366</b>	<b>1273</b>	<b>28134</b>	<b>339391</b>
<b>G. Total DK Regular</b>	<b>379835</b>	<b>979127</b>	<b>90728</b>	<b>87068</b>	<b>1536758</b>	<b>185824</b>	<b>493341</b>	<b>10447</b>	<b>29311</b>	<b>718923</b>
<b>Mixed Conifer Selection</b>										
SFC	281460	728745	188961	0	1199166	140071	364551	35364	0	539986
Deptt	23878	3685	0	0	27563	11491	2166	365	0	14022
<b>Sub-Total</b>	<b>305338</b>	<b>732430</b>	<b>188961</b>	<b>0</b>	<b>1226729</b>	<b>151562</b>	<b>366717</b>	<b>35729</b>	<b>0</b>	<b>554008</b>
<b>Fir Selection</b>										
SFC	5608	67750	107197	0	180555	2315	31932	4340	0	38587
Deptt	0	0	0	0	0	0	0	0	0	0
<b>Sub-Total</b>	<b>5608</b>	<b>67750</b>	<b>107197</b>	<b>0</b>	<b>180555</b>	<b>2315</b>	<b>31932</b>	<b>4340</b>	<b>0</b>	<b>38587</b>

Deptt./SFC	Deodar	Kail	Fir	Chir	Total Marking (Cft)	Deodar	Kail	Fir	Chir	Total (Outturn) Extraction(Cft)
<b>Chir Irregular</b>										
SFC	1500	39238	2090	410469	453297	468	17789	0	107710	125967
Deptt	873	638	1067	27137	29715	641	284	0	10842	11767
<b>Sub-Total</b>	<b>2373</b>	<b>39876</b>	<b>3157</b>	<b>437606</b>	<b>483012</b>	<b>1109</b>	<b>18073</b>	<b>0</b>	<b>118552</b>	<b>137734</b>
<b>Reboisement</b>										
SFC	229	46326	57856	80875	185286	109	23496	10536	26993	61134
Deptt	32832	22785	30	15657	71304	16134	15971	19	2940	35064
<b>Sub-Total</b>	<b>33061</b>	<b>69111</b>	<b>57886</b>	<b>96532</b>	<b>256590</b>	<b>16243</b>	<b>39467</b>	<b>10555</b>	<b>29933</b>	<b>96198</b>
<b>Protection</b>										
SFC	0	0	0	0	0	0	0	0	0	0
Deptt	1695	0	0	949	2644	864	0	0	617	1481
<b>Sub-Total</b>	<b>1695</b>	<b>0</b>	<b>0</b>	<b>949</b>	<b>2644</b>	<b>864</b>	<b>0</b>	<b>0</b>	<b>617</b>	<b>1481</b>
<b>Grand Total</b>	<b>727910</b>	<b>1888294</b>	<b>447929</b>	<b>622155</b>	<b>3686288</b>	<b>357917</b>	<b>949530</b>	<b>61071</b>	<b>178413</b>	<b>1546931</b>

**APPENDIX XXII STATEMENT SHOWING LAND DIVERSION CASES UNDER THE FOREST (CONSERVATION) ACT, 1997  
IN BATOTE FOREST DIVISION**

S.No.	Project	User Agency	Area Diverted (Ha.)	Compartment No.	No. of trees	Order No. & date
1	220 KV T/L Kishtwar Kishanpur	PGCI	10.884			DO/111-20/85 dated:-26-04-1986
2	220 KV T/L Kishanpur Pampoor (Srinagar)	XEN PDD	48	14b,15,16,22,23,31, 36,28,37/Btt49,51 and 52/G	1240	45-FST of 1993 Dt;29-01-1993
3	Observatory Sanasar	CWC	0.593	0	0	25-FST of 1998 Dt;10.6.1998
4	Ramban Gool road (0-20 Km)	52-RCC Gref	9.1915	49,51,52,53,54,55,56 &57/G	381	242-FST of 1998 dated:-10-06-1998
5	Filtration plant at Patnitop	PHE Doda	0.113	11/Btt	3	0
6	Baglihaar HEP	PDC	44.51	13,23, 28/Btt	3014	471-FST of 1999 Dated:-29-11-1999
7	Additional Land BHEP	PDC	5	13/Btt	2073	471-FST of 1999 Dated:-29-11-1999
8	Dhalwas Sawani Road	PWD Ramban	0.6	23a/Btt	33	F.O. No 07-FC of 2001 dated:-30-03-2002
9	Batote Boon Bari Road	RDD Ramban	0.89	11/Btt	36	F.O. No 08-FC of 2002 dated:-10-06-2002
10	Dharam kund Sawalakote Road	PDC Ramban	37.515	57,58,61, 62,70,72, & 73/G	14549	G.O. 533-FST of 2003 dated;-08-12-2003
11	33 KV DC Chanderkot to Dharmound	PDD	2.00	13,14a,23, 28/Btt	37	F.O. 516-FST of 2003 Dated:-24-10-2003
12	Upgradation of Govindpura kohul	XEN Irrigation Doda	0.179	41	0	F.O. 19-FC of 2003 dated:-28-03-2003
13	Maitra Balout Road	PWD Ramban	2.6	40b,41 & 43/Btt	456	G.O.341-FST of 2003 dated;-17-07-2003
14	400 KV DC Kishanpur Srinagar (Wagoora)	PGCI	37.24	19,20,22a, 23, 24,27, 29, 31,32, 36, 37, 40ab, 41, 43/Btt, 49, 51&52/G	1681	F.O. No. 8-412/FC dated:-10-03-1989, PCCF/MFP/208/1755-57 Dated:-09-09-2003



S.No.	Project	User Agency	Area Diverted (Ha.)	Compartment No.	No. of trees	Order No. & date
14	400 KV DC Kishanpur Srinagar (Wagoora)	PGCI	37.24	19,20,22a, 23, 24,27, 29, 31,32, 36, 37, 40ab,41, 43/Btt, 49, 51&52/G	1681	F.O. No. 8-412/FC dated:-10-03-1989, PCCF/MFP/208/1755-57 Dated:-09-09-2003
15	Kanga-Bhathni Road	PWD Ramban	0.16	64/G	5	DDC/DDB/2K3/6667-90 Dated:- 01-11-2003
16	Mobile LPT Doordarshan at Patnitop	DD	0.05	10b/Btt	0	G.O. 445-FST of 2004 Dated:-05-08-2004
17	BSNL Tower at Kanga	BSNL	0.07	55,56/G	12	G.O. 269-FST of 2006 Dated:-18-05-2006
18	Briddle path from Batote Bye pass to Gurdwara	XEN REW Doda	0.1025	11/Btt	9	F.O. No. 153 of 2005 Dated:- 14-01-2005(CCF-J)
19	MVA 220/130/33 grid Station Maitra	PDD	7.0095	40c/Btt	3013	G.O.268-FST of 2006 dated:-18-05-2006
20	Airtel Mobile tower at Kanga	Airtel	0.016	55,56/G	0	G.O.267-FST of 2006 dated:-18-05-2006
21	Baglihaar HEP (Quarry site)	PDC	10.00	01/Btt	1577	G.O.46-FST of 2006 dated:-02-02-2006
22	400 KV TL/DC Baglihaar to Kishan pur	BHEP	14.612	20,22a,23a&28/Btt	618	G.O.444-FST of 2004 dated:-01-10-2004 & G.O. No. 260-FST of 2006 Dated:-18-05-2006.
23	Kanga Bhathni Road	PWD Ramban	3.62	67,69/G	216	G.O.263-FST of 2007 dated:-26-04-2007
24	Irrigation Khul	XEN Irrigation Division Doda	0.2	65/M	4	PCCF FO No. 21 of 2007 dt:14-12-2007
25	Marsoo-Charota road	PMGSY	1.2	58/M	107	PCCF FO No. 37 of 2008 dt:17.01.08
26	Bargran- Behota road	PMGSY	0.92	21/M	357	PCCF FO No. 39 of 2008 dt:17.01.08
27	Bargran-Roat road	PMGSY	1.27	48/M	67	PCCF FO No. 38 of 2008 dt:17.01.08

S.No.	Project	User Agency	Area Diverted (Ha.)	Compartment No.	No. of trees	Order No. & date
28	Four lannings NHIA (Peera Karol Sector)	NHAI	34.20	22,23,28 and 31/Btt	10046	G.O.No.190-FST of 2008 dated:-27-05-2008
29	Double Lanning NHIB Batote Khellani	Gref	13.21	1,2,3,10,12/Btt and 10,12,13/M	10542	G.O.No.269-FST of 2008 dated:-03-06-2008
30	Rakh-jarog Road	PMGSY	1.17	12,13/Btt	261	63 FC of 2009 Dt 9-6-2009
31	Mobile Tower at Kanga	Vodafone	0.0274	55,56/G	12	G.O.No.269-FST of 2009 dated:-09-06-2009
32	Maitra Ballout Km 8-17	PMGSY	6.838	38, 40/Btt	477	223 FST of 2010 Dt; 26-05-2010
33	Champa-Dhanoo	PMGSY	2.49	14c, 22/Btt	351	36 FC of 2010 Dt' 9-9-2010
34	132-KV DC line Ramban Khellani	PDD	16.775	13,14,28,1/Btt & 13/M	231	
35	132-KV DC CSTL/LILO Grid Statio Maitra	TLMD Udh	0.094	40c/Btt	71	G.O. 503-FST of 2010 Dated:-28-12-2010
36	Chenani Nashiri Tunnal	NHAI	22.207	14c,16 &17/Btt	40	G.O. 205-FST of 2011 Dated:-21-04-2011
37	Dumping site Chennai Nashiri Tunnal	NHAI	12.98	14b,14c,&22/Btt	1224	G.O. 204-FST of 2011 Dated:-21-04-2011
38	Sanasar to Sana via Karma Gali	PWD	0.51	20,21/Btt	24	30 FCA of 2011Dt' 30-09-2011
39	Abutement A-1 pier of Mandyal Bridge Sawalakote HEP SPDC		0.505	73/G	19	G.O. No:-465-FST of 2011 Dated;-17-12-2011
40	Dumping sites and approach road to Mandyal Bridge Sawalakote HEP SPDC	SHEP	9.57	73/G	223+ 16148 poles	G.O. 132-FST of 2012 Dated:-27.03.2012
41	Dhalwas -Sawni Karma Road	PMGSY	3.56	24, 27b, 29 & 30b/Btt	41 Trees / 119 Poles & 42 Saplings	G.O 222-FSt of 2013 Dated:-17.05.2013

S.No.	Project	User Agency	Area Diverted (Ha.)	Compartment No.	No. of trees	Order No. & date
42	Additional land required for Chenani Nashiri Tunnel in Co. 22b/Btt	NHAI	2.34	22b/Btt	92	G.O.No. 174-FST of 2012 Dated:- 02.04.2012
43	Laying of 400 KV D/C New Wanpoo ( Qagigund)	PGCI	68.99		3393 including poles	0
44	Abutement A-1 pier of Mandyal Bridge Sawalakote HEP SPDC		0.505	73/G	19	G.O. No:-465-FST of 2011 Dated;- 17-12-2011
45	Dumping sites and approach road to Mandyal Bridge Sawalakote HEP SPDC	SHEP	9.57	73/G	223+1614 8 poles	G.O. 132-FST of 2012 Dated:- 27.03.2012
46	Additional land required for Chenani Nashiri Tunnel in Co. 22b/Btt	NHAI	2.34	22b/Btt	92	G.O.No. 174-FST of 2012 Dated:- 02.04.2012
47	Submergence of BHEP	JKSPDC	67.42	1,13/Btt, 74, 9, 10, 12/ & 13/M	4687 trees /poles	G.O.No. 224-FST of 2013 Dated:- 17.05.2012
48	Underground tunneling(Tunnel) BHEP	JKSPDC	9.37	1,13/Btt,	0	G.O.No. 225-FST of 2013 Dated:- 17.05.2012
49	Dhalwas -Sawni Karma Road	PMGSY	3.56	24, 27b, 29 & 30b/Btt	41 Trees / 119 Poles & 42 Sap	G.O 222-FSt of 2013 Dated:- 17.05.2013
50	Laying of 400 KV D/C New Wanpoo ( Qagigund)	PGCI	80.29	19,20,21,22,24,27,29,30 ,31,36,37, 40b,41 &43/Btt. 48,49,51& 52/G	3393 including poles	G.O. No 214FST of 2013 Dated:- 17.05.2013

<b>S.No.</b>	<b>Project</b>	<b>User Agency</b>	<b>Area Diverted (Ha.)</b>	<b>Compartment No.</b>	<b>No. of trees</b>	<b>Order No. &amp; date</b>
51	33 KV over head line (Janghi Morh)	NHAI	0.42	14B/Btt 14c/Btt	9 Trees 45 Poles	G.O. No 83-FST of 2015 Dated:- 16.04.2015
52	400 KV D/C Kishenpur-wagoora Transmission Line Lilloo BHEP-state -II Pot head yard	BHEp	20.304	23ab, 27b,28b/Btt	244 trees, 110 Poles	G.O.No 283-FST of 2015 dated:- 21.10.2015

**APPENDIX XXIII STATEMENT OF NON-TIMBER FOREST PRODUCE EXTRACTED ANNUALLY FROM BATOTE FOREST DIVISION**

<b>Year</b>	<b>Resin (Qntls)</b>	<b>Mushak Bala (In Qntls)</b>	<b>Discorea (Qntls)</b>	<b>Anardana (in qntls)</b>	<b>Guchhies</b>	<b>Bunafsha (Qntls)</b>	<b>Cedar wood oil</b>	<b>Deo. Stumps (Qntls)</b>	<b>Surjam (Qntls)</b>	<b>Rasount (Qntls)</b>	<b>Nagchatri</b>
<b>2000-01</b>	2471.01	0	0	0	LSR	0	0	2148	0	0	0
<b>2001-02</b>	4458.31	4	80	965.67	LSR	223.95	0	1939.5	2.5	10	0
<b>2002-03</b>	5029.42	0	433.69	151	LSR	29	0	0	8	0	0
<b>2003-04</b>	3663.55	0	178.71	1003.27	LSR	6.4	0	0	5	0	0
<b>2004-05</b>	0	0.5	0.83	1428.61	LSR	0	0	0	0	0	0
<b>2005-06</b>	0	0	10.85	819.3	LSR	0	0	0	0	0	0
<b>2006-07</b>	0	0	0	0	LSR	0	0	0	0	0	0
<b>2007-08</b>	0	0	11.7	0	LSR	0	0	0	0	0	0
<b>2008-09</b>	0	0	0	172.14	LSR	0	0	0	0	0	0
<b>2009-10</b>	0	0	0	1817.42	LSR	0	0	0	0	0	0
<b>2010-11</b>	0	0	14.5	0	LSR	0	0	669.5	0	0	0
<b>2011-12</b>	0	0	3.00	1403.15	LSR	0	0	0	0	0	0
<b>2012-13</b>	0	0	36.10	135.00	LSR	0	0	0	0	0	0
<b>2013-14</b>	0	0	0	859.46	LSR	0	0	0	0	0	0
<b>2014-15</b>	0	0	0	578.20	LSR	0	2 barral	0	0	0	0
<b>2015-16</b>	0	0	0	259.7	LSR	0	68 Qtls	0	0	0	5 Qtls

**APPENDIX XXIV LIST OF IMPORTANT MEDICINAL PLANTS FOUND IN  
BATOTE FOREST DIVISION**

<b>Botanical Name</b>	<b>Family</b>	<b>English Name</b>	<b>Local Name</b>
<i>Aconitum heterophyllum</i>	Ranunculaceae	Mank's Hood Aconite	Atis
<i>Adiantum venustum</i>	Filicales	Maidenhair Fern	Kalijanth
<i>Anemone obtuseloba</i>	Ranunculaceae	Anemone	Rattanjog
<i>Artemisia spp.</i>	Compositae	Warmseed	Afsantin
<i>Atropa belladonna</i>	Solanaceae	Deadly Nightshade	Ban Tamaku
<i>Brassica rapa</i>	Brassicaceae	Wild Turnip	Shalgum, Gagu
<i>Bunium persicum</i>	Apiaceae	Black cumin	Kala Zeera
<i>Cannabis sativa</i>	Urticaceae	Hemp	Bhang
<i>Dioscorea deltoidea</i>	Dioscoreaceae	Yam	Kinas
<i>Ephedra gerardiana</i>	Gnetaceae	Sea-grape	Asmani Buti
<i>Ferula asafoetida</i>	Apiaceae		Hing
<i>Foeniculum vulgare</i>	Apiaceae	Fennel	Saunf
<i>Geranium wallichianum</i>	Geraniaceae	Geranium	Kao-ashud
<i>Inula racemosa</i>	Compositae	Elecampane	Pushkramul
<i>Malva sylvestris</i>	Malvaceae	Common mallow	Bade sochasl
<i>Meconopsis aculeata</i>	Papaveraceae	Blue Poppy	Kandeli
<i>Morchella esculenta</i>	Pezizales	Morels	Guchchi
<i>Mentha longifolia</i>	Lamiaceae	Mint	Pudina
<i>Picrorhiza kurrooa</i>	Schrophulariaceae	Yellow Gentian	Kutki, Kuor
<i>Plectranthus rugosus</i>	Labiatae	Country Potato	
<i>Podophyllum hexandrum</i>	Berberidaceae		Ban-kakri
<i>Potentilla anserina</i>	Rosaceae	Silver weed	Penma
<i>Prunus armeniaca</i>	Rosaceae	Apricot	
<i>Salvia moorcroftiana</i>	Labiatae	Sage	Kali-jari

<b>Botanical Name</b>	<b>Family</b>	<b>English Name</b>	<b>Local Name</b>
<i>Sambucus ebulus</i>	Caprifoliaceae	Dwarf elder	Gandal
<i>Saussurea lappa</i>	Compositae	Kuth	Kuth
<i>Saxifraga ligulata</i>	Saxifragaceae	London pride	Silphata
<i>Skimmia anquetilia</i>	Rutaceae		Sangli Dhoop
<i>Trigonella foenum-graecum</i>	Fabaceae	Fenugreek	Methi
<i>Taraxacum officinale</i>	Compositae	Dandelion	Dhudal
<i>Thymus serpyllum</i>	Labiatae	Garden Thyme	
<i>Trillium govanianum</i>	Trilliaceae	Wood Lily	Nagchattri
<i>Urtica dioica</i>	Urticaceae	Common nettle	Soie
<i>Valeriana jatamansi</i>	Valerianaceae	All heal	Mushkabala
<i>Viola odorata</i>	Violaceae	Violet	Bunafsha

**APPENDIX XXV    STATEMENT SHOWING DETAIL OF ACTIVITIES UNDER  
TAKEN UNDER FDA (JFM) FROM 2003-04 TO 2015-16 IN  
BATOTE FOREST DIVISION**

<b>National Afforestation Programme, Joint Forest Management</b>				
<b>S.No.</b>	<b>Year</b>	<b>Total Outlay</b>	<b>Total Release</b>	<b>Total Utilised</b>
1	2003-04	42.91	34.33	30.31
2	2004-05	46.36	53.50	52.33
3	2005-06	37.06	25.00	25.00
4	2006-07	24.21	14.00	16.36
5	2007-08	131.58	116.32	118.56
6	2008-09	84.74	67.00	66.43
7	2009-10	166.83	134.00	135.51
8	2010-11	91.70	34.41	34.88
9	2011-12	0.00	55.89	55.89
10	2012-13	56.50	56.50	56.50
11	2013-14	73.39	73.39	73.39
12	2014-15	0.00	0.00	0.00
13	2015-16	15.68	15.68	15.68
<b>Total</b>		<b>770.96</b>	<b>680.02</b>	<b>680.84</b>



**APPENDIX XXVI STATEMENT SHOWING ENTRY POINT ACTIVITIES DONE  
BY VILLAGE FOREST COMMITTEES IN BATOTE FOREST  
DIVISION**

Year	Bridle Paths (Kms)	Bridges (Nos)	Ponds (Nos)	Bath room (Nos)	No. of Beneficiaries	Water tankies/Bowlies (Nos)
2003-04 (15 VFCs)	42	2	1	1	3162 Families excluding padestrians and nomads	16
2004-05 (15 VFCs)	32	2	4	0		21
2005-06 (15 VFCs)	0	0	0	0		0
2006-07 (15 VFCs)	61	0	4	1		1
2007-08 (27 VFCs)	102	6	10	2		21
2008-09 (27 VFCs)	98	2	2	1		9
2009-10 (27 VFCs)	112	4	3	4		23
2010-11 (27 VFCs)	0	0	0	0		0
2011-12	0	0	0	0		0
2012-13	0	0	0	0		0
2013-14	0	0	0	0		0
2014-15	0	0	0	0		0
2015-16	14 (rep)	0	0	0		0
<b>Total</b>						

**APPENDIX XXVII STATEMENT SHOWING PLANTATION ACTIVITIES  
CARRIED BY VILLAGE FOREST COMMITTEES IN BATOTE  
FOREST DIVISION**

S.No.	Name of VFC	Plants Planted			No. of Beneficiaries
		Location	Species	No of Plants	
1	Thopal	1/BTT	Naked root	18601	3162 Families , excluding padestrian and nomades
2	Chakwa	9/B TT	Naked root	17951	
3	Chilla	17/BTT	Naked root	16968	
4	Dhalwas	23b/BTT	Naked root	20200	
5	Khandal	23a, 24/BTT	Naked root	20600	
6	Karma	27b, 29//BTT	Naked root	19668	
7	Khattar	46/G, 47/G	Naked root	20800	
8	Phalti	48/G, 49/M	Naked root	21300	
9	Parnote	51/G, 52/G	Naked root	21400	
10	Bagarh	62/G, 63/G	Naked root	20800	0
11	Kabbi	64/G, 65/G	Naked root	20800	0
12	Baggar	73/M, 74/M	Naked root	18400	0
13	Draggri	70/M,68/M	Naked root	20600	0
14	Chorota	65/M	Naked root	20100	0
15	Dantally.	9/M,10/M	Naked root	22435	0
16	Failthy	48/G, 49/M	Naked root	32020	15400
17	Kanga	54/G	Naked root	31820	15400
18	Dharamkund	56/G	Naked root	32420	2000
19	Sharore	51/G, 52/G	Naked root	33220	2000
20	Kabbi	64/G, 65/G	Naked root	33220	0
21	Kothi	67/G	Naked root	32420	8000
22	Duthan	75/G	Naked root	32020	16500
23	Badhole	73/G	Naked root	32020	0
24	Balout	40/Btt	Naked root	32020	16500
25	Shopyal	35/Btt	Naked root	31620	0
26	Tatarsoo	36/Btt	Naked root	31020	4000
27	Papriya	27a/Btt	Naked root	33810	3800
28	Sawni	27/b/Btt	Naked root	32220	0
29	Sanna	19/Btt	Naked root	33610	0
30	Ludhwal	10a/Btt	Naked root	38410	2800
31	Dharmound	14a/Btt	Naked root	30420	4400
32	Thopal	1/Btt	Naked root	32020	16500
33	Kilhota	13/M	Naked root	32210	0
34	Mothi	21/M	Naked root	30620	22000

S.No.	Name of VFC	Plants Planted			No. of Beneficiaries
		Location	Species	No of Plants	
35	Labbar	23/M	Naked root	32800	4200
36	Bargran	15a/M	Naked root	31935	0
37	Upper Behota	33/M	Naked root	32135	0
38	Kansar	56/G	Naked root	31335	0
39	Sewat	51/M	Naked root	31935	20700
40	Jatar	59/M	Naked root	32335	3000
41	Marry	61/M	Naked root	32255	16500
42	Hirni	70/M.	Naked root	32230	4200

**APPENDIX XXVIII STATEMENT SHOWING BRIDGES CONSTRUCTED UNDER  
VARIOUS SCHEMES IN BATOTE FOREST DIVISION  
DURING THE PREVIOUS PLAN PERIOD**

<b>S.No.</b>	<b>Physical (Item of Work)</b>	<b>Fin</b>
1	Wooden Foot Bridge over Channi Nallah	4.13
2	Wooden Foot Bridge over Parnote Nallah	4.13
3	Wooden Foot Bridge over Landri Nallah	3.75
4	Wooden Foot Bridge over Ballout Nallah	4.50
5	Wooden Foot Bridge over Kunhar Nallah	6.00
6	Wooden foot bridge over Magota Nallah of Dranga	3.00
7	Wooden Foot Bridge over Paddri Nallah	2.00
8	Wooden Foot Bridge over Dubroon Nallah	2.50
9	Wooden Foot Bridge over Tadoo Nallah	2.00
10	Wooden Foot Bridge over Kunfar Nallah	1.50
11	Wooden Foot Bridge over Kanyala Nallah	1.80
12	Wooden Foot Bridge over Masrola Nallah	2.00
13	Wooden Foot Bridge over Tulwali Nallah	2.40
14	Wooden Foot Bridge over Karhola Nallah	2.60
15	Completion of wooden Foot Bridge over Channi Nallah	1.00
16	Completion of wooden Foot Bridge over Parnote Nallah	1.00
17	Completion of wooden Foot bridge over Landri Nallah	1.00
18	Completion of wooden Foot bridge over Ballout Nallah	1.50
	<b>Grand Total</b>	<b>46.81</b>

**APPENDIX XXIX STATEMENT SHOWING ABSTRACT OF WORKS  
EXECUTED UNDER PDA SCHEME. 2006-07 TO 2015-16**

S.No.	Item of Work	Quantity	Remarks
<b>Patnitop and Sanasar areas</b>			
1	Root Protection	1953 cum	Patnitop & Sanasar
2	View Points	5 Nos	One Fabricated
3	Bridle Paths	20 Km	6 Nos Paths
4	Trecking Paths	1911 Mtrs	8 Nos Paths
5	Foot Bridges	17 Nos	Sanasar & Patnitop
6	Buildings	7 Nos	Repair renovation of 6 Nos Forest rest House and Check Posts & One new Chowkidar Hut at Patnitop
7	Soil and Moisture Conservation	160 cum	Sanasar & Patnitop.
8	Crate Work	10 Nos	Sanasar Patnitop
9	Fire Lines	102 Km	Sanasar & Patnitop
10	Water harvesting structures	3 Nos	Sanasar & Patnitop
11	Construction of Drains	330 Ft	Patnitop.
12	Chain Link fencing	3270 Rft	Railway Hut, FRH Sanasar & Children Park
13	Land scaping	3 Nos	Sanasar & Railway Hut
14	Removal of creepers	16350 Nos	Patnitop (Maintt. Of natural forest
15	Bush clearance	16 Ha	Maintt of natural forest.
16	Formation of mini plantation closures	5 Nos	Patnitop & Sanasar
<b>City Forest Park Batote</b>			
1	Chain Link Fencing	600 Rft	
2	Root Protection	35 cum	
3	Cleanning operations (Grabbing out)	2 Ha	
4	Land scapping	1 Ha	
5	View Point	1 Nos	
6	Sanitation (Water supply)	2 Nos	Shifting of slaughter houses
7	Drain	500 Rft	
8	Foot bridge	1 Nos	
9	Stone paved path	220 Ft	
10	Herbal Garden	1 Nos	
11	Renovation of Old Hut	1 No.	For Chowkidar
<b>Total amount received from PDA</b>		<b>206.26 Lac</b>	
<b>Amount utilized</b>		<b>193.53Lac</b>	

**APPENDIX XXX    STATEMENT SHOWING YEAR WISE TOTAL REVENUE  
GENERATED AND EXPENDITURE MADE FROM 2000-01  
TO 2015-16**

S.No	Year	Total Expenditure		Total Revenue generated
		All Plan schemes including CSS / CAMPA schemes	Non-Plan (Salary & other heads)	
<b>1</b>	<b>2000-01</b>	15.00	141.01	155.26
<b>2</b>	<b>2001-02</b>	27.06	154.14	101.09
<b>3</b>	<b>2002-03</b>	37.39	135.73	107.93
<b>4</b>	<b>2003-04</b>	47.31	139.82	279.63
<b>5</b>	<b>2004-05</b>	70.03	111.26	257.14
<b>6</b>	<b>2005-06</b>	25.00	142.50	17.21
<b>7</b>	<b>2006-07</b>	42.89	141.69	19.78
<b>8</b>	<b>2007-08</b>	148.52	149.78	14.24
<b>9</b>	<b>2008-09</b>	93.40	163.36	8.46
<b>10</b>	<b>2009-10</b>	204.66	203.70	15.43
<b>11</b>	<b>2010-11</b>	156.71	255.75	259.31
<b>12</b>	<b>2011-12</b>	207.31	419.61	37.97
<b>13</b>	<b>2012-13</b>	201.40	383.08	31.32
<b>14</b>	<b>2013-14</b>	198.00	424.69	42.62
<b>15</b>	<b>2014-15</b>	172.16	380.18	60.46
<b>16</b>	<b>2015-16</b>	140.72	457.42	59.36
<b>Total</b>		<b>1787.56</b>	<b>3803.71</b>	<b>1467.21</b>

**APPENDIX XXXI STATEMENT SHOWING YEAR WISE GRAZING FEE RECOVERED IN BATOTE FOREST DIVISION (B rate)**

Year	Buffalo		Goat		Sheep		Horse		Mule		Donkey		Poney		Camel		Total	
	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount
<b>2001-02</b>	1934	6264	3127	1251	3207	641	0	0	0	0	0	0	0	0	0	0	8268	8157
<b>2002-03</b>	2862	9298	2306	920	1776	355	8	60	0	0	82	53	0	0	0	0	7034	10686
<b>2003-04</b>	3182	10511	2505	1002	1858	372	0	0	0	0	14	9	0	0	0	0	7559	11893
<b>2004-05</b>	1063	3389	2519	890	2109	527	0	0	0	0	17	11	34	170	0	0	5742	4988
<b>2005-06</b>	1020	3225	1946	804	1411	382	119	745	0	0	0	0	9	68	0	0	4505	5223
<b>2006-07</b>	1979	6358	2342	937	1971	394	0	0	3	15	12	8	0	0	0	0	6307	7712
<b>2007-08</b>	2376	7633	2995	1198	1370	394	78	585	26	180	0	0	0	0	0	0	6845	9990
<b>2008-09</b>	987	3109	2109	844	1193	239	0	0	0	0	0	0	0	0	0	0	4289	4191
<b>2009-10</b>	934	2942	1558	623	1390	278	3	23	4	30	0	0	0	0	0	0	3889	3896
<b>2010-11</b>	673	2120	1178	471	858	242	0	0	0	0	0	0	0	0	0	0	2709	2833
<b>2011-12</b>	577	1819	1061	424	938	188	0	0	0	0	0	0	0	0	0	0	2576	2431
<b>2012-13</b>	802	2657	1255	502	1317	263	0	0	0	0	0	0	0	0	0	0	3374	3423
<b>2013-14</b>	550	1733	1346	539	973	195	0	0	0	0	0	0	0	0	0	0	2869	2466
<b>2014-15</b>	248	802	552	221	346	69	0	0	0	0	0	0	0	0	0	0	1146	1092
<b>2015-16</b>	426	1343	867	347	731	146	26	195	0	0	0	0	0	0	0	0	2050	2031
<b>Total</b>	<b>19613</b>	<b>63202</b>	<b>27666</b>	<b>10972</b>	<b>21448</b>	<b>4685</b>	<b>234</b>	<b>1608</b>	<b>33</b>	<b>225</b>	<b>125</b>	<b>81</b>	<b>43</b>	<b>238</b>	<b>0</b>	<b>0</b>	<b>69162</b>	<b>81010</b>

**APPENDIX XXXII STATEMENT SHOWING YEAR WISE COMMERCIAL GRAZING FEE RECOVERED IN BATOTE FOREST  
DIVISION (C rate)**

Year	Buffalo		Goat		Sheep		Horse		Mule		Donkey		Poney		Camel		Total	
	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount
2001-02	0	0	3346	8565	9287	6037	138	1035	83	623	18	33	37	278	0	0	12909	16570
2002-03	0	0	2469	6173	5837	3794	129	968	25	188	31	20	0	0	4	60	8491	11202
2003-04	13	148	1967	4918	6203	4032	223	1673	115	863	27	70	0	0	7	155	8555	11858
2004-05	985	3201	2040	5100	4744	3083	272	2040	134	1005	24	155	157	1178	0	0	8356	15762
2005-06	12	135	3094	7735	4790	3103	232	1746	0	0	0	0	95	713	5	125	8228	13557
2006-07	0	0	1764	4410	3939	2560	477	3555	8	60	0	0	0	0	14	350	6202	10935
2007-08	2	23	1237	3093	2956	1921	361	2708	35	263	28	18	20	150	0	0	4639	8175
2008-09	0	0	1290	3075	1953	1269	231	1733	0	0	0	0	25	188	0	0	3499	6264
2009-10	0	0	1423	3558	1372	892	336	2520	0	0	8	33	0	0	0	0	3139	7002
2010-11	0	0	1746	4365	3693	2387	345	2587	0	0	0	0	0	0	0	0	5784	9339
2011-12	0	0	1476	3690	3374	2193	343	2577	23	100	4	30	0	0	4	100	5224	8690
2012-13	3	34	3081	7703	5648	3671	492	3690	37	278	23	173	0	0	4	100	9288	15647
2013-14	15	106	1231	3078	3264	2122	479	3600	0	0	2	10	14	105	13	325	5018	9345
2014-15	0	0	388	970	1543	1003	421	3158	0	0	0	0	54	405	31	775	2437	6310
2015-16	0	0	642	1605	2281	1479	301	2258	1	8	0	0	0	0	4	100	3229	5449
<b>Total</b>	<b>1030</b>	<b>3646</b>	<b>27194</b>	<b>68035</b>	<b>60884</b>	<b>39547</b>	<b>4780</b>	<b>35845</b>	<b>461</b>	<b>3385</b>	<b>165</b>	<b>542</b>	<b>402</b>	<b>3015</b>	<b>86</b>	<b>2090</b>	<b>94998</b>	<b>156105</b>