HIMACHAL PRADESH GOVERNMENT

FOREST DEPARTMENT

REVISED DRAFT WORKING PLAN

FOR THE FORESTS OF

RENUKAJI FOREST DIVISION

VOLUME – II

(2021-22 TO 2030-31)

BY

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(Volume –II)

CHAPTER IX

GENERAL PRESCRIPTIONS

9.1. Broad objectives of management

With the passage of time, much reliance has been laid upon sustainable management of natural resources. The principles of sustainable forest management wherein thrust is laid upon conservation of the forest resources vis-à-vis utilization of forest usufructs shall be the underlying objective of the revised working plan. The revised working plan shall incorporate holistic management of forest resources keeping in view the need for conservation as well as utilization of forest produce. Reliance shall be made to scientific working parameters that confirm to the set criteria indicators of sustainable forest management. The broad objectives of the revised working plan would be as under:

a. To work the forests in a scientific way so as to promote regeneration and health of the growing stock through overwood removal based on sound silvicultural principles.

b. To obtain optimum / sustainable yield of timber and other forest produce subsidiary to the conditions as mentioned in broad objective (a) supra.

c. To conserve the floral and faunal diversity to maintain a robust ecosystem.

d. To bring about comprehensive eco-rehabilitation through afforestation and soil and water conservation measures and to increase the quality and quantity of tree cover.

e. To nourish natural resource management by encompassing multi-stakeholder participation and increased participatory forest management efforts.

9.2. Constitution of working circles

To achieve the broad objectives mentioned above, the revised working plan shall have the following working circles:

Category A) Over wood removal working circles:

i. Deodar and Deodar – Kail working circle

ii. Oak working circle

iii. Chir pine working circle

iv. Fir – spruce working circle

v. Tropical dry deciduous and scrub forest working circle

Category B) Management / overlapping working circles

i. Resin tapping working circle:

ii. Biodiversity, and NTFP management working circle (Includes biodiversity management, development, utilization& conservation of NTFP Species)

iii. Wildlife management working circle

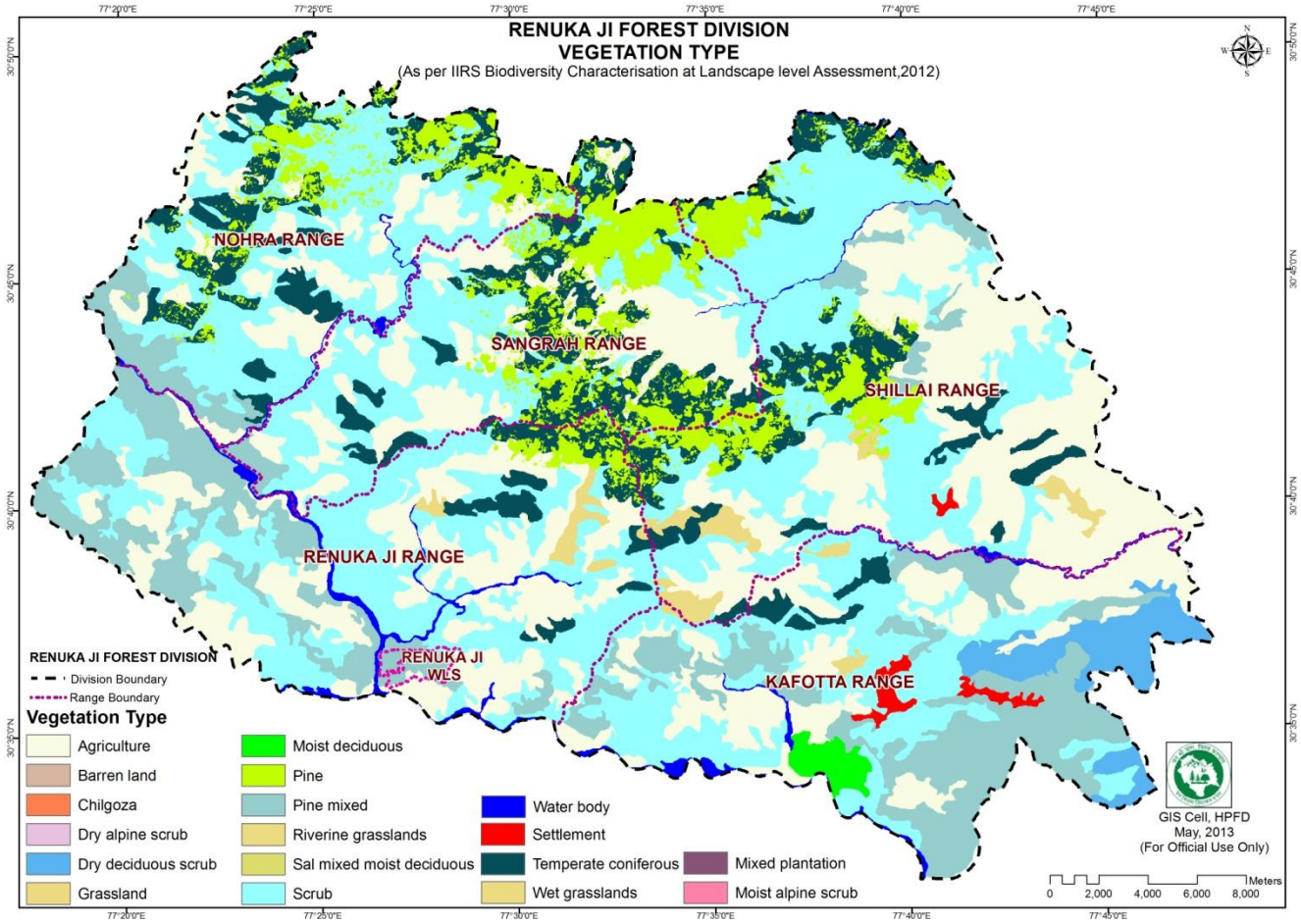
iv. Protection working circle (Eradication of Invasive Alien Species & protection works)

v. Soil and moisture conservation working circle (Thrust to spring conservation)

vi. Ecorestoration and Plantation / Afforestation working circle

vii. Human Resource Management circle. (Includes JFM, Forest dependence, Eco-development, Ecotourism)

Maps showing the Vegetation type is being given hereinunder:



9.3. Deodar-Kailworking circle

The deodar working circle shall comprise of all such areas that are dominated by deodar forests. Very often, some kail trees are also seen mixed with deodar. As no trees of IA class & above are available, hence no removal is prescribed in this working circle. The area of this working circle is 1213.71 ha.

9.4. Oak (*Quercus* spp.) working circle

Oak working circle shall constitute of areas bearing ban oak, moru oak and kharsu oak predominantly. Oak forests have been managed on coppice based silvicultural systems as well as selection system in the past. Based on this fact and the present condition of the crop, the the best silvicultural system for managing these oak forests is coppice with reserved system. The basic concept of the system is the improvement of the oak crop and regeneration in addition to meeting demands of fuel-wood, fodder, charcoal and small timber for agricultural purposes. The area of this working circle is 11343.99 ha.

9.5. Chir pine (*Pinus roxburghii*) working circle

Chir pine forests occupy about 1500 ha of area on legally classified forest land in the Division. These forests in some parts have sporadic natural regeneration while in other parts natural regeneration is deficient or even absent. Overwood removal in this chir pine circle will favours natural regeneration and at the same time shall provide ambient conditions for the young and pole crops to put up sufficient growth. The main objective of the chir pine working circle would be to improve the growth and regeneration of chir pine forests vis-a-vis over-wood removal, decongestion and other cultural operations. Based on the enumeration studies and regeneration survey that would elucidate density, basal area, regeneration status, age-class distribution, regeneration status etc. the most suitable silvicultural technique that would cause least damage to the forest floor and the ecosystem and at the same time would ensure better growth and development of the stands and aid regeneration of chir pine. As most of the chil crop is in class IV trees, the best way to utilize the existing mature/ over mature trees and to free the young crop of over head shade and to space them out, is to apply the selection system. The area of this working circle is 2966.15 ha.

9.6. Fir – Spruce working circle

The fir – spruce working circle shall include all such areas bearing predominantly fir-spruce. Fir and spruce are found intermixed at higher altitudes on steeper slopes. It has been generally observed that natural regeneration in these forests is absent or very scanty. Some of these patches are under grazing pressure also. Selection system is the most suitable silvicultural technique to bring about natural regeneration in these forests and improve the general health of these forests. The area of this working circle is 620.30 ha.

9.7. Tropical dry deciduous and scrub forest working circle

The Division has a considerable forest area occupied by tropical dry deciduous, sal and scrub forests in the Shivalik region. These forests require special silvicultural management interventions as these are comprised of a mixture of species each having variable silvicultural characters and phenology.Besides these forests are also heavily burdened by the needs of local people. Such areas are also very fragile and are susceptible to land

degradation than any other forests in the Division. Keeping these points in view, Coppice with reserves system is prescribedfor improving the stocking of these forests. The area of this working circle is 11221.05 ha.

9.8. Resin tapping working circle

Resin tapping is being done in some of the chir pine forests. However to bring about sound and scientific resin extraction process,a separate resin tapping working circle incorporated.

9.9. Biodiversity and NTFP management circle

This working circle shall prescribe means and ways of conserving the floral and faunal diversity of the Division. Sustainable management of NTFPs shall also be dealt with in this working circle.

9.10 Wildlife management circle

This sub-circle shall delve into matters relating to the conservation and management of wildlife outside protected area network. It would be imperative to have a broad view of wildlife population in the Division. Therefore, reliance shall be laid on the indirect evidences, sightings if any, and accounts of villagers and field staff during enumeration exercise shall be considered to generate a fair idea about the preferred wildlife areas. The two broad components to be covered under this sub-circle would be – conservation measures and mitigating man-animal conflicts. The former would include prescriptions regarding habitat improvement measures like creating water holes and augmenting fodder base for herbivores and fruit tree plantations for the simians. In the latter component, importance shall be given to prioritizing efforts to reduce man-animal conflicts like sterilization of *Rhesusmacaques* as a step to control their population, educating the people to minimize man-animal interface.

9.11. Protection working circle

This working circle shall focus on activities that would afford maximum legal protection to forest resouces. Forests areas susceptible to illicit felling, mining and encroachments are dealt in this chapter. In addition to this forests needs protection from climbers and invasive alian species are also mentioned in this chapter.

9.12. Soil and moisture conservation working circle

Renuka Ji Forest Division is characterized by precipitous slopes and rugged terrain that are erosion prone. Land-slides and slips, gully formation and stream bank erosion are manifested during the rainy season. Unscientific cutting of hill slopes and mismanagement of debris / muck in road construction adds to the high soil erosion rates. Under such circumstances, most erosion prone areas where soil and water conservation measures are to be adopted are identified. In this working circle the specific prescriptions with respect to the following aspects were made:

- Site specific treatment prescriptions for major landslides.

- Incorporation of bio-engineering measures in soil and moisture conservation and suggest cost effective and efficient SMC methods based on indigenous technical knowledge.
- Identify natural springs and their catchment and suggest treatment measures.

9.13. Ecorestoration and Plantation / Afforestation working circle

This working circle shall consider two aspects viz. prescriptions regarding the restoration of degraded forests, protection of hill slopes and unstable terrain through forestry activities and carrying out afforestation activities to increase tree cover and improve quality of forest cover.

9.14. Eco-development and Human Resource Management Circle

9.14.1 This working circle shall look into aspects that are related to multiple stakeholders in forests and natural resources conservation. On one hand, it shall prescribe measures related to strengthening people's participation in forest management and utilization and on the other hand shall discuss about capacity building aspects of the field functionaries. The issues to be dealt under this circle are proposed in the following paragraphs.

9.14.2. Joint Forest Management: Several JFMCs/VFDCs have been formed in the Division under different projects like FDA, NPV, NBM and NMPB. Few VFDCs and User Groups have been created under Mid-Himalayan Watershed Development Project also. However, all of these JFMCs are not active.

9.14.3. Ecotourism: There are few tourism related spots in Renuka Ji Division like the Renuka Lake and temple complex, HaripurdharBhangayni Mata temple and surrounding areas, Nohradhar (base camp of Churdhar Peak). Besides there are several spots that can be developed as ecotourism spots like Peulilani, Chou-bhogar, Charna, Bogdhar-Blaindhar etc. At present, tourists from Chandigarh, Ambala, Delhi and Dehradun visit these areas regularly. Keeping these points in mind, some spots were identified and mentioned methods to develop ecotourism in these areas. However, care should be taken not to cause ecological degradation; it should be in compliance to the provisions of Forest Conservation Act 1980 and should benefit the local community along with education for the tourists.

9.14.4. Public awareness and forestry extension: This prescribes different cost effective methods to create public awareness regarding forest conservation; fire protection and wildlife conservation.Thischapter also suggest methods to reach out the general public in order to meet their ever increasing demand for fuel wood and fodder. In this chapter also suggests ways to incorporate agro-forestry practices among the people and also suggest agro-forestry models for demonstration purpose so that trees outside forests can be increased and therefore release pressure from the forests.

9.14.5. Training and capacity building of field staff: The frontline staff are the real human resource who shall ultimately implement the prescriptions of the working plan and any other works related to nursery, plantation, soil and water conservation, protection, team building etc. It has been generally noted that the field staff lack the skills and knowledge in certain fields like JFM, use of modern technology like GPS and computers, forest and allied laws, new concepts in forest and natural resource management etc. Therefore training and capacity building modules based on his interactions with the field staffwere suggested.

Table No. 9.1: Area camparisionbetweenP. Thaplial's Plan and Proposed Plan.

Praveen Thapliyal WP		**Proposed WP**	
Chil WC	1792.05 ha	Chil WC	2966.15 ha
Coppice WC	10404.92 ha	Deodar- Kail WC	1213.71 ha
Rehabilitation WC	10828.8 ha	Oak WC	11343.99 ha
Protection WC	4339.98 ha	Fir- Spruce WC	620.30 ha
		Tropical Dry deciduous & Scrub WC	11221.05 ha
Total area	**27365.75 ha**		**27365.75 ha**

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CHAPTER -X

THE CHIL WORKING CIRCLE

10.1 General Constitution:

This working circle includes all Reserved and Protected Forests having chil as main crop. The chil forests are invariably moderately stocked and the density is above 0.3. The old chil plantations taken up during late sixties and early seventies are at pole stage have also been included in this working circle. The total area of the working circle is 2966.15 ha. The detailed origin of the area is as under:

A.	Area of Chil Working Circle in P. Thaplial's Plan	1636.22 ha.
B.	Area of rehabilitation Working Circle in P. Thaplial's Plan	1151.22 ha.
C.	Area of Protection Working Circle of P. Thaplial's Plan	132.57 ha.
D.	Area of Coppice 'B' Working Circle of P. Thaplial's Plan	46.14 ha.
	Total	2966.15 Ha.

10.2 General Character of Vegetation:

The vegetation comprises of almost pure chil and is heterogeneous in age classes. Ban oak crop mixed with chil found at higher elevations and miscellaneous broad-leaved species occur in depressions and along khalas. All the areas are under stocked. Poles, saplings and seeding of natural regeneration are present where openings had been created. The detailed description of vegetation has been given on Chapter II.

10.3 Special objects of Management:

i} To exploit the mature/over mature trees on sustainable basis and also to free the young trees of overhead shade and to enable them to take optimum growth by utilizing full light, air and soil nutrients.

ii} To meet the bona fide requirements of local inhabitants for timber.

iii} To improve the stocking of existing forests naturally as well as artificially.

iv} To maximize the yield of timber, pulpwood and resin on sustained basis.

10.4 Area Statement:

The total of the working circle is 2966.15 ha. Out of which 1548.49 ha. {About 52.2%} areas are under chil.

Table No. 10.1: The range wise distribution of the Reserved and Protected Forests is given below

Name of Range	Reserved Forest {ha}	Protected Forest {ha}	Total {ha}
Sangrah	95.60	0	95.60
Shillai	1503.90	0	1503.90
Kaffota	1022.82	271.18	1294.00
Renuka Ji	5.20	67.45	72.65
Total	**2627.52**	**338.63**	**2966.15**

Table No. 10.2: The details of species-wise area distribution are given as under:

Species	Area {in ha.}
Chil	1548.49
Mixed Deadar/ Kail	31.64
Ban	100.20
Kharsu	4.85
Broad Leaved	175.61
Culturable blanks	778.89
Unculturable blanks	273.83
Included cultivation	52.64
Total	**2966.15**

10.5 Blocks and Compartment:

The boundaries of compartment as given in the previous working plan are retained.

10.6 Enumerations:

The data for various grid points as allotted by the FSI Dehradun was collected and submitted to FSI Dehradun. The data was analyzed and processed data was returned back. The result is shown in the following table No. 10.4.

Table No. 10.3: The results have been statically analyzed and are given below:

No of trees in dia classes			
Dia classes	**No of trees**	**Volume Factor**	**Volume**
V	30848	0.0504	1554.7392
IV	117460	0.2499	29353.254
III	76823	0.6846	37363.4142
IIA	18983	1.3544	25710.5752
IIB	7118	2.2593	16083.9567
IA	1186	3.3994	4031.6884
IB	1186	4.7746	5662.6756
IC	0	6.3949	0
ID	0	8.2303	0
Total	**253605**		

Total area of the working Circle = 2966.15

No. of Trees/ha = 78

Volume/ha = 40.38 cum.

Table No. 10.4: Summary of Enumeration Results of Chil Working Circle (Area= 2966.15 Ha.)								
Species	**Diameter Class (CM)**							
	10-20	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**	**70+**	**Total**
Ougeiniadalbergioides	0	0	1.2	0	0	0	0	1.2
Total Stems	**0**	**0**	**3559.38**	**0**	**0**	**0**	**0**	**3559.38**
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	0	1487.82084	0	0	0	0	1487.82084
Pinus roxburghii	10.4	39.6	25.9	6.4	2.4	0.4	0.4	85.5
Total Stems	**30847.96**	**117459.54**	**76823.285**	**18983.36**	**7118.76**	**1186.46**	**1186.46**	**253605.825**
Volume Factor	0.0504	0.2499	0.6846	1.3544	2.2593	3.3994	4.7746	
Volume	1554.737184	29353.13905	52593.22091	25711.06278	16083.41447	4033.252124	5664.871916	134993.6984
Putranjivaroxburghii	0	0	0.4	0	0	0	0	0.4
Total Stems	**0**	**0**	**1186.46**	**0**	**0**	**0**	**0**	**1186.46**
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	0	495.94028	0	0	0	0	495.94028
Pyrus pashia	1.2	0	0	0	0	0	0	1.2
Total Stems	**3559.38**	**0**	**0**	**0**	**0**	**0**	**0**	**3559.38**
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	227.80032	0	0	0	0	0	0	227.80032
Quercus leucotrichophora	20	42.8	10	0	0	0	0	72.8
Total Stems	**59323**	**126951.22**	**29661.5**	**0**	**0**	**0**	**0**	**215935.72**
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	3203.442	31737.805	16551.117	0	0	0	0	51492.364
Rhododendron arboreum	0.4	0.8	0	0	0	0	0	1.2
Total Stems	**1186.46**	**2372.92**	**0**	**0**	**0**	**0**	**0**	**3559.38**
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	64.06884	593.23	0	0	0	0	0	657.29884
Syzygiumcumini	0.4	0	0	0	0	0	0	0.4
Total Stems	1186.46	0	0	0	0	0	0	1186.46

Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	75.93344	0	0	0	0	0	0	75.93344
Total Stems	**96103.26**	**246783.68**	**111230.625**	**18983.36**	**7118.76**	**1186.46**	**1186.46**	**482592.605**
Total Volume	**5125.981784**	**61684.17405**	**71128.09903**	**25711.06278**	**16083.41447**	**4033.252124**	**5664.871916**	**189430.8562**

10.7 Analysis and Valuation of crop:

i} Stock Maps: Stock maps for all the areas on 1:15,000 scale maps have been prepared and pasted in the respective compartment history files.

ii} **Site Quality:**Average site quality for each compartment has been determined by ocular estimation as per the height of the tree. This was cross checked during field visits by measurements. The average quality of chil is II/III/ {FRI}.

iii}. Density: Density of the compartments has been determined by basal area method. The actual basal area has been compared with basal area II/III quality crop of corresponding dia. Given in multiple yield tables and recorded in respective compartment history files. The density various from 0.3 to 0.6 with an average of 0.37.

iv} Regeneration: Natural regeneration of chil is not a problem provided fire protection is effective. Artificial planting has been successful as the nursery and planting techniques have been standardized over a period of time. The regeneration both by natural and artificial methods has been in various stages of seedlings, saplings and pole. The overall position of regeneration is satisfactory.

10.8 Silvicultural System:

The enumeration result reveal that the crop is mainly in IV and III class and it is difficult to demarcate areas in various age classes /PBs. In the forests where plantations have been carried out, mature to over-mature trees are also standing. The composition of the crop is highly irregular everywhere and removal of the mature to over mature trees on selection principles will help freeing young crop from overhead shade and the natural regeneration will also be induced in the forests where the openings are made. Therefore, it is prescribed that the forests will be managed in the selection system. The exploitable diameter is fixed as 60 cms. Thinning/cleanings will be carried out in young crop. Although the areas are expected to regenerate naturally but it is advisable to supplement natural regeneration by artificial planting. The plants may be raised in the nurseries in polythene bags. The plants should be kept in the nursery for 9 months. This may be done particularly for the areas which are refractory. For it the seeds be sown in polythene bags during September-October and planted in succeeding July.

10.9 Exploitable Diameter:

The exploitable diameter is fixed at 60 cm. d.b.h. which gives maximum out turn of commercial size of sawn timber.

10.10 Felling Cycle:

The felling cycle is fixed at 10 years corresponding to the plan period.

10.11 Calculation of Yield:

The yield will be calculated by the number of selection trees and further regulated by the increment as explained hereinafter. It will be calculated by smithies safeguarding Formula which defines the yield available during the felling cycle as the number of trees of the next lower diameter class {IIB 50-60 cms. Dbh} that may be expected to survive and grow up to exploitable size {> 60 cm. dbh} during the felling cycle as under. To this will, however, be added the silviculturally available trees of more than 70 cm. dia {IB & above} present at the beginning of the felling cycle.

$$X = \frac{F}{T} \{I\text{-}Z\}\ II.$$

Where X =No. of 50-60 cm, dia class {II B} which survive and pass into 60 cm. diameter {IA} class during felling cycle.

F = felling cycle 10 years.

T =No. of years required by II B class trees to pass into 1st class.

Z = Fraction of II B trees that die or do not pass up to IA class in t years.

II =No. of trees in II B class.

This yield X can be expressed as % {P} of the number of selection trees {N} present at the time of marking as.

$$P = \frac{X}{N} \times 100$$

At the beginning of the felling cycle, only 1st class trees {IA & above} represent the number of selection tree {N}. It adds X number at the end of the felling cycle. Thus the average number of selection trees during the felling cycle will be

N 1st class trees + X/2

Thus the total yield available during the filling cycle will be calculated by substituting the value of N in the above formula as under:

$$P = \frac{X}{I + X/2} \times 100$$

Where:

P = Available yield expressed in percentage of total number of selection trees during felling cycle.
X = Number of class II trees passing in class I {Selection trees} during felling cyclePeriod.

I = the number of selection trees {1st Class}: a known figure as enumerated.

In addition to the basic yield worked out as above it is reasonable to remove 50% of the existing excess stock of over mature trees {IB & above}, That would otherwise die or decay. Also the removal of class I tree, that is, Selection tree depends on siliviculturally available and the extent to which Regeneration is present to permit the removal of mature trees. The above Formula has therefore been modified by introducing an arbitrary factor. A to cover all factors influencing the yield so that eventually formula becomes:

$$P = \frac{X}{I + X/2} \times 100] \pm A$$

The yield is now calculated as under:

Species	**No.of Trees in dia classes**					
	IIB	IA	IB	IC	ID	Total
Chil	7118	1186	1186	0	0	9490

T = 30 years and Z = 0.23 {Refer para 8.1.3}

$$\text{Basic yield} = \frac{10}{30}\{1-0.23\} \times 7118$$

$$= \frac{1}{3}0.77 \times 7118$$

= 1826 selection trees during felling cycle i.e. in 10 years. To this will be added 50% of IB and above trees which are over-mature and should be felled during felling cycle. So trees available during felling cycle:

Trees in IB and above	1186+0+0	= 1186
50 %	1186/2	= 593
Total Trees	**593+1826**	**= 2419**

Expressed as % age of selection trees present at the time of marking, the yield {P} will be:

$$P = \frac{2419}{2372 + 2419/2} \times 100 \{+/-\} A$$

$$= \frac{2419}{3581} \times 100 \{+/-\} A$$

$$= 67.55 \{+/-\} A$$

Let's put 'A' = -0.55,

P = 67%

The number of exploitable selection trees available for felling annually is calculated as under:

A- 1st class trees existing i.e. 1186+1186+0+0 =2372

B- To this is to add half the number of IInd class trees that would pass into 1st class in 10 years. i.e. 1826

C- The total comes as (2372+1826) = 4198

D- 67% of 4198 trees will be available during felling cycle i.e. 10 years= 2812.

E- The trees available annually = 2812/10 = 281 trees

Or say = 281 trees per annum.

Table No. 10.5: Here the CAI is also calculated as under:

Dia Class	No of trees	Volume factor {cum}	Volume {cum}	CAI %	Total Increment {cum}
V	30848	0.0504	1554.7392	4.56	70.90
IV	117460	0.2499	29353.254	3.75	1100.75
III	76823	0.6846	52593.02	2.69	1414.75
IIA	18983	1.3544	25710.5752	2.26	581.06
IIB	7118	2.2593	16081.69	1.99	320.02
IA	1186	3.3994	4031.6884	1.56	62.89
IB	1186	4.7746	5662.6756	1.14	64.55
IC	0	6.3949	0	0.92	0.00
ID	0	8.2303	0	0.66	0.00
Total	**253605**				**3614.92**

*** Refer Para 8.1.2.2**

Total increment = 3614.92 cum

The total volume of 1st class trees is 9694.36 cum. And their number is 2372. The average volume per tree comes to 4.087 cum. The volume of 281 trees {The Selection Trees} comes to 1148.4 cum. on the average basis. The increment is 3614.92 cum per annum. The volume of selection trees arrived at is much below the increment and there is ample scope to meet the removals in thinning. However, to be on conservative side, it is prescribed that the total volume removed {of all classes including selection ones} for whatsoever purpose

like regular marking, TD, salvage etc. should not exceed 1500 cum as a safeguard against over-felling and also to build up the growing stock.

10.12 Yield:

The yield of 281 selection trees {IA and above} per year is prescribed with a further provision that total removals including thinning etc. will not exceed 1500 cum.

10.12.1 Control of Yield:

The yield will be controlled by number of selection trees {281} as well as by volume of all the removals including selection trees. The total volume removed should not exceed 1500 cum annually. A deviation of +/-15% will be allowed each year and +/-10% for a block of 5 years. All age classes are to count towards volume removed.

10.13 Sequence of Felling:

Following sequence of felling is laid down for felling. Along with fellings, cleaning /thinning will also be carried out: Table No. 10.6: Sequence of Felling.

Year	Name of Range	Number & Name of Forest	Comptt. No.	Gross Area {Ha}
2021-22	Sangrah	(R) R45 Ghaton	C2	28.00
	Sangrah	(R) R45 Ghaton	C11	45.50
	Shillai	(S) R1 Khalandon	C3	25.73
	Shillai	(S) R.2 Koti Bonch	C1	33.50
	Kaffota	(Pt) R1 Khajuri	C1	31.06
	Kaffota	(Pt) R1 Khajuri	C2	26.70
	Shillai	(S) R.2 Koti Bonch	C2	23.40
	Shillai	(S) R.2 Koti Bonch	C3	9.10
2022-23	Shillai	(S) R.2 Koti Bonch	C4	37.86
	Kaffota	(Pt) R1 Khajuri	C3	41.75
	Sangrah	(R) R45 Ghaton	C.15	22.10
	Renuka Ji	(N)R 1 Gahanu	-	5.20
	Kaffota	(Pt) R1 Khajuri	C5	29.61
	Kaffota	(Pt) R1 Khajuri	C7	40.70
	Shillai	(S) R.2 Koti Bonch	C6	31.55
	Shillai	(S) R.2 Koti Bonch	C7	30.58
	Shillai	(S) R.2 Koti Bonch	C8	11.65
2023-24	Kaffota	(Pt) R1 Khajuri	C8	30.10
	Kaffota	(Pt) R1 Khajuri	C9	46.11
	Kaffota	(Pt) R1 Khajuri	C10	25.25
	Kaffota	(Pt) R1 Khajuri	C12	28.92
	Kaffota	(Pt) R1 Khajuri	C11	28.65
	Shillai	(S) R.2 Koti Bonch	C9	26.70
	Shillai	(S) R.2 Koti Bonch	C10	26.70
2024-25	Kaffota	(Pt) R1 Khajuri	C13	49.40
	Kaffota	(Pt) R1 Khajuri	C15	28.60

	Kaffota	(Pt) R8 Mailani	C2	46.14
	Shillai	(S) R8 Kharakahan	C3	22.10
	Shillai	(S) R8 Kharakahan	C4	27.18
	Shillai	(S) R8 Kharakahan	C5	31.07
	Shillai	(S) R8 Kharakahan	C7	28.15
2025-26	Shillai	(S) R8 Kharakahan	C8	32.50
	Renuka Ji	(R) P 10 Chhobhogar	C9	46.00
	Renuka Ji	(Pt) P9 Charag	C6	21.45
	Kaffota	(Pt) P2 Jamna-Pabar	C1	13.11
	Kaffota	(Pt) P2 Jamna-Pabar	C2	9.22
	Kaffota	(Pt) P2 Jamna-Pabar	C3	40.78
	Kaffota	(Pt) P2 Jamna-Pabar	C4	20.87
	Kaffota	(Pt) P2 Jamna Pabar	C7	55.90
	Shillai	(S) R10 Manal	C1	19.10
2026-27	Shillai	(S) R10 Manal	C2	52.00
	Shillai	(S) R11 Loja	C3	37.70
	Shillai	(S) R11 Loja	C5	28.20
	Kaffota	(Pt) R2 Tatiyana	C20	33.80
	Kaffota	(Pt) R5 Sewa	C4	25.92
	Kaffota	(Pt) R2 Tatiyana	C1	37.37
	Kaffota	(Pt) R2 Tatiyana	C2	50.97
	Shillai	(S) R11 Loja	C6	32.50
	Shillai	(S) R11 Loja	C7	49.40
2027-28	Shillai	(S) R11 Loja	C8	33.80
	Shillai	(S) R17 Bali Koti	C1	44.20
	Shillai	(S)R17 Balikoti	C3	72.80
	Kaffota	(Pt) P2 Jamna Pabar	C8	97.50
	Kaffota	(Pt) P2 Jamna Pabar	C9	33.80
	Shillai	(S)R17 Balikoti	C12	19.50
	Shillai	(S)R17 Balikoti	C17	75.40
2028-29	Shillai	(S) R17 Bali Koti	C10	39.31
	Kaffota	(Pt) R2 Tatiyana	C3	53.39
	Kaffota	(Pt) R2 Tatiyana	C5	35.10
	Shillai	(S) R17 Bali Koti	C9	37.70
	Shillai	(S) R1 Khalandon	C2	35.43
	Shillai	(S)R2 Koti Bounch	C5	20.39
	Shillai	(S)R8 Kharakhan	C1	84.50
	Kaffota	(Pt) R2 Tatiyana	C10	49.40
2029-30	Shillai	(S)R8 Kharakhan	C2	87.10
	Shillai	(S)R8 Kharakhan	C6	48.10
	Shillai	(S)R11 Loja	C9	40.90
	Kaffota	(Pt) R2 Tatiyana	C14	24.70
	Shillai	(S)R12 Naopanjore	C6	31.60
	Shillai	(S)R12 Naopanjore	C7	6.50
	Shillai	(S)R12 Naopanjore	C8	26.00
2030-31	Kaffota	(Pt) R2 Tatiyana	C21	19.30
	Kaffota	(Pt) R6 Janjhli	C7	190.48

Shillai	(S)R16 Chyali	C2	55.60
Shillai	(S)R16 Chyali	C9	19.20
Kaffota	(Pt) R2 Tatiyana	C19	49.40
Shillai	(S)R17 Balikoti	C4	71.50
Shillai	(S)R17 Balikoti	C7	37.70
Total			**2966.15**

Note: -i} In some of the areas, selection trees may not be available. Here only theCleanings/thinning be carried out.

ii. The lopping of branches is carried out before felling trees.

10.14 Methods of Executing Felling:

The following guidelines are suggested for felling the areas:

i. Half of the number of trees of 60 cm and above in dia meter should be marked for felling. But care is taken to ensure that no lasting permanent gap is created in the canopy.

ii. Where there are two selection trees standing nearby the preference will be given to mark the tree of bigger dia and or deed/malformed/diseased/dry tree.

iii. The tree along nala. Banks broken, grounds/steep slopes should be felled only if there is sufficient regeneration below to take its place.

iv. The selection trees suppressing young growth should be marked for felling.

v. No felling be done in steep to precipitous slopes.

vi. In young crop, thinking be done. While thinning, a thumb rule of keeping spacing about 5 times the girth of tree should be followed. The well grown trees/poles be retained.

vii. The lower branches of poles/trees (Till about 1/3rd height) should be pruned to avoid fire hazards. This be done simultaneously with marking and the pruned branches removed outside the area/allowed to be taken by right holders.

10.15 Treatment of Felled Areas including subsidiary silvicultural operations:

(i) Cleanings (removals of unwanted saplings/trees below V class trees) be carried out. The average spacing be kept about 1.8m.

(ii) Fire lines 5m. wide, dividing the areas into blocks of not more than 20ha. shall be kept clear of inflammable material.

(iii) The blanks (more than 1 ha. in extent) be taken up for plantation. For it, the nursery plants raised in polythene bags during October be used for planting in succeeding monsoons when these are about 9 month old. The existing trees will be used as fence posts.

(iv) Grass cutting under strict supervision shall be allowed as a fire safety measures.

(v) All felling debris shall be collected into heaps and burnt in places where it is likely to cause least possible harm to the poles, regeneration and seed bearers.

(vi) In low lying areas where lantana is invading, it be cut and uprooted and seed broadcasting planting of chil be done.

10.16 Fire Protection:

The protection of forests from fire had been neglected in the currency of Shri O.P. Sharma's plan. The lack of funds was one of the major constraints which lead to the neglect of protection of forests from fires. The fire lines were not maintained. Control burning in the chil forests was not done. Cultural operations in the young crops have been forgotten. The help rendered by right-holders in lieu of rights and concessions availed by them in the Government forests is also becoming negligible. In the Year 2009-10 in Sri Renuka Ji Forest Division, 24 No. of fire cases were reported in which 521 ha of Area burnt. Similarly in the year 2010-11, 15 case reported whereas 75.5 ha area was reported on fire. In 2012-13 there were 23 No. of cases where 268 ha area was reported as burnt.

In future, fire fighting measure shall have to be carried out on war footing. Following measures are prescribed.

10.16.1 Clearing of Fire Lines:

The roads and village paths in/near chil area have become natural fire lines and clearing of pine needles up to 5 meter and 3 meters respectively will be carried out continuously during fire season. However the list of existing fire lines of the division is mentioned in Appendix –XIII.

10.16.2 Creation of New Fire Lines:

The reserve forest Khajuri needs effective fire protection measures. 5 meter wide fire lines are suggested along all its compartment's boundaries. The road leading to the forest colony will also act as a fire line. The fire line will be continuously kept clear of inflammable material. The implementation of this provision will be monitored annually by C.C.F. (Settlement & Working Plan)/C.C.F. (Protection).

10.16.3 Pruning.

The areas under regeneration and plantations, where trees have attained height of 1.5 meters should be pruned up to 1/3rd of their height and debris is control burnt.

10.16.4 Nature awareness.

The local villagers seldom come for assistance in fire fighting. DFO should organize fire prevention camps in every range during the first week of march and people should be told about the methods adopted by

the department, funds spent on fire fighting and requests for assistance whenever the occurs. A letter from DC Sirmour should be got issued every year to all the Revenue staff and local bodies that all able bodied male inhabitants of all the villages shall be liable to patrol duty for the safety of the property amenities under section 3 of H.P. Village Small Towns Patrol Act, 1964.

10.16.5 Mobile Allowance.

The department is paying mobile allowances to all the field staff during the fire season. The amount should be increased from current 100/- month to 250/- month.

10.16.6 Construction of Gang Huts:

Gang huts are needed for the forest workers and the staff during fire season to ensure availability of the staff in the close proximity of the forests. It is suggested that the gang hut may be constructed at the following places:-

1. Tatiyana
2. Ghaton
3. Khalandon
4. Koti-Bonch

The staff should be given training. Mock exercises should be conducted for fire prevention so that they can perform efficiently while fighting forest fires.

10.16.7 Modern Forest Fire Fighting Equipment:

Following equipment be purchased in adequate quantity:-

Pulaski

Flappers

Rakers

Hose Pipes Fire fighting jackets & trousers

10.16.8 Removal of Pine needles:

Local people should be allowed and encouraged to collect the pine needles for their domestic use. This will reduce the fire hazard to a great extent.

10.16.9 Fire watchers:

Adequate fire watchers should be deployed during the fire season with set of equipments for keeping fire lines, paths and roads clear of the inflammable material and watching the forests

from strategic point with fire fightingequipments provided to them. A rapid response team which is constituted for the fires season should be equipped with all the necessary fire fighting tools.

10.16.10 Control Burning:

Entire Chil areas including areas from others where chil is present shall be control burnt once in 3 years as per the programme given below:-

Table No. 10.7: Control Burning.

Year	Name of Range	No & Name of Forest	Compt. No	Areas {ha}
2021-22 2024-25 2027-28 2030-31	Sangrah	(R) R45 Ghaton	C2	28.00
	Sangrah	(R) R45 Ghaton	C11	45.50
	Shillai	(S) R1 Khalandon	C3	25.73
	Shillai	(S) R.2 Koti Bonch	C1	33.50
	Kaffota	(Pt) R1 Khajuri	C1	31.06
	Kaffota	(Pt) R1 Khajuri	C2	26.70
	Shillai	(S) R.2 Koti Bonch	C2	23.40
	Shillai	(S) R.2 Koti Bonch	C3	9.10
	Shillai	(S) R.2 Koti Bonch	C4	37.86
	Kaffota	(Pt) R1 Khajuri	C3	41.75
	Sangrah	(R) R45 Ghaton	C.15	22.10
	Renuka Ji	(N)R 1 Gahanu	-	5.20
	Kaffota	(Pt) R1 Khajuri	C5	29.61
	Kaffota	(Pt) R1 Khajuri	C7	40.70
	Shillai	(S) R.2 Koti Bonch	C6	31.55
	Shillai	(S) R.2 Koti Bonch	C7	30.58
	Shillai	(S) R.2 Koti Bonch	C8	11.65
	Kaffota	(Pt) R1 Khajuri	C8	30.10
	Kaffota	(Pt) R1 Khajuri	C9	46.11
	Kaffota	(Pt) R1 Khajuri	C10	25.25
	Kaffota	(Pt) R1 Khajuri	C12	28.92
	Kaffota	(Pt) R1 Khajuri	C11	28.65
	Shillai	(S) R.2 Koti Bonch	C9	26.70
	Shillai	(S) R.2 Koti Bonch	C10	26.70
	Kaffota	(Pt) R1 Khajuri	C13	49.40
	Total			**736.00**

Year	Name of Range	No & Name of Forest	Compt. No	Areas {ha}
2022-23 2025-26 2028-29	Kaffota	(Pt) R1 Khajuri	C15	28.60
	Shillai	(S) R8 Kharakahan	C3	22.10
	Shillai	(S) R8 Kharakahan	C4	27.18
	Shillai	(S) R8 Kharakahan	C5	31.07
	Shillai	(S) R8 Kharakahan	C7	28.15

	Shillai	(S) R8 Kharakahan	C8	32.50
	Renuka Ji	(R) P 10 Chhobhogar	C9	46.00
	Renuka Ji	(Pt) P9 Charag	C6	21.45
	Kaffota	(Pt) P2 Jamna-Pabar	C1	13.11
	Kaffota	(Pt) P2 Jamna-Pabar	C2	9.22
	Kaffota	(Pt) P2 Jamna-Pabar	C3	40.78
	Kaffota	(Pt) P2 Jamna-Pabar	C4	20.87
	Kaffota	(Pt) P2 Jamna Pabar	C7	55.90
	Shillai	(S) R10 Manal	C1	19.10
	Shillai	(S) R10 Manal	C2	52.00
	Shillai	(S) R11 Loja	C3	37.70
	Shillai	(S) R11 Loja	C5	28.20
	Kaffota	(Pt) R2 Tatiyana	C20	33.80
	Kaffota	(Pt) R5 Sewa	C4	25.92
	Kaffota	(Pt) R2 Tatiyana	C1	37.37
	Kaffota	(Pt) R2 Tatiyana	C2	50.97
	Shillai	(S) R11 Loja	C6	32.50
	Shillai	(S) R11 Loja	C7	49.40
	Shillai	(S) R11 Loja	C8	33.80
	Total			**823.83**

Year	**Name of Range**	**No & Name of Forest**	**Compt. No**	**Areas {ha}**
2023-24 2026-27 2029-30	Shillai	(S) R17 Bali Koti	C1	44.20
	Shillai	(S)R17 Balikoti	C3	72.80
	Kaffota	(Pt) P2 Jamna Pabar	C8	97.50
	Kaffota	(Pt) P2 Jamna Pabar	C9	33.80
	Shillai	(S)R17 Balikoti	C12	19.50
	Shillai	(S)R17 Balikoti	C17	75.40
	Shillai	(S) R17 Bali Koti	C10	39.31
	Kaffota	(Pt) R2 Tatiyana	C3	53.39
	Kaffota	(Pt) R2 Tatiyana	C5	35.10
	Shillai	(S) R17 Bali Koti	C9	37.70
	Shillai	(S) R1 Khalandon	C2	35.43
	Shillai	(S)R2 Koti Bounch	C5	20.39
	Shillai	(S)R8 Kharakhan	C1	84.50
	Kaffota	(Pt) R2 Tatiyana	C10	49.40
	Shillai	(S)R8 Kharakhan	C2	87.10
	Shillai	(S)R8 Kharakhan	C6	48.10
	Shillai	(S)R11 Loja	C9	40.90
	Kaffota	(Pt) R2 Tatiyana	C14	24.70
	Shillai	(S)R12 Naopanjore	C6	31.60
	Shillai	(S)R12 Naopanjore	C7	6.50
	Shillai	(S)R12 Naopanjore	C8	26.00
	Kaffota	(Pt) R2 Tatiyana	C21	19.30
	Kaffota	(Pt) R6 Janjhli	C7	190.48

	Shillai	(S)R16 Chyali	C2	55.60
	Shillai	(S)R16 Chyali	C9	19.20
	Kaffota	(Pt) R2 Tatiyana	C19	49.40
	Shillai	(S)R17 Balikoti	C4	71.50
	Shillai	(S)R17 Balikoti	C7	37.70
	Total			**1406.5**
	Gross Area			**2966.15**

There have been no major fire incidents in the chil areas in the past. However, the cause of fires is generally escaped of fire when the villagers set their ghasnies on fire. A strict vigil is kept during onset of winters when the villagers set the ghasnies on fire.

The villagers exercising rights in various forests are required to render all possible help in detection and extinguishing of forest fires. In case of negligence on their parts the right of the villagers is suspended at least for a period of 5 years.

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CHAPTER – XI

THE BAN- OAK WORKING CIRCLE

11.1 General Constitution:

This chapter includes the areas having Ban species as its major crop. This was mainly covered under Coppice 'A' Working Circle in P. Thaplial's Plan. Some areas of the plan have, however, been deleted in this plan as they are transferred to Deodar Kail or other Working circles. Some areas are added from Protection and Rehabilitation Working Circle of P. Thaplial's Plan. The detailed breakup of the area with respect to allotments of P. Thaplial's Plan is under:

a)	Coppice "A" Areas of P. Thaplial's Plan	8008.92 ha.	
b)	Chil Working Circle of P. Thaplial's Plan		38.83 Ha.
c)	Protection Working Circle of P. Thaplial's Plan		2142.46 Ha.
d)	Rehabilitation Working Circle of P. Thaplial's Plan		849.00 Ha.
e)	Coppice 'B' areas from P. Thaplial's plan		304.78 Ha.
	Total		**11343.99 Ha.**

11.2. General Character of Vegetation:

A general description of the forests allotted to this Working Circle is given in Chapter VIII of part I.The major portion of Oak Working Circle type is covered with oaks. Some conifers are also met with here and there. These are as a result of plantations. Brass is usual associate of ban. Among the three Oaks, the Ban is most common. In higher reaches however, some Moru/Kharshu are also observed.

11.3. Special Objects of Management:

i) To improve the existing growing stock of the forests.

ii) To increase the proportion of fuelwood and fodder.

iii) To increase the productivity of the area.

iv) Consistent with the above to obtain progressive yield of minor forest produce, fodder and fuel wood.

11.4 Area statement

Forest wise details are given in Appendix –II. An abstract of different categories of forests, Range wise is given below:

Table No. 11.1: Area Statement.

Name of Range	Reserved Forests	Protected Forests	Mushterqua Forest	Total Area
Nohra	2642.25	153.40	58.50	2854.15
Kaffota	696.31	61.10	--	757.41
Renuka	787.80	404.60	--	1192.4
Sangrah	2043.85	724.30	--	2768.15
Shillai	3730.28	41.60	--	3771.88
Total :	**9900.49**	**1385**	**58.50**	**11343.99**

Table No. 11.2: The species-wise area distribution Oak working circle is given as under:-

OAK WORKING CIRCLE		
Sr. No.	**Species**	**Area in Ha.**
1	Chil	51.93
2	Broad Leaved	669.72
3	Ban	8202.92
4	Mohru	358.3
5	Kharsu	54.55
6	Deodar	32.10
7	Kail	13.60
8	Fir/Spruce	139.20
9	Culturable Blanks	1095.38
10	Uncultivable Blanks	496.42
11	Included cultivation	229.87
Total		**11343.99**

11.5 Blocks Compartments:

No change has been made in the existing boundaries of the block and compartments.

11.6 Felling Series:

Oak felling series is constituted.

11.6.1 Oak Felling Series:

The areas under this felling series are categorized as exploitable and Unexploitable.

a) Exploitable Areas:

These constitute such compartments where the trees are mature to over mature and the working is commercially economical. The details of the area are given in the Appendix-II.

Area under this category is 3012.08 ha.

b) Unexploitable Area:

These constitute such compartment which are near habitation form catchment or are inaccessible. It is proposed that rotational closure for lopping be adopted in these areas which are close to habitation. The details of the areas are given in Appendix-II

The extent of the area under this category is 8331.91 ha.

11.7 Oak Felling Series (Coppice 'A' Area):

11.7.1 Analysis and valuation of crop:

i) Stock Maps:

These have been prepared on 1:15000 scales for each forest allotted to this working circle. These have been pasted and placed in compartment history files.

ii) Density:

The density has been occularly estimated and recorded in the compartment history files of individual compartments.

iii) Enumeration:

The data for various grid points as allotted by the FSI Dehradun was collected and submitted to FSI Dehradun. The data was analyzed and processed data was returned back.

The Detailed results of Enumeration are being depicted hereinbelow:-

Table No. 11.3: Summary of Enumeration Results of Oak Working Circle (Area= 11343.99 Ha.)								
	Diameter Class (CM)							
Species	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**	**70+**	Total
Abies smithiana	**0.48**	**0.71**	**0.36**	**0**	**0.24**	**0**	**0**	**1.79**
Total Stems	5445.1152	8054.2329	4083.8364	0	2722.5576	0	0	20305.7421
Volume Factor	0.06	0.28	0.99	1.84	3.11	4.81	6.51	
Volume	326.706912	2255.185212	4042.998036	0	8467.154136	0	0	15092.0443
Acacia catechu	**0.71**	**0.12**	**0**	**0**	**0**	**0**	**0**	**0.83**
Total Stems	8054.2329	1361.2788	0	0	0	0	0	9415.5117
Volume Factor	0.065	0.17	0.411	0.906	1.487	1.487	1.487	
Volume	523.5251385	231.417396	0	0	0	0	0	754.9425345
Albizzia species	**0**	**0.12**	**0**	**0**	**0**	**0**	**0**	**0.12**
Total Stems	0	1361.2788	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	250.4752992	0	0	0	0	0	250.4752992
Alstoniascholaris	**0.95**	**0.12**	**0**	**0**	**0**	**0**	**0**	**1.07**
Total Stems	10776.7905	1361.2788	0	0	0	0	0	12138.0693
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	689.714592	250.4752992	0	0	0	0	0	940.1898912
Anogeissus latifolia	0.83	0.24	0	0	0	0	0	1.07
Total Stems	9415.5117	2722.5576	0	0	0	0	0	12138.0693
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	602.5927488	500.9505984	0	0	0	0	0	1103.543347
Bauhinia species	0	0	0.12	0	0	0	0	0.12
Total Stems	0	0	1361.2788	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	

Volume	0	0	569.0145384	0	0	0	0	569.0145384
Boehmeria species	0.12	0	0	0	0	0	0	0.12
Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Cedrela toona	0.36	0	0.12	0	0	0	0	0.48
Total Stems	4083.8364	0	1361.2788	0	0	0	0	5445.1152
Volume Factor	0.113	0.347	0.772	1.692	2.924	4.389	6.074	
Volume	461.4735132	0	1050.907234	0	0	0	0	1512.380747
Cedrus deodara	6.9	10	1.9	0	0.12	0	0	18.92
Total Stems	78273.531	113439.9	21553.581	0	1361.2788	0	0	214628.2908
Volume Factor	0.0707	0.1416	0.7019	1.4158	2.5484	3.5395	4.8137	
Volume	5533.938642	16063.08984	15128.4585	0	3469.082894	0	0	40194.56988
Chloroxylon swietenia	1.67	0.83	0.12	0	0	0	0	2.62
Total Stems	18944.4633	9415.5117	1361.2788	0	0	0	0	29721.2538
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	1212.445651	1732.454153	569.0145384	0	0	0	0	3513.914342
Ehretialaevis	0.12	0	0	0	0	0	0	0.12
Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Emblica officinalis	0.12	0	0	0	0	0	0	0.12
Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Eucalyptus species	0.12	0	0	0	0	0	0	0.12

Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Flacourtia indica	0	0	0	0.12	0	0	0	0.12
Total Stems	0	0	0	1361.2788	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	0	0	1204.731738	0	0	0	1204.731738
Grewia oppositifolia	0.48	0	0	0	0	0	0	0.48
Total Stems	5445.1152	0	0	0	0	0	0	5445.1152
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	348.4873728	0	0	0	0	0	0	348.4873728
Holoptelea integrifolia	0	0.12	0	0	0	0	0	0.12
Total Stems	0	1361.2788	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	250.4752992	0	0	0	0	0	250.4752992
Illex species	0.83	0.24	0	0	0	0	0	1.07
Total Stems	9415.5117	2722.5576	0	0	0	0	0	12138.0693
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	602.5927488	500.9505984	0	0	0	0	0	1103.543347
Lanneacoromandelica	0.48	0	0	0	0	0	0	0.48
Total Stems	5445.1152	0	0	0	0	0	0	5445.1152
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	348.4873728	0	0	0	0	0	0	348.4873728
Litsaea species	4.52	1.9	0.36	0	0	0	0	6.79
Total Stems	51274.8348	21553.581	4083.8364	0	0	0	0	77025.6921
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	3281.589427	3965.85890	1707.04361	0	0	0	0	8954.491946

		4	5					
Lyonia ovalifolia	9.4	2.98	0.36	0	0	0	0	12.74
Total Stems	106633.506	33805.0902	4083.8364	0	0	0	0	144522.4326
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	6824.544384	6220.136597	1707.043615	0	0	0	0	14751.7246
Mallotusphilippinensis	0.36	0.24	0	0	0	0	0	0.6
Total Stems	4083.8364	2722.5576	0	0	0	0	0	6806.394
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	261.3655296	500.9505984	0	0	0	0	0	762.316128
Myrica sapida	3.45	1.43	0.24	0	0	0	0	5.12
Total Stems	39136.7655	16221.9057	2722.5576	0	0	0	0	58081.2288
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	2504.752992	2984.830649	1138.029077	0	0	0	0	6627.612718
Olea cuspidate	0.24	0.48	0.12	0	0	0	0	0.84
Total Stems	2722.5576	5445.1152	1361.2788	0	0	0	0	9528.9516
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	174.2436864	1001.901197	569.0145384	0	0	0	0	1745.159422
Pajanelia longifolia	0.12	0	0.12	0	0	0	0	0.24
Total Stems	1361.2788	0	1361.2788	0	0	0	0	2722.5576
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	569.0145384	0	0	0	0	656.1363816
Pinus excels	0.12	0.12	0.6	1.19	1.67	0.48	0	4.17
Total Stems	1361.2788	1361.2788	6806.394	13499.3481	18944.4633	5445.1152	0	47304.4383
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	250.4752992	2845.072692	11946.92307	28700.8619	12491.09427	0	56321.54907

Pinus roxburghii	1.07	2.26	0.83	0.24	0.12	0	0.12	4.64
Total Stems	12138.0693	25637.4174	9415.5117	2722.5576	1361.2788	0	1361.2788	52636.1136
Volume Factor	0.0504	0.2499	0.6846	1.3544	2.2593	3.3994	4.7746	
Volume	611.7586927	6406.790608	6445.85931	3687.432013	3075.537193	0	6499.561758	26726.93958
Pseudostachyampolymorphum	0.12	0	0	0	0	0	0	0.12
Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Pyrus pashia	0.36	0.12	0	0	0	0	0	0.48
Total Stems	4083.8364	1361.2788	0	0	0	0	0	5445.1152
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	261.3655296	250.4752992	0	0	0	0	0	511.8408288
Quercus dilatata floribunda	12.02	4.29	1.55	0	0	0	0	17.86
Total Stems	136354.7598	48665.7171	17583.1845	0	0	0	0	202603.6614
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	7363.157029	12166.42928	9811.416951	0	0	0	0	29341.00326
Quercus griffithii	2.02	2.26	0.71	0.12	0	0	0	5.12
Total Stems	22914.8598	25637.4174	8054.2329	1361.2788	0	0	0	58081.2288
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	1237.402429	6409.35435	4494.261958	1304.10509	0	0	0	13445.12383
Quercus leucotrichophora	111.43	54.4	17.86	7.86	4.05	2.86	2.14	200.6
Total Stems	1264060.806	617113.056	202603.6614	89163.7614	45943.1595	32443.8114	24276.1386	2275604.394
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	68259.28351	154278.264	113052.8431	85418.88342	68914.73925	60572.59588	45323.55077	595820.1599

Quercus semecarpifolia	0.6	0.12	0	0	0	0.12	0	0.83
Total Stems	6806.394	1361.2788	0	0	0	1361.2788	0	9415.5117
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	367.545276	340.3197	0	0	0	2541.50752	0	3249.372496
Quercus species	0	0.12	0	0	0	0	0	0.12
Total Stems	0	1361.2788	0	0	0	0	0	1361.2788
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	0	340.3197	0	0	0	0	0	340.3197
Rauwolfia serpentine	0.12	0	0	0	0	0	0	0.12
Total Stems	1361.2788	0	0	0	0	0	0	1361.2788
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	87.1218432	0	0	0	0	0	0	87.1218432
Rhododendron arboretum	37.62	29.52	15.36	4.76	0.83	0.6	0.6	89.29
Total Stems	426760.9038	334874.5848	174243.6864	53997.3924	9415.5117	6806.394	6806.394	1012904.867
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	23045.08881	83718.6462	97227.97701	51729.50192	14123.26755	12707.5376	12707.5376	295259.5567
Terminalia belerica	0.48	0	0	0	0	0	0	0.48
Total Stems	5445.1152	0	0	0	0	0	0	5445.1152
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	348.4873728	0	0	0	0	0	0	348.4873728
Terminalia crenulata	0.36	0.12	0	0	0	0	0	0.48
Total Stems	4083.8364	1361.2788	0	0	0	0	0	5445.1152
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	261.3655296	250.4752992	0	0	0	0	0	511.8408288
Rest Of Species	3.1	2.02	1.07	0.24	0	0	0	6.43
Total Stems	35166.369	22914.8598	12138.0693	2722.5576	0	0	0	72941.8557
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	

Volume	2250.647616	4216.334203	5073.712967	2409.463476	0	0	0	13950.15826
Total Stems	**2287855.903**	**1303197.571**	**474178.782**	**164828.1747**	**79748.2497**	**46056.5994**	**32443.8114**	**4388309.092**
Total Volume	**128399.5372**	**305337.0356**	**266001.6822**	**157701.0407**	**126750.6429**	**88312.73527**	**64530.65012**	**1137033.324**

iv) Growing Stock:

The results of enumeration have been statistically analyzed and are given below:

Mean volume per ha. 56.58 Cum/ha.

The total growing stocks for ban comes to as under:

i) In the exploitable area	=	3012.08x 56.58	=	170,423.49 cum.
ii) In the unexploitable area	=	8331.91x 56.58	=	471,419.47 cum.
Total			**=**	**641,842.96cum.**

11.7.2 Silvicultural System:

The forests will be managed under the Coppice with Reserved System. The retention of standard is essential to serve as mother trees and also for the production of charcoal.

11.7.3 Rotation:

Rotation for coppice is fixed at 45 years and for standards 90 years keeping in view the size of 22 cms for fuel wood {45 years} and 30 cms for Charcoal {90 years}.

11.7.4 Calculation of Yield:

The annual yield shall be regulated by area. The annual coupe based on 45 years rotation works out as

$$= \frac{3012.08}{45} = 66.93 \text{ or say } 65 \text{ ha.}$$

The annual yield can also be expressed in terms of CuM. As explained under.

In the area about 61.18 trees of IV class, that is 15.2 cum, will be retained as standards. So the volume available for felling comes out to 56.58-15.2 = 41.38 cum. But trees taken as 30 cum per ha of solid volume. Expressed in terms of stacked cum, it comes to 60 cum stacked per ha.

It is however; made clear that control of yield will be by area that is 65 ha annually. A 65 ha Annual yield be taken in control forms and deviations brought forward. The reason of deviation be explained in detail.

11.7.5 Methods of Executing Felling:

Following general guidelines are suggested for carrying out marking in oak forest:

i. The annual coupe prescribed should be marked by cleaning one meter wide strip all around in case the boundary does not happen to be natural feature. The marking officer should ensure that coupe of correct area has laid.

ii. About 50-60 {20-30 cm diameter class} healthy, vigorously growing oak trees will be retained as standards depending on the terrain. Trees will also be retained along Nalas/vulnerable locations.

iii. The Oak/Rhododendron trees in the remaining coupe excluding the trees retained will be felled. The height of stood shall not exceed 10-15 cm. and those retained otherwise. The cut surface should not slope towards the centre of stump/towards the Sun.

iv. Coniferous trees/seedlings and saplings growing naturally will be preserved tended and will not be felled.

v.Fellings must be completed by 28th February and all material collected in suitable location be removed from area by March 31st.

vi. Cut material shall not be stacked over stools.

11.7.6 Sequence of Fellings:

The following sequence of felling for exploitable areas is proposed. It is however to be noted that there is complete ban on felling of ban on independent approval of Government is required before felling ban {Oak} areas.

Table No. 11.4: Sequence of Felling.

Year	Name of Range	Name of Forest	Comptt. No	Total Area {Ha}	Approximate area proposed for felling
2021-22	Kaffota	(pt) R.2 Tatiyana	C18	38.83	10.00
	Shillai	(R) R.50 kotaPab	C2	27.30	10.00
	Nohra	(R) R-2 Thanga	C1	62.40	15.00
	Renuka Ji	(R) P-9-P.F. Charag	C5	18.50	5.00
	Shillai	(S) R.10 Manal	C7	59.80	15.00
	Nohra	(R) R.5 Ghandoori	C1	41.60	10.00
2022-23	Sangrah	(R) R.33 Bhalar	C3	127.40	25.00
	Shillai	(S) R.6 Jaswi	C1	55.90	10.00
	Sangrah	(R) R.38 LajwahJablog	C1	35.40	5.00
	Nohra	(R) R-2 Thanga	C2	61.10	10.00
	Nohra	(R) R.15 Bandal	C2	14.40	5.00
	Shillai	(S) R.12 Naya Panjore	C4	54.60	10.00
2023-24	Sangrah	(R) P.4 PF Thian	C2	93.60	20.00
	Renuka Ji	(pt) R.2 Tatiyana	C18	38.83	5.00
	Nohra	(R) R.14 Pipli	C3	19.50	5.00
	Shillai	(S) R.11 Loja	C16	46.10	10.00
	Nohra	(R) R.9 Bhangari	C2	72.80	15.00
	Sangrah	(R) R.38 LajwahJablog	C4	44.20	10.00
2024-25	Sangrah	(R) R.38 LajwahJablog	C2	92.30	20.00
	Sangrah	(R) R.37 Art	C5	78.00	15.00
	Nohra	(R) R.5 Ghandoori	C3	44.20	5.00
	Nohra	(R) R.5 Ghandoori	C4	33.80	5.00
	Renuka Ji	(R) R-45-R.F. Ghatton	C23	106.60	15.00
	Shillai	(S) R.17 Bali koti	C11	10.40	5.00
2025-26	Nohra	(R) R.13 Manal	C2	57.20	15.00
	Nohra	(R) R.13 Manal	C3	88.40	25.00
	Shillai	(S) R.18 Khatna	C2	41.60	10.00

	Sangrah	(R) R.37 Art	C2	62.40	15.00
2026-27	Sangrah	(R) R.37 Art	C6	40.30	10.00
	Sangrah	RF R-45 Ghatton	C12	164.80	20.00
	Nohra	(R) R.13 Manal	C1	46.40	10.00
	Renuka Ji	(R) R-45-R.F. Ghatton	C16	83.20	25.00
2027-28	Nohra	(R) R.6 Charna	C3	31.20	10.00
	Sangrah	(R) R.38 LajwahJablog	C3	87.10	20.00
	Nohra	(R) R.7 Dowehna	C2	28.60	5.00
	Sangrah	RF R-39 Uncha Tikker	C1	58.50	15.00
	Sangrah	RF R-39 Uncha Tikker	C2	41.60	15.00
2028-29	Sangrah	RF R-39 Uncha Tikker	C4	37.70	10.00
	Sangrah	RF R-39 Uncha Tikker	C7	52.00	15.00
	Sangrah	RF R-45 Ghatton	C10	33.80	10.00
	Nohra	(R).24 Sail	C1	78.00	20.00
	Shillai	(S) R.1 Khalandon	C1	21.45	10.00
2029-30	Nohra	(R) R.14 Pipli	C1	78.00	15.00
	Nohra	(R) R.14 Pipli	C2	46.80	10.00
	Sangrah	(R) P.4 PF Thian	C1	46.80	10.00
	Sangrah	(R) P.4 PF Thian	C3	87.10	15.00
	Sangrah	(R) P.4 PF Thian	C8	76.70	15.00
2030-31	Sangrah	(R) P.4 PF Thian	C9	83.20	15.00
	Sangrah	(R) P.5 Dada	C2	34.00	5.00
	Renuka Ji	(R) P-10-P.F. ChhowBhogar	C2	61.10	10.00
	Nohra	(R) R.5 Ghandoori	C2	44.20	10.00
	Sangrah	(R) R.49 GataMandwaj	C1	45.50	10.00
	Sangrah	RF R-45 Ghatton	C14	115.70	15.00

11.7.7 Control of yield:

The yield will be controlled by area. A deviation of +/-15% will be allowed in a particular year. The cumulative deviation for each five year blocks should be within +/-10%.

Since the entire compartment is not prescribed for felling so, exact demarcation and measurement of annual coupe within compartment. This should be almost equal to area proposed for felling.

11.7.8 Subsidiary Silvicultural Operations:

i. Weeding be done where shrub growth interferes with coppice shoots.

ii. Cleaning and thinning and stool dressing should be done after three years of felling. Healthy and vigorously growing shoots not more than three per stump shall be retained and other cut back. The singling out of coppice shoots will be done within they reach a height of about 4-5 meters. This height is expected after about 15 years.

11.7.9 Regeneration:

Regeneration will be by coppice supplemented by seed and artificial planting. It is prescribed that in order to facilitate area to regenerate by seed quickly it be closed to grazing /lopping at least two years in advance of felling. Akhrot, Toon, Mulberry, Goon {Asculum} can also be tried it some pockets along *nalas*.

11.7.10. Control:

The details of felled areas including thinning will be reflected in Control Forms and reasons for deviations be explained.

11.7.11 Treatment of Blank- Afforestation.

The blank areas will be planted in the manner suggested as artificial planting, bush cutting, closure, weeding and mulching. The programme of afforestation will be strictly as appended to this volume as per Afforestation Programme.

Note: DFO can, however, take alternative areas from the forests allotted to this type (Tropical Dry Deciduous WC, Dry Deciduous WC) subject to condition that minimum target of 20 ha net area per annum should be met with.

11.7.12 Control.

The afforestation target will be reflected year wise in control forms; deviation brought forward every year and reasons for deviation explained.

11.7.13. Grazing and Grass cutting.

The felled areas will be closed to grazing immediately after felling, grass cutting may be allowed to right holders under strict supervision so that coppice shoots and seedlings are not cut along with grass.

11.7.14 Notification of closure:

Coppice and afforestation areas shall be got notified well in advance.

11.7.15 Fire Protection:

Slash disposal and timely thinning will be carried out.

11.7.16 Assessment of survival percentage:-

The survival percentage as well as status of coppice will be assessed every year after felling/ planting for at least five years personally be RO/ACF in every year. DFO/CF will also do checking quite frequently and reports sent to CF WP through CF (T).

11.7.17 Nursery Programme:

Keeping in view the year of felling/ afforestation, DFO will chalk suitable nursery programme in advance so that required number of good quality plants are made available in time.

CHAPTER – XII

THE TROPICAL DRY DECIDUOUS AND SCRUB WORKING CIRCLE

12.1 General Constitution:

The miscellaneous broad leave and Blank including cultivation areas are included in this Working circle. The areas are taken from Praveen Thapliyal's Plan. The area supports miscellaneous broad leaved species and Blank including cultivate areas with Khair as mixture; some pure Khair Plantations been raised in past; stunted poor quality Sal forest not fit for managing under the uniform system and old eucalyptus plantations. The areas as per previous working plan are as under:

a)	Coppice "A" Areas of P. Thaplial's Plan	63.70 ha.	
b)	Chil Working Circle of P. Thaplial's Plan		117.00 Ha.
c)	Protection Working Circle of P. Thaplial's Plan		1382.04 Ha.
d)	Rehabilitation Working Circle of P. Thaplial's Plan		7738.61 Ha.
e)	Coppice 'B' areas from P. Thaplial's plan		1919.70 Ha.
	Total		**11221.05 Ha.**

In these areas some Eucalyptus was planted in small patches in sixties. The approximate area under Eucalyptus in these areas is 27 Ha.

12.2. General Character of Vegetation:

The Crop in Tropical Dry Deciduous WC Dry Deciduous areas is of following kinds:

1. Miscellaneous broadleaved species like Chhal, Jhingan, Khair, Shisham, etc.
2. Pure Khair Patches.
3. Degraded Sal with Usual associates like Sain/ *Mallotus* (Kamella)
4. Eucalyptus patches.
5. Blank areas supporting scrub growth.

The growth of trees is generally poor. The detailed list of the forests is given in Appendix III.

12.3. Special Objects of Management:

i) To improve the existing growing stock of the forests.

ii) To increase the proportion of important fuel, fodder and small timber species along with Khair.

iii) To increase the productivity of the area.

iv) To meet the bonafide requirement of local people for fodder, fuel and timber.

v) Consistent with the above to obtain progressive yield of timber, minor forest produce, fodder and fuel wood.

12.4 Area statement

An abstract of different categories of forests, Range wise is given below:

Table No. 12.1: Tropical Dry Deciduous WC (Areas in ha.)			
Name of Range	**Reserved Forests**	**Protected Forests**	**Total Area**
Nohra	1027.70	67.60	1095.30
Kaffota	6041.60	482.20	6523.80
Renuka Ji	418.20	371.80	790.00
Sangrah	359.80	53.65	413.45
Shillai	2284.10	114.40	2398.50
Total :	**10131.4**	**1089.65**	**11221.05**

It is to be made clear here those areas of Chaks (Included cultivation) have been included in the areas of compartments where these (Chaks) fall.

The species wise area distribution for Tropical Dry Deciduous Working Circle is given as under:

TROPICAL WORKING CIRCLE		
Sr. No.	**Species**	**Area in Ha.**
1	Chil	240.67
2	Broad Leaved	3285.63
3	Ban	55.80
5	Kharsu	18.05
6	Mixed Deodar/Kail	34.99
7	Deodar	3.20
9	Fir/Spruce	5.50
10	Culturable Blanks	4901.40
11	Uncultivable Blanks	2107.13
12	Included cultivation	238.10
13	Area under Plantations	330.58
Total		**11221.05**

12.5 Blocks and Compartments:

No change has been made in the existing boundaries of the block and compartments.

12.6 Felling Series:

Miscellaneous felling series is constituted.

12.7 Miscellaneous felling Series (Tropical Dry Deciduous WC):

12.7.1 Analysis and valuation of crop:

i) Stock maps:

The stock maps for all the areas in the scale of 1:15000 have been prepared pasted and in the Compartment history files.

ii) Density:

The density of miscellaneous forests has been taken occularly. The density has been entered in the compartment history files. The density of the forests varies from 0.3 to 0.4.

iii) Enumeration:

The data has been collected on the plot wise and accordingly analyzed by Forest Survey of India.

The Detailed Results is herein under:

Table No. 12.2: Summary of Enumeration Results for Tropical Working Circle 11221.05 Ha.)								
	Diameter Class (CM)							
Species	10-20	20-30	30-40	40-50	50-60	60-70	70+	Total
Abies smithiana	0.721	0	0.18	0.18	0.09	0	0	1.171
Total Stems	8090.37705	0	2019.789	2019.789	1009.8945	0	0	13139.8496
Volume Factor	0.06	0.28	0.99	1.84	3.11	4.81	6.51	
Volume	485.422623	0	1999.59111	3716.4118	3140.7719	0	0	9342.19739
Acacia catechu	3.604	1.441	0	0	0.09	0	0	5.135
Total Stems	40440.6642	16169.5331	0	0	1009.8945	0	0	57620.0918
Volume Factor	0.065	0.17	0.411	0.906	1.487	1.487	1.487	
Volume	2628.64317	2748.82062	0	0	1501.7131	0	0	6879.17691
Aegle marmelos	0.631	0.09	0	0	0	0	0	0.721
Total Stems	7080.48255	1009.8945	0	0	0	0	0	8090.37705
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	453.150883	185.820588	0	0	0	0	0	638.971471
Anogeissus latifolia	0.631	0.18	0	0.09	0	0	0	0.901
Total Stems	7080.48255	2019.789	0	1009.8945	0	0	0	10110.1661
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	453.150883	371.641176	0	893.75663	0	0	0	1718.54869
Anogeissus pendula	0.18	0.36	0.18	0.631	0	0.09	0	1.441
Total Stems	2019.789	4039.578	2019.789	7080.4826	0	1009.8945	0	16169.5331
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	743.282352	844.271802	6266.2271	0	2316.698	0	10299.7457
Areca catechu	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Bauhinia retusa	0	0.27	0.09	0	0	0	0	0.36
Total Stems	0	3029.6835	1009.8945	0	0	0	0	4039.578
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	

Volume	0	557.461764	422.135901	0	0	0	0	979.597665
Bauhinia species	1.261	1.081	0.721	0	0.18	0	0	3.243
Total Stems	14149.7441	12129.9551	8090.37705	0	2019.789	0	0	36389.8652
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	905.583619	2231.91173	3381.77761	0	3059.9803	0	0	9579.25329
Bombax ceiba	0.36	0	0	0	0	0	0	0.36
Total Stems	4039.578	0	0	0	0	0	0	4039.578
Volume Factor	0.064	0.176	0.467	0.977	1.523	2.265	2.265	
Volume	258.532992	0	0	0	0	0	0	258.532992
Callicarpa longifolia	0.36	0	0	0	0	0	0	0.36
Total Stems	4039.578	0	0	0	0	0	0	4039.578
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	258.532992	0	0	0	0	0	0	258.532992
Cassia fistula	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Cedrela toona	0	0.18	0.27	0	0	0	0	0.45
Total Stems	0	2019.789	3029.6835	0	0	0	0	5049.4725
Volume Factor	0.113	0.347	0.772	1.692	2.924	4.389	6.074	
Volume	0	700.866783	2338.91566	0	0	0	0	3039.78245
Cedrus deodara	1.351	1.081	2.883	0.901	0.360	0.000	0.000	6.577
Total Stems	15163.5811	12130.8649	32348.973	10109.054	4043.6216	0	0	73796.0946
Volume Factor	0.0707	0.1416	0.7019	1.4158	2.5484	3.5395	4.8137	
Volume	1072.06518	1717.73046	22705.7441	14312.399	10304.765	0	0	50112.7038
Celtis australis	0.09	0.45	0.27	0.18	0	0	0	0.991
Total Stems	1009.8945	5049.4725	3029.6835	2019.789	0	0	0	11120.0606
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	929.10294	1266.4077	1787.5133	0	0	0	4047.65716
Citrus species	0	0.09	0	0	0	0	0	0.09
Total Stems	0	1009.8945	0	0	0	0	0	1009.8945

Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	185.820588	0	0	0	0	0	185.820588
Dalbergia sissoo	0.541	0.27	0	0	0	0	0	0.811
Total Stems	6070.58805	3029.6835	0	0	0	0	0	9100.27155
Volume Factor	0.064	0.176	0.467	0.977	1.523	2.265	2.265	
Volume	388.517635	533.224296	0	0	0	0	0	921.741931
Ehretialaevis	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Emblica officinalis	0.36	0.36	0	0	0	0	0	0.721
Total Stems	4039.578	4039.578	0	0	0	0	0	8090.37705
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	258.532992	743.282352	0	0	0	0	0	1001.81534
Eucalyptus globules	0	0.09	0	0	0	0	0	0.09
Total Stems	0	1009.8945	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	185.820588	0	0	0	0	0	185.820588
Evodia lunuankenda	*1.441*	*0.45*	*0*	*0*	*0*	*0*	*0*	*1.892*
Total Stems	16169.5331	5049.4725	0	0	0	0	0	21230.2266
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	1034.85012	929.10294	0	0	0	0	0	1963.95306
Flacourtia indica	0.901	0.27	0	0	0	0	0	1.171
Total Stems	10110.1661	3029.6835	0	0	0	0	0	13139.8496
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	647.050627	557.461764	0	0	0	0	0	1204.51239
Flacourtia species	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Grewia elastica	0	0.09	0	0	0	0	0	0.09

Total Stems	0	1009.8945	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	185.820588	0	0	0	0	0	185.820588
Grewia oppositifolia	1.171	0.991	0.721	0.09	0	0	0	2.973
Total Stems	13139.8496	11120.0606	8090.37705	1009.8945	0	0	0	33360.1817
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	840.950371	2046.09114	3381.77761	893.75663	0	0	0	7162.57575
Holarrhenaantidysenterica	0.27	0	0	0	0	0	0	0.27
Total Stems	3029.6835	0	0	0	0	0	0	3029.6835
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	193.899744	0	0	0	0	0	0	193.899744
Lanneacoromandelica	0.09	0.991	0.721	0.991	0	0	0	2.793
Total Stems	1009.8945	11120.0606	8090.37705	11120.061	0	0	0	31340.3927
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	2046.09114	3381.77761	9841.2536	0	0	0	15333.7556
Lithecarpuspachyphyllus	1.712	1.261	0.09	0	0	0	0	3.063
Total Stems	19210.4376	14149.7441	1009.8945	0	0	0	0	34370.0762
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	1229.46801	2603.55291	422.135901	0	0	0	0	4255.15681
Lyonia ovalifolia	0.45	0.09	0	0	0	0	0	0.541
Total Stems	5049.4725	1009.8945	0	0	0	0	0	6070.58805
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	323.16624	185.820588	0	0	0	0	0	508.986828
Mallotusphilippinensis	1.171	0.36	0	0	0	0	0	1.532
Total Stems	13139.8496	4039.578	0	0	0	0	0	17190.6486
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	840.950371	743.282352	0	0	0	0	0	1584.23272
Myrica sapida	0.09	0.09	0	0	0	0	0	0.18
Total Stems	1009.8945	1009.8945	0	0	0	0	0	2019.789
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	185.820588	0	0	0	0	0	250.453836

Nyctanthesarbortristis	0.36	0	0	0	0	0	0	0.36
Total Stems	4039.578	0	0	0	0	0	0	4039.578
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	258.532992	0	0	0	0	0	0	258.532992
Ougeiniadalbergioides	0.09	0.09	0	0	0	0	0	0.18
Total Stems	1009.8945	1009.8945	0	0	0	0	0	2019.789
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	185.820588	0	0	0	0	0	250.453836
Pajanelia longifolia	1.802	1.712	0.09	0	0	0	0	3.604
Total Stems	20220.3321	19210.4376	1009.8945	0	0	0	0	40440.6642
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	1294.10125	3534.72052	422.135901	0	0	0	0	5250.95767
Pajaneliarheedii	0.09	0.18	0.09	0	0	0	0	0.36
Total Stems	1009.8945	2019.789	1009.8945	0	0	0	0	4039.578
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	371.641176	422.135901	0	0	0	0	858.410325
Palaquimellipticum	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Phoenix sylvestris	0	0.27	0.27	0	0	0	0	0.541
Total Stems	0	3029.6835	3029.6835	0	0	0	0	6070.58805
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	557.461764	1266.4077	0	0	0	0	1823.86947
Pinus excels	0.09	0	0.09	0	0.09	0	0	0.27
Total Stems	1009.8945	0	1009.8945	0	1009.8945	0	0	3029.6835
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	422.135901	0	1529.9902	0	0	2016.75932
Pinus roxburghii	10.45	14.054	7.387	0.991	0	0.27	0.09	33.243
Total Stems	117259.973	157700.637	82889.8964	11120.061	0	3029.6835	1009.8945	373021.365
Volume Factor	0.0504	0.2499	0.6846	1.3544	2.2593	3.3994	4.7746	

Volume	5909.90261	39409.3891	56746.423	15061.01	0	10299.106	4821.8423	132247.673
Pistacia integerrima	0.721	0.45	0	0	0	0	0	1.171
Total Stems	8090.37705	5049.4725	0	0	0	0	0	13139.8496
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	517.784131	929.10294	0	0	0	0	0	1446.88707
Pithecolobium dulce	0	0.27	0.18	0	0.09	0	0	0.541
Total Stems	0	3029.6835	2019.789	0	1009.8945	0	0	6070.58805
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	557.461764	844.271802	0	1529.9902	0	0	2931.72373
Pongamia pinnata	0.18	0	0	0	0	0	0	0.18
Total Stems	2019.789	0	0	0	0	0	0	2019.789
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	0	0	0	0	0	0	129.266496
Pyrus pashia	0.18	0.631	0.09	0	0	0	0	0.901
Total Stems	2019.789	7080.48255	1009.8945	0	0	0	0	10110.1661
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	1302.80879	422.135901	0	0	0	0	1854.21119
Quercus dilatata floribunda	2.252	0.09	0.09	0	0	0	0	2.432
Total Stems	25269.8046	1009.8945	1009.8945	0	0	0	0	27289.5936
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	1364.56945	252.473625	563.521131	0	0	0	0	2180.5642
Quercus glauca	0.09	0.09	0	0	0	0	0	0.18
Total Stems	1009.8945	1009.8945	0	0	0	0	0	2019.789
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	54.534303	252.473625	0	0	0	0	0	307.007928
Quercus griffithii	0.901	0.541	0.09	0.18	0	0	0	1.712
Total Stems	10110.1661	6070.58805	1009.8945	2019.789	0	0	0	19210.4376
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	545.948967	1517.64701	563.521131	1934.9579	0	0	0	4562.07497
Quercus leucotrichophora	17.658	10.000	2.613	0.541	0.360	0.180	0.360	31.712
Total Stems	198137.459	112210.5	29316.2568	6065.4324	4043.6216	2021.8108	4043.6216	355838.703

Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	10699.4228	28052.625	16358.4713	5810.6843	6065.4324	3774.7208	7549.4416	78310.7981
Rhododendron arboreum	0.901	0.901	0.000	0.000	0.180	0.180	0.000	2.162
Total Stems	10109.0541	10109.0541	0	0	2021.8108	2021.8108	0	24261.7297
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	545.888919	2527.26351	0	0	3032.7162	3774.7208	0	9880.58943
Rhus species	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Sapindusemarginatus	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Schleicheratrijuga	0.18	0	0	0	0	0	0	0.18
Total Stems	2019.789	0	0	0	0	0	0	2019.789
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	0	0	0	0	0	0	129.266496
Shorearobusta	0.18	0.811	1.261	0.541	0.27	0.09	0.36	3.514
Total Stems	2019.789	9100.27155	14149.7441	6070.5881	3029.6835	1009.8945	4039.578	39430.7697
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	1674.44997	5914.59301	5372.4704	4589.9705	2316.698	12898.373	32895.8209
Stereospermumpersonatum	0.541	0.18	0	0	0	0	0	0.721
Total Stems	6070.58805	2019.789	0	0	0	0	0	8090.37705
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	388.517635	371.641176	0	0	0	0	0	760.158811
Stereospermumsuaveolens	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Symplocoscrataegoides	0.18	0	0	0	0	0	0	0.18

Total Stems	2019.789	0	0	0	0	0	0	2019.789
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	0	0	0	0	0	0	129.266496
Syzygiumcumini	0.36	0.541	0.09	0	0	0	0	0.991
Total Stems	4039.578	6070.58805	1009.8945	0	0	0	0	11120.0606
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	258.532992	1116.9882	422.135901	0	0	0	0	1797.65709
Terminalia belerica	0.09	0	0	0	0	0	0	0.09
Total Stems	1009.8945	0	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	64.633248	0	0	0	0	0	0	64.633248
Terminalia chebula	0	0.09	0	0	0	0	0	0.09
Total Stems	0	1009.8945	0	0	0	0	0	1009.8945
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	185.820588	0	0	0	0	0	185.820588
Terminalia crenulata	0.18	0	0.18	0.27	0.09	0	0	0.721
Total Stems	2019.789	0	2019.789	3029.6835	1009.8945	0	0	8090.37705
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	129.266496	0	844.271802	2681.2699	1529.9902	0	0	5184.79836
Rest Of Species	2.703	1.171	0.18	0	0	0	0	4.054
Total Stems	30330.4982	13139.8496	2019.789	0	0	0	0	45490.1367
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	1941.15188	2417.73232	844.271802	0	0	0	0	5203.156
Total Stems	**654017.888**	**478106.296**	**211253.047**	**62674.518**	**20207.999**	**9093.0941**	**9093.0941**	**1444558.15**
Volume	**37925.7206**	**106535.352**	**126200.967**	**68571.71**	**36285.32**	**22481.944**	**25269.656**	**423270.67**

12.7.2 Silvicultural System:

Coppice with reserves system will be followed. The coppice regeneration shall have to be supplemented by natural and artificial regeneration. Reserves will be of two type's viz. the usual standards and those trees which are to be retained either as these are younger or are of some other species to be retained.

12.7.3. Rotation and thinning Cycle

The tree crop in the felling series is of following types.

1. Pure Khair patches.
2. Miscellaneous broadleaved species and poor quality Sal.
3. Eucalyptus.

As explained in Appendix-XXVIII (Detail of Khair data growth), 20 cm dbh is suitable in the Division for exploitation of Khair. This is based upon the productivity, outturn of Katha, problem of Khair trees of higher diameter classes becoming hollow, stunted growth and problem of illicit felling. The diameter of 20 cm is also suitable for fuelwood which will be the major product of the miscellaneous broadleaved species. As explained in the chapter of statistics of Growth and Yield, the 20 cm dbh can be attained within 30 years in most of the cases. Therefore, a rotation of 30 years is prescribed. The eucalyptus, however, should be worked on a rotation of 10 years. But, no independent working circle is made for it. To overcome this situation the felling programme of Coppice areas is made in such a way that eucalyptus can be worked on 10 year rotation.

Since all the species are light demanders so it is also prescribed that two thinning, one at the age of 10 years and another at the age of 20 years are carried out. No thinnings are, however, foreseen in broadleaved patches presently. These may be required after fellings/ planting. The DFO (T) should make thinning programme in time and get it approved from Govt. of India before fellings. The thinning programme for Khair is, however, given in Para 12.7.9.

Rotation of standards:

a) Khair: Rotation of 40 years is prescribed for Khair standards. They should be felled along with first thinning.

b) Eucalyptus: The Eucalyptus standards will however be felled along with Eucalyptus main fellings, i.e. on 20 years rotations.

c) Broadleaved: The standards of broadleaved species be felled on a rotation of 60 years.

12.7.4. Yield:

The yield will be of 3 typesand will be controlled by area.

1. From main felling areas (Coppice with Reserves.)

2. From afforestation targets.

3. From thinnings.

Total area is 11221.05 ha out of which 2107.13 ha is unculturable and 238.1 ha is of included cultivations. Balance area remains 8875.82 ha. So annual yield comes to 8875.82/30=295 or say 290 Ha. The yield of afforestation is also calculated on 30 years basis in order to avoid undue hardship to right holders from closure. As a lot of Broad leaved species are involved in this working circle, thus the volume of the species will vary. So it is not possible to calculate the yield by volume. So the yield is prescribed by area. This yield is bifurcated in two parts viz. one from felling (200 Ha. annually) and second from afforestation (90 Ha. net area excluding the unculturable one) annually. Both type of yields viz. felling and afforestation will be accounted for separately in control forms and excess/ deficient will be brought forward. Variations to be explained in detail giving reasons for it.

Thus the yield from main felling areas is prescribed as 200 Ha. per annum.

The yield from afforstation is prescribed as target of 90 Ha. net area.

The yield from thinnings will be as per thinning programme mentioned afterwards. It is to be pointed out that keeping in view the neglect in past, the thinning cycle is kept 5 years in order to compensate the earlier delay.

12.7.5. Methods of Treatment:

A look at Appendix-IIIshows that considerable area of compartments is blank. Therefore, two type of treatment viz. one felling in coppice with reserve system along with thinnings and second, afforestation will be given to these areas.

12.7.6: Felling in Coppice with reserve system:

The wooded areas will be felled as per the following guidelines:-

i) Khair:

a) No Khair tree is to be felled unless marked for felling.

b) The trees below 15 cm dbh will not be marked for felling.

c) The trees above 15 cm dbh will be marked for felling except when these are to be retained as standard/ vulnerable locations.

d) Regarding standards the trees in 15-20 cm dia class will be preferred to be retained as standards.

ii) Eucalyptus: The felling in pure patches of Eucalyptus will be carried out after keeping standards at a distance of about 20 meter. The number of trees per ha to be retained as standards come to 30 to 40 per ha. The trees of other species standing in the patch need not to be felled.

iii) Sal/Sain:

a) No Sal/ Sain trees are to be felled unless marked for felling.

b) All IV class and below trees of Sal/ Sain are to be retained.

iv) Misc. Broadleaved Species (Kokath):

The miscellaneous broadleaved (Kokath) trees are to be felled unless kept as standards/ retained along nalas/ vulnerable locations.

v) Standards: The purpose of standards is to retain moisture, minimize frost affects, keep weeds under control and to provide trees of higher dia classes which may be required. But their retention should not hamper adequate light. The general principal in keeping in standards is that the spacing between crowns of standards should be of one crown width. But in cases where the trees are strong light demanders like Khair, the spacing between crowns of standards can go up to two-three crown width. Therefore, the number of standards will vary from area to area depending upon the light requirements, crown width of existing trees and coppicing power. The standards should preferably be of Vth, IVth, IIIrd classes. While keeping standards species is available. All trees retained as standards or otherwise be serially numbered and record serial number wise species and class-wise be kept in Compartments History Files.

vi) General:

The fellings be completed by 28th February and cut material stacked at suitable places (not over stumps) in the area by 31st March. A white band at breast height on all the trees which are not to be felled is to be put.

vii) Sacred Grove:

It was found during the inspection of the forest that a patch of *Anogeissus* in Gatlog forest has not been felled. On enquiry the people informed that these *Chhal* trees are not felled due to some religious sentiments. This patch of forest is showing good growth and density. It is suggested that this patch of Forest be preserved as a “Sacred Grove” as found in North Eastern States.

12.7.7. Sequence of Fellings:

Keeping in view the status of the Forest following sequence of fellings is proposed. It is, however, to be noted that in case the crop dia does not reached 20 cm d.b.h. in the year of final felling then the prescribed area be postponed and some other area where dbh is about 20 cm dbh be chosen for final felling. The thinning programme is to be amended accordingly.

Table No. 12.4: Sequence of Felling.

Year	Range	Forest		Gross Area (Ha.)	Area to be felled (Ha.)	Portion to be felled(B.L./ Khair Eucalyptus/ Sal/ Others)
		Name	Comp.			
1	2	3	5	6	7	8
2021-22	Kaffota	(Pt) R.1 Khajuri	C16	42.9	21	B.L.
	Kaffota	(pt) R.8 Mailani	C1	52.58	26	B.L.
	Kaffota	(pt) R.8 Mailani	C3	37.24	15	B.L.
	Shillai	(R) R.50 kotaPab	C1	71.5	35	B.L.
	Shillai	(S) R.3 Bandauli	whole	55.9	26	B.L.
	Nohra	(R) P.2 Devamanal	C1	67.6	32	B.L.
	Sangrah	(R) R.29 BeyongTatwa	C2	37.7	19	B.L.
	Renuka Ji	(R) R-47 R.F. Charighatti	C1	52	26	B.L.
	Kaffota	(pt) P.3 Pamta	C3	61.1	25	B.L.
	Kaffota	(pt) R.12 Gabar	C1	116.14	40	B.L.
	Shillai	(S) R.14 Shri Kiyari	C1	67.6	25	B.L.
2022-23	Kaffota	(pt) R.2 Tatiyana	C6	76.7	32	B.L.
	Kaffota	(pt) R.2 Tatiyana	C7	22	10	B.L.
	Kaffota	(pt) R.2 Tatiyana	C8	39	15	B.L.
	Kaffota	(pt) R.2 Tatiyana	C9	41.6	20	B.L.
	Shillai	(S) R.4 Kinu Panog	C1	113.1	51	B.L.
	Shillai	(S) R.4 Kinu Panog	C2	61.1	25	B.L.
	Nohra	(R) R.9 Bhangari	C3	35.1	16	B.L.
	Sangrah	(R) R.29 BeyongTatwa	C3	39	15	B.L.

	Renuka Ji	(R) R-47 R.F. Charighatti	C2	35.1	16	B.L.
	Kaffota	(pt) R.12 Gabar	C2	158.56	60	B.L.
	Kaffota	(pt) R.12 Gabar	C3	135.62	50	B.L.
2023-24	Kaffota	(pt) R.2 Tatiyana	C15	48.1	20	B.L.
	Kaffota	(pt) R.2 Tatiyana	C16	45.63	20	B.L.
	Kaffota	(pt) R.2 Tatiyana	C24	28.6	14	B.L.
	Kaffota	(pt) R.3 DhabPipli	C2	62.3	30	B.L.
	Shillai	(S) R.5 Ajrawali	C3	48.1	20	B.L.
	Nohra	(R)R-12 Punner	whole	53.7	22	B.L.
	Nohra	(R) R=11 Garari	C3	44.2	22	B.L.
	Renuka Ji	(R) R-47 R.F. Charighatti	C3	67.6	32	B.L.
	Renuka Ji	(R) R-47 R.F. Charighatti	C4	40.3	20	B.L.
	Shillai	(S) R.14 Shri Kiyari	C2	89.7	35	B.L.
	Shillai	(S) R.14 Shri Kiyari	C3	70.2	20	B.L.
	Shillai	(S) R.16 Chyali	C4	62.4	20	B.L.
	Shillai	(S) R.16 Chyali	C5	53.3	15	B.L.
2024-25	Kaffota	(pt) R.3 DhabPipli	C5	84.5	40	B.L.
	Kaffota	(pt) R.3 DhabPipli	C6	46.8	20	B.L.
	Shillai	(S) R.8 Kharakahan	C9	106.6	50	B.L.
	Shillai	(S) R.8 Kharakahan	C11	42.2	20	B.L.
	Nohra	(R) R=11 Garari	C4	49.4	24	B.L.

	Nohra	(R) R=11 Garari	C6	48.1	21	B.L.
	Renuka Ji	(R) R-47 R.F. Charighatti	C5	55.9	25	B.L.
	Sangrah	(R) R.36 Gahal	C4	139.1	60	B.L.
	Kaffota	(pt) R.12 Gabar	C4	133.31	50	B.L.
2025-26	Kaffota	(pt) R.3 DhabPipli	C7	131.3	60	B.L.
	Kaffota	(pt) R.5 Sewa	C1	66.81	30	B.L.
	Kaffota	(pt) R.5 Sewa	C2	52.82	20	B.L.
	Kaffota	(pt) R.5 Sewa	C3	36.72	10	B.L.
	Shillai	(S) R.9 Jakhandon	C2	78.6	30	B.L.
	Shillai	(S) R.9 Jakhandon	C3	67.6	30	B.L.
	Kaffota	(pt) R.13 Sakhauli	C1	236.43	70	B.L.
	Kaffota	(pt) R.13 Sakhauli	C2	159.61	50	B.L.
2026-27	Kaffota	(pt) R.6 Janjhli	C4	112.87	50	B.L.
	Kaffota	(pt) R.6 Janjhli	C5	154.37	70	B.L.
	Shillai	(S) R.11 Loja	C1	66.5	25	B.L.
	Nohra	(R) R.19 jamalNihog	C1	36.7	10	B.L.
	Nohra	(R) R.19 jamalNihog	C2	49.4	20	B.L.
	Renuka Ji	(R) R-42-R.F. Unger	C1	33	10	B.L.
	Renuka Ji	(R) R-42-R.F. Unger	C2	42	15	B.L.
	Kaffota	(pt) R.13 Sakhauli	C3	149.4	50	B.L.
	Shillai	(S) R.16 Chyali	C7	53.3	10	B.L.
	Shillai	(S) R.17 Bali koti	C2	32.5	10	B.L.

	Kaffota	(pt) R.14 Kathar	C1	101.36	30	B.L.
2027-28	Kaffota	(pt) R.7 Salag	C1	113.2	50	B.L.
	Kaffota	(pt) R.7 Salag	C2	125.76	60	B.L.
	Shillai	(S) R.11 Loja	C2	29.2	10	B.L.
	Shillai	(S) R.11 Loja	C4	35.1	15	B.L.
	Shillai	(S) R.12 Naya Panjore	C1	31.2	15	B.L.
	Nohra	(R) R16 Gatlog	C3	45.5	20	B.L.
	Renuka Ji	(R) R-43-R.F. Thana Khegwa	C1	63.7	30	B.L.
	Kaffota	(pt) R.14 Kathar	C2	108.15	30	B.L.
	Kaffota	(pt) R.14 Kathar	C3	89.04	20	B.L.
	Kaffota	(pt) R.14 Kathar	C4	178.78	50	B.L.
	Nohra	(R) R-18 Gawahi	C3	59.8	10	B.L.
2028-29	Kaffota	(pt) R.7 Salag	C5	146.82	60	B.L.
	Shillai	(S) R.13 Bhatnol	C2	89.7	35	B.L.
	Shillai	(S) R.13 Bhatnol	C3	44.2	20	B.L.
	Nohra	(R) R16 Gatlog	C4	55.9	25	B.L.
	Nohra	(R) R16 Gatlog	C5	52	20	B.L.
	Renuka Ji	(R) P-9-P.F. Charag	C1	96.2	40	B.L.
	Shillai	(S) R.17 Bali koti	C8	63.7	30	B.L.
	Kaffota	(pt) R.14 Kathar	C5	145.38	40	B.L.
	Kaffota	(pt) R.15 Chandni	C4	86.52	40	B.L.
2029-30	Kaffota	(pt) R.9 Sehbara	C1	77.47	30	B.L.
	Kaffota	(pt) R.9 Sehbara	C2	76.77	30	B.L.

	Kaffota	(pt) R.9 Sehbara	C3	38.6	10	B.L.
	Kaffota	(pt) R.9 Sehbara	C4	58.88	20	B.L.
	Shillai	(S) R.15 Milla	C2	76.7	30	B.L.
	Shillai	(S) R.15 Milla	C11	63.7	25	B.L.
	Nohra	(R) R.17 Kufar Kiara	C1	66.3	25	B.L.
	Nohra	(R) R.17 Kufar Kiara	C2	68.9	30	B.L.
	Kaffota	(pt) R.15 Chandni	C2	148.4	70	B.L.
	Kaffota	(pt) P.1 Sherli Manpur	C3	48	20	B.L.
2030-31	Kaffota	(pt) R.10 Sataun	C4	64.13	20	B.L.
	Kaffota	(pt) R.11 Manal	C1	67.67	20	B.L.
	Kaffota	(pt) R.11 Manal	C2	76.46	30	B.L.
	Kaffota	(pt) R.11 Manal	C3	125.5	40	B.L.
	Shillai	(S) R.14 Shri Kiyari	C6	45.5	15	B.L.
	Shillai	(S) R.16 Chyali	C1	30.2	10	B.L.
	Nohra	(R) R.17 Kufar Kiara	C3	57.2	20	B.L.
	Nohra	(R) R-18 Gawahi	C2	61.1	25	B.L.
	Renuka Ji	(R) P-9-P.F. Charag	C2	57.2	20	B.L.
	Shillai	(S) R.17 Bali koti	C13	46.8	20	B.L.
	Nohra	(R) R16 Gatlog	C1	67.6	30	B.L.
	Sangrah	(R) R.36 Gahal	C5	46.8	20	B.L.
	Kaffota	(pt) R.5 Sewa	C6	55.88	20	B.L.
Total				7686.08	**3000 Ha.**	

Note: DFO can change the sequence of felling of broad leaved patches subject to the condition that annual yield is not exceeded. Fellings of Khair should, however, be followed subject to the condition of attainment of 20 cm dbh.

12.7.8 Treatment of felled areas and Subsidiary Silvicultural Operations.

i) Artificial Planting:

a) In pockets of good soil depth, soil depth along nalas and easy slopes the planting of *Kachnar, Shisham, Harar, Bahera*, *Amla* and *Toon* be done. Kachnar and Shisham be planted out of root shoot cuttings made out of about 1.5 to 2 year old plants grown in nursery at a spacing of 25 x 25 cms. The Root Shoot cuttings be planted in monsoons. No naked root plants be planted. The Harar and Bahera be planted out of 1 to 1.5 year old plant with ball of earth. The size of pits should be 45 cm.

b) In refractory areas patch sowing of Kainth berries in 30 x30 x15 cm. Patches be done 5 to 6 berries be tried in a patch. In such area root-shoot cutting of Amaltas with three years plants raised in Nursery at a spacing of 25 x 25 cms be also tried during monsoons.

c) In other areas Khair/ Siris planting raised in P.Bags in 30 x30 x30 cm pit be done.

d) In areas whereSain is natural root shoot cuttings of Sain prepared out of 2 years old nursery raised plants be tried.

e) For beating up of failures 1-1.5 years old root-shoot cuttings of *Darek* grown in Nursery at a spacing of 25 x 25 cms be done. For this purpose, Amaltas root-shoot cuttings (3 years old grown in nursery at a spacing of 25 x 25 cms be also tried.

f) In lantana infested areas the strips of 2 meter width be cleared and planted with suitable species. The strips be kept clear of lantana for a period of about 7 years.

g) *Anogiessus latifolia* is an excellent fodder and is also very suitable for small timber/ fuelwood/ charcoal. But so far nursery techniques have not been standardized. Tata Energy research Institute, New Delhi, however, have been preparing tissue culture seedlings and supplying to various States. Some plants were tried in 1997-98 in Kunihar Division and doing well. It is, therefore, suggested that tissue culture raised seedlings be procured from TERI and tried in suitable areas.

h) In pure Khair patch areas some Shisham and Semal be also introduced.

Much advance and meticulous planning is required for regenerating these areas.

ii) Slash disposal:

The cut material if left out in the area will be collected in heaps outside the area and control burnt before fire season. The right holders be also encouraged to carry it.

iii) Singling out of coppice shoots:

Coppice shoots of Khair and other species (except Eucalyptus) will be tended in the Fourth year (when shoots are 3 years old) after felling and only 2-3 shoots per stump will be retained. In the Seventh year only best growing shoot will be retained. In case of eucalyptus, the singling out of coppice shoots be undertaken in the third year. The most robust shoot be retained. There is no need for two operations in case of eucalyptus.

iv) Bush cutting:

Bush cutting be carried till 5 years from planting. All bush need not be cut but only those interfering with the growth of the plant be cut.

v) Closure:

A closure of about 10 years when plants reach beyond trampling/ browsing damage be done.

vi) Weeding:

In pits weeding be done after 10-15 days of planting and once more after about the same interval. These may be repeated next year.

vii) Mulching:

Mulching be done after weeding.

12.7.9. Thinning in Khair Patches:

The necessity of thinning for proper growth of trees particularly strong light demanders like Khair cannot be ruled out. It is estimated that a spacing of about 3x6 meter is required in the 10^{th} year of plantation and that of about 6x6 meter in 20^{th} year on average sites. Since no thinning were carried out in past and the stocks are above poor. So following sequence of thinning is laid down. The thinning will be of mechanical nature:-

Table No. 12.5: Thining in Khair Patches.

Range	Forest		Year of Plantation	Area (Ha.)	3x6m. spacing in the year	6x6 spacing in the year
	Name	Comptt.				
Kaffota	Sataun	C-1	1978-79	10	2021-22	2027-28
Kaffota	Sataun	C-1	Not known	10	2021-22	2027-28
Kaffota	Sataun	C-1	Not known	10	2021-22	2027-28
Kaffota	Sataun	C-3	Not known	10	2021-22	2027-28
Kaffota	Kather	C-2	1979-80	10	2021-22	2027-28
Kaffota	Gabar	C-2	1979-80	20	2022-23	2021-22
Kaffota	Gabar	C-4	Not known	10	2022-23	2028-29
Kaffota	Chandni	C-3	1979-80	20	2022-23	2028-29
Kaffota	Janjhli	C-4	1980-81	10	2022-23	2028-29
Kaffota	Janjhli	C-4	1982-83	10	2022-23	2028-29
Kaffota	Janjhli	C-4	1984-85	10	2022-23	2028-29
Kaffota	Manal	C-3	Not known	25	2022-23	2028-29
Kaffota	Kather	C-4	Not known	20	2023-24	2029-30
Kaffota	Kather	C-5	1982-83	10	2023-24	2029-30

Kaffota	Chandni	C-4	Not known	20	2023-24	2029-30
Kaffota	Gabar	C-2	Not known	20	2023-24	2029-30
Renuka Ji	Unger	C-2	1981-82	30	2023-24	2029-30

Note: 1. Incase of those patches where no thinning programmeis made, the DFO (T) will make the thinning programme. The guideline will be that first thinning will be done when average crop dia is about 8-10 cms (Girth 25-31 cm) and age about 10 years. The trees are to be spaced at about 3x6M. The second thinning will be done when average crop dia is about 15-17 cms. (Girth 45-52 cms) and age about 20 years. The felling programme be made after inspection by DFO and got approved from the Govt. of India through CF (T), CF (WP), and CCF (WP &Settlement)

2. In case the above felling programme is not followed in a particular year, then it should be followed in next/subsequent suitable year.

12.7.10 Control:

The details of felled areas including thinning will be reflected in control forms and reasons for deviations be explained.

12.7.11 Treatment of Blank- Afforestation.

The blank areas will be planted in the manner suggested in Appendix-XXIXfor artificial planting, bush cutting, closure, weeding and mulching. The programme is suggested in the Chapter plantation working circle.

12.7.12. Grazing and Grass cutting.

The felled areas will be closed to grazing immediately after felling, grass cutting may be allowed to right holders under strict supervision so that coppice shoots and seedlings are not cut along with grass.

12.7.13 Fire Protection:

Slash disposal and timely thinning will be carried out.

12.7.14 Assessment of survival percentage:-

The survival percentage as well as status of coppice will be assessed every year after felling/ planting for at least five years personally be RO/ACF in every year. DFO/CF will also do checking quite frequently and reports sent to reports sent CF (WP) through CF (T).

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CHAPTER –XIII

THE DEODAR-KAIL WORKING CIRCLE

13.1 General Constitution : This working circle covers all the moderate to well stocked {density>0.3} reserved, protected forests bearing Deodar and Kail as the principal species pure or mixed and considered suitable for working under a system of concentrated regeneration fellings. Areas as per previous plan are:

a)	Protection Working Circle of P. Thaplial's Plan	340.84 Ha.
b)	Rehabilitation Working Circle of P. Thaplial's Plan	872.87 Ha.
	Total	**1213.71 Ha.**

This working circle covers an area of 1213.71 ha as per details given in table 13.1.

Table 13.1: Area Statement of Deodar-Kail Circle

S. No.	Name of Range	Reserve Forest	Protected Forests	Area {ha}
1.	Nohra	91.00	0.00	91.00
2.	Kaffota	483.21	0.00	483.21
3.	Sangrah	403.10	30.00	433.10
4.	Shillai	206.40	0.00	206.40
Total		**1183.71**	**30.00**	**1213.71**

The details of the area statement by Ranges, Forest Blocks and comptt/Sub compartments showing gross and stocked area under various species are given in Appendix IV.

13.2 General Character of Vegetation: The crop is mainly deodar and kail occurring either gregariously in pure patches or in mixture of varying proportions. Deodar is predominantly middle aged with slight to fair admixture of mature trees, whereas kail is of young to middle age group. Stocking in general is moderate to fairly dense. Natural regeneration of deodar is deficient and is found either in few pockets or in scattered form. Kail being pioneer species is coming up naturally in open places and along the fringes.

In the upper reaches spruce is found mixed with deodar and kail. Along the nallas and depressions and at places dense crops of ban oak Pure or mixed with Mohru are also found. Along the lower linits deodar is confined to shelter placed only. Chil is met within the lower altitudinal zone and is mainly confined to spurs and warmer aspects.

13.3 The forests included in this working circle mainly conform to 12/C 1 C, 12/C 1 F AND 12/2SI of Champion and Seth s Types which have already been described in detail in Chapter-2 of part I of the plan.

13.4 Blocks and compartments: No change has been made in the existing boundaries of forests and compartments. Forests compartments have been formed keeping in view the area extent, natural boundaries and crop conditions. Such forests have been numbered and named after Mauza. All the compartmets are distinguishable on the ground.

13.5 Special objects of Management: Without prejudice to the general objects of management, the special objects of managements are:

a) To convert the irregular and uneven aged crops into more or less uniform, normal, even aged crops.

b) To improve the growing stock of the forests by obtaining and inducing natural regeneration as far possible and also by supplementing it with artificial regeneration wherever necessary.

c) To obtain progressive yield in perpetuity after meeting the legitimate demands of the local people.

d) To preserve and protect the forests to maintain the mountain ecosystem.

13.6 Area and allotment: The gross area of this working circle is 1213.71 ha with 463.24 ha under Deodar and Kail {38.16%]. The detailed distribution of compartmentis given in Appendix -IV and the summary thereof is presented in Table 13.1.

13.7 Analysis and Valuation of the Crop:

13.7.1 Stock maps: Stock maps for all the compartments have been prepared on 1:15,000 scale maps. The areas under different categories and species are given in Appendix IV and abstract produced in Table 13.2.

Table-13.2 Species-wise area distribution of Deodar-Kail Circle

Sr. No.	Species	Area in Ha.
1	Chil	1.30
2	Broad Leaved	49.00
3	Ban	82.70
4	Kharsu	4.55
5	Mixed Deo-Kail	463.24
6	Fir/Spruce	76.00
7	Culturable Blanks	234.95
8	Included Cultivation	38.47
9	Uncultivable Blanks	263.50
Total		**1213.71**

13.8 Site Quality: and age classes: Each compartment has been assigned an average quality class determined by ocular estimation of height and checked by actual measurement. The average quality for deodar and kail is {FRI}. The crop is mostly of mixed age classes, the middle age classes predominating and the mature is deficient.

13.9 Density: The density of each compartment is determined by ocular estimate and recorded in compartment history files. Most of the reserved and protected forests are well stocked. The density varied from 0.4 to 0.6.

13.10 Enumerations: The data for various grid points as allotted by the FSI Dehradun was collected and submitted to FSI Dehradun. The data was analyzed and processed data was returned back. The Details of Enumeration Lists are herein under:

Table No. 13.3: Summary of Enumeration Results for Deodar -Kail Working Circle (1213.71 Ha.)

Species	Diameter Class (CM)							
	10-20	20-30	30-40	40-50	50-60	60-70	70+	Total
Abies smithiana	0	1.67	0	0	0	0	0	1.67
Total Stems	0	2026.8957	0	0	0	0	0	2026.8957
Volume Factor	0.06	0.28	0.99	1.84	3.11	4.81	6.51	
Volume	0	567.530796	0	0	0	0	0	567.530796
Alnus nitida	43.33	6.67	5	0	0	0	0	55
Total Stems	52590.0543	8095.4457	6068.55	0	0	0	0	66754.05
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	3365.763475	1489.562009	2536.654	0	0	0	0	7391.97938
Cedrus deodara	16.67	13.33	13.33	0.00	0.00	0.00	0.00	43.33
Total Stems	20228.5	16182.8	16182.8	0	0	0	0	52594.1
Volume Factor	0.0707	0.1416	0.7019	1.4158	2.5484	3.5395	4.8137	
Volume	1430.15495	2291.48448	11358.71	0	0	0	0	15080.3468
Pinus excelsa	3.33	0.00	6.67	0.00	0.00	0.00	0.00	10.00
Total Stems	4045.7	0	8091.4	0	0	0	0	12137.1
Volume Factor	0.0504	0.2499	0.6846	1.3544	2.2593	3.3994	4.7746	
Volume	203.90328	0	5539.372	0	0	0	0	0
Pinus roxburghii	0.00	0.00	10.00	0.00	0.00	0.00	0.00	10.00
Total Stems	0	0	12137.1	0	0	0	0	12137.1
Volume Factor	0.0504	0.2499	0.6846	1.3544	2.2593	3.3994	4.7746	
Volume	0	0	8309.059	0	0	0	0	8309.05866
Pyrus pashia	3.33	0.00	0.00	0.00	0.00	0.00	0.00	3.33
Total Stems	4045.7	0	0	0	0	0	0	4045.7
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	258.9248	0	0	0	0	0	0	258.9248
Pseudostachyampolymorphum	0	1.67	0	1.67	0	0	0	3.33
Total Stems	0	2026.8957	0	2026.896	0	0	0	4041.6543

Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	372.9488088	0	1793.803	0	0	0	2166.7515
Quercus dilatata	3.33	0.00	0.00	1.67	5.00	0.00	1.67	11.67
Total Stems	4045.7	0	0	2022.85	6068.55	0	2022.85	14159.95
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	218.4678	0	0	1937.89	9102.825	0	3776.66	15035.8441
Quercus griffithii	23.33	23.33	6.67	0.00	0.00	0.00	3.33	56.67
Total Stems	28319.9	28319.9	8091.4	0	0	0	4045.7	68776.9
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	1529.2746	7079.975	4515.001	0	0	0	7553.32	20677.5727
Quercus leucotrichophora	103.33	85.00	16.67	16.67	8.33	6.67	0.00	236.67
Total Stems	125416.7	103165.35	20228.5	20228.5	10114.25	8091.4	0	287244.7
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	6772.5018	25791.3375	11287.5	19378.9	15171.38	15106.64	0	93508.2641
Rest of Species	26.67	0.00	0.00	3.33	0.00	0.00	0.00	30.00
Total Stems	32365.6	0	0	4045.7	0	0	0	36411.3
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	2071.3984	0	0	3580.445	0	0	0	5651.8429
Rhododendron arboretum	3.33	1.67	5	1.67	0	0	0	11.67
Total Stems	4041.6543	2026.8957	6068.55	2026.896	0	0	0	14163.9957
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	218.2493322	506.723925	3386.251	1941.766	0	0	0	6052.99024
Total Stem	**275099.5086**	**161844.1828**	**76868.3**	**30350.84**	**16182.8**	**8091.4**	**6068.55**	**574493.446**
Volume	**16068.63844**	**38099.56252**	**46932.55**	**28632.81**	**24274.2**	**15106.64**	**11330**	**174701.106**

13.11 Regeneration: The regeneration is not satisfactory. It is lagging the expectations. Efforts of raising plantations have met with partial to scanty success. The luxuriant undergrowth after seeding felling seems to be the main cause of unsuccessful regeneration. It is smothered before the establishment. Through bush cuttings and rising of massive plantations with nursery grown seeding followed by frequent weeding and beating up of mortality is the only solution to regenerate the area fully.

13.12 Silvicultural System:

The enumeration result reveal that the crop is mainly in V and IV class and it is difficult to demarcate areas in various age classes /PBs. As no mature or over mature trees are available hence no silvicultural system is prescribed. However thinning/cleanings will be carried out in young crop. Although the areas are expected to regenerate naturally but it is advisable to supplement natural regeneration by artificial planning. The plants may be raised in the nurseries in polythene bags. The plants should be kept in the nursery for 9 months. This may be done particularly for the areas which are refractory. For it the polythene bags be sown during September-October and planted in succeeding July.

13.13 Exploitable Diameter:

The exploitable diameter is fixed at 60 cm. d.b.h. which gives maximum out turn of commercial size of sawn timber.

13.14 Felling Cycle:

The felling cycle is fixed at 10 years corresponding to the plan period.

13.15 Calculation of Yield:

From the perusal of the enumeration data it is clear that there is no tree of First A and above class is available in this working circle for Deodar and Kail. Hence, no yield is prescribed for this Working Circle.

13.15.1 Treatment of existing plantation: Periodical repairs of the fencing to be ensured to provide effective closures to such old plantations. The unfenced areas to be fenced effectively. The causalities are replaced by beating up. Deodar should be planted up with nursery grown seeding and kail by patch sowings, after through bush cuttings. Weeding have to be done invariably twice a year till the plants have attained sufficient height and not smothered by bushed any more. The beating up and bush cutting operations are to be repeated successively for a couple of years uninterrupted till the area is regenerated successfully. In established plantation, cleaning, pruning, thinning have to be carried out wherever necessary.

13.15.2 Choice of species: The species eminently suited to the locality will be favored and shall get preference over all other species. In majority of forests, deodar and Kail are found growing side by side in

mixture as well as in pure groups of varying sizes. Deodar occurs pure in large proportions in Kaffota and Shillai Ranges. Kail is more susceptible to fire damage and is often base burnt. It is also lopped heavily and therefore attacked by fungus Termites' pini. As such all reasonable attempt must be aimed at, similarly spruce and silver fir belts and pockets shall not be converted into deodar and kail except the transitional belts where the site conditions are favorable for deodar. Broad leaved species like Maple, Walnut, Chestnut Ash, and Bird cherry etc. should be introduced on suitable grounds along nalas and in moist locations, where these species grow naturally as well In nut shell, each species should be raised on the ground best suited to it. However, in mixed forests of deodar, kail and spruce, deodar should have upper hand. This can be achieved be planting the area with deodar seeding and by retaining more deodar seed bearers in preference to kail of spruce. No attempt should be plant the 'Thatches' occurring naturally on the top of the high ridges. Money is not to be waste on planting trees in places where nature never intended them to grow. Therefore, a detailed suitability and treatment map should be prepared for the area and sowing/planting be carried out accordingly.

13.15.3 Plants like Sarcococca, Viola, Ainslaes, Indigofera, Desmodus, Fragaria, and Maiden hair fern, are the good indicators of deodar sites where, to some extent, reliance can be placed on natural regeneration also. Iris, Spiraea Sorbifolia, Plectranthuisstrobilanthes and Balsam are the bad indicators of deodar sites where only artificial regeneration shall have to be relied upon.

13.15.4Nursery technique: The technique of artificial regeneration has already been standardized and well understood and need no elaboration. The temporary nurseries of deodar and broad-leaved species should be raised within or in the vicinity of the plantable area well in advance of the year of fellings/planting schedule. Deodar should be raised as per the new Nursery Norms issued by the Government.

13.15.5 New plantations methods of establishment etc.

(i) Fencing: The areas shall be notified for closure immediately after fellings are over. All the subsidiary operations shall be completed by 31st May of the year and the areas should be fenced with 4 strands barbed wire. If stone is available locally, stone wall fencing should be preferred. This reduces the future cost of fence post replacement and repair of barbed wire fencing.

(ii) Soil Working: After through bush cuttings in the entire areas or in strips and their disposal by way of burning or dumping in nallas, 30cm x 30cm x 30cm pits should be dug in advance along the contours at an

average distance of 2mx 2m and soil working should be completed latest by June of the year in which planting has to be done.

(iii) Sowing and planting: Each of the felled area will be planted up in the rainy season preferably in July following the year of exploitation. Deodar seedlings to years old with > 25cm height will be planted up. Patch or line sowing of deodar may also be resorted to in ideal areas only. This can be taken up even during the year of fellings. Kail shall be regenerated by patch/ line sowing along contours. This will be done on dry and exposed sites where deodar is notexpected to do well. Kail almost seeds every year and as such it will be regenerated naturally or by line/patch sowing along the contours 3mpart. Entire transplanting of broad leaved species shall have to be done in very moist locations near Khallas.

(iv) Weeding: All the regeneration areas should be weeded properly in the infancy. Normally two weeding- one in June/July and another in August/September are considered sufficient for young plantations. It should be done judiciously and carefully and young nts should be freed from over shade and smothering of leading shoots. Removal of weaker plants from the patches where patch sowing is done should be done continuously along with the weeding operations.

(V) Cleaning: This operation should be carried out in the early stages both in congested natural regenerations and plantations and should be continued till the area is suitable for thinning. Best and vigorously growing stems should be retains. All forked, crooked sickly and damaged stems should be removed in cleanings so as to provide growing space to better stem. Nothing more than what is absolutely necessary should be cut in cleaning. In deodar plantations, kail found coming up naturally in plenty, must be cut at the initial stage to avoid suppression of deodar. For cleaning operations, vigor and health of the young plants is much more important of make the young crop fire resistant within reasonable time and also not to permit the side branches to persist unnecessarily.

{VI} Thinning: Early and frequent thinning after the saplings have attained 10 cm diameter at base should be carried out. All the materials removed in cleanings and thinning should be removed outside the regeneration area to avoid any fire hazards.

13.15.6 Closures: Effective closure is most essential for success of a plantation/regeneration area. It is thus imperative that the P.B.I areas are closed immediately before the actual planting / sowing takes place.

The area will have to be closed for cattle grazing till the regeneration establishes itself. Normally this period is 30 years. Government notifications for such closures should be got issued well in time to avoid litigations.

13.15.7 Grazing: The P.B.I areas planted up shall be closed to grazing III those areas which are not under regeneration is established Grazing rights of the holders as admitted in the Faisla-e-Janglat and contained in Wazi-ul-Araz will not be interfered within the areas other than those closed for regeneration.

13.15.8 Grass Cutting: There will be no restrictions on grass cutting in those areas which are not under regeneration. Grass cutting in closed areas shall be allowed to the right holders when the seedling has attained a height of 50 cm provided no plants are cut along the grasses.

13.15.9 Lopping: Kail and spruce are lopped for litter and Oaks for fodder. Deodar and kail trees are being lopped for staking of tomato, peas and other vegetable crops being grown recently in the area. This should be stopped completely as it makes deodar, kail and spruce trees susceptible to diseases and retards growth. Indiscriminate lopping of Oaks should also be prohibited.

13.15.10 Requirement of Right Holders: As per the new TD rules only salvage trees can be given to the right holders. So TD should be given as per the new rules and as per the availability of the salvage trees.

13.15.11 Fire protection: Forests will be protected from fires though the frequency of forests fires in deodar forests is negligible. Young deodar plantations and regeneration areas require special care and complete protection from fire. Special precautions are necessary in the areas adjoining chil forests. Forests floors are to be kept clean of the debris another combustible material. The fireflies, inspection and bridle paths should be kept clean of needles especially during summer. Fire watchers should be posted during fire season along with the fire fightingequipments. Above all, public co-operation is very necessary to keep fire out of the area.

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CHAPTER XIV

THE SPRUCE-FIR WORKING CIRCLE.

14.1 General Constitution: All the commercially exploitable spruce and sliver fir forests either pure or mixed, growing in compact blocks or in patches, are included in this working circle. It includes all the forests of Fir-Spruce working circle and some forests of deodar working circle bearing considerable stocking of spruce and sliver fir. It also includes those oak forests and alpine pastures which could not be separated by formation of Sub-compartments. This working circle covers 620.30 ha of Reserve Forests spread over Shillai, Sangrah, Sri Renuka Ji and KaffotaRanges.The areas included in this circle are taken from previous working Plan as under:

a)	Protection Working Circle of P. Thaplial's Plan	342.10 Ha.
b)	Rehabilitation Working Circle of P. Thaplial's Plan	278.20 Ha.
	Total	**620.30 Ha.**

14.2 General character of vegetation: The forests included in this working circle conform to Champion and Seth's Type 12/C (West Himalayan moist temperate mixed coniferous forests), and Type 12/2d (West Himalayan Upper Oak/fir forests) with Type 12/C1e (Moist temperate deciduous forests) found on moist localities in depressions, and along nalas, the details of which are already given Chapter II or Part I. Sliver fir and spruce are the main species of this circle. Sliver fir predominates in upper parts and spruce down below. Sliver fir descends below in cooler localities whereas spruce ascends higher along the warm spurs. Majority of the forests are the mixture of Fir and Spruce with narrow belt of Kharsu oak at the higher limits and board belt of Ban and Mohru oak along the lower limit. Proportion of Spruce is higher than Fir. At place, small patches of Kail and Deodar are found pure or mixed with Spruce. Fir and Spruce forests are typical selection forests consisting of irregular crop of all age and diameter classes mixed together. Stocking is moderate. Regeneration of Fir and Spruce is lacking. However, patches containing young crop in the form of saplings and poles and found in the gaps. A fairly dense under storey of oak and Brass is present. The Oaks are mostly virgin forests but badly lopped in areas close to Gujjar *paraos*. The ground is generally covered with dense bush and luxuriant weed growth.

14.3 Blocks and Compartments: The boundaries of the forests and compartment remain the same as given in the plan under revision.

14.4 Felling Series: The areas have not been divided into separate felling series.

14.5 Special Object of management: Without prejudice to the general objects of management, the special objects of management are:

a) To preserve and maintain the existing forests spruce and fir to conserve the environment and ecology, to project the mountains from erosion and landslide and to conserve the moisture regime of the locality.

b) To tend the regeneration of spruce and fir and restock blanks with spruce, fir, deodar, kail and valuable broad-leaved species artificially.

c) To obtain the maximum possible sustained yield of timber by exploiting the siliviculturally available mature and over mature fir spruce trees.

d) To preserveand nurse up all trees below the exploitable diameter, which is expected to reach that diameter under the best possible conditions of growth.

14.6 Area and Allotment: The details of the forests allotted to this working circle are given in Appendix V. The abstract showing the area distribution by Range is given in Table 14.1. Out of the total area of 620.30ha only 263.25 hai.e42.44% is under spruce and fir.

Table 14.1: Range wise area in Fir Spruce working circle

Name of Range	Reserved Forests	Protected Forests	Total Area
Nohra	0.00	0.00	0.00
Kaffota	53.30	0.00	53.30
Sri Renuka JI	58.50	0.00	58.50
Sangrah	320.60	0.00	320.60
Shillai	187.90	0.00	187.90
Total :	**620.30**	**0.00**	**620.30**

14.7 Analysis and Valuation of the crop:

14.7.1 Stock Maps: All the forests allotted to this working circle have been stock maps on 1:15,000 scale maps and posted in the C.H. file. Forest wise details area occupied by each species is given in Appendix V and abstract showing distribution of species is given Table 14.2.

Table 14.2: Species wise stocking in Fir Spruce Working Circle

Sr. No.	Species	Area in Ha.
1	Chil	21.20
2	Broad Leaved	65.00
3	Ban	99.40
4	Kharsu	9.30
5	Mixed Deo-Kail	74.90
6	Fir/Spruce	263.25
7	Culturable Blanks	41.80
8	Uncultivable Blanks	28.30
9	Included Cultivation	17.15
Total		**620.30**

14.8 Site Quality: No standard quality classes have been fixed for sliver fir and spruce so far. In the absence of multiple yield Table, the spruce and fir crops could not be assigned a definite quality class. However, the height of spruce and fir is over 30 meters. Deodar and Kail are of average quality II according to F.R.I. tables.

14.9 Density: Density has been assessed jocularly while stock mapping and describing the forests and recorded in the concerned compartment history files. It varies from 0.4 to 0.7, the average being 0.55.

14.10 Regeneration: Regeneration on the whole is deficient. However, some saplings and poles in groups as well as in isolated form are noticed in the gaps.

14.11Enumeration: The data for various grid points as allotted by the FSI Dehradun was collected and submitted to FSI Dehradun. The data was analyzed and processed data was returned back. The Detail of Enumeration Lists are herein under:

Table No. 14.3: Summary of Enumeration Results of Fir Spruce Working Circle (Area= 620.30 Ha.)								
	Diameter Class (CM)							
Species	10-20	20-30	30-40	40-50	50-60	60-70	70+	Total
Abies smithiana	28	6	32	6	0	0	2	74
Total Stems	17368.4	3721.8	19849.6	3721.8	0	0	1240.6	45902.2
Volume Factor	0.06	0.28	0.99	1.84	3.11	4.81	6.51	
Volume	1042.104	1042.104	19651.1	6848.112	0	0	8076.306	36659.73
Cedrus deodara	34	54	6	4	0	0	0	98
Total Stems	21090.2	33496.2	3721.8	2481.2	0	0	0	60789.4
Volume Factor	0.0707	0.1416	0.7019	1.4158	2.5484	3.5395	4.8137	
Volume	1491.077	4743.062	2612.331	3512.883	0	0	0	12359.3534
Lyonia ovalifolia	0	2	2	0	0	0	0	4
Total Stems	0	1240.6	1240.6	0	0	0	0	2481.2
Volume Factor	0.064	0.184	0.418	0.885	1.515	2.294	3.193	
Volume	0	228.2704	518.5708	0	0	0	0	746.8412
Quercus dilatata	22	28	32	2	0	0	6	90
Total Stems	13646.6	17368.4	19849.6	1240.6	0	0	3721.8	55827
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	736.9164	4342.1	11076.08	1188.495	0	0	6948.6006	24292.1886
Quercus leucotrichophora	96	18	2	2	0	0	2	120
Total Stems	59548.8	11165.4	1240.6	1240.6	0	0	1240.6	74436
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	3215.635	2791.35	692.2548	1188.495	0	0	2316.2002	10203.935
Rhododendron arboreum	0	4	6	0	2	0	0	12
Total Stems	0	2481.2	3721.8	0	1240.6	0	0	7443.6
Volume Factor	0.054	0.25	0.558	0.958	1.5	1.867	1.867	
Volume	0	620.3	2076.764	0	1860.9	0	0	4557.9644
Total Stems	**111654**	**69473.6**	**49624**	**8684.2**	**1240.6**	**0**	**6203**	**246879.4**
Volume	**6485.733**	**13767.19**	**36627.1**	**12737.98**	**1860.9**	**0**	**17341.107**	**88820.0126**

14.12 Silvicultural system: The terrain in general is difficult and prone to erosion and snow slides wherever spruce-fir forests occur. In the past plan, the areas worked under concentrated regeneration felling and allotted to P.B.I. could not be regenerated satisfactorily. The fir and spruce forests are typically selection forests with all age classes represent well moreover, both the species are shade tolerant and younger regeneration thrive well under the canopy of older trees. As such spruce and fir forests shall be managed under "Selection System". This system aims at getting irregular/uneven aged forests which provides good soil cover. This system allows the conservative removal of trees subject to silvicultural availability and on the basic, that the trees of the next lower diameter class would reach the exploitable size and replace the trees removed. Young trees and natural regeneration are expected to cover the gaps created by the selective felling. The areas are far away from the habitation and there is little biotic interference. As such natural regeneration will not be problem. Thinning and improvement felling are to be carried out in congested groups of young to middle aged age crops. In mixed forests, transitional belts and patches suited to deodar and kail, felling will be done in favour of deodar and kail by keeping them as seed bearers, to facilitate the natural regeneration of these species in the area. Although natural reproduction is aimed in selection system and every effort will be made to include and encourage it, the blanks and areas with deficient natural regeneration will be taken up for artificial regeneration of spruce, sliver fir, deodar, kail and suitable broadleaved species like walnut, ash, maple, bird cherry, horse chestnut etc. after providing proper closures.

14.13 Exploitable Diameter: The exploitable diameter is fixed at 60cm d.b.h. for all the conifer species, which is commercially economical size for round, pulpwood and swan timber. As per growth statistics, this diameter is attained in 160 years for fir, 140 years for spruce, deodar and kail and in 116 years for chil. Trees of all species>60cm d.b.h. will hereafter be referred to as selection trees.

14.14 Felling Cycle: The felling cycle is fixed at year's correspondence to the plan period. All the forests will be gone over once during this period.

14.15 Calculation of Yield:

The yield will be calculated by the number of selection trees and further regulated by the increment as explained hereinafter. It will be calculated by smithies safeguarding Formula which defines the yield available during the feeling cycle as the number of trees of the next lower diameter class {IIB 50-60 cms. Dbh} that may be expected to survive and grow up to exploitable size {> 60 cm. dbh} during the feeling cycle as

under. To this will, however, be added the silviculturally available trees of more than 70 cm. dia {IB & above} present at the beginning of the feeling cycle.

$$X = \frac{F}{T}\{I\text{-}Z\}\ II.$$

Where X =No. of 50-60 cm, dia class {II B} which survive and pass into 60 cm. diameter {IA} class during felling cycle.

F = felling cycle 10 years.

T =No. of years required by II B class trees to pass into 1st class.

Z = Fraction of II B trees that die or do not pass up to IA class in t years.

II =No. of trees in II B class.

This yield X can be expressed as % {P} of the number of selection trees {N} present at the time of marking as.

$$P = \frac{X}{N} \times 100$$

At the beginning of the felling cycle, only 1st class trees {IA & above} represent the number of selection tree {N}. It adds X number at the end of the felling cycle. Thus the average number of selection trees during the felling cycle will be

N 1st class trees + X/2

Thus the total yield available during the filling cycle will be calculated by substituting the value of N in the above formula as under:

$$P = \frac{X}{I + X/2} \times 100$$

Where:

P = Available yield expressed in percentage of total number of selection trees during felling cycle.

X = Number of class II trees passing in class I {Selection trees} during felling cyclePeriod.

I = The number of selection trees {1st Class}: a known figure as enumerated.

In addition to the basic yield worked out as above it is reasonable to remove 50% of the existing excess stock of over mature trees {IB & above}, That would otherwise die or decay. Also the removal of class I trees, that is, Selection tree depends on siliviculturally available and the extent to which Regeneration is present to permit the removal of mature trees. The above Formula has

therefore been modified by introducing an arbitrary factor. A to cover all factors influencing the yield so that eventually formula becomes:

$$P = \left[\frac{X}{I + X/2} \times 100 \right] +/- A$$

Table No. 14.4: The yield is now calculated as under:

Species	**No.of Trees in dia classes**					
	IIB	IA	IB	IC	ID	Total
Fir/ Spruce	0	0	1240	0	0	1240

T = 30 years and Z = 0.23 {Refer para 8.1.3}

Basic yield $X = \frac{10}{30}$ ----------{1-0.23} X 0

$= \frac{1}{3}$ 0 .77 X 0

= No tree available is during felling cycle i.e. in 10 years in the lower classes. But when we add 50% of IB and above trees which are over-mature and should be felled during felling cycle. So trees available during felling cycle:

Table No. 14.5: Trees available for felling Cycle

Trees in IB and above	1240	= 1240
50 %	1240/2	= 620
Total Trees	**620**	**= 620**

Expressed as % age of selection trees present at the time of marking, the yield {P} will be:

$$P = \frac{620}{1240 + 620/2} \times 100 \{+/-\} A$$

$$= \frac{620}{1550} \times 100 \{+/-\} A$$

= 40.00 {+/-} A

Let's put 'A' = -0.0,

P = 40%

The number of exploitable selection trees available for felling annually is calculated as under:

A- 1st class trees existing i.e. 1240 =1240

B- To this is to add half the number of IInd class trees that would pass into 1st class in 10 years. i.e. 0

C- The total comes as (1240+0)= 1240

D- 40% of 1240 trees will be available during felling cycle i.e. 10 years.

E- The trees available annually = 1240/10x 40% = 49.6 trees

Or say = 49 trees per annum.

Table No. 14.6: Here the CAI is also calculated as under:

Dia Class	No of trees	Volume factor {cum}	Volume {cum}	CAI %	Total Increment {cum}
V	17368	0.0600	1042.08	4.72	49.18
IV	3721	0.2800	1041.88	4.69	48.86
III	19849	0.9900	19650.51	2.57	505.01
IIA	3721	1.8400	6846.64	2.09	143.09
IIB	0	3.1100	0	1.36	0
IA	0	4.8100	0	1.20	0
IB	1240	6.5100	8072.24	0.53	42.78
IC	0	8.4900	0	0.51	0.00
ID	0	9.9100	0		0.00
Total	**45899**		**36653.35**		**788.92**

As per Working Plan of Rajgarh Forest Division.

Total increment = 788.92 cum

The total volume of 1st class trees is 8072.24 cum. And their number is 11240. The average volume per tree comes to 6.51 cum. The volume of 49 trees {The Selection Trees} comes to 318.99 cum. on the average basis. The increment is 788.92 cum per annum. The volume of selection trees arrived at is much below the increment and there is ample scope to meet the removals in thinning. However, to be on conservative side, it is prescribed that the total volume removed {of all classes including selection ones} for whatsoever purpose like regular marking, TD, salvage etc. should not exceed 400 cum. As a safeguard against over-felling and also to build up the growing stock.

14.15.1 Yield:

The yield of 49 selection trees {IA and above} per year is prescribed with a further provision that total removals including thinning etc. will not exceed 400 cum.

14.15.2 Control of Yield:

The yield will be controlled by number of selection trees {49} as well as by volume of all the removals including selection trees. The total volume removed should not exceed 400 cum annually. A deviation of +/-15% will be allowed each year and +/-10% for a block of 5 years. All age classes are to count towards volume removed.

14.15.3 Sequence of Felling:

Following sequence of felling is laid down for felling. Along with fellings, cleaning /thinning will also be carried out:

Table No. 14.7: Sequence of Felling.

Year	Name of Range	Number & Name of Forest	Comptt. No.	Gross Area {Ha}
2021-22	Kaffota	(pt) R.2 Tatiyana	C12	53.3
2022-23	Shillai	(S) R.9 Jakhandon	C1	56.6
2023-24	Shillai	(S) R.11 Loja	C10	53.3
2024-25	Shillai	(S) R.11 Loja	C14	45.5
	Renuka Ji	(R) R-45-R.F. Ghatton	C-22	20.0
			Total	65.5
2025-26	Shillai	(S) R.11 Loja	C15	32.5
	Renuka Ji	(R) R-45-R.F. Ghatton	C22	18.5
			Total	51.0
2026-27	Sangrah	(R) R.25 DeoriKharahan	C3	78.0
2027-28	Sangrah	(R) R.25 DeoriKharahan	C6	28.6
	Renuka Ji	(R) R-45-R.F. Ghatton	C22	20.0
			Total	48.6
2028-29	Sangrah	(R) R.25 DeoriKharahan	C7	37.7
		RF R-45 Ghatton	C8	44.8
			Total	82.5
2029-30	Sangrah	RF R-45 Ghatton	C3	22.1
		(R) R.49 GataMandwaj	C3	54.6
			Total	76.7
2030-31	Sangrah	(R) R.49 GataMandwaj	C4	54.8
			Total Area	**620.3**

Note: -i} In some of the areas, selection trees may not be available. Here only the Cleanings/thinning be carried out

ii. The lopping of branches is carried out before felling trees.

14.15.4 Method of Executing Felling: The marking should be carried out on principles of selection system. Following guide lines are prescribed for marking officer.

1. Marking should commence from the top of forest and its ridge, working downhill and marking each forests completely before proceeding to the next forest or compartment.

2. All dead, dying, diseased, damaged and uprooted will be marked.

3. Trees over 60cm d.b.h. standing over and interfering with be growth of younger trees and regeneration will be removed.

4. In all selection markings, silvicultural availability will have overriding priority A trees of exploitable diameter will be considered, silvicultural available when:

a) It is dead, drying, diseased, malformed, deteriorating or putting on negativeincrements;

b) Its removal does not create a permanent gap in the canopy and there are other equally valuable trees to take its place;

c) Its removal tends to improve the remaining crop and helps the growth of group trees down to the sapling stage of any of the valuable species.

d) There is some undergrowth underneath to take its place and the ground is not opened unnecessarily by its removal.

5. The older selection trees will always be marked in preference to the younger exploitable trees which are likely to improve the growing stock by putting more increments. Old, hollowed and unfit trees will always be preferred for removal to the younger exploitable trees wherever there is a choice in the matter.

6. Thinning are an inseparable part of selection felling and must in no case be neglected. It is to be done in congested group's alongwith the main felling.

7. To safeguard the future yield, trees below 60cm d.b.h. shall not be marked unless unfit or actively suppressing the group of younger crop.

8. All marking are to be carried out in favour of the valuable and promising species- deodar being preferred to kail and healthy kail to spruce and silver fir. In mixed forests in areas suitable for deodar and kail, spruce and fir should be opened up heavily.

9. In areas where mature and over mature trees are plenty but regeneration younger crop is deficient, cautions opening should be made in the canopy by removal of the older trees. The opening should be large enough to allow sufficient light to induce fresh regeneration but not too large to encourage weed growth.

10. Marking should always be done in favour of the best grown and most vigorous trees in the main canopy, irrespective of age or size.

11. Trees liable to damage the younger crops should be lopped before felling.

12. Beyond the slope of 40% the uneven aged character of the crop should be maintained as permanent feature.

13. In localities subject to damage by avalanches and snow slides a protection belt should be maintained along the blanks of streams and nalas.

14. Trees standing in blanks area, on the precipitous slopes, eroding locations, edges of an opening, inaccessible ground, lower portion of roads, rocky cliffs, along the boundary lines and water courses must not be felled.

15. Climber cutting will be done during the markings.

16. The broadleaved trees should be left as such till the market is available for them.

17. In fir areas, marking should be done in such a way that at least 25% mixture of broadleaved associates of the conifers is retained.

14.15.5 Subsidiary silvicultural operations: Immediately after the felling are over, the subsidiary silvicultural operations will be carried out in the same year or in the next year. The marked trees not felled by the contractor or other felling agencies shall be felled and removed. Bush cutting and lopping of inferior broadleaved species interfering with the growth of the healthy young crop and regeneration of valuable species shall be carried out. The area shall be gone over under cleanings and unsalable thinning in dense patches of saplings and poles. The felling refuse shall be allowed to be taken by the local people wherever possible. The left over slash should be collected in small heaps away from the standing trees and burnt or dumped in the nalas. While burning the slash, great care be exercised as deodar, kail, Spruce and fir are very susceptible to fire and die from the excessive blast or hot air from the burning heaps. The damaged and unserviceable trees of saleable size should preferably be savaged simultaneously and handed over to be contractors or felling agencies as preferably be salvaged simultaneously and handed over to the contractors or felling agencies as supplementary makings. Weeding operation should be carried out on small scale in limited areas where dense weed growth is positively inhibiting the natural regeneration and cleaning done in patches where regeneration is very dense. All the climbers and liane should be cut alongwith weeding, bush cutting and lopping. In fir and spruce areas raking of humans in alterative strips 3 to 5 meter wide should be carried out to expose the mineral soils to expose the mineral soils to help the germination of space and fir seeds.

14.15.6 Artificial Regeneration: Natural regeneration of kail and deodar is inadequate. It is scanty of deficient in case of spruce and silver fir. There are cultivable and uncultivable blanks in the forests allotted to this working circle. It is suggested that sowing and planting of suitable species should immediately be undertaken to stocks the blanks and very open areas.

14.15.7 Choice of species: Deodar and Kail will be the main choice in lower elevations and warmer slops below 2,700m, whereas areas spruce and silver fir will be planted on higher elevations. Nature distribution of spruce and silver fir indicates that spruce grows in the lower part and silver fir occupies the upper belt. Silver fir prefers cooler, moist and shady locations in spruce zone, whereas spruce occupies the raised ground and exposed spurs in the silver fir zone. Broadleaved species fill up the depressions. These factors should be taken into considerations while taking the site for sowing and planting. Broadleaved species have a good market. They are also very useful to neutralize the acid reaction of the soil and help the decomposition of confer needles as the foliage of broadleaved species are rich in alkali salts. They are also easy to grow. Therefore mixture of broadleaved species should be introduced while raising spruce and silver fir plantations. In fact any mixture with silver fir help to reduce accumulation of humus layer and a mixture is automatically ensured if silver fir is not planted on sites suitable for spruce and kail and in too moist depressions which are suitable for broadleaved species like walnut, maple, Chestnut, Bird cherry, Ash etc. A detailed treatment map should therefore be prepared before taking up actual planting, indicating the areas to be planted with different species.

14.15.8 Grazing: Grazing in fir and spruce forests is generally of moderate intensity and does little harm to forests. It helps in keeping the weeds down, prevents formation of deep humus layers and exposes fresh soil for seed germination. As such the entire areas will be kept open to grazing. Some of the areas are being over-grazed by the migratory grazers and Gujjars when they pass and halt while moving to alpine pastures. Blanks are creating at halting place which at widened up gradually by the girdling of surrounding trees. Strict measures should be taken to stop this practice. Severe lopping of trees is practiced around the village and Gujjar practice. Control over such lopping should strictly be exercised and defaulters be dealt with severely. The grazing by migratory grazers and Gujjars should be regulated by a check on the number of cattle. The over-grazed areas should be closed to grazing under a rotational closure.

14.15.9 Fire Protection: Generally the entire working circle lies beyond the fir zone, but as the coniferous species growing in the areas susceptible to fir, all the precautionary measure must be taken to protect the forest from fir. Extra care should be taken in areas being for felling.

14.15.10 Right Holder's Requirements: The requirements of right holder will continue to be met with from the forest as heretofore, except that no grass cutting will be allowed in the freshly sown patches till the sending are 60cm high. The timber requirement is generally nominal, and should, as far as possible, be met from the dead, dying, uprooted and snow damaged trees or those available in thinning, improvement felling and salvage marking. Marking of unexploitable size is forbidden. No green trees are felled for meeting the local demands, unless it is strictly silviculturaly available. All exploitable sized trees granted to right holders will, count the yield.

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CHAPTER – XV
PLANTATION (OVERLAPPING) WORKING CIRCLE

15.1 General Constitution

This is a overlapping working circle which includes mainly blank Reserved and Protected Forests degraded, barren or poorly stocked, natural regeneration is quite unsatisfactory which require immediate attention and is a overlapping working circle**.** It also includes the plantations areas which are not yet established.

15.2 Special Objects of Management

Keeping in view the present status and biotic pressure put on these forests, the following special objects of management have been laid down:

i) To develop and augment the forest resources of the area by afforestation in blank and poorly stocked areas.

ii) To improve the soil cover by closing eroded areas and thus improving the general environment of these degraded areas.

iii) To regulate the flow of water in the stream and rivers by resorting to large scale plantation.

iv) Raising suitable species which can fulfill the local demand of fuel, fodder and timber etc.

v) To assess the old plantations and derive critical conclusions therein.

vi) To eradicate Invasive Align Species from forest Ecosystem and restore their productivity and biodiversity values.

15.3 Choice of Species

The Choice of Species to be planted will vary according to the altitudinal zone and locality factors. Species best suited to the locality and which can fulfill the demand of fuel, fodder and timber will be preferred. Planting of exotic species will be avoided in general; the broad leaved species like Khair, Shisham, Bamboos, Darek, Gehnu, Kachnar etc. will be preferred in lower zone. Deodar and kail will be raised between 1500 to 2500 meters. However, fir/spruce and walnut etc. will be planted in between 2500 to 2800 meters. The specific entries regarding choice of species have been made in the general recommendations for different altitudinal zones are as under:

Altitudinal Zone	**Species recommended**
600-1000 m	Amla, Gehnu, Kachnar, Behal, Jamun, harar, Behra.

1000-1500m	*Pinus roxburghil* (Chil), *Morus alba* (Mulberry), *Robinia, Grewia oppositifolia* (Beul), *Bauhinia variegata* (Karyal), *Ailanthus spp., Buxus sempervirens* (Boxwood), *Melia azadirach* (Drek) etc.
1500-2500m	*Cedrus deodara* (Deodar), *Pinus wallichiana* (Kail), *Junglans regia* (walnut), *Acer spp*. (maple), *Fraxinus spp*. (Ash), *Robinia, Ailanthus spp*. *Quercus incana* (Ban) *Aesculus indica* (Goon) etc.
Above 2500 m	*Abies pindrow* (Fir), *Piceasmithiana* (Spruce), *Pinus wallichiana* (Kail), *Juglans regia* (Walnut) etc

15.4 Planting Programme

Planting shall be carried out in monsoon or in winter season. The conifers will generally be planted in monsoon and broad leaved in winter. The species considered suitable for planting have been indicated for each area and also recorded in the respective compartment history files. However, the DFO will have discretion to change the species and year wise sequence depending on circumstances, but the efforts should be to bring all these under well established plantation within the currency of this plan. A definite planting programme has been suggested; Range wise areas available for plantation is listed in Appendix -XXIX.

15.5 Control and Deviation

The annual target of areas prescribed for planting must be achieved every year and deficit of any one year must be made up in the following year. The excess or deficit achievements will be shown in the control forms and checked at 5 years intervals. Only successful areas of plantations will be counted against the prescribed target. The detailed reasons for deviation should be given and sanction of deviation obtained from competent authority.

15.6 Regeneration Assessment

Regeneration survey on 1:3750 scale map shall be carried out every year till the plantation is established. Reasons of the failures, if any, should be recorded in the survey report and posted in respective compartment history files. All heavy failures will be personally investigated by DFO who will send report to CF for taking corrective steps.

15.7 Closures

Closures shall be got notified in advance of actual planting. Old plantations may be thrown open if these are beyond browsing damages. Effective closure is must in order to reduce the total closure period of each plantation. However, the areas prescribed for planting will remain closed till the plantations are established i.e. reaches to a height of more than 3 meters.

15.8 Grazing and Grass Cuttings

Grazing will not be allowed till the plantation is at a level where no damage is caused by the animals. However, grass cutting in closed areas may be permitted when the plants have attained sufficient height and there is no chance of their being damaged by sickle. The permission of grass cuttings rests at the discretion of RO. The grass should be equally distributed amongst all the right holders. It is better if panchayats are associated for the purpose.

15.9 Fire Protection

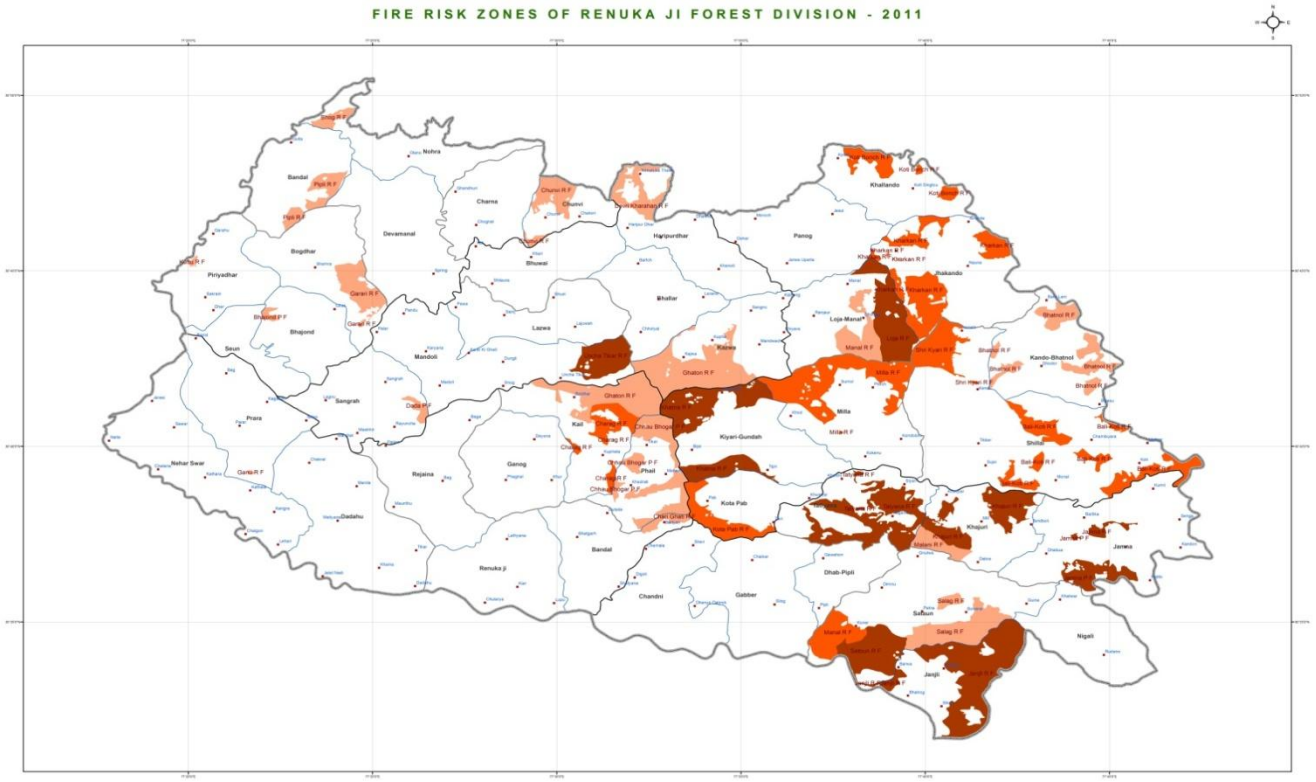
15.9.1 The whole of the working circle shall be protected against fire by taking all possible preventive measures in advance. Maintaining cordial relations with the local people through participatory management, educating them properly and deployment of fire watchers are some such measures.

15.9.2 Fire lines of 5 meter width dividing the entire plantation areas into suitable blocks may be provided by clearing the bushes and other vegetations. Such fire lines are required to be made in areas which are prone to fire and particularly chil areas. These fire lines should be shown on treatment maps.

15.9.3 In the event of fire, timely action to extinguish the some will be taken through the help of right holders and JFMC's.

15.9.4 The offenders should be booked under the Indian Forest Act, 1927, H.P. Panchayati Raj, Act 1994 and under provisions of Indian Penal Code etc.

Fire Map of Sri Renuka Ji Forest Division showing the risk zones in the Division is as under:



15.10 Plantation Technique

The bushes which do not serve any purpose will be removed along contours with width ranging from 1 to 1.5 meter apart 4 to 5 meter strips so that the planting be done uniformly throughout the area closed for planting. The normal height of plants should be 45 cm to 60 cm in case of conifers while 1 to 1.5 meter in case of broad leaved species. Selection of sites and choice of species are very important aspect of raising plantation which should be done by ACF. Detailed instructions regarding plantation techniques are given in technical order No. 3 and 4 of the Punjab Forest manual Vol. III. Each species should be raised under favorable site conditions and in areas suitable to its silvicultural requirements.

15.10.1 Fencing

The area should be partially fenced with RCC fence post with 5 strands of barbed wire especially in those areas which are situated along road side. Those areas which are situated in far flung areas and where the carriage of RCC fence post becomes costlier and difficult to carry, those areas should be fenced with barbed wire in wooden fence post. Wooden fence post of good quality and size can be obtained from un-saleable thinning as prescribed in the Working Plan from PB-IV and PB-III areas. Fencing in wooden fence post should be done with 4 strands of barbed wire with spacing of first strand as 20 cm, second strand at 23 cm and third and fourth at 28cm each.

15.10.2 Preparation of Site and Earth Work

The bushes and grasses should be cut around the planting sites and then these should be burnt at least six months in advance of planting. After the sites are cleared, the pit digging operations shall be done at least one month in advance of planting. Planting of conifer spp. will be done at a space of 3m x 3m along the contour in pits of 30cm x30cm x 30cm dimensions. For broad leaved planting the size may be 45cm3. If patch sowing has to be done then square patches of 50cmx 50cm with 15cm to 20cm depth should be made at a distance of 3 meter along the contour. These patches should also be made at least one month in advance of sowing. Tall plants to be planted in 60x60x60 cm pits.

15.10.3 Sowing / Planting

Sowing / Planting is prescribed in monsoon i.e. July / August as well as in winter i.e. December / January. Though, the cost involved in sowing will be less but the survival through the planting will be more, thus planting will be preferred. For this, suitable plants will be raised in nurseries. The seeds should be collected from healthy trees to get good survival. The work must be done under close supervision of the field staff and must be regularly inspected by RO/ACF/ DFO.

15.10.4 Nursery Techniques Site for temporary nurseries should be selected within or nearer to the plantation areas and the source of water, to reduce the cost of carriage and mortality of the seedlings. The

plants requirements should be worked and entire operation be planned in advance. The nursery should be raised well before the actual planting depending upon the time required to get seedlings of plantable size.

Table-15.1

Method of Nursery raising and the time required in respect of some Common species

Species	Time and Method of sowing	Time required
Chil	September, October in P. bags (4x9)	9 month for monsoon planting.
Bamboo	April, May in P. bags (4x9)	2 to 3 years.
Kachnar	September, October in nursery beds	2 to 3 years (root shoot cutting)
Poplars	February, March cutting in nursery beds	1 year (one year shoot and two Year root)
Walnut	December to February in nursery beds	2 to 2 ½ year.
Deodar	December in P. bags (4x9)	1 ½ year.
Fir	December, January in P. bags (4x9)	After 1 ½years to be transplanted in P. bags. Plants will be ready for planting after 3 ½to 4 ½ years.
Spruce	December, January in nursery beds (4x9)	3 to 3 ½ years. Plants will be ready for planting after 3 ½.

15.11 New Concept of Nursery

It is apparentthat the degree of survival of plantations is directly linked to the quality of healthy nursery stock raised in nurseries. More so, when we are faced with increasing swings in seasonal fluctuations, both in terms of erratic rainfall and rising temperatures. Vastly improved nursery stock can in a major way address most of these impediments coming in the way of establishing successful plantations in and outside forests.

Few important qualities of any good nurseries would include:

i) It should be large in size (atleast 0.5ha) so that its cost is effective and also proper infrastructure including water supply, germination chamber (poly-house), Mali-hut, soil mixing yard, vermicompost etc can be developed.

ii) Adequately trained, dedicated staff should be available in each nursery. Mali and laboureres should be trained and guided from time to time about raising of quality stock.

iii) Each nursery should specialize in 5-6 species suited to the area and have large stock of each species, which is graded from time to time so that only quality stock goes for planting.

iv) Soil mixture is most vital component for raising healthy nursery stock. Thus care must be taken not to compromise with quality and quantity of soil, sand and vermin-compost.

15.12 Digging, collection, carriage and sieving of Soil

A forest soil is a living, dynamic, biological unit always undergoing change through forest vegetation and silvicultural treatment. Thus the role of soil is very crucial and important to grow healthy and vigorous saplings in the nurseries. Essentially, for this purpose soil is to be dig out and collected from natural forest of conifers preferably from Deodar forests where soil and humus layer have accumulated and acquired depth of at least 30 cms. The soil should be brought from the coniferous/oak forests which are rich in soil/humus. Soil after sieving is to be mixed with mixture of sand, vermicompost and required doze of insecticide in the proportionate ratio as per table No. 15.3 given above. Techniques for collection and treatment of seed and raising of nursery have been given in H.P. Forest Manual Volume-IV under Chapter - III which should be kept in view while raising nursery.

15.13 Tall Planting

One of the main reasons for failure of plantations is that at present either planting is being done of naked roots plants or in smaller sizes in P. bags. The terrain of this working plan is hilly with shallow soil depth and the areas available for planting are very high, dry and degraded. To overcome this situation and to make the plantation successful, technically if a sapling which is raised in the polythene container and has attained height of 45 to 60 cm is taken out for planting along with ball of earth then the quantity of soil moved from the nursery to the plantation site will provide the necessary soil nutrients and such plantations can be made a success right upto 100%.

15.14 Plantation Practices

To achieve this target it has become necessary that the number of plants per ha should be reduced from 1100 per ha to 400 plants per ha. This concept was brought to the notice of Govt., HoFF. The Government has reduced the number of plants per hectare as per the suitability i.e. 200/ha, 400/ha, 500/ha, 600/ha 700/ha etc. The field staff should be trained and educated to give better result during the period of this plan. Care should be taken that all the plants which have been carried to plantation site in P. bags with ball of earth should not be disturbed during planting, ramming should be restricted outside the ball of earth, instead of doing with foot it should be done with hands which will practically help the plant to get its nutrients from the ball of earth as it is, as it was getting in the nursery itself plus the sapling will get extra space for expansion of its roots.

15.15 Subsidiary Siliivcultural Operations

15.15.1 Beating up

Beating Up of failures will be carried out for at least up to 5 years after the planting if the survival is less than 90%. Where the success is more than 90% no beating up is to be done unless the failures are in compact block of 0.2 ha. or more in extent. Therefore, suitable funds for maintenance of old plantations should be made in the annual budget estimates.

15.15.2 Pruning, Cleaning and Thinning

These operations will be carried out in old plantations. Pruning be done up to 1/3rd height of the chil plants when the crop has a mean height of 3 meter, cleaning and thinning should be done where the crop is dense and the height of plant is 5 meter or above one cleaning shall be enough.

15.15.3 Weeding

At least two weedings in the first year and one weeding during the rains in the following year is considered as essential.

15.15.4 Treatment Map

Treatment Map on 1:3,750 scale shall be prepared for each plantation area showing the plantable, unpalatable locations, soil depth, slope and species to be planted. This map should be maintained in the compartment history files/ plantation journals.

15.15.5 Plantation Journal

It is essential that whenever a site is selected for plantation a proper hard bound plantation journal is prepared for that site. The plantation journal must have a large sketch may be of the area showing boundaries and other details like nallas, rocky, crops, existing patches of trees etc. It is important that GPS coordinates of atleast 6 to 8 points around plantations are recorded and entered in the plantation journal along with the altitude of the area. Details of all works carried out must be entered in the plantation journals and signed by the concerned officials showing date of signature. All inspecting officers are to record their visits and comments/observations in the plantation journals. Once a plantation journal is complete i.e. in the sixth and seventh year of the plantation, it should be transferred to the division office and kept properly in record there.

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CHAPTER-XVI

THE FOREST PROTECTION (OVER LAPPING) WORKING CIRCLE

16.1 General Constitution

This is overlapping working circle covering all the working circles and is constituted to evolve the strategy to ensure the protection of forests against the Forest Fires, illicit felling and smuggling of the timber, resin and NTFPs, encroachments over forest land, protection of the forests from the invasion by climbers, alien species, and illegal mining.

16.2 General Prescription

In this Working Circle deals with the problems like Forest Fires, illicit felling, smuggling of the timber, resin and NTFPs, encroachments over forest land, protection of the forests from the invasion of the alien species, and illegal mining etc. will be discussed and analyzed and pragmatic strategy on this issue will be suggested in the foregoing paras.

16.3 General Character of the Vegetation

The Forest Protection Working Circle being an overlapping Working Circle, it represents all the forest types starting from subalpine to Western Himalayan forests.

16.4 Special Objects of Management

The special objects of management are as under:-

i) Fire vulnerability of each forest to be assessed especially Chil area and preventive measures against fires planned and put in the APO.

ii) The assessment of the illicit felling cases is to be done and a strategy to be adopted.

iii) There are cases of smuggling of the timber in this division, its legal course of action and strategy for curbing down such incidences.

iv) Dealing with the encroachments, legal course of action and strategy to mitigate the problem.

v) Regular assessment of spread of invasive alien species in this WC to be monitored at least once in two years and priority given to their removal in APOs.

16.5 Area Statement

This working circle covers the entire tract of this Working Plan (Overlapping).

16.6 Methods of Treatment

The prescriptions in this chapter have been subdivided into following parts.

i) Fire Management

ii) Illicit felling and smuggling of the timber resin and NTFPs.

iii) Climber Control Management

iv) Encroachments over forest land.

v) Illegal mining on the Forest Land.

vi) Invasive Alien Species.

16.6.1 Fire Management

Conserving forests mean conserving life. Forests are the storehouse of biological diversity, home to two-thirds of all plants and animals. Therefore, it is the primary duty of foresters to save the forests from fire by taking preventive measures in advance. Because uncontrolled forest fires are the major threats to the forest wealth i.e. flora and fauna, disturbing the bio-diversity and the ecology and environment of a region.There are basically two seasons of the Forest fires in this division. The prominent one is the summers between April to June and another is the winters, November-December. The winter season is not that prominent because most of the time there are winter rains and snowfall, therefore the impact is comparatively low. In summers the forest fires in Hilly region has a very high impact as the terrain in the hills being sloppy, the fires spread very quickly and engulfs large tracts in no time as compared to the fires in the plains. This exposure of forest soil to the fire affects the soil structure and texture rendering it vulnerable to erosion and subsequently when the monsoon rains come; it washes away this loose soil. The Himalayas being the most recent and youngest mountain ranges are greatly fragile where the land mass is yet to find its final form and are consequently highly vulnerable to erosion. Thus this geological problem is further aggravated by the ill effects of uncontrolled fire.

Causes of Forest Fire

a) **Manmade Fires**- The three most important factors for fire are Temperature, humidity and quantity of inflammable material. In summers all these three factors are highly favorable for forest fires thus bringing thresh-hold point for fire ignition. In the prevailing conditions of low humidity, High temperature and forest floor littered with highly inflammable pine needles, a fire spreads is caused immediately when a source of fire like naked flame, cigarette or bidi, electric spark or any source of ignition comes in contact with inflammable material.

b) **Natural Fires-** A few forest fires are because of the natural causes such as lightning which set trees on fire. For the practical purpose, the focus should be on the manmade fires.

The causes of the man made fires are discussed herein under:

A. Deliberate:

i) People have a feeling (to some extent rightly so) that burning of an area stimulates a fresh flush of grass which is a primary need for fodder over vast stretches of the state.

ii) Similarly in higher reaches people do this for "Guchhies" in the belief that the fire stimulates the growth of this much delicious and highly priced minor forest produce.

iii) In many areas of the state, a well established modus operendii for encroachment of forest lands has been evolved over the years. Burning of such prospective areas so as to render them devoid of vegetation is an early step in this subtle and gradual process of encroachment.

iv) Since the marking of green trees has been stopped in the state and only dry trees can be marked, certain bad elements do not hesitate to put forests on fire in the hope of rendering the trees dry to facilitate them to get such trees felled.

v) There is orthodox belief among people smoke raised from the fire will bring rains.

B. Unintentional mistakes of the people:

i) Throwing cigarette/bidi etc. by people passing through fire prone areas.

ii) Throwing lighted cigarettes/ *bidis* out of the passing vehicles which when falls on the inflammable material along the roadside, turns into forest fires.

iii) Fire left unattended after working hours, by PWD labour engaged in road tarring which spreads to nearby forest with the strong wind.

iv) School children putting fire for fun and then becoming uncontrolled many times.

v) Burning of the '*ghasnis'* in the peak summer season and then fire going out of control.

vi) People lighting fire during picnic and fun and then leaving fire lighted which sometimes spreads as forest fire.

vii) People passing through forest in the dark burn torchwood for lighting their path. Sometimes sparks from such torchwood turns into fire.

viii) Inebriated conditions and can be expected to do things which defy normal human behavior.

"Since people are the main cause of forest fires, therefore prevention and control must mainly involve communities living near forests." Investing in fire education and awareness will reduce the number of fires and the cost of fire management.

Therefore community/people need to:

A. Educate them regarding:

i) About the right season for burning of '*ghasnies'*.

ii) The burning of the forest in the peak fire season means destroying the nests and the chicks of the birds, young born of the wild animals which are a sin.

iii) The estimated loss occurring to the forest wealth due to the fire.

iv) The adverse impact of the fires on the water retention capacity of the area and its consequent ill effect on agriculture/horticulture.

v) Gradual depletion of palatable grasses due to repeated fires and eventual invasion of inferior and unpalatable species.

vi) The addition of the carbon to the atmosphere due to fire.

vii) The nutrient deficiency in the soil etc.

viii) Responsibility as citizen as well as consumer of forest resources.

ix) Making forest fire as one of the chapter in the school level curriculum.

B. Train them:

i) In fire fighting and provide the equipment to them.

ii) Collection of the fire hazardous material and put that in proper use.

iii) Linking this with the employment generation.

iv) Making fire fighting as a community based activity.

v) Involving the communities in the management of the forest.

"As long as people do not understand the dangers of using fire in the open without proper protection and often under extreme weather conditions, like hot summer temperatures of sometimes over 35 degrees, the fight against forest fires will continue to have only limited success" -FAO report. Women should be better trained in fire prevention because they play a key role in educating their children.

Two fold actions are required:

i) Prevention

ii) Remedial

Prevention: During the leaf fall deciduous and semi deciduous forests that keeps on accumulating on the ground. If there are not proper rains the material does not degrade completely and becomes a ready material (fuel) for the forest fire in summer. Such areas be put to control burning in advance which will result in sprouting green grasses and will minimize the impact of fire in the peak season. The Controlled burning depends on seasons, weather, humidity, the amount of moisture in dead vegetation, and the fullness of the forest floor vegetation and is very carefully.

There need a strategy for addressing this problem. Some are:

i) Control burning of the forests:

- Season of control burning is the key thing. (In any case this work should be finished latest by second week of April.)
- Identification of the areas to be control burnt.

- The technique of the control burning is to be taught to the forest guards and the workers. (The control burning has to be done from top to downwards.)
- The plan for all the forests is to be drawn and then effectively implemented having all the forest area control burnt every third year. The four year cycle in practice in is too long a period to reduce inflammable material in the changed scenario.
- Presently the control burning is practiced and budget allocated for Chil areas only listed in the working plan. There are large areas outside the Chil working Circles, especially scrub areas, grasslands, which are equally prone to fire but are out of focus at present. Most of the fire incidents originate from such area and then travel to regular forests. But Forest department's approach, embedded as it is, in the production forestry era, does not foresee any need to reduce fire hazard in such areas which are outside the purview of working plans. Fires in such areas may not be very detrimental to our "tree crops" but when flames in such areas (or even in private ghasnies) lit up the night sky, the local newspapers are full of criticism of forest department next morning.

ii) Maintenance of the fire lines:

iii) The fire lines are to be identified and maintained every third year by collection of the combustible material and control burning the same. The list of identified Fire lines is given in Appendix-XIII.

iv) Cleaning and thinning in congested crop should be carried out to avoid and minimize fire incidents. It has been observed especially in PB I and PB III area in Chil and Deodar/Kail Working Circle that due to lack of cleaning and thinning operations the crop has been so congested that in case fire breaks in such areas it becomes almost impossible to control such fires and the entire crop reduces to ashes.

v) Effective publicity in the peak season among the communities, school children and tourists.

Remedial:

The front line staff needs to be geared up for the fire season in advance in the following ways:

i) Holding the workshops well before the fire season and accessing the strengths and weaknesses.

ii) The officers should bear the responsibility to minimize the weaknesses.

iii) Effective planning at all the division level as well as Range level.

iv) Timely Purchase of the firefighting equipment by assessing the need at Range level. The equipment should be handy and usable. Most of fire fighting tools purchased so far is hardly used in fire fighting as it is not designed for effective use in hilly terrain and is rather considered as a liability during fire fighting. Quality fire fighting tools are not readily available in local markets and good quality tools if sourced from major markets are quite expensive. Rather than giving meager budget to each DFO every year for

purchase of fire equipment, which serves no purpose, quality and effective tools should be sourced from reputed suppliers under a realistic and well thought out procurement plan in a centralized manner.

v) More focus on the areas which are fire prone and where control burning has not been done.

vi) Lack of strategy, equipment, resources, manpower, and community response reduces the success of firefighting efforts. These results in de-motivating even a highly enthusiastic forest official who in sheer helplessness and frustration gradually develops a sense of apathy towards forest fires. Such situation will be a great setback in our effort against forest fires and needs to be guarded against.

vii) Making a fully equipped team of at least 10 people which should be placed at Range level and should be engaged exclusively for the fire season and should not do any other work during fire season.

viii) The areas which are not covered departmentally responsibility be given to the Communities/NGOs etc by paying them incentive in the form of Cash. This incentive needs to be substantial rather than token.

ix) Having effective liaison with other organizations like Police or para military Battalions, Fire department, volunteers etc.

"The remedial as well as preventive measures are complimentary to each other and one cannot supplement the other".

Now let us discuss the "Fire as a good tool".

i) In forest areas particularly the wild life habitats the fire is used as a major tool in preventing the natural succession and maintaining the grasslands.

ii) Fire is a powerful, natural phenomenon. Scientists have gathered more information on the effects of fire on forest ecosystems; they have learned that fire exclusion might not have been the best practice for land management.

iii) Fire exclusion causes thick vegetation and large amounts of dead fallen materials. The heavy vegetation and dead material increase the fuel quantity on the forest floor and may cause fires to ignite more easily.

iv) In certain cases controlled fire is essential to maintain the biological diversity.

v) Many trees are dependent on the heat of fire in order to open up their seed cones for regeneration (conifers). Vegetation modification also affects the ecosystem's insects and diseases, wildlife populations, soil structure, and nutrient recycling.

vi) Control burning creates an open forest floor. This eliminates any fuel that could contribute to a high intensity fire in the future.

vii) When the fire burns the organic material in the forest, nutrient rich ash is left behind. When the first rain comes, the nutrients in the ash dissolve into the soil for the new plants to use. This process is called nutrient recycling.

viii) Another outcome of controlled burning is that new growth begins immediately after the fires have been extinguished.

ix) Fires also burn the unwanted fungi and insects which may destruct the forests otherwise.

x) The controlled burning does not release as much smoke as uncontrolled fires do.

xi) Leave snags that provide nesting spots for woodpeckers and many other bird species.

SEVEN ACTION POINTS

- Use of modern technologies like GIS and satellite images for creating data base and planning.
- Planning the control burning activity and maintenance of Fire lines in well budgeted form.
- Plan Forest Fire fighting well in advance.
- Provide all equipments and facilities of mobility and communication to the fire fighting teams.
- Involve the communities in action as well as for educating.
- More stress on awareness during peak season.
- Evolve effective monitoring system.

Out of the total forest area of 27365.75 ha in Sri Renuka Ji Forest Division 2966.15 ha. (10.83%) is under Chil Working circle in the plan under revision. It is estimated that about one to three tons needles fall per hectare per season depending on the density of the forest. Dry pine needles are a fire hazard to the forest. Every year hundreds of hectares of forest area gets fire burnt mainly in Chil area and also in Deo-Kail Working Circle due to accumulation of needle. The decomposition of pine needle is extremely slow. List of forests affected by fires in past is given in table under Paragraph-2.4.1 of part 1.Each beat will be taken as unit in addressing fire problem. Wherein the beats have been categorized is very sensitive to prone to fire.

16.6.1.1 Strategy for Fire Management

The strategy for fire management will include the following:

i) Clearing of Roads: Accidental fires in Chil forests are caused by lit cigarettes negligently thrown by passersby. As all Chil forests have sufficient fallen needles during summers (April –June), it easily catches fire and results in forest fires most of which are restricted to ground. To address this, both sides of roads upto 10m will be cleared off the pine needles twice a fortnight. The needles thus collected will be either control burnt in presence of forest official (FG/FW) or will be made use of in making check dams/vermicomposting/briquettes.

ii) Needle Collection: Another important and probably the most common reason for fires in Chil forests are the intentional fires lit by locals to get fresh flush of grass from the forests.

iii) To combat such fires following strategies may be adopted singly or in combination:

a) Participation of Local People: Since all such fires are caused by local people especially those having cattle, thus involving these stakeholders in fire management may help. Awareness programs combined with monetary incentives could be tried here. Fire management committees may be constituted at Panchayat level or existing /new JFMCs may be involved.

b) Development of Fire Watchers: In areas where cooperation from local people is not forthcoming or habitations too far from the forest to keep a vigil against fire, fire watchers may be deployment who will patrol the forests and alert the **Rapid Response Team** specially constituted at Range level during fire seasons.

c) Use of Pine Needles: Another way of addressing the issue of fire is to make use of the pine needles. It could be in any form like handicrafts, fire briquettes, check dams etc.

Presently in H.P., handicrafts of Chil needles are being made by Kangra Mahila Sabha, Dharamsala and they have imparted such training to SHGs formed by MHWDP in Salooni, Chamba. After making a study of the economics of the enterprise, the same may be adopted in Renuka Ji. However, as the exercise would involve identification of marketing channel etc, it is better to get it done through an NGO or any local Community based organization that are already into marketing of handicrafts.

Pine briquetting has also been tried in several places. This activity will not only save the forest but also help to improve seasonal livelihood of rural people. State Council for Science Technology & Environment has tried this enterprise in certain Panchayats. After making a study of the economics of the enterprise, the same may be adopted in Renuka Ji. Similarly pine needle check dams, *Pirule* have been made in Uttarakhand Forest Department and have also been tried in KalatopKhajjiar Wildlife Sanctuary. The collection of needles may be executed through JFMCs. This will result in dual advantage to JFMCs from Chil forests and will help in creating stake in Chil forests which otherwise generally being a mono-crop of timber species (which means no immediate use/ access to resource) are neglected by people.

In forest compartments that are under active resin tapping, HPFDC resin workers or resin agents should get such compartments cleared of fallen pine needles atleast twice in the fire season. This condition should be built into the agreement with the Corporation at the time of handing over the forest to them. Failure to comply should attract a penal price to the Corporation.

16.6.2 Illicit Felling and Smuggling of Timber, Resin and NTFPs:

With development of good network of roads, there has been an increase in incidences of illicit felling in table-2.4.9 of Part-I.

The high price of timber in the market has attracted/created tendency to become rich overnight and hence the smuggling of timber takes place more than often. The illicit felling and smuggling are both related, many times organized. The incidences of smuggling have, however, reduced after the amendment in Indian Forest (H.P.2nd Amendment) Act, 1991 vide which DFO has been designated as Authorized Officer to hear the cases pertaining to illegal transportation of Govt. property i.e. timber, resin, Khair wood and katha and may order confiscation of both forest produce and the vehicle involved. The detail of cases admitted and decided in the court of Authorized Officer Renuka Ji under 52A has been given in table given below:

Table No. 16.1: Detail of Cases under Section 52-A of IFA in the Court of AO –cum- DFO Renuka Ji.

Sr. No.	Vehicle No. & FIR No.	Name of Owner	Released on Bond by AO	Released on Bond by Court	Auction	Remarks
1.	Truck No. HP 63-3219 Pick Up No. HP 63-2389 FIR No. 69/2009 dated 31.12.2009	Sh. Guman Singh, S/o Sh. Devi Ram, R/o Juinidhar, PO Charoli, Tehsil Kupvi, District Shimla, H.P.	Pick up released on bond by AO on dated 06.07.12	---	---	Appeal in session court dt. 22.09.12
2.	Max. Pick up No. HP 17B-4175 FIR No. 68/2010 dt. 15.11.2010	Sh. Jeet Singh, S/o Sh. Man Singh, R/o Vill.- Chakri, PO Balikoti, Tehsil-Shillai, District Sirmour, H.P.	Released by AO on dt. 28.2.2013	--	--	Decided/released
3.	Jumbo Isher Truck No. A/F FIR No. 11/2006 dt. 25.01.2006	Raghubir Singh, S/o Sh. Neeta Ram, R/o Vill.- Choras, PO Devna, Tehsil-Nohra, District Sirmour, H.P.	--	--	--	Under trial with AO
4.	Truck No. 08B-271 FIR No. 387/2009 dt. 2.11.2009	Het Ram, S/o Sh. Relu Ram, R/o Purli Manal, PO Bharahu, teh-Chopal, District Shimla, H.P.	Released by AO on dated 2.11.2009	--	--	Decided/Released
5.	Truck No. HR38G -0492 FIR No.73/2007 dt. 9.9.7	Sukhvinder Singh, S/o Sh. Jaspal Singh, R/o 84/1C, MC Ward No. 7, Paonta Sahib, H.P.	--	--	Confiscated by AO on dt. 29.5.2010	Appeal in Session Court Nahan
6.	Truck No. HP18A-0455 FIR No.10/2003	Bahadur Singh, S/o Sh. Kalu Ram, R/o Bandli, Tehsil-	--	Released by Session Judge	--	Decided

	dated 01.03.2003	Shillai, District Sirmour, H.P.		Nahan dt. 01.08.2003		
7.	Pick Up No. HP 17-7844 FIR No. 14/2003 dt. 09.04.2003	Sh.Siya Ram, S/o Sh. Gulab Singh, R/o Vill.- NavnaBhatwar, Tehsil- Shuillai, District Sirmour, H.P.	decided by AO dt. 30.06.2003	--	--	Decided
8.	Vehicle No. HP25-0903 FIR No. 44/2002 dt. 11.05.2002	Satish Kumar, S/o Sh. Bishan Dutt Sharma, R/o Vill.- Kalot, PO Kumharhatti, District Solan, H.P.	Released by A.O. dt. 31.03.2003	--	--	Decided
9.	Vehicle No. HP18-4770 FIR No. 61/2001 dt. 29.08.2001	Smt. Rukmani Devi, W/o Sh. Anup Kumar, R/o VPO & tehsil- Dadahu, District Sirmour, H.P.	Confiscated by AO dt. 19.10.2001	--	--	--
10.	Vehicle No. HR No. 02A-6005 FIR No. 96/99 dt. 29.10.99	Tarun Madan, S/o Sh. R.D. Dhaman, R/o Sasanli, Tehsil- Jagadhari, Distt. - Yamunanagar, HR.	Confiscation by AO.	Released by Session Court on Bond of 3,00,000/-	--	--
11.	Vehicle No. HP16-1121 Case No. 1/97-98 dt. 11.2.98	Basti Ram, S/o Sh. Hukmi Ram, R/o Shivpur, Tehsil- Sangrah, District Sirmour, H.P.	Released by AO dt. 07.08.2000	--	--	Decided
12.	Vehicle No. HR 37/6044 FIR No. 72/99 dated 30.08.99	Smt. Krishana Devi, W/o Ranjeet Kumar, R/o Ward No. 11 of Mohalla sarvania, PO Sadhora, District Yamunanagar, HR.	Confiscation by AO 03.02.2000	Released by Session Court on Bond of 4,00,000.00	--	Decided
13.	Utility No. HP 17A-5003 FIR No. 36/2009 dt. 20.06.2009	Kishan Singh, S/o Sh. Mehar Singh, R/o Bhatnol, PO Kando, Tehsil- Shillai, District Sirmour, H.P.	Released by AO on dated 20.06.2009	-	-	-

16.6.2.1 Strategy

i) **Task Force**

A task force is to be constituted one each at Range level which will constitute Range Officer as the leader of the team who will choose seven members committee constituting of atleast 1 Block Officer and four Forest Guards and 2 Forest Workers on receiving any information regarding illicit felling, smuggling of timber and fire fighting or any other forest offences of serious nature. The team will rush to the spot. For this purpose team leader can hire the private vehicle under intimation to DFO. Similarly, a task force is to be constituted at divisional level under the leadership of ACF constituting of 3 members from each Ranges.

16.6.3 Climber Control

Climbers are menace in the patch of young regeneration areas as they seriously affect the growth of young plants and trees. They are very harmful to forest trees. There slender varieties some times, completely cover young regeneration and even fully grown trees which either kill it or branch it badly. These climbers twine round the stem increasing in diameter with the result that makes a grove on it and if they do not get broken even then, they get close inside the stem. Thus they damage trees/timber considerably. Certain thick climbers either band the trees by their wait or completely cover their crowns and sometimes, even kill them by cutting out light or together. Some of the common climbers which are found in the tract of this Working Plan are:

1. *Acacia pinnata* (Agla)
2. *Bauhinia vahlii*(Taur)
3. *Caesalpinia sepiaria*(Karanj)
4. *Clematis buchananiana (*Garol*)*
5. *Clematis montana*(Garol, Mauniebali)
6. *Comberatumdecandrum*(Ruel)
7. *Cuscutareflexa*(saragbali)
8. *Dioscorea deltoids* (KuralmMithiari)
9. *Hedra helix* (Kural, Mithiari)
10. *Poranapeniculata*(Safed bel)
11. *Rosa moschata* (Bal Gulab)
12. *Smilax niveus* (Ushwa)
13. *Smilax parviflora* (Ushwa)
14. *Vitis himalayana* (Pani bel)

These climbers which are found frequently in the tract of this Working Plan in addition to causing the damage discussed above create unhygienic condition and such areas are more prone to fire and when the fire breaks out it spreads from ground fire to crown fire. Therefore from the better management point of view, to create suitable hygienic conditions, to liberate the trees from these climbers and to distribute the growth potential amongst the trees of superior species these and other climbers are required are to be cut back. Thick climbers are generally at two places i.e. one year the base and other about a meter above it. Though cutting back is fairly effective for thick climbers, it is not so effective for thin climbers which should generally be uprooted after tracing the tubers or roots during the rainy season or snow season when the ground is soft. For this purpose a plan of five years is to be chalked out and all such forests which have been invaded by these climbers are to be enlisted. DFO while purposing APO may ask the Range Officers to send the list of such forests, so that the areas infested and invaded by these climbers be eradicated within 1st five year period of this plan.

16.6.4 Encroachments on Forest Land:

In recent years encroachment of forest land has emerged as a big threat to forest land. This is more so in UPF. However in RFs and PFs also the incidence of encroachment is not uncommon. Thus the boundary pillars of forests must be maintained regularly, if any shifting is noticed, action must be initiated immediately under IFA, 1927. Upto March 2018, 274 cases measuring 89.6085 ha. where the encroachment were detected and challaned in to the court of DFO Renuka Ji. In the cases where the land involved is more than 10 Bigha of Encroachment, FIR have been lodged and the cases have been challaned in the court of JMIC Nahan at the direction of Hon'ble High Court. These are 16 No. of such cases and the area involved is 34.1216 Ha. As by now244 cases having area 79.4675 Ha.have been decided in the court of the collector-cum-DFO Renuka Ji where eviction orders have been passed. The concerned Range Officers should take it seriously and get the encroached land evicted and get it fenced and planted with forest species. In addition to this, 30 cases are under trial in the court of collector-cum-DFO Renuka Ji but no case is under trial in the court of collector-cum-Tehsildars. At present some cases of encroachment is suspected to have occurred, which are pending with the Range Officers, wherein they have been directed to get the demarcation and challan the same immediately in the court of collector-cum-DFO Renuka Ji.

16.6.4.1 Preventive and Remedial Measures

i) The forest officials must be well conversant with boundaries of the forests under their jurisdiction. The range officers, block officers and forest guards must check the boundary pillars frequently and

in case of damage to boundary pillars, immediate legal action to punish the guilty and repair work should be undertaken on priority. DFO/ACF should also inspect the boundary pillars while inspecting forests, plantations and other forestry works.

ii) The old stone masonry pillars should be replaced with cement mortar after proper demarcation. The new boundary pillars of only cement mortar should be constructed in future.

iii) The field staff should be made accountable and sensitive towards the ever increasing menace of encroachments. The forest guard must initiate legal action as soon as the encroachment is noticed by him. He should chalk out the damage report and report the matter to range officer through block officer. The block officer should immediately seek demarcation and Chillan the case in the appropriate court. Range officer must act quickly to file the case in the court; the laxity at any level must be dealt with under CCS (CCA) Rules.

iv) All the encroachment cases on forest land are within the jurisdiction of DFO as collector of the division under H.P. Public Premises and Land (Eviction and Rent Recovery) Act, 1971. Range officers should challan all such cases before collector for speedy trial.

v) The powers of carrying out demarcation are vested with the revenue officers under H.P. Land Revenue Act, 1954 and as such, many times, the demarcation of forests is delayed due to their pre-occupation. It is therefore, suggested that the Tehsildar, Kanugo who are on deputation with the forest department be delegated the powers of demarcation of forests to process encroachment cases expeditiously.

16.6.4.2 Strategy

i) Repair all existing boundary pillars and construct more boundary pillars close to habitation. For this areas need to be identified that are prone to encroachments.

ii) Immediate focus should be on the construction of new BPs in the New DPFs.

iii) Railway girders can be used in encroachment prone areas and all BPs should be depicted in digitized maps of the area which will be maintained as a permanent record.

iv) As a deterrent, FIRs should be registered as soon as an encroachment is detected. Court proceedings will then follow.

v) Latitude, longitude and altitude readings of all Boundary Pillars(old and new) to be recorded in the BP register in place of traditional Backward and Forward bearing and database in the Division office.

16.6.5 Illegal Mining on Forest Land:

The Himalayas and its foothills are a treasure house of the minerals being exploited by human beings since times immemorial. With the advent of society, the methods of the extraction of the minerals became more and more mechanized which resulted in extraction of the minerals at a pace much faster than the pace at which the nature could meet itself with such a situation to recover from the onslaughts of human

beings. It brought into sharp focus the conflict between development and conservation, which served to emphasize the need for reconciling the two into the larger interest of the society.

People have their right for the collection of building stones and slates for roofing which sometimes take the shape of the quarrying which causes damage to the hill side and forest growth especially in UPFs. With increase in population and better living standard, the demand for minerals such as stone, sand and lime stone had greatly increased. The extraction of stones and sand is done un-authorizedly in a very surreptitious and clandestine manner at certain places by the sides of the link roads and along the nallas and streams which results in destruction of forests. Such activities need to be checked as its continuance would cause landslides and also turn the drainage channels into deep gullies to destroy surrounding vegetation. In addition to destruction of forests the mining activities result in soil erosion, air pollution and water pollution in the streams as well as the ground water. Under the Mining Act, powers have been vested now with forest guards to take contingence of illegal mining within their respective jurisdiction.

16.6.5.1 Preventive and remedial measures.

(a) The Range Officer should get the mining plan of the areas where permission is granted by the Mining Department.

(b) The Front line staff has to have close liaison with the staff of the Mining Department so that the permissions granted by Mining Department are in the knowledge of the Forest Department.

(c) The applicability of the FCA 1980 should be ensured.

(d) To keep a watch on the stone crushers and the source of their raw material.

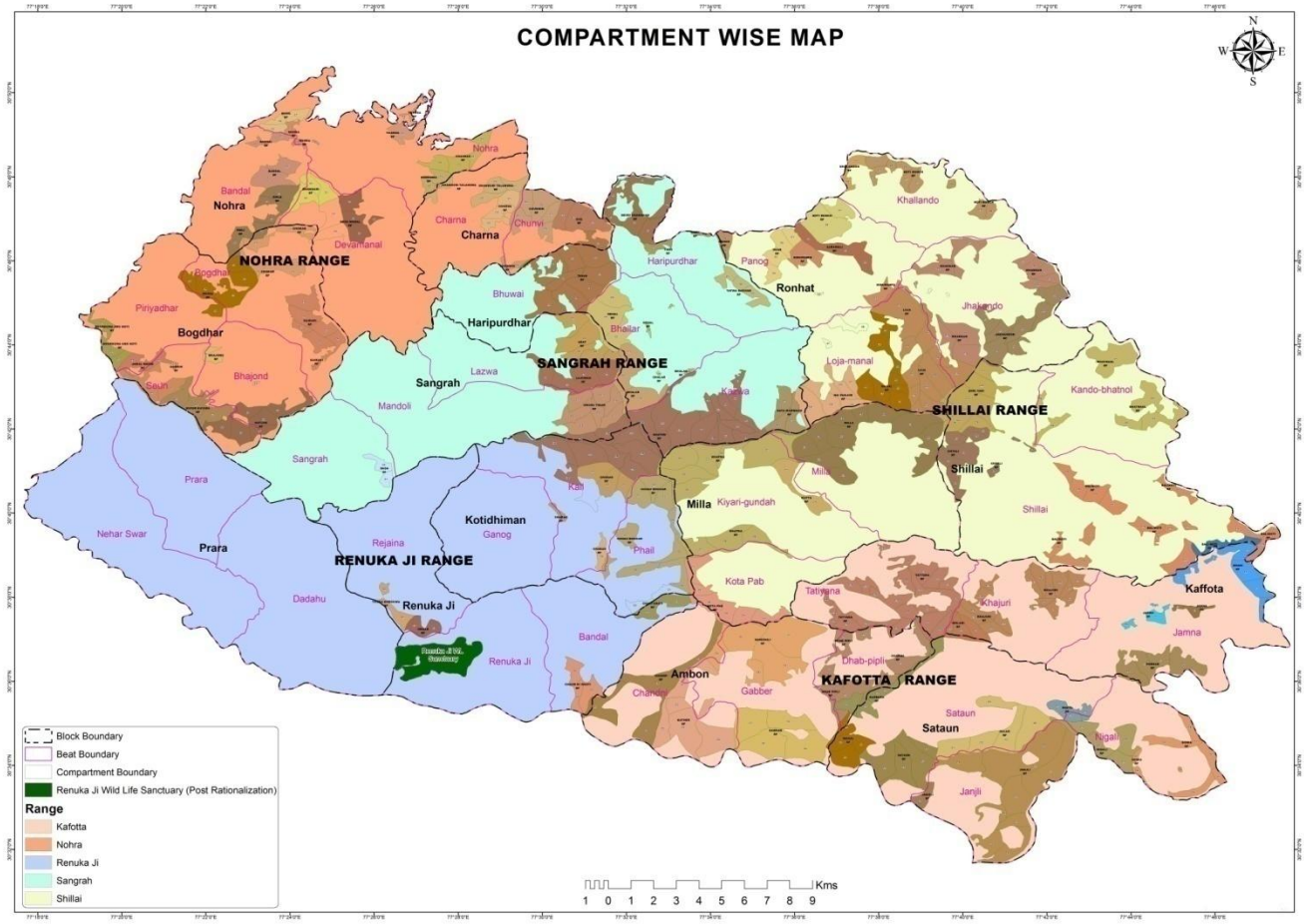
(e) Close liaison has to be maintained with the PRIs and other NGOs to get the information as well as to take preventive steps.

16.6.5.2 Strategy

To ensure systematic and scientific mining, few amendments shall be required in Himachal Pradesh Minor Mineral (Concession) Revised) Rules, 1971. For this a close liaison with the Mining Department is required.The District Level River/Stream Bed Mining Action Plan should be procured and its proper implementation in the field should be ensured.Some of the sensitive River beds/Streams or the section thereof for extraction of minor minerals be declared closed for the specific period which are sensitive from the Wildlife point of view as well as Soil Conservation point of view.Mining in River/Stream beds shall be allowed with the prior approval under FCA 1980 with adhering to the conditions imposed there on.Rehabilitation of the mined areas should be ensured in a time bond manner.The species to be planted in the mined areas should be as per the soil condition and planning for the same be done in advance.The areas where there is

plenty of house constructions are on, especially around Dadahu Township, specific sites for dumping the debris be identified and prepared for the dumping so that haphazard dumping is avoided/stopped.

A map of compartments of the Division is being shown below:



16.6.6 Invasive Alien Species:-

Biological invasions- one of the anthropogenically mediated ecological perturbations- are threatening native biodiversity, preventing natural ecological succession and changing the community structure and composition, besides impacting ecosystem services. Lantana camara is perhaps one of the most important invasive alien plant species (exotic weed) in the forest ecosystems of India as also in the Renuka Ji forest Division.

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CHAPTER-XVII

RESIN EXTRACTION

17.1 General:

Resin is a metabolic exude being tapped from *Pinus roxburghii*commonly Known as Chil. Resin produced from the tract dealt in this working plan accounts for a major portion of the revenue of this division. In fact, it is the most important source of income to the Government and also the local people owning Chil trees. The large numbers of local people find employment in its extraction and carriage. Resin tapping was done departmentally till 1975, when it was taken over by the H.P. State Forest Corporation and the natural exude i.e. Resin is supplied to the Corporation Factories at Nahan and Bilaspur. The material is marketed as rosin 75% and turpentine 18%.

17.2. Constitution of Resin tapping section:

All the reserved, protected and Mushterqua forests bearing chil crops shall be taken up for resin tapping. The chil trees above 30 cm d.b.h. are considered capable of resin tapping. The chil trees above 30cm d.b.h are considered capable of resin tapping. Such trees are enumerated; punch marked and grouped into sections of 1000 blazes each after every five years. This Work is done during winter. Trees upto 60cm d.b.h. are tapped with one blazes whereas trees <60 cm d.b.h. are tapped with two blazes. Trees below III class are not prescribed for resin tapping. One section is working by a Mazdoor who refreshes each blaze once in six days or so.

17.3. Area extent and resin blazes:

Area under Chil working circle is selected for tapping. The chil trees found in the other working circles are banned for resin extraction on account of poor growth, open density and limited extent. Only III class and above trees are allowed for resin tapping. The number of chil trees available for tapping totals to 9259. This will provide 09 sections in the entire division for the plan period.

17.4. Resin tapping season:

The resin season is from 15th March to 15th November. There is period of another 15 days upto 30th November for scraping and collection. A long dry and hot weather produces high yield of resin. The yields are usually highest for the month of May and June

17.5. Methods of tapping:

17.5.1 The French Cup and Lip Method:

This is the method being employed from the early days of resin tapping in the State. This method has proved faulty in the sense it renders biological interference to injure the cambium and thereby the cambium and thereby the vital growth of the trees. This stems from the contractual system of resin

tapping where by the labour engaged, are tempted to give deeper blazes just with a wrong notion that deeper incisions may yield more exude. This biological ignorance injures the water conducting system and eventually may kill the tree. Such heavily blazed trees cannot withstand high velocity wind storms resulting in large scale stem break and uprooting of the trees. Furthermore, the instrument employed in this method does not render any check on the depth of the blaze which may extend as deep as the central core of the tree.

To overcome the disadvantage of this method, German Rill Method was tested in our conditions. It showed an edge over the French Cup and Lip Method. The details of this method are described below;

17.5.2 German Rill Method:

The injury to the stem is negligible, as this method invades only 2-3 mm of sapwood. A set of instruments are needed to set the crop for resin tapping. Bark of the tree is removed at least a month before tapping operation is taken up. A blaze of 35 cm x 20 cm is given superficially by a marker. A Center groove 4mm deep and 10-13 mm wide is made with the help of a center groove cutter. Rills of 2-3 mm depth at an angle of 40 are made on both sides of center groove. The resin flow from the arms of rill and is collected in a pot through the center groove. Acid mixtures (HNO_3 +H_2SO_4) is also sprayed at the time of cutting of rill to increase the flow of exude. The central groove cutter and knife used for cutting of rill are so designed that the cut does not extend than the required dimensions. The operations involved are briefly narrated as under:-

(a) Shaving the bark:

With the help of bark remover the loose bark over a surface area of about 45cm x 30 cm is removed leaving a space of about 15 cm from ground level. The bark left should not be more than 2 mm in thickness to facilitate freshening. To save the cost, it is better to remove the bark over the surface area to be covered in two years

(b) Marking of Blaze and Groove:

Blaze frame is put in vertical position on the stem so that the lowest point is 15 cm from the ground level. Position of blaze and the central groove are marked on the stem.

(C) Central groove cutting:

Central groove is cut by drawing the central groove cutter from above downwards.

(d) Fixing the Lip:

The lip is fixed with two horse shoe nails with fits snugly against the tree. A 5 cm long wire nail is driven into the trees about 2 cm below the midpoint of the lip for hanging the collection pot on it. The nail is driven at an angle so that the pot hangs snugly against the tree.

(e) Freshening:

The second and subsequent freshening is repeated at weekly intervals just above the previous rills. The rill is made parallel to each other with an uncut bark of 5 mm in between the two successive rills. Average width of the rill is 6 to 7 mm. The length of rills neither exceed the blaze limit nor fall short of it.

(f) Spraying of stimulants:

After making a freshening on both arms of the blaze, the stimulant (Acid mixture) is sprayed on the freshly cut rill with the help of plastic bottle moving its nozzle in a steady motion along the rill. For obtaining good spray the plastic bottle should be held at 45angle the tree and its nozzle 3 to 5 cm away from it. The acid should be discharged from the bottle in the form of a spray. The pot should be hanged on the nail only after the extra acid has run down the lip.

(g) Collection of resin and cleaning of groove:

Resin is collection into collection can by removing the pot from the tree. The resin adhering to the pot is removed with the help of scraper. Central groove is also cleaned after each collection with groove cleaner to avoid accumulation of resin in it.

(h) Cleaning of lips and pots:

At the end of the tapping season, the nails should be pulled out lips removed. The lips and pots should be washed with warm water containing washing soda.

(i) Installation in subsequent years:

In second year, the positing of the blaze is marked above the top of the first year blaze and other operations of the first year remain the same and repeated.

17.5.3 The Forestry wing of the H.P. Agricultural University had conducted the research on resin yield of two tapping methods by laying the experiments at Mallan (Kangra) and Shilli (Solan) forests.

Table No. 17.1: Resin yield by French and German Tapping methods

Year	Yield in Kg per blaze	
	French (Cup and Lip) Method	**German(Rill) Method**
1980	1.80	2.10
1981	1.90	2.15

From the experiment it is concluded that the rill method has advantages over Cup and Lip Method as under:-

i) Resin yield is slightly higher.

ii) Cambium layer is not injured due to superficial incision.

iii) Tree Trunk is protected from deep channels. Thus the quality and quantity of timber is saved from wastage.

iv) Healing of wound is faster.

v) Wind/storm throw and uprooting of trees are reduced. In Order to sustain dual benefits of timber and resin, it is recommended to switch over to Rill Method of resin tapping from conventional Cup and Lip method in the entire division.

17.6 Resin Depots:

The resin collected from the forests is brought to resin depots at road sides close to the tapped areas usually located at a distance 5 Km. A number of sections are attached to each depot under the charge of a Resin Watcher, who maintains the accounts of the depot and supervises the works of labourers in the forest. From the road side depots, the resin is transported by trucks to the Resin and turpentine factory at Nahan.

17.7 Calculation of yield:

The yield of resin expected from the division is based on the number of blazes i.e. number of sections and average yield per blaze vis-a -vis per sections per year. The resin extraction of the division is being carried out by H.P. State Forest Corporation Division Nahan. The number of blazes, and yield of resin realized is summarized in Table 17.1.

Table 17.2 Number of blazes & resin yield

Blazes and resin extracted year wise in Sri Renuka Ji forest division		
Year	**Number of Blazes**	**Total Yield obtained (Qtls.)**
1999-2000	19280	NA
2000-2001	15007	NA
2001-2002	21126	NA
2002-2003	16351	NA
2003-2004	16351	NA
2004-2005	15254	600.702
2005-2006	15283	600.927
2006-2007	15283	610.555
2007-2008	13570	535.065
2008-2009	13570	517.288
2009-2010	13570	505.482
2010-2011	5863	228.657
2011-2012	5863	220.331
2012-2013	4531	177.116
2013-2014	2494	92.278
2014-2015	4777	181.526
2015-2016	4777	192.10
2016-2017	9259	324.31
2017-2018	9259	365.32

(Source Divisional Manager, HPSFDC Ltd. Nahan)

17.8 Resin from Private Forests:

With the nationalization of resin trade under ''The Resin Products (Trade) Act, 1981'' the resin from the private ownership is also purchased by the HP State Forest Development Corporation. This will help a great deal in checking illicit and defective tapping in private ownership and pilferage of resin from government forests. The owners and their agents engaged for tapping are questioned for unreasonably high yield.

17.9 Fire Protection:

All needles and other refuse within 1m of the tree taped for resin should be removed and individual trees freed from fire risks, it is better if bushes within 2 m of these trees are cut. Areas being tapped for resin are very susceptible to fire and need intensive fire protection. Fire fightingequipments should be provided in all resin depots to meet an emergency.

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CHAPTER-XVIII

WILD LIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

18.1. General Constitution

This Working Circle is constituted for emphasizing the necessity of conservation of wild life and collection of information for better management of Wild Life. The whole tract has a variety of wild animals and bird since the forests are distributed fromelevation ranging from 620 mt. to 3647 Mt. from MSL. Therefore this Working Circle overlaps all other Working Circles covering forest area 27365.20 ha.and also will extend to the area outside the forest especially for the purpose of addressing the problems of man-animal interface.

18.2. Importance and value of Wild Life

Sri Renuka Ji Forest Division is located to the east of Sirmour district with species assemblage of flora and fauna representative of front ranges of Western Himalayas. The monsoon affected forests and alpine meadows of the Himalayan front ranges support a unique biota comprised of many distinct altitude-sensitive ecosystems and are habitat to many plants and animals. The Western Himalayas are considered an endemic bird area (EBA) by birdlife international, supporting many rusticated-range species, as well as a Conservation International Biodiversity Hotspot. This region as a whole has come under enormous pressure from human activities, both from the ongoing practice of traditional livelihoods, such as seasonal grazing, hunting and the collection of medicinal plants, as well as more recent developments such as the farming of temperate cash crops, commercial forestry, tourism and hydro-electric power development.

18.3 Distribution of Wild Life

The distribution of Wild Life has been described in detail in Chapter IIB of Part-I of the Plan.

18.4. Special Objects of Management

The primary goal of management of wildlife in the Sri Renuka Ji Forest Division is to conduct Wildlife surveys and mitigate human Wildlife conflicts.

In order to achieve this goal, it is imperative to integrate the functions at two fronts, i.e.

A. Working with the local communities to reduce their dependencies on the forests to minimize human Wildlife conflict and

B. Interventions to manage monitor and protect wildlife.

A. Working with the local communities to reduce their dependencies on the forests to minimize human Wildlife conflict:

i. Help resolve man-animal conflict with emphasis on social and environmental justice for the poor people living in the Shimla Forest Division.

ii. Facilitate organizing of community based organizations, user groups of rural poor, preferably with strong linkages to the Panchayats. Establish the Wildlife conservation efforts at Panchayat level through the consultative process.

B. Interventions to manage, monitor and protect wildlife

i. Maintain and protect the natural vegetation communities (remove exotics and Invasive Alien Species), populations of large ungulates (with emphasis on Sambhar, Ghoral) and pheasants.

ii. Provide facilities and opportunities in natural areas for purposes of formal and informal education, research and study.

iii. Protect (with the consent of the local community) the cultural, historic sites such as Sacred Groves for research purposes as elements of the cultural heritage of the region.

18.5. Management Practices and their Impact on Wild Life

The history of management of the forests of the tract has been discussed in detail in Chapter-VII. The forests of the tract have been worked primarily for the extraction of timber. As such apart from meeting the needs of the local people for the timber, some of the areas were earmarked for hunting by the rulers of the princely states. These areas still hold the potential wildlife. In addition to this, the forests of Sri Renuka Ji Forest division remained major source of the liveli-hood of the poor people by way of NTFP/ MFPs collection. Collection of Guchi is another activity which encourages the local people to visit every nook and corner of the forests. Thus due to geometrical increase of human population and their dependence upon NTFPs and medicinal herbs have added to continuous biotic interference especially during the breeding season. On the other hand, several tree species are often valuable for wildlife e.g; leaves, flowers, fruits, bark, and roots. Tree species with soft timber substrates are used by cavity excavating birds, natural tree cavities are used by a variety of animals. The ground flora in some of the forests is abundant and varied and the miscellaneous broad leaved species form the middle story, such mosaics are the micro habitats of many important Wildlife species.

18.6 Threat Assessment to Wild Life

The local population is dependent on meeting their fuel wood and fodder requirements from the nearby forests. As a result, trees near the villages are heavily lopped. The forests near the habitations are also being cleared of lops and tops and other fallen wood which has an impact on the habitat of wildlife species which burrow holes in such fallen wood. Domestic live stock grazing in the forests also adds to the problem. There are incidences of organized killing of the Wildlife especially leopards by the nomads

"Bangalas" by putting snares. They also get indulged in killing of other endangered species like Jackals, Monitor lizard, Porcupine, Black bear etc for illegal trade. Stray cases of hunting of Pheasants during winter periods are also reported in this division. Degradation of the habitats because of the continuous biotic pressure on the forests had resulted in the total disturbance of the food chain of the Wildlife. As a result the species like leopard has made its niche near the habitations, leading to the cases of cattle/ dog lifting and sometimes attack on human beings resulting in human animal interface. Similarly, the monkeys and langoors are finding a little food in their natural habitat and are approaching nearer to habitation, town and has become a great threat to damage agricultural and horticultural crops.

18.7 Management Strategy

In order to achieve the above objectives and goal, the strategic approach of wildlife management in Sri Renuka Ji Forest Division will aim both at the FLS (front line staff) as well as local communities.

Accordingly, management prescriptions for the objectives mentioned above are given hereinunder:

18.7.1. Orientation and Sensitization of the Territorial front line Staff towards the Wildlife Monitoring and Management.

i) **Training:** It has been observed that the FLS is not oriented towards Wildlife and sensitive enough to address the expected requirement in the present scenario. By organizing short training capsules and workshops for the FLS, an effort will be made to have basics of Wildlife management. For the effective management of wildlife, it is necessary that the staff is suitably trained. Two types of training is envisaged for the staff to increase their managerial capabilities viz., On the Job Training and formal training courses. Following On the Job Training should be arranged for the staff:-

- Several wildlife offence cases fail in the courts for the reasons of inadequate processing, faulty procedures and wrong interpretation of legal provisions. Co-operation of a lawyer can be enlisted periodically to update the knowledge of staff on fundamental of laws and legal procedures. A failed case emboldens others to break the laws. Therefore, staff should be well versed in investigation, adducing evidence and material, dealing with offenders, compoundable and non compoundable cases.

- Staff should be imparted training in matters like postmortem of animals, collection of samples of vital organs for histopathological, viral and bacterial examination, their preservation and dispatch, signs and

symptoms of common wildlife diseases, external indicators of health. Such kind of training should be a continuous process rather than one time affair.

- Training of staff is also necessary in recognizing wildlife evidences and their correct interpretation. Management decisions are often based on interpretation of field evidences hence this aspect becomes critical. Monitoring of pugmarks, collection of scats, collection of skulls and jaw bones are some such evidences in which staff needs to enhance their skills.

In addition to On the Job Trainings, it is essential that staff is sent on formal training courses in wildlife management. Several short terms specialized courses are now available at Wildlife Institute of India and in some other institution. Forest Training Institute & Rangers College, Sunder Nagar and Forest Training Institute,Chail are now offering short terms training courses in wildlife. Field staff should be deployed to attend such courses.

18.7.2 By making the FLS sensitive towards the species identification, its status and significance. This will help in making decision regarding Management inputs, action plan for reducing human Wildlife interface, and also special efforts for the conservation of the endangered Wildlife species.

18.7.3 **Research and Monitoring –** Research and monitoring are among the weakest areas in wildlife management. The need is acknowledged but there is very little progress. The research need not necessarily be only biological as management and sociological areas are equally important. Research on a larger format involving species and community studies will need linkages with organizations possessing such research capabilities. However, small scale data collection and studies can be attempted at local level also. Encouraging the FLS towards indirect evidence collection, reporting and documentation of the same. Once the FLS is trained about the basics of the Wildlife Management, they can be encouraged towards the habit of evidence collection, observing the behavior of wild animals, reporting and sharing with others and if needed documenting the same. This will help in generating enough information to take the management decisions and to formulate action plan.

18.7.4 **Making simple Interventions to improve the micro wildlife habitats.**

i) Maintain and protect the natural vegetation communities (remove exotics and Invasive Alien Species), populations of large ungulates like Ghoral etc. and pheasants. This activity will be done in association with other forestry activities especially to remove exotics and invasive alien species. While carrying out this activity the Wildlife species requirement has to be kept in mind so that the species of grass and plants are planted to meet the requirement of the Wildlife species.

ii) Protection of micro wildlife habitats from Forest Fire especially during breeding season. In Sri Renuka Ji division there are some of the nicely maintained small chunks of forests in which a huge diversity exists. These areas can be managed as micro Wildlife habitats to facilitate the population of some of the endangered species especially the pheasants. List of such micro habitats along with the flagship species of that forest is given in table-18.1. These areas are to be protected from forest fire especially during the breeding season.

Table-18.1

List of the Forests which should be managed as Micro habitatsof the major Wildlife species

Sr. No.	Name of the Forest	Name of Range	Area in hectares	Flagship Wildlife species found in the area.
1	RF Nohra	Nohra	926.60	Leopard, Kaleej, Red Jungle fowl, Monal.
2	RF Bhog	Nohra	816.00	Leopard, Ghoral, Red jungle fowl, Koklas, Cheer.
3	RF Chauras	Nohra	1238.30	Leopard, Black Bear, Red jungle fowl, Koklas, Barking Deer.
4	RF ChhouBhogar	Renuka Ji	80.60	Leopard, Ghoral, Barking deer, Red jungle fowl, Cheer,
5	RF Ghatton	Renuka Ji	765.70	Leopard, Black Bear, Kaleej, Monal, Koklas, Red jungle fowl.
6	RF Ghatton	Sangrah	163.4	Leopard, Black Bear, Red jungle fowl.
7	RF DeoriKharahn	Sangrah	353.60	Leopard, Black Bear, Kaleej, Monal, Red jungle fowl, Cheer.
8	RF Gahal	Sangrah	274.60	Leopard, Black Bear, Kaleej, Monal, Red jungle fowl, Cheer.
9	RF Nigali	Kaffota	564.94	Leopard, Black Bear, Kaleej, Monal, Red jungle fowl, Cheer.
10	RF Bali Koti	Shillai	753.91	Leopard, Kaleej, Red jungle fowl, Koklas.
11	RF Naya Panjore	Shillai	380.00	Leopard, Kaleej, Red jungle fowl, Koklas, Black Bear.
12	RF Bhatnol	Shillai	425.80	Leopard, Red jungle fowl, Koklas.

iii) Planting some percentage of the preferred plant species. As per the policy of the state government that out of the total plantations to be done in an area, at least 10% plants are to be of fruit bearing species, the species to be planted in a particular area is as per the requirement of the Wild life species specifically found in that area.

iv) Identification and protection of the Sacred Groves. There are some of the sacred groves identified in this division by WWF Himachal chapter. These groves are very important from the wildlife point of view and are the home of many critically endangered species, especially pheasants and the Vultures.

v) Estimation of the species population which leads to human Wildlife Interface specifically and others in general to decide the management strategies. The monkey census is a half yearly feature now. Need is the proper documentation of the population trends, pre sterilization and post sterilization of the monkeys. This will help in studying the impact of sterilization and making decision regarding improvements in future. Normally the leopard census is carried out after five years but for quite some time this has not been done in the state. This needs to be made a regular feature and in the present day technologies the camera trap methodology is to be adopted in place of traditional 'Pug Mark Method'.

vi) Dry, hollow trees, fallen trees, those partially submerged in stream water, large hollow logs rotting on the forest floor, tall and large crowned big old trees, with flaking splitting bark, tree species that bear fruits, flowers, seeds, leaf or the bark of roots of some trees are of special significance to wildlife. Some of such trees in a randomly distributed pattern should be retained in the forests.

vii) Micro habitat elements of geomorphic origin like caves, dens, overhangs in rocks have a special significance for wildlife. Different species mainly carnivores use cave and dens as shelter, breeding site and secure place for raising the young ones. Flat shelves along the top of cliffs are used by vultures and eagles for roosting for nesting. Roof of over hung's can have hives of honey bees, nests of swallows, swifts, martins. It is therefore necessary to conduct a proper survey to identify such key sites and to plan the forestry operations in such a way so as to cause least disturbance to wildlife and their habitat.

viii) **Riparian Zones -** The riparian zones are among the most diverse, productive and vulnerable habitats and perform several critical ecological functions. The habitat use pattern in this system by people is often unsustainable hence the Riparian zones are constantly under threat. The felling rules prescribed in this working plan elsewhere provide for no felling in Bio-Sphere Conservation Working Circle and along the banks of the stream but the objective there is more for maintaining stability of banks and preventing erosion. But such zones also have biological values and ecological functions. These sites are more often than not used by pastoralists to establish cattle camps. Timber extraction is generally done by laying temporary roads in this zone along the valley bottoms. Riparian Zones are potential picnic sites. All important streams namely Pallar, Nait ka Khala, Joggar ka Khala and bank of Giri River and all the tributaries of River Tons have been prescribed to be treated as Riparian Zones. Road alignments along these zones should be avoided. A No Felling Zone to a width of three times the top height of trees on either side should be maintained.

ix) **Biological Hot Spots, Key Sites and Sensitive Sites-** These are small areas markedly rich in plant and animal diversity and often unique with respect to the plant and animal species association. These are small sites very vulnerable to change. Key areas have key functions to perform like roosting and nesting sites or breeding grounds of some particular species. Unless sufficient information is available about such areas, these are often ignored. These areas should be the integral strategy components in the other forests managed under different Working Circles as well.

x) **Grassy Blanks- 'Ghasnies'-** In forested areas, treeless openings or sites are called blanks or grassy blanks in forestry lexicon. These are called as 'Ghasnies' in the local terms. These areas are the potential habitats for many species especially like Ghorals, Porcupines, and Cheer Pheasant. These are often prime target for plantation activity. But all care should be taken to understand the ecology of these areas before going for making any interventions. They all need to be managed for their associated characteristic structural, biological attributes, ecological functions and physical integrity in consonance with the stated objectives of management.

18.8 Working with the Local Communities to Reduce the Human Wildlife Interface and Incidences of Poaching.

i) Facilitate organizing of community based organizations, user groups of rural poor, preferably with strong linkages to the Panchayats. Establish the wildlife conservation efforts at Panchayat level through the consultative process. There are many NGO's or other groups interested in becoming flag bearers of the Wildlife conservation. We need to make use of their potential at least in identification of the species, their population trends, and in anti- poaching campaign. Panchyats can act as moderators in reducing the human Wildlife interface provided if there is a continuous consultative process and dialogue with the local residents.

ii) To come up to the expectations of the communities in terms of human wildlife interface, by developing the expertise with in the FLS and making a quick response team. Whenever there is human Wildlife interface the territorial staff is totally dependent on the Wildlife staff. There is need to develop expertise among the FLS and a quick response team is to be constituted for the purpose.

iii) To facilitate the compensation cases of the poor people and making a proposal for pragmatic rates of compensation. Wildlife compensation has been made as part of Public Guarantee Act in HP. There are many cases of cattle lifting by the leopard but only a few are reported because the rates of compensation are too impractical. These need revision to make it realistic.

18.9 Reduction in the Dependence of Local Communities on the Important Habitats to avoid Human-Wildlife Interface.

Good wildlife management is effective management of people's pressures on resources. If the pressures on forest based resources are not resolved to the satisfaction of ecological requirements and the local economic realities of peoples, there would be no habitats left to manage.

i) By putting micro wildlife habitats on the minimum use for the right holders by providing the alternatives. The traditional rights of the local right holders are needed to be adjusted in the other forests at the time of next forest Settlement.

ii) Provide alternate grazing lands to the migratory graziers other than the Micro Wildlife habitat. Efforts are required to be made to provide alternate grazing lands to the migratory graziers so that these micro habitats are kept intact.

iii) Vaccination of the livestock both migratory as well as the domestic cattle. There is sizable population of domestic livestock as well as migratory graziers which in addition to other forest areas, also grazing in these micro habitats. If the grazing is unavoidable, the live stock going for grazing in these micro habitats should be vaccinated every year against the contact diseases.

iv) To tackle the issue of live stock grazing, ways are to be found out as to how the existing cattle number could be reduced. One way could be by substituting them with smaller number of productive variety of cattle for economic and ecological gains. A beginning has already been made in this direction in the tract by introduction of Jersy Cows which are not sent for grazing to the forests but have to be stall fed. The utility of keeping large herds of unproductive cattle has to be impressed upon the people and alternatives popularized.

v) The dependence on forests for fire wood requirement need also to be tackled by providing alternative fuels. Providing LPG connections can be one alternative.

18.10 Crop Depredation

The villagers in Sri Renuka Ji Forest Division raise wheat, maize, potato, peas. Some of the people have raised Orchards or Apples, Peas and Apricot and also have opted for cash crops and off season vegetables. This has changed the whole pattern of the agriculture practices in this division. The time of growing these crops mostly depends on the altitude of the area. The crop depredation is mainly done by Monkeys, Wild boars and Black Bears. Other wild animals such as Ghoral, porcupine, Bats and parrots also do the damage to the crops. Main problem is because of Monkeys and the wild boars. Government of HP had allowed the killing of problematic Monkeys and wild boars but some animal right activists has taken the issue to the HP High Court and the case is still pending.

There are legal provisions to annihilate the small-bodied animals such as rats and many insects; the big-bodied animals are protected under the various Schedules of the Wildlife Protection Act. In

this scenario the poor farmer living on the edge of the forest is faced with the problems of the crop depredation as well as the legal action in the event of his killing a wild animal.

18.11 Livestock Depredation

Due to increasing population pressures and consequent degradation of forest habitat, the wild animals such as Himalayan Black Bear or leopards have become “refugees” in their own habitats. It is a well-known fact that the wild animals avoid areas with disturbances. This means that when their habitat gets further restricted as a result, they venture into the human habitations. The wild animals also intrude into agriculture fields as the crops raised are more palatable, and they are located in easy locations. In addition to this, the poor and marginal farmers in the villages keep livestock such as sheep and goats, which usually survive on grazing on the forest and pasture land. For wild animals find such domestic livestock as easy prey. The timing of the predations by the wild animals is very crucial to understand human-animal conflict. The leopard killings are mostly in July to September and the Black Bear killings are in almost same months. The wild carnivores remain active in the months of June to October when the livestock is in the forests/pastures of the forests.

18.12 Compensation

The occasional damage to live stock as well as to human life caused by the wild animals has earned them the resentment of local people. To reduce this man- animal conflict, and to compensate the sufferers, the government has substantially enhanced the rates of compensation for damage caused to human life as well as to livestock. These rates are appended as Appendix-XI. However, a close look at the Department’s rules reveals their inadequacy with reference to the damage done by the wild animals in the field. The rules provide for postmortem report, and verification by the high authority in the villages such as Pradhan/up-Pradhan of Gram Panchayat/ and a forest official, not less than the rank of a Forest Ranger. For a poor person, it is difficult to approach these high authorities, as a result, we find very few cases of damage by the wild animals are reported for the claim of compensation. Moreover, the rules have been framed for the damage of domestic animals done by the big-bodied animals, mostly the carnivores. This also reflects the inadequacy as most of the damage done relates to the crops and horticulture trees for which there is no provision of compensation. Human-wildlife conflicts have assumed different dimensions in terms of human casualties, livestock killings and agricultural and horticultural crop raiding at the interface of wildlife habitats and human use dominated landscape. Such a situation affects the diverse sections of the village society, differently. Those who live closer to the forest areas and away from the road-head are mostly poor and bear

most of the burns of the human-wildlife conflict. Man-animal interface filter down to the base of the pyramid where the people are most directly affected by the depletion of physical resources, least able to fend off the ill-effects of man-animal conflict, and ill-equipped to take remedial action. Providing relief or compensation for damage to the crops and animals of the poor populations living close to the forests should become the priority for the Forest Officers.

18.13 Dealing with Leopards in Sri Renuka Ji Forest Division

In Himachal, leopard is the dominant predator sitting on the top of the food chain pyramid. This magnificent animal is reported from all corners of this division. The terrain and the altitudinal variation of Sri Renuka Ji Forest Division, makes the leopard more versatile and mysterious. Dealing with leopards in Sri Renuka Ji forest Division need a strategy to be developed keeping in view the field conditions, prey base in the forest area and extent of Human –Leopard interface. In fact leopard is one of the major animal which remains of a permanent source of Man – animal conflict. To understand the extent of the problem is to have a population estimate of the Leopard. Till late Nineties the leopard census once in five years was a regular feature but later on this practice is confined to only PAs. Although in Sri Renuka Ji Forest Division, there are no cases of leopard turning in to man eaters but some incidences occur in a year for leopard attacking the human beings, cattle lifting and getting trapped in the houses or the cowsheds. Whenever there is any such incidence, there is a huge public pressure for the elimination of the animal. The HPFD has not been able to make the people understand the ecology of the leopard. One of the typical habits of the leopard is its being strong territorial animal. As such when a male marks its territory, about 4 to 5 leopards also exist on the periphery of the marked territory, by making their separate territory in the other area. Whenever there is elimination of any leopard from its territory the peripheral leopards also push their territory towards the vacant territory. This results in having many leopards in that area all of a sudden and that makes the operation more difficult. Therefore before taking a decision of eliminating a leopard from any area, it is important that a quick study is conducted before taking any decision.

To overcome this sudden pressure, we need to have continuous interaction with the public, Panchyats and the local NGOs and need to create the awareness about the habits of the leopard. On the other hand although the DFOs (T) are the Wildlife Wardens but they hardly bears the responsibility to tackle the leopard problem. The normal practice is to pass the buck to the Wildlife staff. In fact DFOs (T) should remain equipped for any such situation. It has been observed in this division that Leopard problem is more when 'Guzzars' are not in the area, i.e. the time between October to March. During this period, the leopard tends to move near to the habilitations and dogs being its preferred food, it roams around the houses having reared a dog. During this period at many times it has happened that the leopard targeting the dog, lifts the kid.

Therefore, there is a need to educate the public about it. Most of the injuries caused by the leopards to the human being is because of the retaliatory action of the human being on sighting a leopard. This leads to man-animal conflict.

There is need that at least two Leopard traps and one set of rescue equipments (like blow pipe and tranquilizing drugs should be available with each Territorial Ranges. Rescue staff should be identified and a team of good efficient staff should be trained to meet any emergency situation. Two types of training to rescue team is required. One is training about the use of tranquilizing equipment including a formal training of the basics of the habits and habitat of the leopard including movies of the case studies and handling the situation. Then there is a need of refreshers courses at least once in a year to update the skills and also to have the practical training including the case studies.

One of the simplest exercises which should be done at Range level is that to develop the leopard incidence data base. The simplest way of doing this is that on the range map, a 'DOT' can be put whenever there is confirmed sighting or there is incidence of cattle lifting etc. This will generate a good data base and also the movement of the leopard can also be monitored. Once you observe that any leopard confining to a smaller area for the long time, it will mean that the animal is either old or is injured, as such a public warning can be issued and a close watch is to be kept on such animal.

There is a Rehabilitation and rescue policy of the Department which is available on the web page of the HPFD, http://hpforest.gov.in/Rescue_Release_Guidelines.pdf.

18.14 Monkey- Human Interaction

The monkeys have become a problematic animal for last 10 to 15 years in Himachal. Whether it is the townships or the rural areas now monkey menace is quite common. Not many efforts were made to address this problem in the past as this problem was never considered a public problem. The get going approach has lead the problem to get aggravated and the situation at present is that whether it is farmers or the people living in the townships, everyone is facing the monkey menace helplessly. The efforts made for last 6-7 years at Forest department level are too meager that it has no visible impact as such.

18.14.1 The Monkey Sterilization Programme

Before we go for the mitigation of the monkey problem we need to understand the root causes of the monkey population increase and the abrupt behavior of the monkeys. This programme needs to be expedited to control monkey population.

Causes of increase in Monkey population:-

i) **Change in Land use pattern –**

a. Shift from traditional cropping pattern.

b. Off season cropping and high nutritional value cropping.

ii) **Shift from wild to co-mensal –**

a. Due to increase in the human population even wild monkeys are now used to human habitations.

b. Monkeys are used to the human beings as well.

c. No struggle for food increases the life span

(Average lifespan in the wild is 4 years when they have to compete for food in the wild, where as when easy food is available in the form of garbage/manual feeding in the townships, they can live up to 10-15 years.)

d. Non availability of food base in the wild (WL Habitats have degraded both qualitatively as well as quantitatively).

iii) **No garbage management in townships-**

a. Easy food availability leads to multiplicity.

b. Increases the life span.

iv) **Bifurcation of the groups due to the Fragmentation of Habitat or other reasons.**

a. The bifurcated group tend to regain the minimum same size (Group behavior)

b. Abnormal behavior when get separated from the group.

v) **Manual Feeding-**

a. Due to religious reasons.

b. Increased tourism and increased number of the temples.

c. Disposal of the waste food.

vi) **No predators of the Monkeys in the wild**

Monkeys are not the preferred food of leopard. Earlier large Eagles/Vultures used to pick up the infants of monkeys but now their population has gone down drastically.

18.15 Some of the Facts about Monkeys are:

i) Mating is not confined to a specific season. Females are mature by three years of age, and males at two.

ii) Females cycle similar to humans with menstrual cycles of around 28 days.

iii) The monkey's average gestation period is six months (from 135-194 days) and most of the females in the group give birth to one baby in a year.

iv) Males are the dominant sex, but they do not remain with troops permanently, so female monkeys lead these communities.

v) Because troops include multiple mature males and females, their members are sexually promiscuous.

vi) Females usually produce one young each year, which will be raised by its mother within the very social environment of the troop.

vii) The typical lifespan of a rhesus monkey in captivity is approximately 15-20 years for males and 20-25 years for females.

viii) The life span in the semi urban and urban areas can vary between 10-15 years where as in the wild 3 to7 years.

ix) The monkeys also exhibit typical 'group living' behavior like maintaining minimum population of the group (group size).

x) In HP the population estimate of the monkeys is more than 3 lacs in which about 65 thousands are estimated in the townships and rest in the rural/forest areas.

18.16 Mitigation Measures

We have to address all the above causes if we want to have the effective results. Before doing so actually we need to study all the above causes in detail and then we can come to the conclusion of making recommendation of some measure to control the population of Monkeys. However some of the recommendations are as under:

i) If less than 70% animals of a particular group are not sterilized within 6 months (period of gestation) the impact of the sterilization will be minimal.

ii) Right from capturing the monkeys, sterilization to release back at the same area the group identity has to be maintained and not to be mixed with the other group of the monkeys.

iii) Though the females should be preferred for the sterilization but for the practical purpose both the sexes are to be sterilized to have maximum impact.

iv) The post operative behavior of the monkeys needs to be studied especially after release.

v) The success of the sterilization programme depends upon the percentage of the catches in a group in the first go.

vi) The monkeys confined to the townships need a different treatment than the rural/forested areas.

vii) The monkeys of the rural areas can be pushed back to the forest areas by making them scare and by increasing the natural food base in the wild.

viii) The groups in rural areas which are habituated and feeds on the agricultural crop only may need to be scientifically culled. (the sterilization will not have considerable impact as it is very difficult to capture more than 70% of the group at a time in rural areas as the monkeys being semi co-mensal)

ix) In the first go we should confine to the townships for the sterilization and release back.

x) Modern technologies like drop nets need to be used for capturing the monkeys and to increase the catches.

xi) Training of the staff for monkey capturing.

xii) Focus should be the GROUP rather than number from different groups.

xiii) Stop manual feeding (Donations be put in containers).

xiv) The food accumulated in the containers be medicated with the contraceptive medicines and then monkeys be fed at some common place.

xv) Creating a mass awareness about garbage disposal, no manual feeding, how to avoid monkeys' attacks and post care etc.

xvi) Exploring the options for Export and Translocation to the NE states.

As pointed out earlier, the major animals responsible for Human- Wildlife interface are Leopards, Monkeys, Wild Boars and the Black Bears.

Some of the suggested measures for the reduction in the conflict between man and animals are:-

Proactive:-

i) The villagers are already using deterrents such as making sounds at night, beating drums, lighting a fire, or putting up a scarecrow in their fields. The alternative access to crop fields can be of some use.

ii) The Forest Officials need to take some proactive measures such as proper identification of the rogue animals, their tracking, and if needed "culling" or elimination.

iii) Feasibility of setting up of cages/radio collaring of the problem animals may be explored. The Forest Officials and the local villagers need to put up a combined defense against such animals.

iv) There is a need of regular census of ungulates and carnivores in the forests. The prey-predator relationship needs to be studied and worked out for the mountain animals along with the carrying capacity of their habitats.

Reactive:-

However, once the damage is done, the provisions of compensation should be an easy and straightforward process so that the poor villagers are able to receive the compensation easily and without delay. It is also important that the forest department functionaries ensure that the poor people not only attend Panchayat or Gram Sabha meetings in good number but also participate actively so that their voice is heard. Proper checks and balances can be evolved and the govt. can place the funds for compensation at the disposal of a Panchayat. The removal of problem animals may be considered in case such animals have been properly identified.

In fact, the main solutions lie in awareness about the large-bodied animals, their ecology and behaviour; at the same time recognition of the fact that these are the poor villagers showing tolerance to the existence to the crop damaging bear or livestock lifting Leopard. This enhances the limits of human existence with the large carnivores. The future of man-animal conflict resolution lies as much in the involvement of the local communities in the wildlife habitat management, as in the measure that are taken to leave the wild habitats to the wild herbivores.

18.17 Pheasants

The Sri Renuka Ji Forest Division has Kaleej *(Lophuraleucomelana), The* RedJunglefowl *(Gallus gallusmurghi),* and Peafowl (*Pavocristatus)*.

18.17.1 Dealing with Vultures and Other Raptors for Ecological Balance

The main Species of Vultures found in this division are Lammergeyer, Egyptian Vulture; White backed Vulture, Long billed Vulture, Himalayan Griffon and Red headed Vulture. The population of vultures has reached the critical level especially the White Backed Vultures. Most of them are nesting outside PAs and need the attention of the territorial staff. The vultures nest and breed either on the old Chil trees finding some holes in it or making nest on the dead old branches. Another typical site of nesting of vultures is the rocky cliffs on the southern or south western aspect. These birds nest in colonies. As such the typical nesting sites of the vultures need to be identified and protected.

One of the major threats these magnificent birds are facing is the use of the drug 'Diclofenac' on the animals on which the Vultures feed. The population of the White Backed Vulture has already reached at the most endangered level.

The main efforts which should be made in the field to protect Vultures are:

i) Identification of the nesting sites of the Vultures.

ii) Retaining the snags while carrying markings in the field.

iii) De skinning of the dead animals should be mandatorily be got done.

iv) Ban has imposed on use of dialoguing but need its true implementation.

v) Protecting the nests and nesting sites from forest fires especially in summers.

18.18 Field Craft- How to Observe and Understand the Jungle

(Adopted from an account by Dr. AJT Johnsingh of WII)

When guards/officers/others venture into the forests, they should be equipped with certain indispensable articles: a small sharp knife, a compass, a lighter or a match-box (covered in a water-proof polythene bag), leech-proof socks (if it is a leech country), a small rope, rain-coat (if it is in the rainy season or in an area of high rainfall), a good pair of field shoes and field dress (olive green or khaki), which will merge with the background.

Animals such as Himalayan Black Bear, Brown Bear and Leopard can move much faster than humans. At the first close encounter they may snort, roar or scream. These sounds when heard in the setting of the jungle can frighten us terribly and only experienced lucky persons who have survived these encounters will be able to tell us how week and wobbly their knees became after the first nerve-wracking encounter. We should not think that we can easily outrun and escape these animals which, as said earlier, are much faster than we are. Also the terrain on which we will have to run- with slope, many holes, sharp wooden stumps, tangle of creepers, dense tall grass, logs, and rocks- is not an ideal place to outrun these beasts which run with four legs while we have only two teetering legs.

Therefore, go with caution in a forest where there are dangerous animals. Please follow the dictum "I" should see these animals before "they" see me and should hear them before "they" hear me. Do not talk unnecessarily. Human voice can be heard, even from a long distance, by the jungle animals, in the "silence" of the forest. If there is a need to communicate, better whisper and signal. The objective of our visit to the forest is to see as many animals as possible and observe them. This can be accomplished only when we move as quietly as possible. We spend a fraction of our life looking for and observing animals in the forests. During this brief period, we should be as quiet as possible and observant of the events that happen around us.

Silence is an essential part of jungle-craft.

In the jungle, smokers should become non-smokers. This is necessary for several reasons: by not smoking (i) the animals will not be alerted by the smell of the smoke, (ii) we avoid setting fire to the jungle, (iii) we show the utmost reverence to the jungle which we have resolutely determined to conserve. When we walk along a forest trail, particularly when the wind carries our smell down the train, we should proceed with utmost caution. This is because animals like bear (particularly those which have had encounters with people earlier and therefore are not shy of people) can smell your approach and then either slink away or wait for your arrival. When the wind carries your smell down the path, walk slowly and silently, stop for a few

seconds every 50-100 m, listen for sounds and then proceed. Most animals like bear make some sound and indicate their presence. All these can be heard if you walk silently.

Forest Rules

i) Never approach dangerous animals like black bear (particularly with the cubs) very close when they are in a flat terrain. With caution it is possible to approach them in a hilly or rocky terrain where the chances of escaping these animals are much greater.

ii) If there is a fresh blood trail on the path one should proceed carefully. A wounded animal (e.g. a bear wounded by a poacher) may be ahead of us and should turn aggressive if approached very close. The same is applicable to other potentially dangerous animals like the leopard.

iii) A leopard carrying its fresh kill may cause the fresh blood trail. Approaching a leopard on its fresh kill could be dangerous.

iv) While on a blood trail if there are alarm calls of monkeys, and birds ahead of us it could be an indication of the predator going ahead. Go with caution.

v) If you are returning to your camp alone on foot late in the evening and if you see a dangerous animal (e.g. a bear with cubs), stop immediately. Stay at a safe distance. Hide behind a tree or rock, observe the animal and then by talking, by tapping on the tree with a stone or wood, or even by allowing the wind to carry your smell let the animal know that a human being is somewhere in the vicinity. The presence of the unseen human being makes most animals nervous and they make a slow but steady retreat away from your direction. Who will enter in to a patch of tall dense grass where you hear the hissing of a cobra but don't see the snake? We will move away from the area. The great naturalist Dr. George B. Schaller has successfully used the above technique of remaining unseen and scaring away the Himalayan black bears in Dachigam National Park, Kashmir, India.

vi) Do not stumble through the forest without carefully looking at the path.

vii) Climbing a steep hill slope by clinging on to trees, climbers and rocks. Particularly in a tropical habitat, needs to be done with great caution. Before placing the palms, which like the feet are not protected, to hold on to something, watch carefully. There could be a scorpion, a nettle plant or a wasp nest nearby.

viii) People often fail to differentiate between chasing and charging by a bear. Charging may stop with a forward aggressive rush for 20-50 m but chasing can go much beyond that even for a few hundred meters which could be very dangerous. When chased by an animal throw a conspicuous object (e.g. a white hand-kerchief) on a bush and run down a slope or run zig-zagging among the bushes. Put up as much distance as possible between you and animal. While chased, do not crouch inside a bush hopping to hide.

ix) When chased by an animal, never try to climb a tree. A jungle - living tribal can do that but not a guard if he is recruited from a town or a Manager who is not used to tree-climbing. The fear would drain all the energy needed to climb.

x) Sometimes you will be forced to walk through the forest at night. If you are in a group, stay together. As you walk along make some noise (talk, sing, or tap on a tree or rock at regular intervals). Don't surprise animals by walking in to them. Tap the ground periodically, as you walk along, either with your foot or a stick. The vibrations will keep the snakes away and most animals will also move away when they are warned from a distance.-

Practical's:

Each guard/officer should be persuaded to tell an interesting experience he has had in the jungle during his career.

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Chapter XIX

Soil and Water Conservation (Overlapping) Working Circle

19.1 General Constitution-

This Working circle overlaps all other Working Circles apart from this, it includes all categories of Forest land falling in this Division. The entire tract is drained into Tons and Giri rivers by various tributaries. Manifold increase in population have increased anthropogenic activities such as agriculture, horticulture, animal husbandry and other developmental works such as, roads , buildings , dams and industrial establishments have created ecological imbalance. Acute shortage of water is the main concern, which has assumed great dimension in recent time. Therefore Soil and Water Conservation has assumed importance in management of natural resources as these very resources play vital role in sustainable development.

1. General Characteristics of the Vegetation-

It has already been discussed in respective working circles

2. Block and Compartments –

This being an overlapping working circle, no sub division is required.

3. Special Objective of Management-

a) To prevent land degradation by adoption of multidisciplinary integrated approach in the catchments.

b) To improve the land capability and moisture regime in the watershed and thereby reducing runoff by providing engineering structures wherever necessary so as to ensure stabilization and perennial supply for irrigation and drinking purpose.

c) To improve the land use to match the land capability.

d) To involve people in the management of catchments and also to upgrade the skills in planning and execution of land development.

e) To improve the ecology of the area and biodiversity in the area .

f) To promote aesthetic value and landscaping of the area .

19.2 Selection of Area for Treatment:-

The Area for Treatment under soil and moisture conservation measures be selected keeping in view the following criteria:

1. Very high and high priority micro-watershed must priority or treatment.

2. Micro watershed to be treated should be in contiguity for consolidating the measures of treatment.

3. Annual program must cover whole micro watershed.

Table No. 19.1: Degraded areas which require treatment at priority:

Sr.No.	Name of Range	Block	Beat	Forest	Remarks
1	Kaffota	Ambon	Chandni	R.F Chandni C3,C4& RF Kathar C1 &C2.	Soil erosion
2		Ambon	Gabbar	R.F Gabbar C1 and C2	Soil erosion
4		Sataun	Sataun	R.F Manal C3,R.F Sataun C1, C2	Heavy soil erosion at Tikker khala
5		Sataun	Janjli	R.F Janjli C4 and C1	Soil erosion
6		Sataun	Nigali	R.F Nigali and R.F Shiva C6	Soil erosion
7		Kaffota	Khajuri	R.F Khajuri C1	Soil erosion
8	Sangrah	Sangrah	Lajwa	R.F Arat C1 and C2	Soil erosion Lajwa Khad
9		Sangrah	Mandholi	R.F Uncha Tikker C6 and C7	Soil erosion
10		Sangrah	Sangrah	R.F Dada C1	Soil erosion Lana Mashurkhad, Lagnukhad, Dungikhad.
11	Nohra	Nohra	Devamanal	RF Shillibhangari	Soil Erosion
12		Nohra	Bandal	RF Bandal	Soil erosion
13		Bogdhar	Bogdhar	RF Garari& RF Chokar	Soil erosion

The people in this Forest Division are facing acute shortage of water and most of the area is mountainous. The sources of water are lying in the forest areas which due to erratic precipitation do not get replenished properly thus creating severe shortage of water. It has been observed that every year, with the onset of summer these sources of water go dry.

19.3 Project formulation (Work Plan):

For individual micro watershed selected on priority basis, the preparation of work plan is must. The area intended to be treated under soil and moisture conservation are to be identified and surveyed in micro watershed as per latest revised guidelines issued by the Govt. of India . Therefore, before actual treatment of the micro watershed, their work plan will have to be prepared and the work plan will only be prepared for the areas falling under very high and high Erosion intensities. The Job of the preparation of a work plan is very laborious and time consuming but timely action has to be taken for its preparation for the micro watershed which is going to be treated under centrally sponsored soil conservation schemes. The work plan shows the different work to be carried out in a micro watershed in a phased manner. Thus a detailed survey is carried out and areas are pinpointed to be treated under different modes of treatment of soil conservation.

As a matter of fact, seriously eroded and high degraded areas are taken up for afforestation and are also supplemented by minor engineering structures. Similarly, water harvesting dams, silt detention dams, farm pond big spurs are put up on the flood prone areas to save agricultural lands, life and property around the village threatened by natural calamities. The structures will go a long way in benefiting the farmers directly and provide them water for irrigation and cattle during the lean period of the year. Thus, the work plan essentially envisages integrated treatment of the identified critical areas of the micro watershed. A map is prepared depicting the different operation to be carried out in the identified areas. Implementation of the different work is to be strictly in conformity with the provision of the work plan. Integrated approach of treatment of area in totally has to be adopted.

19.4 Saturation of micro watershed:

With the regular flow of funds, considerable and investment has been made in the catchment areas and some of the micro watersheds have reached saturation point. Thus it has to be ensured that work should be achieved strictly in conformity with provisions of the work plan wherein systematic and integrated treatment is envisaged only in the priority areas i.e. very high and high erosion intensity areas and should be proposed for inclusion and efforts should be made for completing the works and saturation the watershed within the time frame of 5 to 6 years. As soon treatment works on a micro watershed are completed i.e. Saturation point has reached it will here to be shed off.

19.5 Evaluation of effectiveness of soil conservation works:

Evaluation of soil conservation work in the micro watershed can be gauged by:

a.) Analysis of rain fall, run off sediment data: In order ascertain flow of benefits through works carried out under various soil conservation schemes, slit observatory point has to be provided under each micro watershed. At least 3% of the total outlay should be earmarked for the purpose. Monitoring of silt discharge is important to gauge the rate of silt in the catchments area.

b.) Protection provided by structures and storage work.

c.) Irrigation potentials created and utilized.

d.) Employment opportunity generated.

e.) Return from areas treated.

f.) Over all benefit cost analysis.

g.) Summery findings of evaluation by team report.

h.) Over improvement in vegetative cover and moisture regime.

19.6 Annual programme of soil conservation work:

The work plan or FD schemes Projects may be got prepared by DFO as per need and scope in the area and got approved from the Govt. of India and areas treated subjects to the budget provision under the schemes.

19.7 Public participation:

Watershed management needs the local community active involvement in the meaning and project formulation, and participation in the execution and maintenance of assets. People participation will be ensured by:

1. Consulting local people in identifying treatment measures.
2. Securing local community consent and commitments to the protection and maintenance of common resources.
3. Discussion with the local community on the problems in the watershed.
4. Preparing micro plans through PRA exercise and prioritizing activities as per availability of budget.

19.8 Treatment of Non-Priority watershed:

With a view to derive benefits from the available resources, implementation of the program is presently confined only in the very high and high priority watershed as identified. Since the process of erosion and land degradation is dynamic, the preventive measures are to be taken up immediately.There are 482 compartments in this Forest Division and 10 earthen ponds in each compartment should be constructed in order to recharge the aquifers. The territorial DFO should therefore take steps to ensure adoption of proper fund use and land conservation practices in such non priority watershed.

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CHAPTER- XX

JOINT FOREST MANAGEMENT (OVER LAPPING) WORKING CIRCLE

20.1 General Description

Joint Management mean involving people in the decision making process in the management of forests. The participatory forest management started in 1972 in India from west Bengal. A need for participatory forest management arose in Himachal, and the PFM started in H.P in 1985 through National Social Forestry (Umbrella) project. The project achieved its objectives by covering more than 1,00,000 ha area under plantations. During the implementation of this project more emphasis was given on achievement of physical and financial targets than social i.e. participatory and equity issues.

20.1.1 In the 1980s, the World Bank supported Social Forestry project (1984-92) and the Indo-German Integrated Dhauladhar project (1982-92) were implemented in H.P. In these projects the draw backs of Umbrella projects were well addressed. Therefore in 1990s, World Bank funded IWDP Kandi project started in the Shivalik hills in which participatory approach was emphasized and all three issues i.e. physical targets of Forest Department, social and equity were taken all together as per guidelines of world bank.

20.1.2 The framework for JFM in H.P is provided by the Govt. of H.P order of 12.5.1993, which followed the Govt. of India (JFM) circular of 1st June 1990 from the then Secretary (Environment and Forests) enabling the spread of JFM to the Village Forest Development Committees (VFDC's) for Joint Forest Management in the Villages of Himachal Pradesh.

20.2 Strengthening of Joint Forest Management

i) JFM should focus in and around pockets of poverty i.e. remote forested areas (better forest) and where livelihood dependence on forests is high. This would entail several genuine joint management activities (other than plantation) like collective protection against illicit felling, fires, poaching etc. Issues of Rights, equity and benefit sharing are better addressed and conflicts resolved.

ii) In participatory approaches the process is more important than achieving targets. Choosing and regularly training the right persons for the job is therefore critical.

iii) Sharing of removals, including resin, intermediate and salvage fellings with VFDSs are necessary to establish long term stake of local communities in JFM.

iv) Continual policy and rules adjustment and calibration to promote better market returns for wood and non-wood based enterprises. Example, the recent decontrol of bamboo trade and transit and efficient markets for value added products.

v) Local leadership has to play a critical role in JFM. The successful examples of JFM or CFM show that local leadership roles have been crucial in making the change. It could be an enlightened, accepted local person, an elected representative, a dedicated NGO/CBO or even a committed forest officer. This is also important for sustainability of groups.

vi) People dependence on Ban Oak forests for fodder on a large scale in this process most of these forest lopped with high intensity. Thus through JFM controlled lopping for forest can be managed.

20.3 Special Objects of Management

The main objectives of the participatory approach to forests production and management are:

1. To give the local village communities a stake in thewell being of the forest by giving a share of the produce.

2. To develop institutions at the local level to provide a forum for developing the participatory approach and to manage the sharing of responsibilities and benefits.

3. To enlist the help of committed non-governmental organizations, collages and schools, local women and youth clubs and other groups with a proven track record to start the dialogue between the Forest Department and the villagers.

4. To provide an effective treatment for waste lands degraded forests and forest lands situated near villages through protection, afforestation, pasture development and soil conservation by active participation of local people.

5. To augment fuel wood, fodder and small timber production for use by local people.

20.3.1 The Govt. of H.P has notified Himachal Pradesh Participatory Forest Management Regulations 2001 and the Sanjhi Van Yojna Scheme, 2001 which have strengthened JFM approach to a great extent. These regulations are reproduced in Appendix-XV.

20.4 Implementations of JFM in Sri Renuka Ji Forest Division.

The JFM has been implemented in the division through projects like Overseas Development Administration or DFID, Sanjhi Van Yojna and FDA. The micro plans were prepared in accordance with project philosophy, principles and mode of working by VFDC/VFDS. The list of VFDCs constituted under FDA is given in table-20.1. Activities like soil conservation, Afforestation, village development activities, fire protection, grazing have been undertaken in the past but it is observed that in almost all cases, the participation of committees remained upto fund flow. Efforts may be made to identify the potential areas where more JFMCs can be constituted for adopting JFM approach for the protection and management of the forests.

Table-20.1

List of JFMCs Existing in Sri Renuka Ji Forest Divisionas on 31st December, 2017

S. No.	Name of JFMC	Name of Beat	Name of Block	Name of Range
1	JFMC Ghatton	Kail	Kotidhaman	Sri Renuka Ji
2	JFMC Chhou-Bhogar	Phail	Kotidhaman	Sri Renuka Ji
3	JFMC Dabra Bokala	Khajuri	Kaffota	Kaffota
4	JFMC Pedwa	Janjli	Sataun	Kaffota
5	JFMC Lazwa	Lazwa	Sangrah	Sangrah
6	JFMC Maithli	Piriyadhar	Bogdhar	Nohra
7	JFMC Bandal	Bandal	Nohra	Nohra
8.	JFMC ShilliBhangari	Nohra	Nohra	Nohra

20.5 Future Scope

20.5.1 There is some scope for the JFM activities in the division. The forest areas where plantation and protection is the main focus are suitable/ potential sites for afforestation, soil conservation, grassland improvement, NTFP development besides other forests.

20.5.2 Potential Activities of JFM Committees

The JFM/PFM committees can be the future agencies of forest development, conservation and expansion. The potential activities to be executed through JFMCs can be:

i) Afforestation activity (both departmental and MNREGA)

ii) Soil & water conservation through treatment of micro watersheds in a catchment.

iii) Recharging of water bodies like *bouries*, ponds and underground water.

iv) Minor construction work of road, paths and buildings.

v) Awareness programme for forest protection, fire protection, propagation of medicinal herbs on a large scale.

vi) Livelihood options like bee keeping mushroom cultivation, vermicomposting, cutting & pruning etc. through effective training.

vii) Collection, value addition and marketing of NTFP.

20.6 Selection of JFM Working Areas

20.6.1 The following broad guidelines have been devised for selection of potential (pilot) areas:

i) Interest of local forest staff in involvement in joint forest planning and management;

ii) Interest of local people in involvement in joint forest planning and management;

iii) Existence of ongoing 'successful' collective land management systems;

iv) Resource poor areas where there are constraints on the forest and farming system in term of access to grazing and forest products;

v) Relatively homogenous local communities.

20.6.2 The information will be gathered from village-level PRA studies; workshops held with range officers and forest guards, in conjunction with village visits and meetings to determine local people's perception of problems and possible intervention. User's definition of problems and approaches will provide the principal guide to action. Complex social environments will not be tackled in the initial stages. It is not expected that there will be 100% success rates in the establishment of Village Forest Development Committees. In some cases the field staff may have to withdraw from certain villages, because conflicts are too great. This should not be seen as a failure of the process, rather it is part of the process of adapting to and accepting village-level realities, where there is sometimes irreconcilable difference between groups. In order to reduce the risk of failure, planning exercises will focus on assessing the current and future needs of all the users of the forest resources (including women, poorer villagers and migratory grazers), and reaching consensus through negotiation in order to establish sustainable ways of managing resources for those who most need them.

20.7 Participatory Rural Appraisal (PRA):

20.7.1 Participatory Rural Appraisal (PRA) will be used as a way to facilitate communication between users and the Forest Department and to determine problems and priorities. At this initial discussion stage it is likely that only partial information will be obtained from the village, so it will be necessary to repeat the PRA exercise. Repeated PRAs would be used to continue the dialogue and build on the information base. PRA will be used to identify particular area needing more detailed socio-economic research.

20.7.2 Specifically PRAs will be used to:

i) Finalize village selection

ii) Build up baseline information

iii) Indentify forest users and their priorities

iv) Provide the context for experimental learning for the staff and to create the basis for effective interaction between the department and forest users

v) Indentify local option for institution building

vi) Draw up village level agreements.

20.7.3 The key objectives of this PRA would be:

i) To identify local resource use system; access rules; differential control; legal and customary status of land of land; past and current tenurial status of land.

ii) To document existing land use practices and management as a basis of their development.

iii) To document current interaction between forest, farm and pasture; type of usage; division of labour.

iv) To build a detailed picture of the socio-economic context of villages; identify different categories of household (i.e. household profiles); to identify and assess effectiveness of village institutions and leaders; to identify different levels of decision making in resource use and their relative importance, i.e. village council. Men, women, rich, poor.

v) To identify user's priorities and means of reaching consensus.

vi) To identify different users' constraints to participation, for example women's labour time, poorer people's lack of access to decision making.

vii) To identify and assess effectiveness of existing village level institutions, cooperative action between villages as a means to build more effective village or user group organizations.

20.8 PRA Process

The PRA process will be iterative to provide a growing dialogue between the department and forest users. Initially, information may be colored by misunderstanding and mistrust on both sides. It is only as familiarity and participation in the benefits of joint management become apparent to forest users that a relationship of understanding and trust will be built between the staff of the department and villagers.

20.9 PRA Technique

The PRA technique to be used in joint forest planning and management will include:

i) Review of secondary data and existing information.

ii) Direct observation.

iii) Semi-structured interviews.

iv) Group interviews (casual, focused, village).

v) Use of key information's, local experts.

vi) Use of local researchers.

vii) Ranking: wealth ranking, pair-wise ranking, direct matrix ranking.

viii) Livelihood analysis.

ix) Seasonal diagramming (firewood, fodder, NTFPs, labour etc.)

x) Transects (systematically walking through an area with a group of local people).

xi) Participatory mapping, modeling; people's mapping and modeling.

xii) Linkage chart (showing links between village organizations, between villages, and forest resources).

xiii) Case studies and stories.

xiv) Ethno-histories.

xv) Brainstorming (especially joint sessions with villagers).

20.10 Role of Front Line Staff

Forest Guards will coordinate all inputs to the village and will act as the interface between villager and the department. They will be conduit for the flow of information both up and down the system. They will establish links with other village-level organizations and government extension agents where appropriate. The departments most likely to be involved are Animal Husbandry, Agriculture and Rural Development.

20.10.1 Forest Guards will have the following responsibilities:

i) To establish effective and representative Village Forest Development Committees;

ii) To maintain contact with joint forest management groups (VFDCs);

iii) To provide technical advice as required;

iv) To arbitrate between groups if conflict arises and requested;

v) To collect information through PRAs;

vi) To provide feedback to the department;

vii) To facilitate the full participation of women and poorer people;

viii) To liaise between villagers and the department.

Although these activities are all additional to the current work of forest guard; the experience elsewhere indicates that as the JFM process strengthens the more protection workload of the Guard will reduce.

20.11 Field level Training

Field level training will be carried out through participatory workshops which encourage an experience based learning approach. At outset these workshops may be facilitated by some JFPM Training specialist. Each person participating in the workshop should share his experience and knowledge with other participants including the facilitators. A series of workshops should be organized at different levels, such as:

i) Circle-level workshops

ii) Divisional-level workshops

iii) Range-level workshops

iv) Beat-level workshops

20.12 Villagers Reorientation

Reorientation is not essential for the staff but villagers will also need to be reoriented in their approach to the management of local natural resources, and in their perception of the role of the staff. The joint forest planning and management system forms a major part of this reorientation. Workshops should be organized for local leaders (local politicians, teachers, other key persons); and VFDCs. This will provide a forum where VFDCs can share experiences, learn from each other, and develop combined strategies and approaches to JFPM.

20.13 Micro Plan

20.13.1 Before a VFDC can manage a forest, it will be required to prepare a micro plan. The micro plan will be prepared jointly by Executive Body of the VFDC and the Range staff, and will be discussed with the General House. It will be finally approved by the concerned DFO. The information's gathered during the PRA exercise will be helpful in preparation of the micro plan. Locally drawn maps of the area may be useful to ensure that everyone understands what areas are to be managed.

20.13.2 The micro plan should

i) Detail which households and villages have access and right to the forest lands and forest products;

ii) Include detail on protection and decision-making mechanisms;

iii) Detail forest management prescription;

iv) Detail soil conservation measures if considered necessary by the VFDC

v) Detail grassland management measures if considered necessary by the VFDC

vi) Demarcate the responsibilities of the department and the villagers (forest users);

vii) Detail unambiguous rights to the usufruct and harvesting of common plantation, grassland and forest area;

viii) Detail clear rules and mechanisms for the distribution of benefits: intermediate and the final harvest, among users.

20.14 Duties and Responsibilities of JFM Committees

To make the JFMCs active and functional, each member of JFMC should shoulder certain duties and responsibilities.

20.14.1 Duties of JFM Committees

i) To persuade the villagers to give available areas for plantation.

ii) To assist the Forest Department in planning, protection, afforestation.

iii) To help the F.D. in judicious use, of all existing rights and sharing of usufructs, eco-development of the area as per approved management plan.

20. 14.2 Responsibilities of JFM Committees

It will be the responsibility of committee to ensure:

i) Just and fair distribution of the usufructs derived.

ii) Ensure its management as per prescribed norms.

iii) Settlement of all disputes between villagers

iv) To honor all commitments.

20.15 Power to JFMCs

The committee should make its own bye-law with the concurrence DFO. The concerned DFO should carry out necessary procedure for granting powers of a forest officer as mentioned in HPPFM regulations, 2001.

i) Power to register Damage report.

ii) Power to summon the accused to the general house of JFMC.

iii) Make recommendations to Range officer regarding compounding of damage in respect of offences committed on JFMC areas.

20.16 MOU between Forest Department and JFMCs

20.16.1 In the participatory mode, the scheme is being implemented by setting up Forest department agency (FDA) at Forest division level and JFMC at village level. As per the notified regulation titled HPPFM regulations, 2001 notified vide no. Fts. IIB/15-10/87 dated 23.8.2001, MOUs were signed between State Govt. represented by DFO of Forest Division in which FDA is being implemented and JFMC through its president during November 2009. Govt. of H.P has approved this MOU after getting vetted from the law Department the copy of which is annexed as Appendix-XV. This MOU shall be valid for a period of five years from the date of signing as per terms and conditions detailed in the MOU for proper protection, maintenance, regeneration and management of plantation created under FDA and other forestry schemes within the jurisdiction of the JFMC.

20.16.2 In addition, a MOU has been signed between Forest Department and JFMCs for fire protection. No fire watcher is engaged in the area of JFMC. Further, a provision of honorarium/ assistance has been made to be paid to JFMCs for doing excellent works in fire fighting.

20.17 NTFPs

20.17.1 JFMCs can play an important role, in collection, marketing and propagation of NTFPs. Many villagers are dependent on collection of NTFPs to sustain their livelihood. So there is need to introduce such medicinal plants in the locality of JFM.

20.17.2 The JFM activities would concentrate on NTFP management and no alteration should be permitted in the basic silvicultural prescription but to promote regeneration, development and sustainable harvesting of following NTFPs:

i) Medicinal and aromatic plants

ii) Grasses

iii) Fiber and flosses

iv) Tans and dyes

v) Gums and resin etc.

20. 18 Development of Technology for Value Added Products

There is a lot of scope for development of technology for value added products. Various NTFPs are growing in the vicinity of JFMCs area. The value of original products collected directly from the forest is very less but if it is processed the value goes 2-4 time more than the original one. For example, Anardana, Amla Pickles, Murabba, Jam, Squash etc.

20.19 Eco Tourism

There is need to develop specific sites for eco-tourism in JFM localities. Through various projects like stay home scheme, traditional food/ Ethnic food serving etc. through eco-tourism the villagers not only get employment but self business will raise their income and it will become a source of livelihood.

20.20 Vermi Composting

Almost each JFMCs member has domestic animals. So they are dependent on forest for grazing of animals, collection of grass and fodder from forests. By collecting leaves and grasses for preparing vermicompost the villagers can manufacture vermicompost at their door steps. Thus through training for preparation of vermicompost to the JFMCs members' large amount of vermi compost can be prepared and sold in market in view of its large demand. This activity will definitely increase the agricultural and horticultural production. Moreover, this will help to save and protect the micro and macro natural nutrients of the soil which will subside the adverse effects of use of artificial fertilizers, and therefore will go in the long run to boost the economy of local people and raising their living standard.

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CHAPTER-XXI

MISCELLANEOUS REGULATION

21.1 Petty felling:-

The fellings whose produce does not exceed Rs. 4000/- in value are defined as petty fellings. These are allowed by the Divisional Forest Officer. The removals should be accounted in control forms. The following are considered as petty fellings.

i) Trees may be marked to the local *zamindars* to meet their legitimate and bonafide timber requirements as per the rights mentioned are *Faisla-e-Janglat*. It is emphasized that the marking office should strictly follow the slivicultural principles.

ii) Green trees required for special tests at ICFRE or elsewhere.

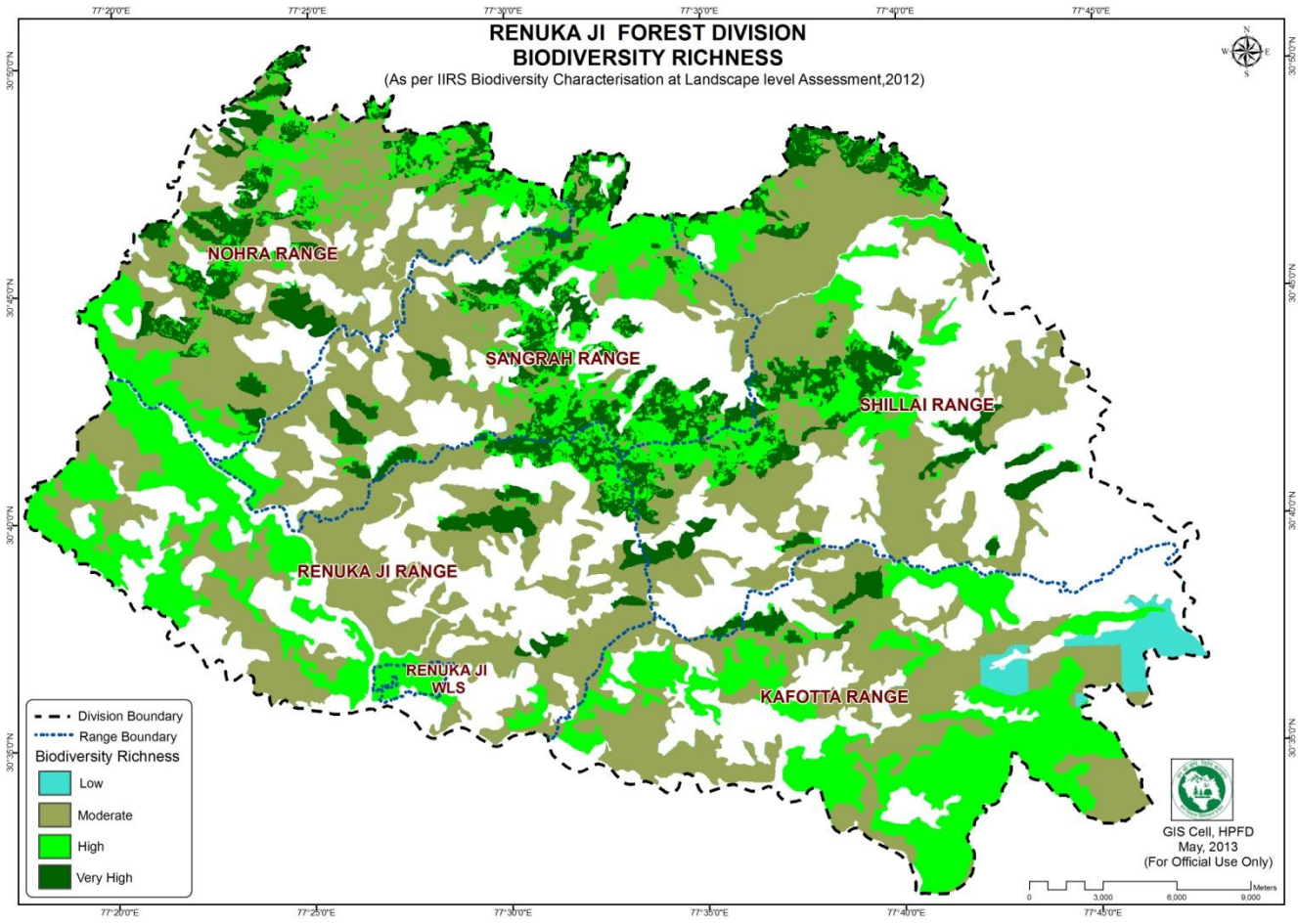
iii) Trees required for departmental use that is construction of bridges and buildings and manufacture of charcoal.

iv) Dry or green trees required to meet special free grants where property is destroyed due to natural calamities.

v) Tree coming in alignment of roads, widening or roads, erection for transmission lines, hydel projects and other development works.

vi) In case of fungal diseases, insect attack independent permission of the competent authority is required to remove the trees for commercial fellings.

A map of bio-diversity richness is being given as under:



21.2 Deviation and Salvage Markings: -

All fellings not covered by the provisions of this plan will constitute a deviation. Sanction for all deviations from the prescription of the working plan shall be obtained from the competent authority well in time. The salvage marking should be, however, carried out as per latest instructions regarding salvage marking issued by the Pr. CCF, H.P. Only fallen and dry are to be counted as salvage. The instructions are appended in Appendix-XVII.

The forests are under stocked. In cases of heavy salvage removals, the proportionate area shall be taken for regeneration operations irrespective of its allotment.

21.3 Nautors:

Nautors have been granted to the villagers on easier slopes and flat tops of spurs and even inside the forest at the time of settlement by ears while Sirmour Darbar during 1961-62 to 1975-76. Subsequently Deputy Commissioner on the recommendations of Divisional forest officer was empowered to grant nautor. The promulgation of the forest conservation Act, 1980 prohibited the use of forest land for non-

forestry purposes except with the approval the central government. Therefore, it is suggested that no forest land should be recommended for Nautors.

21.4 Lopping:

The lopping of Khair, Oak, Chil, Deodar and Kail has been indiscriminate especially near habitations. The regeneration in form of poles is heavily lopped which effects the growth adversely. Even for seed collection the trees are lopped to the last tip. Indiscriminate loppi9ng should be discourage and stopped

21.5 Road and Paths:

There has been considerable construction of roads. Majority of the forest can be visited by motor able roads. However, many forests still remain far away from the motorabale roads and there are no proposals for new roads in near future. However, following inspection paths are suggested to facilitate in the inspection and protection of forest.

Name of Range	Name of Inspection path	Approximate length (kms)
Sangrah	Lajwa-Kota Pab	25
	Kota Pab-Koti Dhiman	5
Shillai	Haripurdhar- Khalandon	10
	Khalandon-Koti BonchRonhat	15
	Ronhan – Manal	12
	Manal –Katara Shillai	18
Nohra	Taunda- Seun	10
	Seun- Sangrah	5
	Taunda-Khurkhana	10
Kaffota	Pamta- Nagali	10
	Nigali- Sewa	5

21.6 Building:

The list of existing building has been given in Appendix XXIV. These buildings need maintenance. Very old buildings should be written off.

The condition of residential buildings for field staff is poor. Effective touring therefore becomes difficult for protecting staff, therefore construction of following new building is suggested:-

Name of Range	Type of building	No.	Location
Sri Renuka Ji	ACF office	1	Renuka Ji
	Type-I Quarter	4	Renuka Ji
	B.O Quarter	1	Kotidhaman
	Range Rest Room(5 sets)	1	Renuka Ji

	Rest house	1	Renuka Ji
Sangrah	F.G hut	3	Haripurdhar,Bhalar and Kajwa
	Inspection Hut	1	Kajwa
	Range Rest Room(3 sets)	1	Sangrah
Shillai	B.O Quarter	1	Ronhat
	F.G Hut	4	Kotapab, , Kiari Gunda,Loza Manal &Panog
	Inspection hut	1	Khaladon
	Range Rest room (3 sets)	1	Shillai
Kaffota	B.O Quarter	1	Ambon
	F.G Hut	2	Jamna, Gabaar
	Range Rest room (3 sets)	1	Kaffota
	Inspection Hut	2	Tatiyana
Nohra	B.O Quarter	1	Bogdhar
	F.G Hut	4	Priyadhar, Chunvi, Bandal, Bhujond
	Range Rest Room(3 sets)	1	Nohra
	Inspection hut	3	Taunda

21.7 Survey, Demarcation and settlement:

The survey sheets on 1:50000 and 1:15000 by survey of India are available. The 1:15000 sheets depict the boundary pillars. Collector (forest), Nahan be requested to demarcate all boundary pillars on ground. The forward and backward bearings from pillar to pillar of all forests should be recorded and boundary pillars serially numbered. This operation should be completed immediately. The S*hamlats* handed over to the department be declared as DPFs after proper settlement.

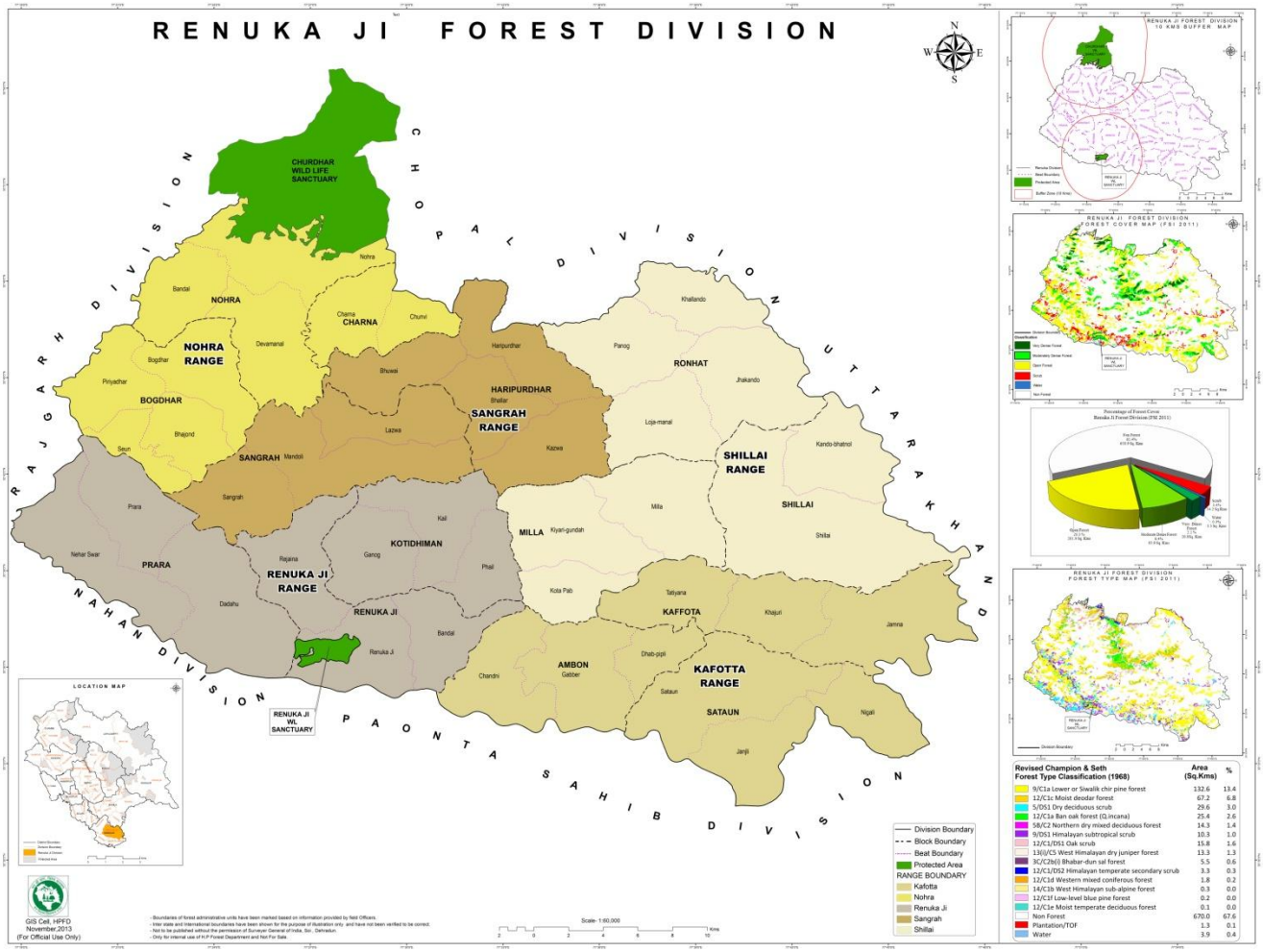
21.8 Boundary Registers:

Some of the Boundary Registers are not maintained. The boundary registers for Reserved, Protected and Musterqua forests should be maintained as per instructions of PCCF.

21.9 Maintenance of Boundaries and Construction of Boundary Pillars:

During the inspection of forests for writing of compartment description and stock mapping most of the boundary pillars of included *chaks* and along private and *Shamlats* lands were missing. The boundaries of these forests are not clear. It is prescribed that boundary pillars of the forests are checked and boundary pillars erected at correct places in consultation with settlement staff. It is also prescribed that all the boundary pillars be checked at least annually during the months of October/.November by the forests guards and boundary pillars of minimum 5-5 forests be re checked during February/ March by the Deputy Rangers and report submitted through RO to the DFO. The work will be monitored by the CCF Working plan & settlement.

An administrative map is being given as under:



21.10 Periodic repair of boundary pillars:

Apart from the usual repair to be carried out as and when necessary, a periodic special drive for the repair of boundary pillars is also prescribed. For this purpose a quinquennial program for the checking and repair of boundary pillars of forests has been laid down as given in Appendix XXV.

21.11 Maintenance of Revenue Maps and demarcation record:

Revenue maps and demarcation record prepared at the time of settlement of forest shall be maintained Mauza/forest wise. In case of dispute of boundary of any forest the revenue record shall be considered as final.

21.12 Compartment Boundaries

All compartment boundaries have been shown on management map/stock maps. Sign boards indicating name of compartment should be displayed in field.

21.13 Survey Sheets

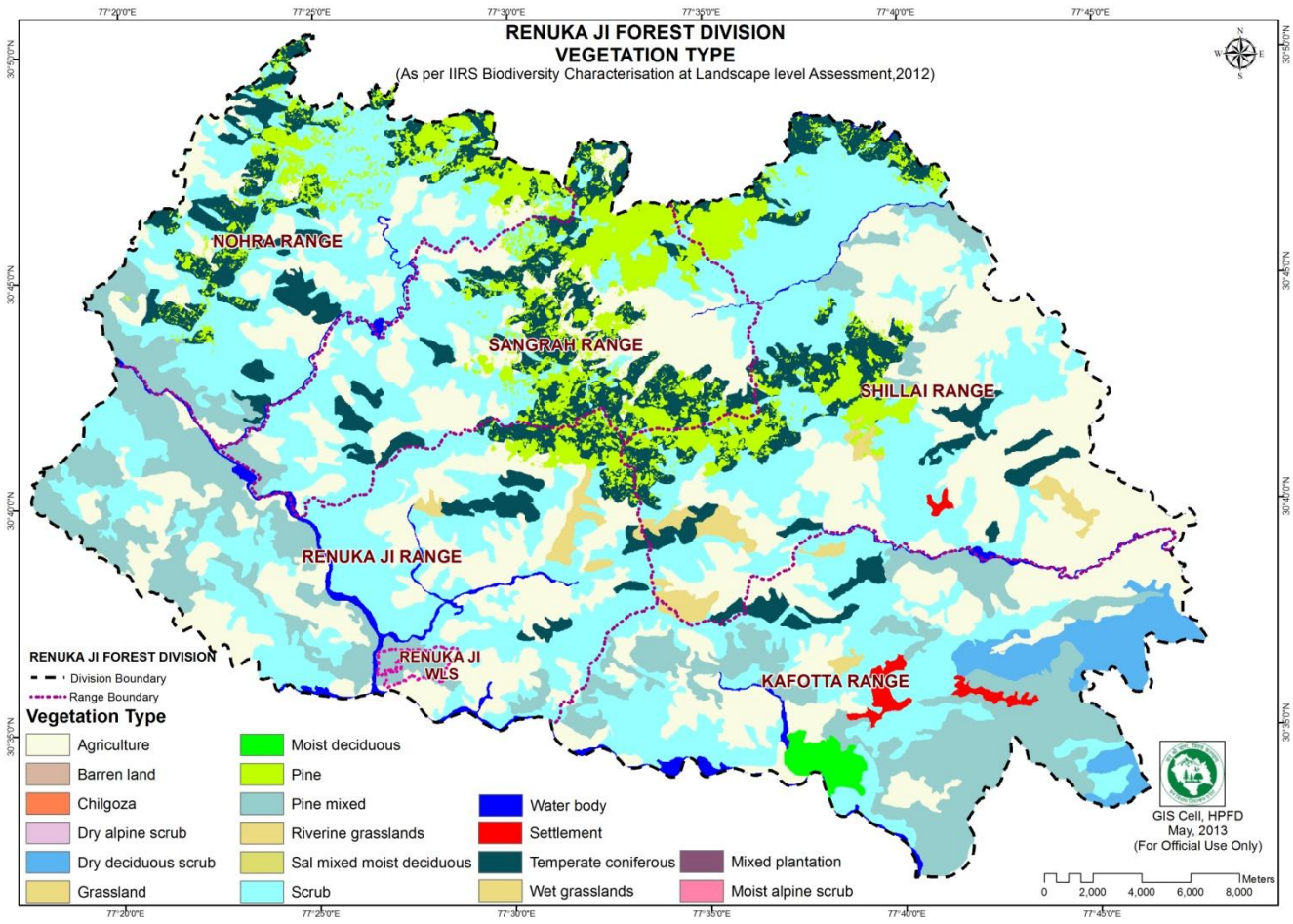
The management maps on 1:15000 scales and stock map on 1:50000 scales have been prepared. The survey sheets of both the scales are available in CF and DFO office.

21.14 Compartment History files:

The compartment his files have been brought up to date.

21.15 Regeneration survey:

Preparation of regeneration survey maps on 1:3750 scale have been provided for each working circle. This be done at the earliest. A map of vegetation types is being given hereunder:



21.16 Weather data equipment:

There are no equipments available for rainfall, temperature, snowfall, humidity and wind speed. It is suggested that, Divisional Head quarters and Range head quarters should be provided with a weather station for record all weather data. It is suggested to install rain gauge, wet and dry thermometer, wind speed guage and humidity gauges at Range Head quarters.

21.17 Midterm appraisals:

It is also laid down that interim reviews after every five years will be carried out. For this purpose a committee should be formed comprising of CCF working plan and settlement, CF Central (GOI), CF Nahan and DFO Renuka. The committee should monitor the implementation of the various prescriptions and suggestions study their results and make suitable recommendations

21.18 Pilot project for Rotational lopping of Ban Oak in Sri Renuka Ji Forest Division under Joint Forest Management:

During the field inspections it was found that some villages have adopted the rotational closures for ban oak lopping. The forests are lopped on a rotation of 4 years. It was observed that this method is working satisfactorily and on one hand the leaf production in increased, many of the forests have rejuvenated on the other. The practices followed in Nohra, parts of Shillai and Sangrah Ranges. It is suggested that the scheme of rotational closure be applied to all other areas of the division under joint forest management. It is needless to say that dur to increase fodder production there should be no hitch in allowing green fellings (Silvicultural fellings) in Ban forests. A detailed pilot project be framed and got approved from the competent authority.

21.19 Preservation plots/Monumental Trees.

i) Ban Oak: (R) 45 Ghatoun forest is the biggest and most dense forest in Renuka. It has 24 compartments and an area of 1595.60 ha. The various compartments support crops of Ban, Chil, Fir and Spruce. The Ban Oak is up to 6 M. Girth in thickness. Such trees should be preserved as monumental trees. The entry has been made in the compartment history file as well.

ii) Sacred Gove: (R) 16 Gatlog has 6 compartments with an area of 320.45 ha. Compartment C-3 enroots Seun Taunda bridle path supports a patch of Chaal which has not been felled. Villagers have a belief that this patch is sacred and no fellings/removals are done. This should be preserved as a 'Sacred Grove, as per the practice in North East. People should also be motivated to preserve certain other patches of forests for posterity.

21.20 Deodar plantations in Nigali forest:

Nigali forest has been taken up for the planting of deodar since 1962. These plantations have been raised very successfully. Deodar is at very low elevation but has survived well due to the aspect. These plantations may need some cleaning and thinning of better growth. DFO may check out scheme for the same and get it approved from the competent authority.

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CHAPTER -XXII
BIODIVERSITY CONSERRVATION &NON TIMBER FOREST PRODUCE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

22.1 General Constitution

Forests are not only source of commercial timber but are rich in valuable Non Timber Forest Produce. The present National forest policy of 1988 lays special stress on meeting the requirement of rural and tribal populations. The rights and concessions from forests should primarily be for the bonafide use of the communities living within and around forest areas and their rights should be fully protected. The Govt. of India has enacted. The Scheduled Tribes And Other Traditional Forest Dwellers (Recognition Of Forest Rights) Act, 2006 and Scheduled Tribes And Other Traditional Forest Dwellers (Recognition Of Forest Rights) Rules 2008 to recognize and vest the forest rights and occupation in forest dwelling Schedule Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose right could not be recorded; to provide for a frame work for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. Therefore meeting the domestic requirement of fuel wood, fodder, medicinal plants and NTFPs would be the first priority.

22.1.1 The area of this working Circle is equal to 27365.75 ha of Renuka Ji Division. This would be an overlapping working circle covering all the working circles and is constituted to ensure systematic development and exploitation of non timber forest produce species that occurs in the division. The main non timber forest produce found/extracted in the division are Guchhi, Banaksha, Resin, Medicinal plants, grasses, Anardana etc. The main emphasis/focus would be on medicinal plants.

22.1.2 The forests covered under this working plan have plenty of species giving minor forest produce like resin, medicinal plants, tannins, and grasses and many other important MFPs (NTFPs). The NTFP species occur throughout the tract, both in the forests and non forest area. A lot needs to be done in the field of conservation, development and management of NTFPs. This would be in accordance with the National Forests Policy of 1988, wherein conservation and propagation of NTFPs and their contribution towards the local economy have been given due recognition and emphasis. In Renuka Ji Forest Division, resin, medicinal plants, bamboos, tannins and grasses are the important NTFPs cultivation propagation, harvesting and trading of which can boost the economy of local people to a great extent. Information on medicinal plants is not readily available and there is a need to study and document the occurrence, yield estimates, exploitation and marketing of valuable medicinal plants in the division.

22.2 Special Objects of Management

The State has formulated Himachal Pradesh Forestry Sector Medicinal Plants Policy, 2006 which is aimed at conserving and strengthening medicinal plant resources based in forest areas as well as outside for use towards enhancing, economy, health and livelihood security of the people of the State on sustainable basis. The special objects of management would be:

i) To conserve and augment existing non timber forest produce including medicinal plants resource in its natural habitat i.e. in situ conservation.

ii) To encourage cultivation of commercially important species of medicinal plants on private lands ex-situ conservation.

iii) To develop a system of marketing even the concept of MIS like agricultural crops can be followed through Forest Development Corporation for wild harvest so as to reflect both the conservation costs and the community benefits and especially for adoption of cultivation on wasteland/additional land by farmers.

iv) To encourage public-private-community partnership for building capacity for cultivation, value addition and processing of raw material before export from the state so that load on extraction is reduced.

v) To promote the manufacture of essential oil, pharmaceutical cruet extract, herbal medicines for commercial use. There are 19 manufacturers in Himachal Pradesh who are manufacturing essential oil, phytochemicals, crude extract, herb traders & growers which is given in the table below:

MANUFACTURER OF ESSENTIAL OIL, PHYTOCHEMICALS, CRUDE EXTRACT, HERB TRADERS & GROWERS IN HIMACHAL PRADESH.

Sr.No.	Name & address of manufactures	Products
1.	Mr. Surender Mohan, M/S Hari Industries, Baggi, Distt. Mandi-175027 (H.P.)	Mfr. Essential Oil & Herb Extracts & Oleoresin
2.	Mr. Jitender Sodhi, Ayush Herbs, 25 Phase I, Ind. Area NagrotaBagwan, Kangra,	Mfr. Phytochemicals, Herbs Extracts & Herbal Medicine.
3.	Manoj Nayer, M/S Namiex Chemicals (P) Ltd, Lodhwan, Nurpur, Distt. Kangra. (H.P.)	Phytochemicals
4	Mr. R. N. Kapoor, Grass root Industries, Plot No. 4 Phase III, I Area, Mandi.	Essential Oil
5.	Dr. Bimal Chander, M/S Kanha Aromatics, Vill& P.O. Seobagh, Distt. Kullu (H.P.)	Essential Oil

6.	Mr. Rajender Mohan, M/S Hitesh Aromatics, Vill. Nalsar, P.O. Baggi-175027, Distt. Mandi (H.P.)	Essential Oil
7.	Mr. Kailash Sharma, M/S Himalyan Lap Aromatics, Arsu, Distt. Kullu (H.P.)	Essential Oil
8.	Mr. Hans Raj Rana, M/S Mhamaya Traders, Vill. Salahar, P.O. Devdhar, Distt. Mandi-175029 (H.P.)	Cultivator large scale Crop of Medicinal & Aromatic Plants.
9.	Dr. Lal Singh, Director, Himalyan Research Group, Umesh Bhawan, Chotta Shimla, Shimla- 171002.	Cultivator & N.G.O.
10	Mr. Govind Goswami, Naina Aromatics Industry, Sakroha, Distt. Mandi (H.P.)	Essential Oil & Herb Extract
11	Manoj Gupta, M/S Himalyan Herbal Extracts, Vill. Tawan, P.O. Dhawan, Distt. Mandi (H.P.)	Essential Oil & Herb Extract
12	Mr. Vikas Gupta, M/S Sant Bhama Enterprises, Baggi-175027, & Herb Extract Distt. Mandi.(H.P.) E-Mail: sant I @sancharnet.in	Mfr. & Exporter Essential Oil
13.	M/S MediromaNirgalits International, H.40, Industrial Area Shamshi, Distt. Kullu(H.P.)-175126.	Essential Oil and Aromatherapy
14.	Mr. Madan Awasthi, Awasthi Cottage,Manali, Distt. Kullu(H.P.)	Cultivator
15.	Mr.K.G. Butail, Vill. Sungal, P.O. Sungal Tea Estate, Palampur (H.P.)- 176061.	Cultivator & Mfr. Essential Oil
16.	Mr.Shiv Bhushan, R.T. Aromatics E.O. Pvt., Ltd., Una, Distt. Una (H.P.)	Essential Oil
17.	Mr.B.M.Sood, Himachal Pharmaceutical, Ind. Area Distt. Kangra, Kandaruri, 176402.	Phytochemicals
18.	M/S Natraj Industries, Vill. & P.O. Badhu, Distt. Mandi (H.P.)	Essential Oil
19.	Mr. Vijay Kumar Sharma, Mountainous Herb (P) Ltd. Plot No.4, Phase III, I Area Rati. Distt. Mandi (H.P.)	Essential Oil

Source: A training manual for Forest Officers year 2005, a publication by institute of Himalayan Bio-Resources Technology Palmpur (H.P.)

vi) To maximize yield of medicinal plants through sustainable natural and artificial regeneration and scientific exploitation.

22.3 Blocks and Compartments

The entire tract of the division will be covered by taking beat as a unit.

22.4 Area Statement

This is overlapping working circle spreading over the entire tract of this plan hence, no area statement is required.

22.5 Analysis and Valuation of the Crop

The entire tract is rich in many useful herbs, shrubs and trees which are being exploited since decades. The area produces large quantities of Guchhi, Banaksha, Shigli, Mingli and Anardana etc. A list of commonly used or economically extracted medicinal herbs, plants occurring naturally are given in table-22.1.

Table -22.1

List of Medicinal Herbs, Shrubs and Trees of Renuka Ji Forest Division

S. N.	Botanical Name	Common Name	Habit	Occurrence Zone	Uses
1	*Aconitum heterophyllum*	Atis	Herb	Sub alpine	Root- antipyretic used in diarrhea and cough.
2	*Angelica glauca*	Chora	Herb	Above 2200m	A stimulant, used in constipation
3	*Aloe vera*	Ghea Quwanr	Shrub	Upto 1200m	Plant is stomachic, purgative, anthelmintic used in pile and rectal fissures dried Juice has cooling effect, useful in fevers.
4	*Emblica officinalis*	Amla	Tree	Upto 1200m	Fruits-acrid, diuretic, laxative. Dried fruit used in hemorrhages, diarrhea, dysentery, jaundice and dyspepsia
5	*Berbrisaristata*	Kashmal	Shrub	1800-3200m	Root, Bark extract known as Rasaunt used in skin diseases, jaundice and in eye infection.
6	*Cannabis sativa*	Bhang	Herb	Up to 1600m	Leaves used as a tonic, intoxicant, antispasmodic, analgesic and narcotic.
7	*Dioscoreadeltoide a*	Shingliming li	Climber	Upto 2200m	Tuber used to kill lice, produces diosgenin a sterolidal drug.

8	*Morchella esculenta*	Guchhi	Fungi	1500-2500m	Used as delicious dish.
9	*Myrica nagi*	Kaphal	Tree	1000-2100 m	Edible Fruit
10	*Dactylorhizahata girea*	Salam Panja	Herb	Above 3000m	Roots
11	*Gentiana kurroo*	Karoo	Herb	Sporadic to alpine to sub alpine meadows, at lower altitude 20003	Roots-Stomachic, febrifuge used in urinary infections.
12	*Pistacia integerrima*	Kakar-singhi	Tree	Up to 1500m	Used as tonic, expectorant, in coughs and asthma
13	*Podophyllum emodi*	Bankakri	Herb	Above 2200m	Rhizome and roots are purgative specially used in uterine cancer.
14	*Polygonatumvati cilatum*	Salam Mishri	Herb	2300-3000m	Leaves
15	*Rhododendron arboreum*	Buras	Tree	1200-2400m	Young Leaves- useful for headache, flower used for chatni and juice making.
16	*Rhododendron campanulatum*	Kali Jarri	Tree	Sub alpine	Leaves-Used in rheumatism, sciatica, syphilis.
17	*Bergenia ligulata*	Pathar Tor	Shrub	1800m & above	Whole plant.
18	*Taxus baccata*	Rakhal	Tree	2400-3000m	Fruits and leaves selective, antispasmodic, leaves used in asthma, bronchitis, cough and epilepsy.
19	*Thymus serphyllum*	Ban ajwain	Herb	1200-1800m	Given in complaint of stomach and liver oil-applied toothache.
20	*Viola odoreada*	Banafsha	Herb	1000-3000m	Plant has antipyretic
21	*Valeriana wallichii*	Mushakbala	Herb	2100-3000m	Root stock
22	*Bauhinia*	Kachnar		Upto 1200m	Bark used as tonic, astringent, useful in skin diseases. Dried bark for dysentery piles, diahhrhea. Decoction of roots used in dyspepsica.
23	*Cynodondactylon*	Doob	Herb	Cosmopolitan	De-cocktation of root is diuretic used in dropsy. Infusion of root used in bleeding from piles. Juice of plant is astringent used as in application to fresh cutss.
24	*Daturametal*				
25	*Meliaazedaredcha*	Bakain (Darek)	Tree	Upto 1200m	Root, Bark/Fruit/ Flowers/ Leaves- Deodorant, Flowers

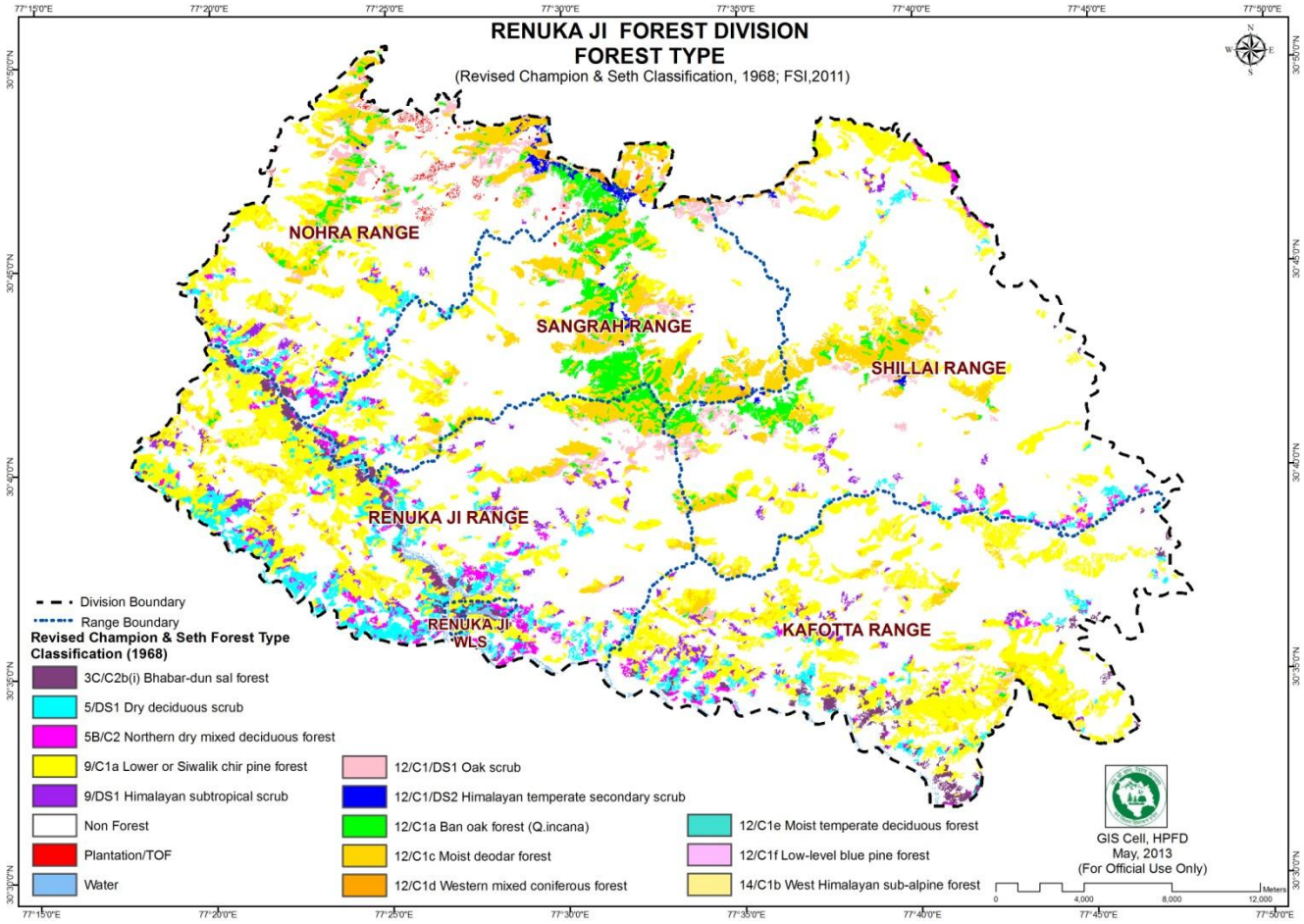
					and leaves applied as a poultice to relive nerves headaches, Seeds- used in remeterisum.
26	*Mentha spicata*	Pahari Pudina	Herb	Cultivated in middle and lower	Used in Bronchitis and fever. Herb used as Stimulant, carminative and anticpecimodic
27	*Ocimum sanctum*	Tulsi	Herb	1800m	Leaves used as expectorant, Juice of leaves used in bronchitis, gastric disorders. Seeds- Demulcent , given in urinal treatments
28	*Rosa damascena*	Gulab	Herb	Sub mountain hills to high hills temperate wet.	Petals-applied externally as astringent. Gulukand which is used as tonic
29	*Rosa moschata*	Kujai Gulab	Herb	Upto 2500m	Patels- beneficial in burning of skin and in eye diseases
30	*Sapindusmukorossi*	Ritha	Tree	Upto 1300 m	Fruits-Expectorant, used in epilepsy.
31	*Tagetes erecta*	Gainda	Herb	Available throughout in division	Flowers-Used in eye diseases for unhealthy ulcers, purifies blood. Leaves used in application boils.
32	*Tinospora cordifolia*	Giloi		Upto 1200 m	Stem-Stomachic, antipyretic, starch from roots and stem- used in diarrhea and dysentery.
33	*Fegopyrumeuculentum*	Kutt			
34	*Prunus armeniaca*	Khumani	Tree	Upto 2500 m	Dytro- used as laxative
35	*Prinsepia utilis*	Bhekhal		Upto 3000m	Oil from the seeds-applied externally for erhumatihm
36	*Punica granatum*	Daru	Tree	1000-2000 m	Seeds-stomachic
37	*Rosa damascena*	Gulab		Found in mid hills	Patles- applied as extrigentle
38	*Swertia angustifolia*	Pahari chirata		1600-3000m	Plant-Bitter, tonic, stomachic laxative used in jaundice
39	*Artitemisavalugeris*		Herb	Upto 4000 m	Antispasmodic. Flowering tops used in asthma and brain diseases.
40	*Asparagus adscendens*	Shatavari		1600-2600m	Root-Demulcent, used as tonic.
41	*Cedrus deodara*	Deodar	Tree	2200-2800m	It's essential oil have antiseptic properties

42	*Delphinium denudatum*	Nirbissi	Shrub	1500-2000 m	Root-Bitter, used to toothache.
43	*Cotoneaster microphulia*	Mangu	Shrub		Branches used for making baskets. Leaf and fruit extract taken in diarrhea.
44	*Verbascum thapsus*	Jungli Tobacco	Herb	1800-3000m	Leaf juice applied to check bleeding, believed to be poisonous to livestock.

Source: A training manual for Forest Officers year 2005, a publication by institute of Himalayan Bio-Resources Technology Palmpur (H.P.)

22.6 Stock Maps

As the medicinal plants are mostly herbs and shrubs found on annual or perennial basis, stock mapping is not possible due to scattered occurrence.. A map showing Forest types is being reproduced as under:



22.7 Methods of Treatment

22.7.1 Rotational Extraction

Unscientific and unsystematic extraction of medicinal plants is likely to reduce the yield and quality of the plants and may even lead to extinction of the species. A four year extraction cycle of the medicinal plants is proposed and extended to the plan period as given in the table-22.2.

Table-22.2
Cycle of Extraction of Medicinal Plants, Herbs, Shrubs and Trees

Range	Block	Year of Extraction
Renuka Ji	Renuka Ji	2021-22, 2025-26, 2029-30
	Parara	2022-23, 2026-27, 2030-31
	Kotidhiman	2023-24, 2027-28
Sangrah	Sangrah	2021-22, 2025-26, 2029-30
	Haripurdhar	2022-23, 2026-27, 2030-31
Nohra	Nohra	2021-22, 2025-26, 2029-30
	Charna	2022-23, 2026-27, 2030-31
	Bogdhar	2023-24, 2027-28
Kaffota	Kaffota	2021-22, 2025-26, 2029-30
	Ambon	2022-23, 2026-27, 2030-31
	Sataun	2023-24, 2027-28
Shillai	Shillai	2021-22, 2025-26, 2030-31
	Ronhat	2022-23, 2026-27, 2030-31
	Milla	2023-24, 2027-28

22.7.2 In case of Daru-seed/ Anardana, annual extraction through village communities is proposed.

22.8 Artificial Propagation and Conservation

Keeping in view the economic importance and demand of medicinal herbs, it is desirable to encourage naturally occurring medicinal plants and other NTFP in suitable localities. The demand of medicinal plants have picked up with setting up of pharmaceutical industries in the State. The existing germplasm of different herbs endemic to the division needs to be conserved. Following measures are suggested for the conservation, protection and propagation of medicinal plants.

i) Enthobotanical Survey for area of existence of various important usable NTFP along with established usage of different medicinal & aromatic plants.

ii) Systematic rotational collection should be followed strictly on three year basis as above.

iii) Heavy grazing and destruction of medicinal herbs should be checked as these species do not produce sufficient seeds/vegetative form of regeneration. Closure for biotic interference will be followed in specific area, range-wise.

iv) The raising of nurseries/herbal garden, drug farms should be developed through various research institutes like HFRI, UHF, Nauni, HPKVV Palampur, CSIR Palampur, Ayurveda department who are

engaged in medicinal and aromatic plants. Three such gardens are proposed in lower, middle & higher altitude of the Division, one in five year term basis after survey & site selection.

v) Medicinal plant collectors should be educated and provided proper information or guidelines so that there is continuous regeneration of medicinal herbs and threatened plants are propagated ex- situ & planted in forests.

vi) The community based organizations like Mahila Mandals, Yuvak Mandals, VFDCs and other rural co-operatives should be involved in the development, protection, propagation and conservation of medicinal plants.

vii) Exposure visit & training be arranged for such community based institution along with liaison with Agriculture & Ayurveda Department of the State.

22.9 Propagation Technique

Whereas method of propagation and harvesting of important plants be standardized after research in puts, the technique of propagation and harvesting of some important plants is described as detailed in table-22.3

Table-22.3
Method of Propagation of Medicinal Plants

Name	Method of Propagation	Harvesting/Collection	Uses
Artemisia nilagirica	The seeds are minute. The sowing is done in Feb. /March. Seedlings are transplanted in June-July in pits at a spacing of 0.5m×0.5m.	The crop is harvested in October when the plants flower.	The flowers are used in extraction of drug used as wormicide.
Acorus calamus	The species is propagated by sowing as well as planting rhizomes at 15m deep at 30cm×30cm spacing during Feb.-March. If direct sowing is decided, then the soil is worked up to a depth of 15 cm. Sowing is done in patches which may be spaced at 30cm×30cm.	Harvesting is done after one year during Nov.-Dec.	The dried zhizome is generally used in the form of infusion. It produces best results in case of dyspepsia and chronic 305ehavior.
Aconitum heterophyllum	The species is propagated by direct sowing in patches at 30cm×30cm during Feb.-March.	Roots are dug out in the month of Oct.-Nov.	Roots are used as astringent, tonic and in 305ehavior, cough.

Angelica glauca	The species is easily propagated by sowing in patches at spacing of 3′×3′. Sowing is carried out in Feb.-March.	Collection/harvesting is done in Sep.-Oct.	Roots, fruits used for flavouring. Used in medicines for digestion, heart burn, flatulence.
Dioscoreadeltoidea	It is propagated by planting rhizomes in 15cm deep pit at the spacing of 60cm×45cm during March. About 15-18 Qtls. Of rhizomes are required for one hectare area.	Tubers are dug out in Nov.-Dec.	Tubers yield steroidal sapogenin which is a source for manufacture of oral contraceptive.
Heracleum candicans	The species is propagated by seeds and root cuttings. Seeds @ 10-15 Kg/ha are required. The root cuttings 2.5cm to 4 cm long should be planted in 30 cm deep pits at a spacing of 75cm×50cm in March-Apr.	After one year, the roots/tubers are dug in Oct.-Nov.	Roots are source of xanthotoxin, a furocoumarin which is used in treatment of leucoderma, fruits as aphrodiasic&nerve tonic
Podophyllum emodi	The rhizomes are planted in 15cm deep pits in the zone of natural occurrence. The seeds germinate in about 3 years but if sowing is done in bores at low altitudes, it can germinate in 6 months, then the seedlings can be taken to sub alpine region and transplanted.	The rhizomes are collected when fully developed.	
Picrorhizakurroa	It is easily propagated by planting rhizomes in 15 cm deep pits at a spacing of 60cm×60cm during Nov.-Dec.	Collection is done after 3-5 years when rhizomes are fully developed.	Roots are used as stomachic, tonic, improve appetite and stimulate gastric secretion.
Swertia chirata	It is propagated by sowing of seeds in patches at a spacing of 30cm×30cm during Feb.-March.	Harvesting is done in following November-December.	The dried plant yields drug used as tonic, stomachic, bronchial asthma & liver disorders.
Valeriana wallichii	The species is propagated by direct sowing or planting rhizomes in 15 cm deep pits at espacement of 30cm×30cm during	Rhizomes are dug out after 3-5 years when fully developed.	Dried rhizomes are employed for hair and perfumes, as incense and in drugs for hysteria

	Feb.-March. About 25-40 Qtls.of root stock is sufficient for one hectare.		and nervous problems.
Viola serpens	The species is propagated by sowing or planting root suckers at a spacing of 15cm×15cm during June-July.	Flowers are collected in Feb.-March in low lying area and in April-May in higher reaches.	Used for lung trouble, eye and ear diseases. Also used as blood purifier.

22.10 Other Non Timber Forest Producing Plants/ Products

In terms of local extraction of NTFPs, the most extracted species (by quantity) is Guchhi (*Morchella esculenta*). Due to transfer of export permit power of about 51 species to Panchayats the record of extraction of such spp. is not available readily but efforts be made to keep such record of extraction & export at least at Range & Block level in future.

22.11 Fungi

The forest area of this Division is very rich in a variety of Fungi, which consists of large number of edible or non-edible fungi. The non-edible fungi have many complex organic chemical compounds, which are of great medicinal value. The most important of all the fungi are Morchella species, which are commonly known as Guchhi. These are collected, dried and exported out and are discussed in detail below:-

The most common Morchella species

i) *Morchella deliciosa.*

ii) *Morchella esculenta.*

iii) *Morchellaconica.*

These grow naturally in the forest areas immediately after snow melting during the month of April and May. These are found mostly in the moderately dense forests, with deep fertile soil where these get the required nutrients from the humus. This is important Minor Forest Produce, which play an important role in the village economy in the area.

22.12 Action on General NTFP Conservation

i) A study to answer the questions raised must be commissioned as early as possible through research Institutes.

ii) Participatory Action Research (PAR) study be undertaken to evolve and adopt and monitor non destructive ways of harvesting all species, as mostly extraction is done by labourers who is uneducated & may not be able to identify the right species.

iii) NTFPs should be raised in large numbers in nurseries, as it is a very versatile species for use in Bio-engineering as well as for *ex-situ* conservation of germplasm.

22.13 Future Line of Action

Medicinal plants trade has tremendously expended worldwide, particularly during the last decade and this momentum is likely to be increased. This has necessitated especially in forest sector to adopt scientifically organized cultivation and propagation and processing of medicinal plants. Consequently efforts are needed to develop methods for *in-situ* propagation either in forest itself or *ex-situ* cultivation. There is a close relationship between the forest and pharmaceuticals and all efforts are to be made regarding **"Propagation, Value Addition and Market Linkage of Medicinal Plants".**The training, workshops and seminars organized by National Bio-Resource Development Board, Govt. of India, New Delhi and IHBT Palampur can prove very effective and helpful in promoting relevant technologies to conserve Bio-Resource gene pool comprising important medicinal plants in forests of Renuka Ji Forest Division. To promote the cultivation, propagation, harvesting and trading of which can boost the economy of local people to a great extent. Following steps, are required to be initiated:

i) Immediate steps should be taken to identify the status of medicinal and aromatic plants found in the division.

ii) For the important drug yielding plants, detailed scientific investigation is necessary for evolving better methods of cultivation, processing etc. that are most profitable to those who undertake their cultivation as also the chemical screening of such plants.

iii) Large scale cultivation of medicinal and aromatic plants should be encouraged so that their ruthless exploitation from the natural zone is checked.

iv) In-situ conservation of medicinal and aromatic plants by regulating their exploitation to a time-circle frame.

v) Proper training for identification, collection, storage handling and marketing should be arranged for local people. Formation of co-operatives will play an important role in eliminating the middleman and maximizing the returns.

vi) Public awareness programme should be launched amongst the local people regarding conservation of rare medicinal plants and to inculcate the concept of gene-pool reserve amongst them

vii) Nurseries and demonstration plots should be created at suitable places and from their planting stock of medicinal plants should be given to farmer at nominal rates as so to induce them to undertake the cultivation of these herbs on their holdings, where production of food crops is not economical.

viii) Compilation of traditional source of knowledge and information regarding identification and utilization of medicinal plants by local people is necessary to keep indigenous technical knowhow alive.

The NTFPs should be given the due thrust and species yielding them should be included in the plantation programme. Nurseries should raise sufficient stock of medicinal and other plants of economic importance and make them available to the local population desirous of planting them. With many JFM schemes being under operation in the division, the stakeholders should be encouraged to include such species in JFM micro plans. The rural people of the area still used to take plant based traditional medicines for health care. Since they are still produced using old methods, their quality, efficacy and self life gets adversely affected. Hence there is a need to introduce low cost, appropriate and simple technologies to encourage this dwindling practice and bring in additional income of rural households. Collection, processing, value addition and marketing aspects of NTFPs need to be studied and the forest department should provide all necessary help in this regard to training programmes on various aspects of NTFPs i.e. collection, refinement, value addition, storage and marketing should make growing and trading of NTFPs more remunerative.

22.14 Policy on Introduction of Medicinal Trees in Forests

It is now the state policy that in different plantations of the forest department about 30% of the trees being planted need to be of medicinal value and also native to the tract where plantation is being done. There is thus a need to identify and grow suitable medicinal trees for different altitudnal zones in addition to 32 spp. identified by NMPB (National Medicinal Plant Board, GoI) already to suit local conditions & as per consumption pattern in Renuka Ji Forest Division. In this Division the area below 1200m is marginally low and therefore some nursery stock of species like Amla, Bahunia, Bel, Kaphal need to be grown. However the major area of this division is between 1200 to 3360mts. Therefore species like *Taxus baccatta, Myrica nagi (kaphal), Walnut, Bird cherry, Horse chestnut* are to be encouraged. To make the plantation of these species successful it is required that these species be grown as tall plants in Polythene bags in the size of 20x12" before planting in the field.

A Database for consumption of NTFPs may be procured from local traditional dealers.

22.15 Calculation of Yield

No yield can be prescribed as the most NTFPs are extracted through right-holders. However, proper record of all the NTFPs extracted through Right Holders for which the export permit will be issued by the Department should be maintained in a separate register at Range level for each year. And its entry should be maintained annually and entered in respective compartment history files which will help in the geographical indication of different spp. in future and help to plan for their conservation in future.

22.16 Subsidiary Silvicultural Operations

No silviculture system as well as subsidiary operations are proposed, however, in situ as well as ex-situ conservation in herbal garden is proposed for important NTFPs spp.

22.17 Bio-doversity Conservation Plots

It is emphasized that atleast two areas to be identified in each Range on pilot basis as bio-diversity conservation plots. Regular monitoring, assessments be carried out for these plots for the future planning and management. As the Van Samridhi Jan samridhi scheme is being implemented in Renuka Ji range it is suggested that one of reference plots may be taken from these areas.

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CHAPTER XXIII

CONTROL AND RECORD

23.1 Compartment History Files:

The Compartment History Files (in duplicate) for all reserved, protected and mushterqua forest have been brought upto date. Compartment descriptions for all compartments in a forest have been written. In all there are 98 forests with 482 compartments.

The stocks maps on 1:15.000 scales have been prepared and place in every compartments History File. The stocks maps have been prepared forest wise showing all compartments. In cases where the maps have become large these have been drawn on 2 or more sheets.

The posting of the compartment History Files is not satisfactory. It is again reiterated that these should be posted upto date. The Divisional Forest Officer is required to submit a certificate together with the control Form that all compartment history files have been brought upto date.

23.2 Control Forms:

Control Forms be prepared annually as per instruction on the subject.

23.3 Forest Beat Books:

The old forest beat guard book issued to beat guard are not traceable. Similar observation was made by W.P.O. in the expired working plan. No action is being taken.

It is emphasized that forest guard books should be got printed. These beat books should have information regarding forests, their boundary pillars, details of right and concession, road and path and area closed for regeneration etc. This will keep beat guards well posted with a handy information regarding his beat. The range officer should check these books once every month on pay day.

Administrative maps of Sri Renuka Ji Forest Division is as under:

23.4 Divisional Note Book:

The Divisional note book shall be maintained in the prescribed form. This is mainly a record for use of DFO showing the experiment, methods of estimating outturn of coupes and other items of special interest.

23.5 Plantation Journals:

Plantation is one of the major activities of this Division. Block officer should be made responsible for updating of plantation journals. These should be maintained for such plantation areas which have no compartment history files. These should be prepared on following lines:

i) Name of area

ii) Boundaries

iii) Legal status

iv) Configuration, elevation, slope, soil indicating depth and type.

v) 1:50000 scale map showing prominent natural features.

vi) Area planted with species, expenditure and no of plants.

23.6 Translation of various old Notifications:

The old Notification issued by the then Sirmour Darbar were in Urdu. It is prescribed that these be got translated in Hindi/English. Simultaneously various other notification mentioned in the working plan but not appended be also got located and bound property. Copies thereof be supplied to all concerned including APCCF/CF Central, Dehradun.

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CHAPTER-XXIV
Eco-Development and Human Resource Management Circle

24.1 General:

This chapter shall look into the aspects that are related to multiple stakeholders in Forests and natural resources conservation. On one hand, it shall prescribe measures related to strengthening people's participation in Forest management and utilization and on the other hand shall discuss about capacity building aspects of the field functionaries. The issues to be dealt under this circle are proposed in the following paragraphs.

24.2. Joint Forest Management:

Several JFMCs/ VFDCs and User Groups have been formed in the Division under different projects like FDA, NPV, NBM and NMPB. Few VFDCs and User Groups have been created under Mid Himalayan Watershed Development Project and some other project such as GIZ at village Ghandoori also. However, all of these JFMCs are not active. The proper functioning of the JFMCs in the Division and their scope should be taken into consideration. The care is to be taken as to where the JFMCs have to be activated or instituted rather than forming JFMCs haphazardly. There is a need to incorporate a matrix of criteria for forming JFMCs in such a way that the area can be better managed by the JFMCs. The ways and means to improve the functioning of these committees should be suggested. Joint Forest Management is a national programme through which communities have been involved in Forest management right from the 90s. JFM and institutions promoted through it are important from the climate change perspective as these are the core institutional structures suggested under the National Mission for a Green India, one of the eight missions formulated under the National Action Plan on Climate Change (NAPCC). The Mission proposes revamping of JFMCs by reconstituting these as sub-committees of Gram Sabha and by devolving adequate powers to them for protecting and managing forests and deriving benefits from them.

24.2.1 Joint Forest Management in Himachal Pradesh

Himachal Pradesh has around two decades of experience with the JFM approach. The state government issued the first JFM Notification in 1993 for constitution of Village Forest Development Committees (VFDCs). in 2001, Himachal Pradesh Participatory Forest Management Rules were issued for registration of Village Forest Development Societies (VFDSs) under the Societies Registration Act. Subsequently - 2002-03 onwards - JFMCs were constituted and federated into FDAs at the Forest Division level with support from NAP. The JFMCs are registered with HPFD as per the provisions of the NAP guidelines,

whereas FDAs are registered as Societies. The SFDA was constituted in 2010 in accordance with the central guidelines.

24.2.3 Past Experiences in Participatory Approaches:

The social Forestry Umbrella Project was a pioneering effort in which perhaps, for the first time people were associated with Forestry Works and Forestry was taken out side forest area to village lands. This project ended in 1993. A new Scheme "Van lagao-Rozi Kamao" was launched in 1992 in which plantation over 2 Ha. land was awarded to a person belonging to Antyodaya category and in lieu of protection and care of this Area; the beneficiary was to be given remuneration depending upon the survival percentage of the Plantation. This Scheme was also discontinued on 31.03.1993.

24.2.4. Approach to be adopted in implementing JFM Scheme:

The tendency to be maintained in the execution of this scheme is toeducate people on the aim and objectives of the programme/ scheme before launching programme scheme and make extensive and intensive use of PRA techniques to formulate the plan and share the derived information with the people. There is to draw up a working scheme/ micro plan with the active involvement of the local people, ensuring representation of the heterogeneity of the Group. Execute works and use PRA techniques for monitoring as well. Exemplify spirit of participation by well defined lucid usufruct sharing mechanisms and transparency in accounting the expenditure on the works.

24.2.5. Special Objectives of Management

The basic objectives of JFM are:

- To evolve consensus on the basic issues for the conservation of Forest resources including soil and water.
- To provide an effective treatment for wastelands, degraded forests and forest lands situated near villages through protection, afforestation, pasture development, soil conservation by active participation of local people.
- To maintain the environmental stability through preservation of natural resources through involvement of local people in management.
- To augment fuel wood, fodder and small timber production for use by local people.

24.3. Eco Tourism:

There are numerous tourism related spots in Renuka Ji Division like Renuka Lake and temple complex, HaripurdharBhangaynimata temple and surrounding areas, Nohradhar (base camp of Churdharpeak)

Besides there are several spots that can be developed as ecotourism spots like Piuli Lani in Sangrah Range, ChhouBhogar in Renuka Ji Range, Charna, Boghdhar, Blaindhar in Nohra Range and Chandpurdhar in Shillai Range etc. At present, tourists from Chandigarh, Ambala, Delhi and Dehradun visit these areas regularly. However, care should be taken not to cause ecological degradation; it should be in compliance to the provisions of Forest Conservation Act, 1980 and should benefit the local community along with education for the tourists. Renuka Ji Eco Tourism Society has been formed in the Division under the auspices of Renuka Ji FDA.

24.3.1. FRH Haripurdhar:

Haripurdhar is a beautiful place known for its famous Maa Bhagayani temple. During the erstwhile Sirmour state there use to exist rest house of Maharaja Sirmour locally known as Quilla (Fort). This Rest House was completely damaged and now Forest Department has constructed a new rest house at this location. This Rest House is about 2 kms from main road and is connected with jeep able road. This is an ideal place for trekkers as well as religious pilgrims. Residential facility does exist in Maa Bhagayani temple for larger groups.Located at the height of more than 2500 meter and this site is favorable ecotourism activity site. This site can be covered in a day from Nahan and Rajgarh, Paonta and Shillai**.** Entire route leading to Haripurdhar is a nature education program for the students. One can find the Deodar, oak. Rhododendron forests on the way. Short trekking, visiting Mata Bhangyani temple are the other attractions attached with the site.

24.3.2. Chandpurdhar Site:

Chandpurdhar is located in Shillai Range of Sri Renukaji Forest Division and is an ideal camping site for those whose love adventure and trekking. One can reach by trekking from Shillai but the distance shall be about 14 Kms or more, however one can opt for travelling by vehicle for a distance of 6 km from Shillai to Dhalwana and thereafter trekking for 8 kms. Panoramic view of Himalayan ranges in Uttrakhand and Himachal and beautiful forests of deodar and ban with make the trekkers spell bound.Many more such sites are needed to be explored and developed in the same way.

24.3.3. Piuli Lani-ChhowBhogar trekking route:

This track falls in Sangrah and Renuka Ji Range of this Division. Situate above the mean sea level at an altitude of 2100 mtr. to 2400 mtr. This track is more than 14 Kms long. One can get close and personal with the nature as it is rich in its biodiversity. Many species of Flora as well as fauna are found. This track is especially famous for bird watching. Trekking on this track is not only recreational but education too. There are high dense forest of Deodar, Rhododendron and oaks. This site needs to be developed as major touring site.

24.4. Public awareness and Forestry Extension:

Different cost effective methods to create public awareness regarding Forest conservation, Fire Protection and Wild Life conservation is to be utilized. There are many methods to reach out the general public in order to meet their ever increasing demand for fuel wood and fodder. The ways to be incorporated forestry practices among the people and also suggest agro-forestry models for demonstrations purpose so that trees outside forests can be increased and therefore release pressure from the Forests. It is observed that despite huge loss to the cattle and even humans, the people of this Division are leading in wild life and Forest Conservation. Human Wild life conflict is the main issue to be discussed. Any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment. Human wild life conflict refers to the interaction between Wild animals and people and the resultant negative impact on people or their resources or wild animals or their habitats. It occurs when growing human populations overlap with established wild life territory, creating reduction of resources or life to some people and /or wild animals. The conflict takes many forms ranging from loss of life or injury to human and cattle both, to competition for scarce resources to loss and degradation of habitat. Therefore, it is felt that the concept of involving people in management of Forests is necessary because resources are limited and no single solution can satisfy the needs of all. There are specific solutions for each the issue relating to public interaction as under:

24.4.1. Forest Conservation:

Public awareness andinvolvement in Forest conservation is the need of the hour, as it will lead to building the “we” feeling in resources conservation. Not only this, but it will include clarity, transparency and sustainability. There is a general apathy of the youth to come forward in Forest Conservation that acquiring higher education strive them for getting white collared jobs in cities and anything that keeps them back in villages does not enthuse them. There is long gestation period of the Forestry activities, which discourage the people to involve. Fact is that Government functionaries are reluctant to hand over the control of resources to people or share the power with the people. In view of this, people’s participation is a challenge. Forest Officials must take part in *Gram Sabha* or other meetings, in order to win the good will and co-operation of the local people. This can be done by making regular contact and meeting their reasonable bonafied demands of the right holders. Seminars of *Panchayat Pradhan* or local residents once in awhile should be organized in the Division frequently.

24.4.2. Fire Protection:

Fire is a major factor that causes considerable damage to the Forests of this Division. The fire has an adverse effect not only on the vegetation, soil, water and ecological balance but it also deteriorates the habitat of wild animals. The *Chil* forests and other dry deciduous forests which are infested with *Lantana* in this Division are highly susceptible and are subjected to frequent fires in the month of April to June. There is an urgent need to take effective steps to counter the menace of fires with educating local people about fire damage and eliciting their cooperation in preventing, controlling and extinguishing fires. Prevention is better than cure and this holds well in case of forest fires too. Prevention of fire is more beneficial and cost effective than fighting the fire. For this, wide publicity especially in villages nearby forests should be given against harms caused by Forest fires. This includes distribution of pamphlets and other educative material during fire season. Since all such fires are caused by local people especially those having cattle, thus involving these stockholders in fire management may help. Awareness campaign combined with monetary incentives may be tried. Many Self help groups, Mahila mandals and Nav yuvak mandals may be encouraged to collect pine needles especially near roads. These pine needles can be used in many ways such as making charcoal and check dams etc.

24.4.3. Wild life Conservation:

For better management and conservation of wild life, the involvement of people's participation is required. However, the spread of education and awareness, there is a growing concern for production and preservation of wild life and there is a steady opposition to their killing and to the destruction of their habitat. With the increased availability of information on biodiversity a widespread intelligent recognition of the immense value of the myriad species of plants and animals to humankind has been established. The delicate balance of nature is maintained by these animals and plants through the intricate food web and breach in this chain can cause over population of any one species which may prove detrimental to human interests. If the people are led to know the importance and worth of wild life, they will appreciate it as an asset and put in efforts to conserve them. No doubt there are some constraints also in the path of public participation. Major ones of them are Leopard problems, Monkey menace, wild boars and Black bears etc. There have been many cases of damage to cattle by leopards in the Division, who target these cattle in forests, grazing lands or even in Cowsheds. Injury and casualties in case of human being has also been reported and the leopards had to be captured by setting traps and cages. Similarly, monkeys have increased their population many fold. There are several complaints of crop depredation by them. Black bears and wild boars are also infamous for crop damaging. Some of these animals also pose a nuisance in Forests areas where they damage plantations and young regenerations. The strategic approach of wild life protection aims at

recognizing the fact that this is possible only through active support of the local community. There is a need to work with the local communities to reduce their dependence on the Forests to minimize human wild life conflict. The Department has a provision of providing compensation to the person whose cattle have been killed by the wild animal. A close look at the departmental rules reveals that these compensations are inadequate with reference to the damage done by the wild animal in the field. Also there is involvement of verification of high authorities and huge formalities. For poor person, it is not feasible to get all the formalities done. Hence, very few cases are being reported. There is a need to revise these rules in public welfare.

24.5. Training and capacity building of field staff:

The frontline staff is the real human resource who shall ultimately implement the prescription of the working plan and any other works related to nursery, plantation, soil and water conservation, protection, team building, etc. It has been generally noted that the field staff lack the skills and knowledge in certain fields like JFM, use of modern technology like GPS and computers, Forest and allied laws, new concepts in forest and natural resource management etc. There has been a paradigm shift in strategies of managing the Forests. There has been an increasing thrust on adopting intensive and improved nursery techniques, use of GPS/ GIS in forestry and promotion of participatory forest management. Day to day dealing with legal issues has become more complicated as multiplicated rules, regulations, and Acts have come in to effect. Most of the staff is not in a position to handle these new challenges. However, trainings are being conducted in a scattered manner for the field staff at Forest Training Institutes. Trainings and awareness workshops are being conducted at Division level too. One cannot deny the importance of training and capacity building in the newly emerged trends in forestry and for the implementation of the working plan as well. Some of the important trainings which are supposed to be highly effective, being discussed hereinunder.

24.5.1. Training on GPS and Computer Applications:

There used to be a time when areas of compartments and plantations were measured through chain and ropes, but now use of GPS and GIS techniques has taken place. Collection, display, management and analyzing data on Computers have emerged and therefore a GIS cell has been successfully working in this Department. There is a mapping technology that offers a radically different way in which a map is produced. Similarly GPS is a global navigation satellite system that provides geo-location and time information to a receiver. Use of GPS in forestry has larger scopes and aspects. There is a need to conduct such training once in a year for frontline staff.

24.5.2. Training on Detection of Offences:

During past some time, the Forest offences have changed its pattern and use of modern techniques has evolved. The offenders are much more aware of procedures than forest officials. Detection of Offences needs data and knowledge about the location, extent and nature of legal and illegal operations in the forest. Good information is essential for preventing, detecting, monitoring, reporting and investigating illegal operations, and thus facilitating law enforcement. Increased data about illegal forest activities will also enable governments to establish priorities for remedial actions. The lack of a reliable baseline makes it difficult to identify illegal operations and to prosecute law offenders, as it is almost impossible to evaluate and demonstrate the nature and magnitude of the forest alterations they have caused. Therefore, it is felt that there is need to develop such skills in the frontline staff, which can help them to effectively handle the matters through regular training and workshops.

24.5.3. Training on JFM Techniques:

Currently JFM activities in different States are being funded from existing programs of the Forest Department, inter-departmental linkages, donor/externally aided project and from funds generated by village communities, and hence most activities undertaken are ad hoc and lack continuity. In order that activities like micro planning, awareness generation, training, skill development, managerial capacity building, enterprise development and many others that are crucial for JFM are undertaken on a regular basis, there is a need to train Forest Officials so that they could easily and effectively run the activities.

24.5.4. Training on Wild Life management

It is well known fact that there is a sudden call for conservation of wildlife and collection of information for better management of wild life. It is noted that many of the Frontline staff do not even recognize the creatures near extinction. Wildlife conservation aims to halt the loss of species. It does this by taking using ecological principles to balance the needs of wildlife with the needs of people. Forest Department has also to resolve man –animal conflict with emphasis on social and environmental justice for the poor. Besides, wildlife is concerned with the preservation and improvement of habitats. Techniques can include reforestation, pest control, irrigation, coppicing and hedge lying.

Wildlife management has become an integrated science using disciplines such as mathematics, chemistry, biology, ecology, climatology and geography to gain the best results. Hence the training in this sector is much required.

24.5.5. Training on Forest Acts and Rules:

There are numerous Acts and Rules under which Forest Department has to work such as Indian Forest Act, 1927, Wild Life Protection Act, 1972, Forest Conservation Act, 1980 and Forest Rights Act, 2006 to name a few. Similarly there are several Rules made under the provisions of these Acts. Such as HP Forest Produce Transit (Land Routes) Rules 2014, HP Forest TD to Right Holders) Amendment Rules, 2016 and HP Forest Fire Rules etc. A good knowledge of these Acts and Rules encourages staff to act under appropriate procedure and thus effective working come out. There should be some regular workshops at Division Level for this training as the Rules keeps changing from time to time. It is observed that some good steps in this concern have been taken in the past but it should be accelerated more.

24.5.6. Training on Nursery and Planting Techniques:

Demand for best quality seeds and seedlings of forestry species has been increasing over the years. The special plantation drives and greening activities have substantially increased the demand for tree seedlings. Clearly, such efforts need to be taken which is targeting quality seedling production forsuccessful Plantations. Nursery management is an important tool for the success of such entrepreneurships. Forests are the main source of tree based fuel, food, fodder, fiber, etc. The quality and quantity of benefits expected from forests mainly depends on choice of species, seedling quality and their field management. The diverse Indian edapho-climatic condition offers the scope for planting a variety of species. Meanwhile the species or variety or genotypes suitable for cultivation in one region may or may not be remunerative in another region. Besides, many other factors, such as Aspects, depth of soil and soil types, moisture retention ability definitely affect the productivity. Such regular workshops may be organized from time to time that keeps the staff updated and well equipped for the challenges.

24.5.7. Training on Engineering and Soil Conservation Works:

Forest Department does not only undertake the activities merely Planting and Forest Protection but the scope of Forestry also lies in engineering and soil conservation works also. The creation of Check Dams, Spurs, Farm Ponds, Trenches, other Water Harvesting Structures and inspection paths needs the technical knowledge. Estimates have to be prepared before undertaking such works. Therefore, some extent of engineering should be taught to the staff. Workshop for soil conservation works must organized once in year.

24.5.8. Training on survival techniques:

It will help to mobilize the human resource within the department staff during emergency and crisis situation. To find shelter for any length of time,to find food and water in intense situations, knowledge about human metabolism, necessary remedies found in jungle, skills to prevent snake bites, etc. and even

small things such as how to kindle the fire are required to be taught to the Staff. It is to be remembered that one cannot take on an animal in Jungle, so if he do not know how to escape from the place, definitely he will be in trouble. Experts may be called for delivering their technical knowhow to the staff.

24.5.9. Other aspects of learning:

Forest Officials need to learn the working of police, revenue, PWD and Panchayti Raj Department. Expert from such department should be invited randomly, who may deliver the lectures regarding effective working and better co-relation between these departments.

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Chapter-XXV

Carbon Stock, Carbon Sequestration and Mitigation

25.1 General Constitution

The Himachal State is a mountainous state located in Western Himalayan Range which present wide range of land use systems owing to the diverse physiographic and demographic mosaic. It extends over geographical area of 55673 Km2 which is 1.69 % of country area. The predominant land use system comprises of forest and agricultural. Forest comprises of 38.30 % of total land mass. This include plantation as well as trees outside forest e. g. trees on agriculture land. The forest of Himachal Pradesh is rich in vascular flora, which forms the conspicuous vegetation cover. Renuka Ji Forest Division falls in the District Sirmour Himachal Pradesh which is primarily consist of Chil, Broad leave, Oaks,Deodar, Kail and Fir-spruce as major species. The detail description of about the flora is given in the chapter - II of part one of the current plan. The Agricultural landscapes are characterized by undulating topographic where in a terraced field are made on medium to steep slopes. In Renuka Ji forest division, the crop fields are on sloppy lands, in general. The agricultural fields of this division generally have trees on boundaries for interspaced trees are also present.

25.1.1 The climate change now is a common phenomenon and the time is not about trying to find the conclusive evidence but is for action. The need is to give up priority to mitigate climate change, through judicious use of natural resources and implement programmes for enhancement of carbon stock. One of the strategies is to look into the present land use system. The need is to increase efforts in research on the function of forestry and the agro forestry system as carbon sinks. Among the green houses, CO_2 is the most important component, accounting for 60% of global warming. Although the forests are the main land based CO2 sinks, yet the forest ecosystems play a crucial role in general and global terrestrial carbon cycles because they store large quantities of carbon in vegetation, detritus and soil and exchange large amount of carbon with the atmosphere through photosynthesis and respiration. However, it is difficult to determine how and to what extend forest carbon sinks and reservoirs may be managed to mitigate CO_2. Therefore, understanding the determinants of forest carbon storage and allocation in different ecosystems component is important for predicting the response of carbon balance to climate change and forest management. There is a rapid increase in interest in agro forestry and plantation as a land use practice in this division. Plantation generally comprises of monoculture i. e. single tree species. The agro forestry system involved in greater diversity and complexity compared to plantation, have become a research interest which is posing fundamental question like how

much carbon is sequestered in such land use system. The agro forestry is an attractive option for carbon mitigation as it sequesters carbon in vegetation and soil depending on the pre-conversion vegetation and soil carbon. The agricultural lands are believed to be a major potential sink and could absorb large quantity of carbon if trees are introduce to these systems and judiciously managed together with crops. The growth and productivity of plants including trees are directly related to the nutrients present in soil system as well as their uptake by the plant system. The Land Use, Land Use Change and Forestry (LULUCF), an approach that became popular in the contest of Kyoto Protocol to the United Nations Frame work Convention on Climate Change (UNFCCC), allows the use of carbon sequestration through forest (Polyculture and Monoculture) and agro forest. Carbon sequestration potential depends upon the biological productivity, which in turn depends upon interaction between species, climate, topographic, management practices imposed. Thus carbon density and sequestration potential varies from place to place which need to be worked out on region to region species to species basis.

25.2 Forest and land Use

Forest ecosystems also play an important role and provide a wide range of provisioning, regulating, and cultural services broadly termed the 'ecosystem services'. But together with existing socio-economic processes such as population growth, Forest fragmentation, deforestation, degradation and habitat loss, climate change could lead to significant changes in the delivery of such services. However, the forest sector is, unique as regards to the climate change issue in several respects as Forests contribute significantly to global CO2 flux thus providing

- Significant opportunities to reduce the current or projected emissions. Forests also provide a means to remove CO2 accumulated from past
- Emissions in the atmosphere, and sequester it in soil, vegetation and wood products. Forest sector is closely linked to socio-economic systems,
- Particularly the livelihoods of forest dwellers and rural communities. Future climate change, due to increased Greenhouse Gas (GHG)
- Concentration in the atmosphere is likely to have adverse impacts on forest structure, composition, biodiversity, biomass and geographic distribution of plant species, all of which in turn would affect the environment and socio-economic systems.

The forest and land use sector has received significant attention globally in addressing the climate change problem. However, the mitigation potential assessment in the land use change and forest sector has been limited by availability of information at the global-level, and by the lack of disaggregation of

mitigation potential at the national and sub-national level. Further, these mitigation potential assessments provide technical potential estimates rather than economic or market potential. Forests in the state and also in the tract of this division are subjected to degradation, due to anthropogenic pressure. Degraded or open forests are subjected to unsustainable harvesting of timber and non-timber products and heavy infestation of weeds. This has led to thinning of forest cover, loss of biodiversity, reduced biomass productivity, changes in plant community structure and composition, disturbed nutrient cycle and reduced organic carbon in soil. As a consequence, these forests have limited capacity to regenerate by natural means under the prevailing land use. Forest plantations have been raised in Himachal Pradesh and in Renuka Ji Forest Division under different schemes and projects such as the pasture and grazing improvement scheme, afforestation of blank areas, compensatory afforestation, Catchment Area Treatment Plan. Himachal Pradesh like the other states of India is also carrying out afforestation programmes under different schemes as given in the above Para and now gaining momentum under the National Action Plan for Climate Change in the Greening Mission. Given this and the policy to increase forest tree cover to 2/3rd of the total geographic area, there is a need to look at the potential for increasing the forest area and thereby the biomass and carbon stocks

25.3 Approach and methods

The three land categories are considered essential for estimating the mitigation potential for increasing forest area and thereby the biomass and carbon stocks. They include:

25.3.1. Degraded forest land

This land category is owned and controlled by the State Forest Department. However, the communities have right of access to some of the identified forest products as per Forest settlement report which has discussed in detail in the chapter of the plan. According to the prevailing laws, felling of trees in these lands are banned as governed by the Forest Conservation Policy, laws and regulations (Indian Forest Act of 1927, Forest Conservation Act of 1980, Minor Forest Produce Act, Timber for Dwelling Rights Act). Conversion of this land for non-forestry purposes such as agriculture or infrastructure development is banned. These lands are devoid of any significant vegetation cover for the last several decades and are subjected to unsustainable biomass extraction (such as fuelwood and continued degradation caused by soil erosion on the sloping topography (about 15 - 25 degrees).

25.3.2. Other Forest Waste Land

This category includes protected forests declared under 1952 notification.

25.3.3. Degraded and abandoned private land

These lands are owned and managed by individual farmers, often inherited. These lands have been left fallow due to lack of resources or their unsuitability for crop production. These lands were once grasslands or forests on sloping hills but were subjected to land conversion many decades ago Cropping was practiced in the past. These lands were abandoned and left fallow due to low crop productivity caused by land degradation. These lands have very shallow soils subjected to continuous soil erosion and unsustainable grazing and harvesting of grass, further leading to degradation.

25.4 Strategy

To deal with problems related to land use and global warming, it is suggested that introduction of more and more tree-based land use systems like Agroforestry is one of the best option to deal with problems related to land use and global warming. The amount of Carbon sequestered largely depends on the Agroforestry system, structure and functions, determined by environmental and socio-economic factors. Maximum above ground biomass is in the Silvipasture system, followed by Agri-Horti-Silviculture. Maximum below ground biomass is also in the Silvipasture which is significantly higher than all other LUS. Silvipastoral systems help in greater accumulation of soil organic matter and thus more carbon storage when compared to grass only or tree only. The plant component of the Silvipastoral system invests higher proportion of growth into the development of the root system compared to those growing singly. The LUS recorded the above ground biomass in ascending order as Barren land, Agriculture, Horticulture, Agri-Horticulture, Agri-Horti-Silviculture and Silvipasture respectively and lowest belowground biomass is in the Silvipasture and Agriculture land use systems of the tract. Species density and management practices can play an important to influence biomass under different Agroforestry systems. Improvement of management practices, is also important component in carbon sequestration. Forests and wood products can effectively reduce the process of climate change in several ways. Growing trees absorb carbon dioxide from the atmosphere and store the carbon so efficiently that about half the dry weight of a tree is carbon. This carbon remains locked up in the form of wood and wood products. Sustainably grown and harvested wood (and other biomass) also provides a renewable alternative to fossil fuels and enhance carbon storage. Enhanced carbon sequestration through recognized and innovative Silvicultural practices, Ecorestoration of degraded/mined out forestlands, improved biomass productivity, etc. will help in improving forest health and vitality. Forest soil must be kept healthy and fertile. The growth of forest crops must be kept vigorous to attain the most desirable level of biomass production within an optimal time scale. The carbon stock storage and climate change mitigation cannot be easily achieved in the high-altitude Himalayan regions, because of the type of land use available, cold climate

and the land holding capacity of the people. As discussed above, the maximum biomass density capacity is for the Silvipasture system followed by the Agri-Horti-Silviculture system. The Fruit-based systems, viz., Horticulture and Agri-Horticulture system also play important role in carbon storage potential. These fruit-based LUS, like horticulture, Agri-culture and Agri-Horti-Silviculture are first and foremost choice of the farmers of the region because fruit grown under these land uses are of high quality, and also have better storage life, and low disease infestation. At the same time, it also fulfills both objectives of carbon mitigation and economic growth.

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APPENDIX-I

DETAILS OF STOCKING IN THE FOREST OF CHIL WORKING CIRCLE

Sr. No.	Number and Name of Forest	Compartment	Gross Area IN HA.	Chil	Ban	Mixed Deo. & Kail	Kharsu	Broad Leaved	Blank		Included Cultivation	Total
									Culturable	Unculturable		
1	**2**	**3**	**4**	**5**	**6**	**7**		**8**	**9**	**10**	**11**	**12**
SANGRAH RANGE												
1	(R) R45 Ghaton	C2	28.00	15.60	11.40	-		-	-	1.00	-	28.00
2	(R) R45 Ghaton	C11	45.50	21.50	24.00	-		-	-	-	-	45.50
3	(R) R45 Ghaton	C.15	22.10	21.10	-	-		-	1.00	-	-	22.10
TOTAL			**95.60**	**58.20**	**35.40**	**0**		**0**	**1.00**	**1.00**	**0**	**95.60**
RENUKA RANGE												
4	(N)R 1 Gahanu	-	5.20	5.20	-	-		-	-	-	-	5.20
TOTAL			**5.20**	**5.20**	**0**	**0**		**0**	**0**	**0**	**0**	**5.20**
SHILLAI RANGE												
5	(S) R1 Khalandon	C3	25.73	25.73	-	-		-	-	-	-	25.73
6	(S) R.2 Koti Bonch	C1	33.50	25.25	-	-		8.250	-	-	-	33.50
7	(S) R.2 Koti Bonch	C2	23.40	13.00	-	-		-	10.40	-	-	23.40
8	(S) R.2 Koti Bonch	C3	9.10	6.50	-	-		-	-	2.60	-	9.10

9	(S) R.2 Koti Bonch	C4	37.86	37.86	-	-		-	-	-	-	37.86
10	(S) R.2 Koti Bonch	C6	31.55	31.55	-	-		-	-	-	-	31.55
11	(S) R.2 Koti Bonch	C7	30.58	16.02	-	-		-	-	14.56	-	30.58
12	(S) R.2 Koti Bonch	C8	11.65	11.65	-	-		-	-	-	-	11.65
13	(S) R.2 Koti Bonch	C9	26.70	20.88	-	-		5.820	-	-	-	26.70
14	(S) R.2 Koti Bonch	C10	26.70	26.70	-	-		-	-	-	-	26.70
15	(S) R8 Kharakahan	C3	22.10	15.60	-	-		-	-	6.50	-	22.10
16	(S) R8 Kharakahan	C4	27.18	15.53	-	-		11.65	-	-	-	27.18
17	(S) R8 Kharakahan	C5	31.07	16.51	-	-		14.56	-	-	-	31.07
18	(S) R8 Kharakahan	C7	28.15	20.39	-	-		7.76	-	-	-	28.15
19	(S) R8 Kharakahan	C8	32.50	22.10	10.40	-		-	-	-	-	32.50
20	(S) R10 Manal	C1	19.10	15.90	-	-		-	3.20	-	-	19.10
21	(S) R10 Manal	C2	52.00	52.00	-	-		-	-	-	-	52.00
22	(S) R11 Loja	C3	37.70	18.20	-	-		13.00	-	6.50	-	37.70
23	(S) R11 Loja	C5	28.20	17.80	6.90	-		-	2.90	-	0.60	28.20

24	(S) R11 Loja	C6	32.50	19.50	2.00	-		-	6.80	-	4.20	32.50
25	(S) R11 Loja	C7	49.40	35.20	11.00	-		-	-	-	3.20	49.40
26	(S) R11 Loja	C8	33.80	30.30	3.50	-		-	-	-	-	33.80
27	(S) R17 Bali Koti	C1	44.20	36.40	-			-	-	7.80	-	44.20
28	(S)R17 Balikoti	C3	72.80	-	-	-			32.80	40.00	-	72.80
29	(S) R17 Bali Koti	C9	37.70	25.00	-	-		-	12.70	-	-	37.70
30	(S) R1 Khalandon	C2	35.43	10.18	-	-		-	25.25	0	0	35.43
31	(S)R2 Koti Bounch	C5	20.39	-	-	4.86		-	-	15.53	0	20.39
32	(S)R8 Kharakhan	C1	84.50	-	-	-	-	-	67.60	16.90	-	84.50
33	(S)R8 Kharakhan	C2	87.10	-	-	-	-	-	45.50	41.60	-	87.10
34	(S)R8 Kharakhan	C6	48.10	-	-	-	-	-	22.10	26.00	-	48.10
35	(S)R11 Loja	C9	40.90	9.80	-	9.10	-	-	15.3	6.70	-	40.90
36	(S)R12 Naopanjore	C6	31.60	15.60	-	-	-	-	16.00	-	-	31.60
37	(S)R12 Naopanjore	C7	6.50	-	-	-	-	-	6.50	-	-	6.50
38	(S)R12 Naopanjore	C8	26.00	-	-	-	-	-	23.40	2.60	-	26.00
39	(S)R16 Chyali	C2	55.60	-	-	-	-	-	48.10	7.50	-	55.60
40	(S)R16 Chyali	C9	19.20	-	-	1.40		-	17.80	-	-	19.20
41	(S)R17 Balikoti	C4	71.50	30.00	-	-	-	9.10	32.40	-	-	71.50
42	(S)R17 Balikoti	C7	37.70	-	-	-	-	-	33.80	3.90	-	37.70

43	(S)R17 Balikoti	C12	19.50	-	-	1.50	-	-	18.00	-	-	19.50
44	(S)R17 Balikoti	C17	75.40	-	-	-	-	-	49.40	25.00	1.00	75.40
45	(S) R17 Bali Koti	C10	39.31	28.64	0.48	-	-	1.94	0.97	7.28	-	39.31
TOTAL			**1503.90**	**649.79**	**34.28**	**16.86**		**72.080**	**490.92**	**230.97**	**9.00**	**1503.90**
KAFFOTA RANGE												
46	(Pt) R1 Khajuri	C1	31.06	31.06	-	-		-	-	-	-	31.06
47	(Pt) R1 Khajuri	C2	26.70	26.70	-	-		-	-	-	-	26.70
48	(Pt) R1 Khajuri	C3	41.75	31.55	-	-		-	10.20	-	-	41.75
49	(Pt) R1 Khajuri	C5	29.61	28.64	-	-		-	-	0.97	-	29.61
50	(Pt) R1 Khajuri	C7	40.70	35.44	-	-		-	5.26	-	-	40.70
51	(Pt) R1 Khajuri	C8	30.10	27.19	-	2.91		-	-	-	-	30.10
52	(Pt) R1 Khajuri	C9	46.11	45.14	-	0.97		-	-	-	-	46.11
53	(Pt) R1 Khajuri	C10	25.25	25.25	-	-		-	-	-	-	25.25
54	(Pt) R1 Khajuri	C12	28.92	20.82	-	1.6		-	6.50	-	-	28.92
55	(Pt) R1 Khajuri	C11	28.65	-	5.97	-	4.85	17.83	-	-	-	28.65
56	(Pt) R1 Khajuri	C13	49.40	-	-	-	-	43.60	-	5.80	-	49.40
57	(Pt) R1 Khajuri	C15	28.60	-	-	-	-	22.10	-	6.50	-	28.60
58	(Pt) R8 Mailani	C2	46.14	40.00	-	-	-	-	-	6.14	-	46.14
59	(Pt) R2 Tatiyana	C20	33.80	-	-	-	-	-	33.80	-	-	33.80
60	(Pt) R5 Sewa	C4	25.92	5.92				20.00	-	-	-	25.92
61	(Pt) R2 Tatiyana	C1	37.37	26.21	-	-		-	11.16	-	-	37.37

62	(Pt) R2 Tatiyana	C2	50.97	22.82	-	-		-	21.84	-	6.31	50.97
63	(Pt) R2 Tatiyana	C3	53.39	41.26	-	-		-	12.13	-	-	53.39
64	(Pt) R2 Tatiyana	C5	35.10	30.55	4.55	-			-	-		35.10
65	(Pt) R2 Tatiyana	C10	49.40	-	-	3.90		-	39.00	6.50	-	49.40
66	(Pt) R2 Tatiyana	C14	24.70	22.10	-	-		-	2.60	-	-	24.70
67	(Pt) R2 Tatiyana	C19	49.40	20.80	-	-			18.20	-	10.40	49.40
68	(Pt) R2 Tatiyana	C21	19.30	19.30	-	-		-	-	-	-	19.30
69	(Pt) R6 Janjhli	C7	190.48	90.00	20.00	-			60.00	15.00	5.48	190.48
		TOTAL	**1022.82**	**590.75**	**30.52**	**9.38**	**4.85**	**103.53**	**220.69**	**40.91**	**22.19**	**1022.82**
RENUKA RANGE												
70	(R) P 10 Chhobhogar	C9	46.00	38	-	5.40		-	-	-	2.60	46.00
71	(Pt) P9 Charag	C6	21.45	17.55	-	-			3.90	-	-	21.45
TOTAL			**67.45**	**55.55**	**0**	**5.40**		**0**	**3.9**	**0**	**2.6**	**67.45**
KAFFOTA RANGE												
72	(Pt) P2 Jamna-Pabar	C1	13.11	13.11	-	-		-	-	-	-	13.11
73	(Pt) P2 Jamna-Pabar	C2	9.22	9.22	-	-		-	-	-	-	9.22
74	(Pt) P2 Jamna-Pabar	C3	40.78	38.84	-	-		-	1.94	-	-	40.78
75	(Pt) P2 Jamna-Pabar	C4	20.87	18.93	-	-		-	1.94	-	-	20.87

76	(Pt) P2 Jamna Pabar	C7	55.90	24.70	0.00	-			21.45	-	9.75	55.90
77	(Pt) P2 Jamna Pabar	C8	97.50	60.80	-	-			26.65	0.95	9.10	97.50
78	(Pt) P2 Jamna Pabar	C9	33.80	23.40	-	-			10.40	-	-	33.80
		TOTAL	**271.18**	**189.00**	**0**	**0**		**0**	**62.38**	**0.95**	**18.85**	**271.18**
		G.TOTAL	**2966.15**	**1548.49**	**100.20**	**31.64**		**175.61**	**778.89**	**273.83**	**52.64**	**2966.15**

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APPENDIX II															
DETAILS OF STOCKING IN THE FOREST OF THE OAK WORKING CIRCLE															
(Area in ha.)															
Sr. No.	Number and Name of Forest	Com ptt.	Area	Ban	Mor u	Khars u	Deod ar	Kail	Chil	Fir/ Spruce	Broad leave	Blank		Included Cultivatio n	Total
												Cultur able	Uncult urable		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
NOHRA RANGE															
1	(R) R2 Thanga	C1	62.40	-	48.10	-	-	-	-	-		-	14.30	-	62.40
2	(R) R2 Thanga	C2	61.10	-	54.60	-	-	-	-	3.90		-	2.20	0.40	61.10
3	(R) R4 Churas	C1	42.25	28.28	-	-		-	-	-	13.00	-	0.97	-	42.25
4	(R) R4 Churas	C2	39.00	37.05	-	-		-	-	-	-	-	1.95	-	39.00
5	(R) R4 Churas	C3	46.80	46.80	-	-		-	-	-	-	-	-	-	46.80
6	(R) R4 Churas	C4	39.00	37.70	-	-		-	-	-	-	-	1.30	-	39.00
7	(R) R 1 Nohra	C1	26.00	16.25	-	-		-	-	-	7.80	-	1.95	-	26.00
8	(R) R 1 Nohra	C2	13.00	13.00	-	-		-	-	-	-	-	-	-	13.00
9	(R) R5 Ganduri-Talangana	C1	41.60	39.00	2.60	-		-	-	-	-	-	-	-	41.60
10	(R) R5 Ganduri-Talangana	C2	44.20	28.6	-	14.30	D	-	-	-	-	-	1.30	-	44.20
11	(R) R3 Ganduri-Talangana	C3	44.20	44.20	-	-	-	-	-	-		-	-	-	44.20
12	(R) R5 Ganduri-Talangana	C4	33.80	15.60	-	-		-	-	-	17.20	-	1.00	-	33.80
13	(R) R6 Charna	C3	31.20	-	31.20	-	-	-	-	-		-	-	-	31.20
14	(R) R7 Dowahna	C1	32.50	32.50	-	-	-	-	-	-		-	-	-	32.50
15	(R) R7 Dowahna	C2	28.60	28.60	-	-	-	-	-	-		-	-	-	28.60
16	(R) R8 ShilliBhangari	C1	76.70	53.30	-	-	-	-	-	-		23.40	-	-	76.70
17	(R) R9 Bhangari	C2	72.80	31.20	-	-	-	-	-	39.00		-	2.60	-	72.80
18	(R) R10 Chokar	C1	54.60	50.70	-	-	-	-	-	-		-	3.90	-	54.60
19	(R) R10 Chokar	C2	45.50	45.50	-	-	-	-	-	-		-	-	-	45.50

20	(Ṛ) R10 Chokar	C3	80.60	65.00	-	-	-	-	-	14.30		-	1.30	-	80.60
21	(Ṛ) R10 Chokar	C4	49.40	49.40	-	-	-	-	-	-		-	-	-	49.40
22	(Ṛ) R11 Garari	C1	79.30	79.30	-	-	-	-	-	-		-	-	-	79.30
23	(Ṛ) R11 Garari	C2	62.40	46.80	-	-	-	-	-	15.60		-	-	-	62.40
24	(Ṛ) R13 Manal	C1	46.40	46.40	-	-	-	-	-	-		-	-	-	46.40
25	(Ṛ) R13 Manal	C2	57.20	57.20	-	-	-	-	-	-		-	-	-	57.20
26	(Ṛ) R13 Manal	C3	88.40	80.95	-	-	-	-	-	6.50		-	0.95	-	88.40
27	(Ṛ) R13 Manal	C4	52.00	52.00	-	-	-	-	-	-		-	-	-	52.00
28	(Ṛ) R13 Manal	C5	41.60	41.60	-	-	-	-	-	-		-	-	-	41.60
29	(Ṛ) R13 Manal	C6	32.50	-	-	-		-	-	-	-	19.50	13.00	-	32.50
30	(Ṛ) R14 Pipli	C1	78.00	76.05	-	-	-	-	-	-		-	-	1.95	78.00
31	(Ṛ) R14 Pipli	C2	46.80	46.80	-	-	-	-	-	-		-	-	-	46.80
32	(Ṛ) R14 Pipli	C3	19.50	19.50	-	-	-	-	-	-		-	-	-	19.50
33	(Ṛ) R14 Pipli	C4	48.10	35.10	-	-	-	-	-	-		10.40	2.60	-	48.10
34	(Ṛ) R14 Pipli	C5	44.20	40.30	-	-	3.90	-	-	-		-	-	-	44.20
35	(Ṛ) R15 Bandal	C1	23.40	23.40	-	-	-	-	-	-		-	-	-	23.40
36	(Ṛ) R15 Bandal	C2	14.40	14.40	-	-		-	-	-	-	-	-	-	14.40
37	(Ṛ) R15 Bandal	C3	53.30	53.30	-	-	-	-	-	-		-	-	-	53.30
38	(Ṛ) R15 Bandal	C4	93.60	81.90	-	-	-	-	-	-		-	-	11.70	93.60
39	(Ṛ) R22 TardoilaBarasli		31.20	31.20	-	-	-	-	-	-		-	-		31.20
40	(Ṛ) R23 Chunwin	C1	41.60	39.00	-	-	-	-	-	-		-	-	2.60	41.60
41	(Ṛ) R23 Chunwin	C2	41.60	-	31.20	-	-	-	-	-		10.40	-	-	41.60
42	(Ṛ) R23 Chunwin	C3	46.80	42.90	-	-	-	-	-	-		-	-	3.90	46.80
43	(Ṛ) R23 Chunwin	C4	50.70	48.10	-	2.60	D	-	-	-	-	-	-	-	50.70
44	(Ṛ) R23 Chunwin	C5	85.80	39.60	-	-		-	-	-	-	42.90	-	3.30	85.80
45	(Ṛ) R23 Chunwin	C6	28.60	-	-	-		-	-	-	-	5.20	23.40		28.60
46	(Ṛ) R24 Sail	C1	78.00	40.00	27.60	10.40	-	-	-	-		-	-	-	78.00
47	(Ṛ) R24 Sail	C2	66.30	31.10	30.00	3.90	-	-	-	-		-	-	1.30	66.30
48	(Ṛ) R24 Sail	C3	54.60	30.00	21.40	3.20	-	-	-	-		-	-	-	54.60
49	(Ṛ) R20 Anukoti	C1	45.50	45.50	-	-	-	-	-	-	-	-	-	-	45.50

50	(Ṛ) R20 Anukoti	C2	36.40	33.10	-	-	-	-	-	-	-	-	-	3.30	36.40
51	(Ṛ) R20 Anukoti	C3	31.20	22.10	-	-	-	-	-	-	-	-	9.100	-	31.20
52	(Ṛ) R9 Bhangari	C1	42.90	10.50	-	-	-	-	-	-	-	23.30	9.10	-	42.90
53	(Ṛ) R8 ShilliBhangari	C2	74.40	19.50	-	-	-	-	-	-	48.40	-	6.50	-	74.40
54	(Ṛ) R6 Charna	C2	40.30	18.90	-	-	-	-	-	-	16.90	-	4.50	-	40.30
Total			**2642 .25**	**1909. 18**	**246. 70**	**34.40**	**3.90**	**0.00**	**0.00**	**79.30**	**103.30**	**135.1 0**	**101.92**	**28.45**	**2642.25**
SANGRAH RANGE															
55	(Ṛ) R25 Duri Kharahan	C1	31.20	31.20	-	-	-	-	-	-		-	-	-	31.20
56	(Ṛ) R25 Duri Kharahan	C2	36.40	35.10	-	-	-	-	-	1.30		-	-	-	36.40
57	(Ṛ) R26 Tikri	C1	14.30	14.30	-	-		-	-	-	-	-	-	-	14.30
58	(Ṛ) R27 Dasakana	-	43.55	24.05	-	-		-	-	-	19.50	-	-	-	43.55
59	(Ṛ) R32 Panjah	-	10.40	10.40	-	-		-	-	-	-		-	-	10.40
60	(Ṛ) R33 Bhalar	C1	68.90	61.70	-	-	-	-	-	-		6.50	-	0.70	68.90
61	(Ṛ) R33 Bhalar	C2	65.00	61.10	-	-	-	-	-	-		-	3.90	-	65.00
62	(Ṛ) R33 Bhalar	C3	127.4 0	100.3 5	-	-	-	-	3.25	-		22.80	1.00	-	127.40
63	(Ṛ) R36 Gahal	C1	0.90	0.90	-	-		-	-	-	-	-	-	-	0.90
64	(Ṛ) R36 Gahal	C2	5.90	5.90	-	-		-	-	-	-	-	-	-	5.90
65	(Ṛ) R37 Art	C1	85.80	57.20	-	-		-	-	-	6.50	10.40	11.70	-	85.80
66	(Ṛ) R37 Art	C2	62.40	55.30	-	-	-	-	-	-		3.85	-	3.25	62.40
67	(Ṛ) R37 Art	C3	55.90	53.30	-	-	-	-	-	-		1.30	-	1.30	55.90
68	(Ṛ) R37 Art	C4	53.30	28.60	-	-		-	-	-	1.30	16.90	6.50	-	53.30
69	(Ṛ) R37 Art	C5	78.00	75.40	-	-		-	-	-	2.60	-	-	-	78.00
70	(Ṛ) R37 Art	C6	40.30	-	33.60	-		-	-	-	5.20	-	1.50	-	40.30
71	(Ṛ) R37 Lajuwah-Jablog	C1	35.40		35.40	-	-	-	-	-		-	-	-	35.40
72	(Ṛ) R37 Lajuwah-Jablog	C2	92.30	54.90	28.30	-	-	-	-	-		9.10	-	-	92.30
73	(Ṛ) R38	C3	87.10	61.10	-	-		-	-	-	24.70	1.30	-	-	87.10

	LajwaJablog														
74	(Ṛ) R38 LajwaJablog	C4	44.20	23.40	-	-		-	-	-	18.20	-	2.60	-	44.20
75	(Ṛ) R39 Uncha-Tikkar	C1	58.50	48.10	0.00	-		-	-	-	-	10.40	-	-	58.50
76	(Ṛ) R39 Uncha-Tikkar	C2	41.60	37.80	0.00	-	-	-	-	-		-	2.50	1.30	41.60
77	(Ṛ) R39 Uncha-Tikkar	C3	63.70	63.70	0.00	-	-	-	-	-		-	-	-	63.70
78	(Ṛ) R39 Uncha-Tikkar	C4	37.70	37.70	0.00	-	-	-	-	-		-	-	-	37.70
79	(Ṛ) R39 Uncha-Tikkar	C5	66.30	63.60	0.00	-	-	-	-	-		-	2.70	-	66.30
80	(Ṛ) R39 UnchaTikkar	C6	65.60	47.40	0.00	-		-	-	-	11.70	-	6.50	-	65.60
81	(Ṛ) R39 UnchaTikkar	C7	52.00	48.30	0.00	-		-	-	-	-	3.70	-	-	52.00
82	(Ṛ) R41 Bhawan kariyana	-	5.20	5.20	0.00	-		-	-	-	-	-	-	-	5.20
83	(Ṛ) R45 Ghataun	C1	23.40	23.40	0.00	-	-	-	-	-		-	-	-	23.40
84	(Ṛ) R45 Ghataun	C4	44.20	33.35	0.00	-	-	-	-	-		6.85	-	4.00	44.20
85	(Ṛ) R45 Ghataun	C5	35.10	35.10	0.00	-	-	-	-	-		-	-	-	35.10
86	(Ṛ) R45 Ghataun	C9	62.40	62.40	0.00	-	-	-	-	-		-	-	-	62.40
87	(Ṛ) R45 Ghataun	C10	33.80	33.80	0.00	-	-	-	-	-		-	-	-	33.80
88	(Ṛ) R45 Ghataun	C12	164.80	127.70	0.00	-	-	-	-	9.80		23.60	-	-	161.10
89	(Ṛ) R45 Ghataun	C14	115.70	107.90	0.00	-	-	-	-	-		7.80	-	3.70	119.40
90	(Ṛ) R49 Gata-Mandwaj	C1	45.50	45.50	0.00	-	-	-	-	-		-	-	-	45.50
91	(Ṛ) R49 Gata-Mandwaj	C2	41.60	41.60	**0.00**	-	-	-	-	-		-	-	-	41.60
92	(Ṛ) R26 Tikri	C2	33.80	11.70	**-**	-	-	-	-	-	13.65	6.50	1.95	-	33.80
93	(Ṛ) R39	C1	14.30	5.20	**-**	-	-	-	-	-	9.10	-	-	-	14.30

	Ranphuwa														
Total			**2043.85**	**1633.65**	**97.30**	**0.00**	**0.00**	**0.00**	**3.25**	**11.10**	**112.45**	**131.00**	**40.85**	**14.25**	**2043.85**
RENUKA JI															
94	(Ṛ) R45 Ghataun	C16	83.20	76.70	-	-	-	-	-	-		-	-	6.50	83.20
95	(Ṛ) R45 Ghataun	C17	80.60	80.60	-	-	-	-	-	-		-	-	-	80.60
96	(Ṛ) R45 Ghataun	C18	144.30	144.30	-	-	-	-	-	-		-	-	-	144.30
97	(Ṛ) R45 Ghataun	C19	58.50	58.50	-	-	-	-	-	-		-	-	-	58.50
98	(Ṛ) R45 Ghataun	C20	55.90	55.90	-	-	-	-	-	-		-	-	-	55.90
99	(Ṛ) R45 Ghataun	C21	124.80	101.40	-	-	-	-	-	-		23.40	-	-	124.80
100	(Ṛ) R45 Ghataun	C24	53.30	28.60	-	-	-	-	-	-		7.40	15.60	1.70	53.30
101	(Ṛ) R46 Chou-Bhogar	C1	42.90	40.30	-	-	2.60	-	-	-	-	-	-	-	42.90
102	(Ṛ) R45 Ghataun	C23	106.60	-	-	-	-	-	-	3.90	67.60	35.10	-	-	106.60
103	(Ṛ) R46 Chou Bhogar	C2	37.70	-	-	-	-	-	-	-	37.70	-	-	-	37.70
Total			**787.80**	**586.30**	**0.00**	**0.00**	**2.60**	**0.00**	**0.00**	**3.90**	**105.30**	**65.90**	**15.60**	**8.20**	**787.80**
SHILLAI RANGE															
104	(Ṛ) R50 Kota Pab	C2	27.30	18.20	-	2.60	0.00	-	-	-	-	6.50	-	-	27.30
105	(Ṛ) R50 Kota Pab	C3	62.40	26.00	-	-	-	-	-	-		36.40	-	-	62.40
106	(Ṛ) R50 Kota Pab	C4	58.80	58.80	-	-	-	-	-	-		-	-	-	58.80
107	(Ṛ) R50 Kota Pab	C5	61.10	57.20	-	-	-	-	-	-		3.90	-	-	61.10
108	(Ṛ) R50 Kota Pab	C6	80.60	45.50	-	-	-	-	-	-		31.20	2.60	1.30	80.60
109	(S) R1 Khalando	C1	21.45	12.35	-	1.95	D	2.60	-	-	-	-	-	4.55	21.45
110	(S) R5 Ajrawali	C1	128.70	57.80	-	-		-	-	-	69.60	-	1.30	-	128.70
111	(S) R5 Ajrawali	C2	91.00	57.20	-	-		-	-	-	33.80	-	-	-	91.00
112	(S) R6 Jaswi	C1	55.90	31.20	-	-	-	-	-	-		24.70	-	-	55.90
113	(S) R6 Jaswi	C2	97.60	80.70	-	-	-	-	-	-		-	14.30	2.60	97.60

114	(Ṛ) R30 Dahar	C1	39.00	32.50	-	-	-	-	-	-	3.90	2.60	-	-	39.00
115	(Ṛ) R30 Dahar	C6	28.60	-	14.30	-		-	-	-	-	11.50	2.80	-	28.60
116	(S) R8 Kharkhan	C10	94.90	92.30	-	-	-	2.60	-	-		-	-	-	94.90
117	(S) R9 Jakando	C7	49.60	49.60	-	-	-	-	-	-		-	-	-	49.60
118	(S) R10 Manal	C3	18.90	18.40	-	-	-	-	-	-		0.50	-	-	18.90
119	(S) R10 Manal	C5	35.10	35.10	-	-	-	-	-	-		-	-	-	35.10
120	(S) R10 Manal	C7	59.80	59.20	-	-		-	-	-	-	-	0.60	-	59.80
121	(S) R10 Manal	C8	74.80	73.50	-	-		-	-	-	-	0.90	0.40	-	74.80
122	(S) R11 Loja	C11	92.30	90.20	-	-	-	-	-	-		-	-	2.10	92.30
123	(S) R11 Loja	C12	76.70	75.00	-	-	-	1.70	-	-		-	-	-	76.70
124	(S) R11 Loja	C13	58.50	49.20	-	-	-	6.70	-	2.60		-	-	-	58.50
125	(S) R11 Loja	C16	46.10	46.10	-	-	-	-	-	-		-	-	-	46.10
126	(S) R12 Nao-Panjore	C2	41.60	31.50	-	-	-	-	-	-		-	8.20	1.90	41.60
127	(S) R12 Nao-Panjore	C3	67.60	54.20	-	-	-	-	-	-		13.40	-	-	67.60
128	(S) R12 Nao-Panjore	C4	54.60	40.30	-	-	-	-	-	-		14.30	-	-	54.60
129	(S) R12 Nao-Panjore	C5	120.90	106.30	-	-	-	-	-	-		-	-	14.60	120.90
130	(S) R15 Milla	C1	101.40	62.10	-	-	-	-	-	4.60		32.50	-	2.20	101.40
131	(S) R15 Milla	C4	98.80	98.80	-	-	-	-	-	-		-	-	-	98.80
132	(S) R15 Milla	C5	65.60	61.00	-	-	-	-	-	-		-	-	4.60	65.60
133	(S) R15 Milla	C6	59.80	39.00	-	-	-	-	-	-		7.80	13.00	-	59.80
134	(S) R15 Milla	C7	79.30	59.80	-	-	-	-	-	-		5.20	1.30	13.00	79.30
135	(S) R15 Milla	C8	78.00	78.00	-	-	-	-	-	-		-	-	-	78.00
136	(S) R15 Milla	C9	128.70	106.60	-	-	-	-	-	11.70		1.30	9.10	-	128.70
137	(S) R15 Milla	C10	113.10	97.50	-	-	-	-	-	-		-	-	15.60	113.10
138	(S) R18 Khatna	C1	141.70	67.60	-	-	-	-	-	9.10		40.30	19.50	5.20	141.70

139	(S) R18 Khatna	C3	105.30	100.75	-	-	-	-	-	-		1.95	-	2.60	105.30
140	(S) R18 Khatna	C4	128.70	119.60	-	-	-	-	-	-		-	-	9.10	128.70
141	(S) R18 Khatna	C5	67.60	62.10	-	-	-	-	-	-		-	5.50	-	67.60
142	(S) R18 Khatna	C6	133.90	115.70	-	-	-	-	-	6.50		-		11.70	133.90
143	(S) R18 Khatna	C7	80.60	68.90	-	-	-	-	-	-		7.80	3.90	-	80.60
144	(S) R18 Khatna	C8	123.50	89.05	-	-	-	-	-	-		22.10	9.10	3.25	123.50
145	(S) R18 Khatna	C9	71.50	71.25	-	-	-	-	-	-		-	-	0.25	71.50
146	(S) R13 Bhatnol	C5	53.30	32.50	-	15.60	0.00	-	-	-	5.20	-	-	-	53.30
147	(S) R17 Balikoti	C11	10.40	10.40	-	-	-	-	-	-	-	-	-	-	10.40
148	(S) R7 Lani Barar	whole	54.60	10.40	-	-	-	-	-	-	30.55	13.65	-	0.00	54.60
149	(S) R9 Jakando	C5	40.30	10.50	-	-	-	-	-	-	-	-	18.10	11.70	40.30
150	(S) R10 Manal	C4	33.50	13.40	-	-	5.20	-	-	-	-	14.90	-	-	33.50
151	(Ṛ) R30 Dahar	C2	53.30	2.60								28.60	22.10	-	53.30
152	(Ṛ) R30 Dahar	C3	48.10	2.60								27.30	15.60	2.60	48.10
153	(Ṛ) R30 Dahar	C4	36.40	3.90								20.80	11.70	-	36.40
154	(Ṛ) R30 Dahar	C5	23.40	-								19.50	3.90	-	23.40
155	(S)R16 Chyali	C6	45.50	-								24.80	20.40	0.30	45.50
156	(S) R18 Khatna	C2	41.60	9.30					21.90	10.40		-	-	-	41.60
157	(S) R114 Shrikiari	C4	68.53	22.13	-	-	10.40		8.30		27.70	-	-	-	68.53
Total			**3730.28**	**2713.83**	**14.30**	**20.15**	**15.60**	**13.60**	**30.20**	**44.90**	**170.75**	**414.40**	**183.40**	**109.15**	**3730.28**
KAFFOTA RANGE															
158	(Pt) R3 Dhab-Pipli	C1	109.20	53.30	-	-	-	-	-	-		50.70	-	5.2	109.20
159	(Pt) R4 Nigali	C2	94.32	44.00	-	-	-	-	-	-		45.00	-	5.32	94.32
160	(Pt) R4 Nigali	C3	91.55	50.00	-	-	-	-	-	-		40.00	-	1.55	91.55
161	(Pt) R6 Janjhli	C2	148.15	70.00	-	-	-	-	-	-		48.15	30.00	-	148.15

162	(Pt) R1 Khajuri	C4	6.31	6.31	-	-		-	-	-	-	-	-	-	6.31
163	(Pt) R2 Tatiyana	C11	4.55	4.55	-	-		-	-	-	-	-	-	-	4.55
164	(Pt) R2 Tatiyana	C18	38.83	28.15		-	-	-	10.68	-					38.83
165	(Pt) R1 Khajuri	C6	32.52	11.65							19.42	-	-	1.45	32.52
166	(Pt) R1 Khajuri	C14	41.60	12.30							28.20	-	1.10	-	41.60
167	(Pt) R10 Sataun	C3	129.28	40.00			10				70.00	9.28	-	-	129.28
Total			**696.31**	**320.26**	**0.00**	**0.00**	**10.00**	**0.00**	**10.68**	**0.00**	**117.62**	**193.13**	**31.10**	**13.52**	**696.31**
NOHRA RANGE															
168	M F Chogtali	-	58.50	38.50	-	-		-	-	-	20.00	-	-	-	58.50
169	(R) P2 Devamanal	C2	24.70	24.70	-	-		-	-	-	-	-	-	-	24.70
170	(R) P2 Deva Manal	C3	44.20	35.75	-	-		-	-	-	-	7.80	-	0.65	44.20
171	(R) P2 Deva Manal	C4	50.70	50.70	-	-		-	-	-	-	-	-	-	50.70
172	(R) P3 Bhajond	C1	32.50	29.90	-	-		-	-	-	-	2.60	-	-	32.50
173	(R) P3 Bhajond	C2	1.30	1.30	-	-		-	-	-	-	-	-	-	1.30
Total			**211.90**	**180.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**10.40**	**0.00**	**0.65**	**211.90**
SANGRAH RANGE															
174	(R) P4 Thain	C1	46.80	42.90	-	-	-	-	-	-		-	-	3.90	46.80
175	(R) P4 Thain	C2	93.60	66.30	-	-		-	-	-	22.10	-	5.20	-	93.60
176	(R) P4 Thain	C3	87.10	77.75	-	-		-	-	-	9.10	-	0.25	-	87.10
177	(R) P4 Thain	C4	45.50	40.30	-	-	-	-	-	-		5.20	-	-	45.50
178	(R) P4 Thain	C5	67.60	66.30	-	-	-	-	-	-		1.30	-	-	67.60
179	(R) P4 Thain	C6	35.10	35.10	-	-	-	-	-	-		-	-	-	35.10
180	(R) P4 Thain	C7	79.30	46.80	-	-	-	-	-	-		10.20	-	22.30	79.30
181	(R) P4 Thain	C8	76.70	46.80	-	-	-	-	-	-		10.40	-	19.50	76.70
182	(R) P4 Thain	C9	83.20	76.70	-	-	-	-	-	-		5.20	-	1.30	83.20
183	(R) P4 Thain	C10	75.40	73.90	-	-	-	-	-	-		-	-	1.50	75.40
184	(R) P5 Dada	C2	34.00	34.00	-	-	-	-	-	-		-	-	-	34.00

Total			**724.30**	**606.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**31.20**	**32.30**	**5.45**	**48.50**	**724.30**
RENUKA RANGE															
185	(Ṛ) P9 Charag	C3	45.50	15.60	-	-	-	-	-	-	-	7.15	22.75	-	45.50
186	(Ṛ) P9 Charag	C5	18.50	14.75	-	-	-	-	-	-	-	2.50	1.25	-	18.50
187	(Ṛ) P10 Chou-Bhogar	C2	61.10	33.80	-	-	-	-	-	-	-	-	27.30	-	61.10
188	(Ṛ) P10 Chou-Bhogar	C3	52.00	23.40	-	-	-	-	-	-	-	7.80	20.80	-	52.00
189	(Ṛ) P10 Chou-Bhogar	C5	62.40	51.35	-	-	-	-	7.80	-	-	-	-	3.25	62.40
190	(Ṛ) P10 Chou-Bhogar	C1	79.30	13.00	-	-	-	-	-	-	-	23.40	39.00	3.90	79.30
191	(Pt) P9 Cherag	C4	85.80	6.50	-	-	-	-	-	-	-	72.30	7.00	-	85.80
Total			**404.60**	**158.40**	**0.00**	**0.00**	**0.00**	**0.00**	**7.80**	**0.00**	**0.00**	**113.15**	**118.10**	**7.15**	**404.60**
KAFFOTA RANGE															
192	(Pt) P3 Pamta	C1	61.10	52.00	-	-		-	-	-	9.10	-	-	-	61.10
Total			**61.10**	**52.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**9.10**	**0.00**	**0.00**	**0.00**	**61.10**
SHILLAI RANGE															
193	(Ṛ) P11 Kufata	C2	41.60	41.60	-	-	-	-	-	-		-	-	-	41.60
Total			**41.60**	**41.60**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**41.60**
G.TOTAL			**11343.99**	**8202.92**	**358.30**	**54.55**	**32.10**	**13.60**	**51.93**	**139.20**	**669.72**	**1095.38**	**496.42**	**229.87**	**11343.99**

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APPENDIX-III

DETAILS OF STOCKING IN THE FOREST OF THE TROPICAL DRY DECIDUOUS AND SCRUB WORKING CIRCLE

(Area in ha.)

Sr. No.	Number and Name of Forest	Compartment	Gross Area	Ban	Plantation	Kharsu	Deodar/Kail		Mixed Deo. & Kail	Fir/ Spruce	Chil	Broad Leaved	Blank		Included Cultivation	Total
													Culturable	Uncultivable		
1	2	3	4	5	7	8	9		10	11	12	13	14	15	16	17
NOHRA RANGE																
1	(R) R11 Garari	C3	44.20	-	-	-	-	-	-	-	-	-	31.20	13.00	-	44.20
2	(R) R9 Bhangari	C3	35.10	-	-	-	-		-	-	-	-	23.40	11.70	-	35.10
3	(R) R12 Punar	-	53.70	-	-	-	-		-	-	-	40.70	13.00	-	-	53.70
4	(R) R11 Garari	C5	11.70	-	-	-	-		-	-	-	-	9.10	2.60	-	11.70
5	(R) R11 Garari	C6	48.10	-	-	-	-		-	-	-	-	41.60	6.50	-	48.10
6	(R) R11 Garari	C7	23.40	-	-	-	-		-	-	-	18.85	4.55	-	-	23.40
7	(R) R19 Jamalnihog	C1	36.70	-	-	-	-		-	-	-	-	36.70	-	-	36.70
8	(R) R19 Jamalnihog	C2	49.40	-	-	-	-		-	-	-	-	39.00	10.40	-	49.40
9	(R) R21 Kuftupabar	-	10.40	-	-	-	0.95	0	-	-	-	-	9.45	-	-	10.40
10	(R) R18 Gawahi	C1	8.45	-	-	-	-		-	-	-	-	7.15	1.30	-	8.45
11	(R) R18 Gawahi	C2	61.10	-	-	-	-		-	-	-	59.15	-	-	1.95	61.10
12	(R) R18 Gawahi	C3	59.80	-	-	-	-		-	-	-	42.90	16.90	-	-	59.80
13	(R) R18 Gawahi	C4	23.40	-	-	-	-		-	-	-	-	7.80	15.60	-	23.40
14	(R) R17 Kufarkiara	C1	66.30	-	-	-	-		-	-	-	66.30	-	-	-	66.30
15	(R) R17 Kufarkiara	C2	68.90	-	-	-	-		-	-	-	68.90	-	-	-	68.90
16	(R) R17 Kufarkiara	C3	57.20	-	-	-	-		-	-	-	28.60	-	28.60	-	57.20
17	(R) R16 Gatlog	C1	67.60	-	-	-	-		-	-	-	26.00	-	41.60	-	67.60

18	(R) R16 Gatlog	C2	53.95	-	-	-	-		-	-	-	41.60	-	11.70	0.65	53.95
19	(R) R16 Gatlog	C6	45.50	-	-	-	-		-	-	-	-	32.50	13.00	-	45.50
20	(R) R11 Garari	C4	49.40	5.00	10.00	-	-		-	-	5.00	7.00	12.40	10.000	-	49.40
21	(R) R16 Gatlog	C3	45.50	2.00	15.00	-	-		-	-	3.00	6.00	-	-	19.50	45.50
22	(R) R16 Gatlog	C4	55.90	2.00	10.00	-	-		-	-	-	15.00	4.00	24.90	-	55.90
23	(R) R16 Gatlog	C5	52.00	0.00	10.00	-	-		-	-	-	6.00	30.00	6.000	-	52.00
Total			**1027.70**	**9.00**	**45.00**	**0.00**	**0.95**	**0.00**	**0.00**	**0.00**	**8.00**	**427.00**	**318.75**	**196.90**	**22.10**	**1027.70**
SANGRAH RANGE																
24	(R) R29 Tatwa-Beyong	C2	37.70	-	-	-	-		1.30	-	-	-	27.90	8.50	-	37.70
25	(R) R29 Tatwa-Beyong	C3	39.00	-	-	4.55								29.95	4.5	39.00
26	(R) R33 Bhalar	C4	3.70	-	-	-	-		-	-	-	-	3.70	-	-	3.70
27	(R) R33 Bhalar	C5	1.00	-	-	-	-		-	-	-	-	-	1.00	-	1.00
28	(R) R34 Bhalona	C1	1.70	-	-	-	-		-	-	-	-	-	1.70	-	1.70
29	(R) R35 Thola	C1	1.10	1.10	-	-	-		-	-	-	-	-	-	-	1.10
30	(R) R36 Gahal	C3	81.90	-	-	-	-		-	-	-	-	75.00	6.20	0.70	81.90
31	(R) R36 Gahal	C4	139.10	-	-	-	-		-	-	-	-	129.40	9.70	-	139.10
32	(R) R36 Gahal	C5	46.80	-	-	-	-		-	-	-	-	31.20	15.60	-	46.80
33	(R) R44 Punraw	-	7.80	-	-	-	-		-		-	-	3.90	3.90	-	7.80
Total			**359.80**	**1.10**	**0.00**	**4.55**	**0.00**	**0.00**	**1.30**	**0.00**	**0.00**	**0.00**	**271.10**	**76.55**	**5.20**	**359.80**
RENUKA RANGE																
34	(R) R47 Chari Ghati	C1	52.00	-	-	-	-		-	-	-	19.50	32.50	-	-	52.00
35	(R) R47 Chari Ghati	C2	35.10	-	-	-	-	-	-	-	-	24.70	10.40	-	-	35.10
36	(R) R47 Chari Ghati	C3	67.60	-	-	-	-	-	-	-	-	63.70	-	3.90	-	67.60
37	(R) R47 Chari Ghati	C4	40.30	-	-	-	-	-	-	-	-	37.70	-	-	2.60	40.30
38	(R) R47 Chari	C5	55.90	-	23.00							15.00		17.90		55.90

	Ghati														
39	(Ṛ) R42 Ungar	C2	42.00	-	30.00	-	-	-	-	-	-	12.00	-	-	-	42.00
40	(Ṛ) R42 Ungar	C1	33.00	-	5.00	-	-	-	-	-	-	28.00	-	-	-	33.00
41	(Ṛ) R42 Thana Khegwa	C1	63.70	-	-	-	-	-	-	-	-	50.00	10.00	3.70	-	63.70
42	(Ṛ) R42 Thana Khegwa	C2	15.00	-	-	-	-	-	-	-	-	13.00	2.00	-	-	15.00
43	(N) NelaGawahi	whole	13.60	-	-	-	-	-	-	-	-	7.60	6.00	-	-	13.60
TOTAL			**418.20**	**0.00**	**58.00**	**0.00**	**0.00**	**0.0 0**	**0.00**	**0.00**	**0.00**	**271.20**	**60.90**	**25.50**	**2.60**	**418.20**
Shillai Range																
44	(Ṛ) R50 Kota Pab	C1	71.50	-	-	-	4.00	D	-	-	-	51.90	-	-	15.60	71.50
45	(S) R3 Bandoli	whole	55.9	-	-	0	0	0	0	0	22.10	0	32.20	0	1.60	55.90
46	(S)R4 Kin Panog	C1	113.10	-	-	13.0 0	-		-	-	-	-	-	95.55	4.55	113.10
47	(S)R4 Kin Panog	C2	61.1	-	-	0	0	0	0	0	15.60		39.20	5.20	1.1	61.10
48	(S) R4 kinuPanog	C3	2.60	-	-	-	-		-	-	-	2.60	-	-	-	2.60
49	(S)R4 Ajrawali	C3	48.10	-	-	-	-		-	-	-	-	23.40	24.70	-	48.10
50	(Ṛ) R31 Jarwa	-	7.80	-	-	0.50	-		-	-	-	-	-	7.30	-	7.80
51	(S)R8 Kharakhan	C9	106.60	9.80	-	-	-		-	-	-	-	85.40	-	11.40	106.60
52	(S)R8 Kharakhan	C11	42.20	3.20	-	-	-		-	-	-	-	29.90	9.10	-	42.20
53	(S)R9 Jakandon	C2	78.60	-	-	-	-		-	-	-	-	50.70	15.60	12.30	78.60
54	(S)R9 Jakandon	C3	67.60	-	-	-	-		-	-	-	-	40.30	15.60	11.70	67.60
55	(S)R9 Jakandon	C4	58.50	-	-	-	-		-	-	-	-	28.40	30.10	-	58.50
56	(S)R11 Loja	C1	66.50	-	-	-	-		-	-	-	-	29.00	37.50	-	66.50
57	(S)R11 Loja	C2	29.20	-	-	-	-		-	-	-	-	25.00	3.20	1.00	29.20
58	(S)R11 Loja	C4	35.10	-	-	-	-		-	-	-	-	26.90	7.10	1.10	35.10
59	(S) R12 naopanjore	C1	31.20	-	-	-	5.80	-	-	-	-	-	25.40	-	-	31.20
60	(S)R13 Bhatnaul	C1	165.10	-	-	-	-		-	-	-	-	159.90	5.20		165.10
61	(S)R13 Bhatnaul	C2	89.70	-	-	-	-		-	-	-	-	85.20	4.50		89.70
62	(S)R13 Bhatnaul	C3	44.20	-	-	-	-		-	-	-	-	21.10	23.10		44.20

63	(S)R13 Bhatnaul	C4	55.90	-	-	-	-		-	-	-	-	55.90	-		55.90
64	(S)R13 Bhatnaul	C6	17.60	-	-	-	-		-	-	-	-	17.60	-		17.60
65	(S)R15 Milla	C2	76.70	-	-	-	-		1.90	-	-	-	74.80	-		76.70
66	(S) R15 Milla	C11	63.70	16.90	-	-	-		-	-	-	-	23.40	20.80	2.60	63.70
67	(S)R15 Milla	C12	2.60	-	-	-	-		-	-	-	-	2.60	-		2.60
68	(S)R14 Shri Kiari	C1	67.60	3.90	-	-	-		-	-	-	-	63.70	-		67.60
69	(S)R14 Shri Kiari	C2	89.70	6.70	-	-	-		-	-	-	-	31.90	51.10		89.70
70	(S)R14 Shri Kiari	C3	70.20	-	-	-	-		-	-	-	-	9.50	60.70		70.20
71	(S)R14 Shri Kiari	C5	39.00	-	-	-	-		-	-	-	-	32.50	6.50		39.00
72	(S)R14 Shri Kiari	C6	45.50	2.60									27.30	15.60	-	45.50
73	(S)R16 Chyali	C1	30.20		-	-	-		-	5.50	-	-	24.3	0.4		30.20
74	(S)R16 Chyali	C3	36.40	-	-	-	-		-	-	-	-	27.25	7.15	2.00	36.40
75	(S)R16 Chyali	C4	62.40	-	-	-	-	-	-	-	-	-	39.00	19.50	3.90	62.40
76	(S)R16 Chyali	C5	53.30	-	-	-	5.80		-	-	-	-	33.20	14.30		53.30
77	(S)R16 Chyali	C7	53.30	-	-	-	-		-	-	-	-	26.20	12.80	14.3	53.30
78	(S)R17 Balikoti	C2	32.50	-	-	-	-		-	-	-	-	22.10	10.40	-	32.50
79	(S)R17 Balikoti	C5	31.20	-	-	-	-		-	-	-	-	31.20	-	-	31.20
80	(S)R17 Balikoti	C6	37.70	-	-	-	-		-	-	-	-	28.60	9.10	-	37.70
81	(S)R17 Balikoti	C8	63.70	-	-	-	-		-	-	-		19.40	44.30	-	63.70
82	(S)R17 Balikoti	C13	46.80	-	-	-	-		-	-	-	-	26.00	20.80	-	46.80
83	(S)R17 Balikoti	C14	59.40	-	-	-	-		-	-	-	52.30	7.10	-	-	59.40
84	(S)R17 Balikoti	C15	27.30	-	-	-	-		-	-	-	-	27.30	-	-	27.30
85	(S)R17 Balikoti	C16	46.80	-									31.00	15.60	0.20	46.80
TOTAL			**2284.10**	**43.10**	**0.00**	**13.50**	**15.60**	**-**	**1.90**	**5.50**	**37.70**	**106.80**	**1383.85**	**592.80**	**83.35**	**2284.10**
Kaffota Range																
86	(Pt) R1 Khajuri	C16	42.90	-	-	-	-		-	-	-	37.10	-	5.80	-	42.90
87	(Pt) R8 Mailani	C1	52.58	-	12.58	-	-		-	-	-	40.00		-	-	52.58
88	(Pt) R8 Mailani	C3	37.24	-	-	-	-		-	-	-	37.24	-	-	-	37.24
89	(Pt) R2 Tatiyana	C6	76.70	-	-	-	-		-	-	4.55	-	52.65	14.30	5.20	76.70
90	(Pt) R2 Tatiyana	C7	22.00	-	-	-	-		-	-	-	-	19.50	2.50	-	22.00

91	(Pt) R2 Tatiyana	C8	39.00	-	-	-	-		-	-	-	38.10	-	0.90	-	39.00
92	(Pt) R2 Tatiyana	C9	41.60	-	-	-	-		-	-	-	-	26.00	13.00	2.60	41.60
93	(Pt) R2 Tatiyana	C15	48.10	-	-	-	-		-	-	-	-	22.10	26.00	-	48.10
94	(Pt) R2 Tatiyana	C16	45.63	-	-	-	3.89	D	-	-	-	-	41.74	-	-	45.63
95	(Pt) R2 Tatiyana	C22	16.25	-	-	-	-		-	-	-	-	16.25	-	-	16.25
96	(Pt) R2 Tatiyana	C24	28.60	-	-	-	-		-	-	-	-	14.30	14.30	-	28.60
97	(Pt) R3 DhabPipli	C2	62.30	-	-	-	-		-	-	-	-	55.00	-	7.30	62.30
98	(Pt) R3 DhabPipli	C3	20.80	-	-	-	-		-	-	-	-	20.80	-	-	20.80
99	(Pt) R3 DhabPipli	C4	78.00	-	-	-	-		-	-	-	-	55.90	14.30	7.80	78.00
100	(Pt) R3 DhabPipli	C5	84.50	-	-	-	-		-	-	-	59.80	-	22.10	2.60	84.50
101	(Pt) R3 DhabPipli	C6	46.80	-	-	-	-		-	-	-	44.20	2.60	-	-	46.80
102	(Pt) R3 DhabPipli	C7	131.30	-	-	-	-		-	-	-	92.00		35.30	4.00	131.30
103	(Pt) R5 Sewa	C1	66.81	-	-	-	-		-	-	-	-		60.00	6.81	66.81
104	(Pt) R5 Sewa	C2	52.82	-	-	-	-		-	-	-	-		40.00	12.82	52.82
105	(Pt) R5 Sewa	C3	36.72	-	-	-	-		-	-	-	-		30.00	6.72	36.72
106	(Pt) R5 Sewa	C6	55.88	-	-	-	-		-	-	-	55.88	-	-	-	55.88
107	(Pt) R6 Janjhli	C1	113.11	-	-	-	-		-	-	-	85.00	20.00	8.11	-	113.11
108	(Ṛ) R6 Janjhli	C3	81.20	-	-	-	-		-	-	-	70.00	11.20	-	-	81.20
109	(Ṛ) R6 Janjhli	C4	112.87	-	30.00	-	-		-	-	-	35.00	40.00	7.87	-	112.87
110	(Ṛ) R6 Janjhli	C5	154.37	-	-	-	-		-	-	-	80.00	70.00	4.37	-	154.37
111	(Pt) R6 Janjhli	C6	197.95	-	-	-	-		-	-	-	70.00	120.00	7.95	-	197.95
112	(Pt) R6 Janjhli	C8	158.28	-	-	-	-		-	-	-	100.00	50.00	8.28	-	158.28
113	(Pt) R7 Salag	C1	113.20	-	-	-	10.00	D	-	-	-	90.00	-	-	13.20	113.20
114	(Pt) R7 Salag	C2	125.76	-	-	-	-		-	-	40.00	80.00	-	5.76	-	125.76
115	(Pt) R7 Salag	C3	193.42	-	-	-	-		-	-	50.42	100.00	-	43.00	-	193.42
116	(Pt) R7 Salag	C4	230.80	-	-	-	-		-	-	-	30.00	175.00	25.80	-	230.80
117	(Pt) R7 Salag	C5	146.82	-	-	-	-		-	-	-	40.00	100.00	6.82	-	146.82
118	(Pt) R9 Sehbara	C1	77.47	-	-	-	-		-	-	-	-	70.00	7.47	-	77.47
119	(Pt) R9 Sehbara	C2	76.77	-	-	-	-		-	-	-	-	70.00	6.77	-	76.77
120	(Pt) R9 Sehbara	C3	38.60	-	-	-	-		-	-	-	-	30.00	8.60	-	38.60

121	(Pt) R9 Sehbara	C4	58.88	-	-	-	-		-	-	-	-	50.00	8.88	-	58.88
122	(Pt) R10 Sataun	C1	167.76	-	30.00	-	-		-	-	-	60.00	70.00	7.76	-	167.76
123	(Pt) R10 Sataun	C2	115.16	-		-	-		-	-	-	95.16	20.00	-	-	115.16
124	(Pt) R10 Sataun	C4	64.13	-	-	-	-		-	-	30.00	34.13	-	-	-	64.13
125	(Pt) R11 Manal	C1	67.67	-	-	-	-		-	-	-	-	65.00	2.67	-	67.67
126	(Pt) R11 Manal	C2	76.46	-	-	-	-		-	-	-	-	75.00	1.46	-	76.46
127	(Pt) R11 Manal	C3	125.50	-	25.00	-	-		-	-	-	30.00	65.00	5.50	-	125.50
128	(Pt) R11 Manal	C4	26.75	-	-	-	-		-	-	-	-	20.00	6.75	-	26.75
129	(Pt) R12 Gabar	C1	116.14	-	-	-	-		-	-	-	56.00	60.14	-	-	116.14
130	(Pt) R12 Gabar	C2	158.56	-	40.00	-	-		-	-	-	57.00	60.00	1.56	-	158.56
131	(Pt) R12 Gabar	C3	135.62	-		-	-		-	-	-	80.62	55.00	-	-	135.62
132	(Pt) R12 Gabar	C4	133.31	-	10.00	-	-		-	-	-	20.00	30.00	73.31	-	133.31
133	(Pt) R12 Gabar	C5	81.40	-	-	-	-		-	-	-	11.40	70.00	-	-	81.40
134	(Pt) R13 Sakhauli	C1	236.43	-	-	-	-		-	-	-	95.00	115.00	26.43	-	236.43
135	(Pt) R13 Sakhauli	C2	159.61	-	-	-	-		-	-	-	90.00	60.00	9.61	-	159.61
136	(Pt) R13 Sakhauli	C3	149.40	-	-	-	-		-	-	-	40.00	100.00	9.40	-	149.40
137	(Pt) R13 Sakhauli	C4	64.00	-	-	-	-		-	-	-	64.00	-	-	-	64.00
138	(Pt) R13 Sakhauli	C5	62.62	-	-	-	-		-	-	-	60.00	-	2.62	-	62.62
139	(Pt) R14 Kathar	C1	101.36	-	-	-	-		-	-	-	-	51.00	50.36	-	101.36
140	(Pt) R14 Kathar	C2	108.15	-	10.00	-	-		-	-	-	50.00	20.00	28.15	-	108.15
141	(Pt) R14 Kathar	C3	89.04	-		-	-		-	-	-	-	80.00	9.04	-	89.04
142	(Pt) R14 Kathar	C4	178.78	-	20.00	-	-		-	-	-	60.00	30.00	68.78	-	178.78
143	(Pt) R14 Kathar	C5	145.38	-	10.00	-	-		-	-	-	50.00	40.00	45.38	-	145.38
144	(Pt) R15 Chandni	C1	166.00	-		-	-		-	-	-	80.00	80.00	6.00	-	166.00
145	(Pt) R15 Chandni	C2	148.40	-		-	-		-	-	-	40.00	100.00	8.40	-	148.40
146	(Pt) R15 Chandni	C3	111.42	-	20.00	-						60.00	20.00	11.42	-	111.42
147	(Pt) R15 Chandni	C4	86.52	-	20.00	-						20.00	30.52	16.00	-	86.52
Total			**6041.60**	**0.00**	**227.58**	**0.00**	**13.89**	**0.00**	**0.00**	**0.00**	**124.97**	**2337.63**	**2449.70**	**818.78**	**69.05**	**6041.60**
NOHRA RANGE																
148	(R) P2 Deva Manal	C1	67.60	-		-	-		-	-	-	-	65.00	2.60	-	67.60

Total			**67.60**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**65.00**	**2.60**	**0.00**	**67.60**
SANGRAH RANGE															
149	(R) P6 Mashur	-	15.00	-		-	-		-	-	15.00	-	-	-	-	15.00
150	(R) P7 Lagnu	-	25.00	-		-	-		-	-	25.00	-	-	-	-	25.00
151	(R) P8 Dungi	-	13.65	-		-	-		-	-	-	-	-	4.40	9.25	13.65
Total			**53.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**40.00**	**0.00**	**0.00**	**4.40**	**9.25**	**53.65**
RENUKA RANGE															
152	(R) P10 Choubhogar	C4	31.20	-	-	-	-	-	-	-	-	-	1.95	29.25	-	31.20
153	(R) P10 Choubhogar	C6	63.70	-	-	-	3.25	K	-	-	-	-	60.45	-	-	63.70
154	(R) P10 Choubhogar	C7	67.60	-	-	-	-	-	-	-	-	-	16.90	50.70	-	67.60
155	(R) P10 Choubhogar	C8	55.90	-	-	-		-	-	-	-	-	44.20	11.70	-	55.90
156	(Pt) P9 Cherag	C1	96.20	-	-	-	-	-	-	-	-	-	19.50	35.10	41.60	96.20
157	(Pt) P9 Cherag	C2	57.20	2.60	-	-	-	-	-	-	-	-	13.00	40.30	1.30	57.20
Total			**371.80**	**2.60**	**0.00**	**0.00**	**3.25**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**156.00**	**167.05**	**42.90**	**371.80**
Kaffota Range															
158	(Pt) P2 Jamna Pabar	C6	70.20	-	-	-	-		-	-	-	-	5.20	64.70	0.30	70.20
159	(Pt) P2 Jamna Pabar	C5	11.70	-	-	-		-	-	-	-	-	11.70	-		11.70
160	(Pt) P2 Jamna Pabar	C10	35.10	-		-	-		-	-	-	-	32.10	-	3.00	35.10
161	(Pt) P1 Sherli Manpur	C1	61.10	-		-	-		-	-	-	-	38.10	23.00	-	61.10
162	(Pt) P1 Sherli Manpur	C2	65.00	-		-	-		-	-	13.00	-	39.00	13.00	-	65.00
163	(Pt) P1 Sherli Manpur	C3	48.00	-		-	-		-	-	13.00	-	24.60	10.40	-	48.00

164	(Pt) P1 Sherli Manpur	C4	39.00	-		-	-		-	-	4.00	-	9.00	26.00	-	39.00
165	(Pt) P1 Sherli Manpur	C5	35.10	-		-	-		-	-	-	-	35.10	-	-	35.10
166	(Pt) P1 Sherli Manpur	C6	6.50	-		-	1.30	D	-	-	-	-	1.30	3.55	0.35	6.50
167	(Pt) P3 Pamta	C2	49.40	-		-	-		-	-	-	32.50	-	16.90	-	49.40
168	(Pt) P3 Pamta	C3	61.10	-		-	-		-	-	-	49.50	-	11.60	-	61.10
Total			**482.20**	**0.00**	**0.00**	**0.00**	**1.30**	**0.00**	**0.00**	**0.00**	**30.00**	**82.00**	**196.10**	**169.15**	**3.65**	**482.20**
Shillai																
169	(R) P11 Kufata	C1	114.40	-		-	-		-	-	-	61.00	-	53.40	-	114.40
		Total	**114.40**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**61.00**	**0.00**	**53.40**	**0.00**	**114.40**
		G.Total	**11221.05**	**55.80**	**330.58**	**18.05**	**34.99**		**3.20**	**5.50**	**240.67**	**3285.63**	**4901.40**	**2107.13**	**238.10**	**11221.05**

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APPENDIX-IV

DETAILS OF STOCKING IN THE FOREST OF THE DEODAR-KAIL WORKING CIRCLE

(Area in ha.)

Sr. No.	Number and Name of Forest	Compartment	Gross Area	Ban	Kharsu	Deodar/Kail		Mixed Deo. & Kail	Fir/ Spruce	Chil	Broad Leaved	Blank		Included Cultivation	Total
												Culturable	Unculturable		
1	2	3	4	5	6	7		8	9	10	11	12	13	14	15
Nohra															
1	(R) R3 Bhog	C1	19.50	-	-	19.50	K	-	-	-	-	-	-	-	19.50
2	(R) R3 Bhog	C2	29.90	-	2.60	14.30	K	-	-	-	13.00	-	-	-	29.90
3	(R) R6 Charna	C1	41.60	-	-	41.60	D	-	-	-	-	-	-	-	41.60
Total			**91.00**	**0.00**	**2.60**	**75.40**		**0.00**	**0.00**	**0.00**	**13.00**	**0.00**	**0.00**	**0.00**	**91.00**
Sangrah															
4	(R) R25 Duri Kharahan	C4	59.80	20.80	-	-		24.70	-	-	14.30	-	-	-	59.80
5	(R) R25 Duri Kharahan	C5	22.10	10.40	-	-		10.40	-	-	1.30	-	-	-	22.10
6	(R) R25 Duri Kharahan	C8	59.80	-	-	35.10	K	-	24.70	-	-	-	-	-	59.80
7	(R) R28 Gawahu	-	32.50	6.50		18.20	K	-	-	-	6.50	-	1.30	-	32.50
8	(R) R45 Ghataun	C6	50.70	-	-	-		50.70	-	-	-	-	-	-	50.70
9	(R) R45 Ghataun	C7	46.80	-	-	28.60	K	-	18.20	-	-	-	-	-	46.80
10	(R) R45 Ghataun	C13	88.50	-	-	-		80.70	-	-	-	-	7.80	-	88.50
11	(R) R29 Tatwa-Beyong	C1	42.90	-	1.95			7.80				26.65	6.50	-	42.90
Total			**403.10**	**37.70**	**1.95**	**81.90**		**174.30**	**42.90**	**0.00**	**22.10**	**26.65**	**15.60**	**0.00**	**403.10**
Shillai															
12	(S) R10 Manal	C6	42.20	7.80	-	-		-	33.10	1.30	-	-	-	-	42.20
13	(S) R14 Shrikiari	C7	4.30	-	-	-		4.30	-	-	-	-	-	-	4.30
14	(S)R9 Jakandon	C6	76.70	5.00								65.20	6.50	-	76.70

15	(S)R15 Milla	C3	75.40	1.90								66.40	5.20	1.90	75.40
16	(S) R16 Chyali	C8	7.80	-	-	3.90	K	-	-	-	3.90	-	-	-	7.80
Total			**206.40**	**14.70**	**0.00**	**3.90**		**4.30**	**33.10**	**1.30**	**3.90**	**131.60**	**11.70**	**1.90**	**206.40**
Kaffota Range															
17	(Pt) R4 Nigali	C1	130.30	30.30	-	90.00	D	-	-	-	10.00	-	-	-	130.30
18	(Pt) R5 Sewa	C5	1.44	-	-	1.44	D	-	-	-	-	-	-	-	1.44
19	(Pt) R2 Tatiyana	C4	45.50	-	-	-	-	-	-	-	-	31.20	6.50	7.80	45.50
20	(Pt) R2 Tatiyana	C13	26.00	-		2.00	D					14.30	9.70	-	26.00
21	(Pt) R2 Tatiyana	C23	11.70	-	-	-	-	-	-	-	-	11.70	-	-	11.70
22	(Pt) R2 Tatiyana	C17	19.50									19.50	-	-	19.50
23	(Pt) R4 Nigali	C4	118.47	-	-	-	-	-	-	-	-	-	100.00	18.47	118.47
24	(Pt) R4 Nigali	C5	65.40	-	-	-	-	-	-	-	-	-	60.00	5.40	65.40
25	(Pt) R4 Nigali	C6	64.90	-	-	-	-	-	-	-	-	-	60.00	4.90	64.90
Total			**483.21**	**30.30**	**0.00**	**93.44**		**0.00**	**0.00**	**0.00**	**10.00**	**76.70**	**236.20**	**36.57**	**483.21**
Sangrah															
26	(Ṛ) P5 Dada	C1	30.00	-	-	30.00	D	-	-	-	-	-	-	-	30.00
Total			**30.00**	**0.00**	**0.00**	**30.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**30.00**
G. Total			**1213.71**	**82.70**	**4.55**	**284.64**		**178.60**	**76.00**	**1.30**	**49.00**	**234.95**	**263.50**	**38.47**	**1213.71**

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APPENDIX-V

DETAILS OF STOCKING IN THE FOREST OF THE FIR/ SPRUCE WORKING CIRCLE

(Area in ha.)

Sr. No.	Number and Name of Forest	Compartment	Gross Area	Ban	Kharsu	Deodar /Kail	Mixed Deo. & Kail	Fir/Spruce	Chil	Broad Leaved	Blank		Included Cultivation	Total
											Culturable	Unculturable		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RENUKA JI RANGE														
1	(R) R45 Ghataun	C22	58.50	-	-	-	-	11.70	-	39.00	5.30	2.50	-	58.50
Total			**58.50**	**0.00**	**0.00**	**0.00**	**0.00**	**11.70**	**0.00**	**39.00**	**5.30**	**2.50**	**0.00**	**58.50**
SANGRAH RANGE														
2	(R) R25 Duri Kharahan	C3	78.00	3.30	7.80	24.00	-	42.75	-	0.00	-	-	0.15	78.00
3	(R) R25 Duri Kharahan	C6	28.60	-	1.50	0.00	-	27.10	-	-	-	-	-	28.60
4	(R) R25 Duri Kharahan	C7	37.70	-	-	16.90	-	20.80	-	-	-	-	-	37.70
5	(R) R45 Ghataun	C3	22.1	3.30	-	-	3.40	15.40	-	-	-	-	-	22.10
6	(R) R45 Ghataun	C8	44.80	13.60	-	-	-	31.20		-	-	-	-	44.80
7	(R) R49 GataMandwaj	C3	54.60	28.50	-	-	-	24.70	1.40	-	-	-	-	54.60
8	(R) R49 GataMandwaj	C4	54.80	29.90	-	-	-	14.50	10.40	-	-	-	-	54.80
Total			**320.60**	**78.60**	**9.30**	**40.90**	**3.40**	**176.45**	**11.80**	**0.00**	**0.00**	**0.00**	**0.15**	**320.60**
SHILLAI RANGE														
9	(S) R9 Jakando	C1	56.60	-	-	-	30.60	-	-	26.00	-	-	-	56.60
10	(S) R11 Loja	C14	45.50	9.10	-	-	-	36.40	-	-	-	-	-	45.50
11	(S)R11 Loja	C10	53.30	-	-	-	-	-	1.60	-	36.10	15.60		53.30
12	(S) R11 Loja	C15	32.50	-	-	-	-	24.30	7.80	-	0.40	-	-	32.50

Total			**187.90**	**9.10**	**0.00**	**0.00**	**30.60**	**60.70**	**9.40**	**26.00**	**36.50**	**15.60**	**0.00**	**187.90**
KAFFOTA RANGE														
13	(Pt) R2 Tatiyana	C12	53.30	11.70	-	-	-	14.40	-	-	-	10.20	17.00	53.30
Total			**53.30**	**11.70**	**0.00**	**0.00**	**0.00**	**14.40**	**0.00**	**0.00**	**0.00**	**10.20**	**17.00**	**53.30**
G. Total			**620.30**	**99.40**	**9.30**	**40.90**	**34.00**	**263.25**	**21.20**	**65.00**	**41.80**	**28.30**	**17.15**	**620.30**

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APPENDIX – VI

LIST OF MAPS /SURVEY SHEET IN REUNKA JI FOREST DIVISION

S. No	No of Sheet	Sale
1	53 F/5	1:50,000
2	53 F/6	1:50,000
3	53 F/9	1:50,000
4	53 F/10	1:50,000
5	53 / F/5/SW	1:15,000
6	53 F/5/SE	1:15,000
7	53 F/6/NW	1:15,000
8	53 /F/6/SE	1:15,000
9	53 F/6/SE	1:15,000
10	53 F/9/SW	1:15,000
11	53 F/9/SE	1:15,000
12	53 F/10/NE	1:15,000
13	53 F/10/NW	1:15,000
14	53 F/10/SW	1:15,000

Appendix-VII

NOTIFICATION

NO. FFE-A(C) 7-1/96-11 **Dated: Shimla – 2, the 17.11.99**

In exercise of the power conferred by clause (h) of section 32 of the Indian Forest Act, 1927 (Act No.XVI of 1927), the Governor, Himachal Pradesh is pleased to make the following rules; namely:

1. Short title. Commencement and application:

(1) These rules may be called the Himachal Pradesh Forest (Protection from fire) Rules, 1999.

(2) These rules shall come in to force from the date of publication in Rajpura, Himachal Pradesh.

(viii) These rules shall be applicable throughout the year except for the period 1st of julyto 13 of September.

2. Definitions;

1 In case rules, unless there is anything repugnant in subject or context.

A "Act" means the Indian Forest Act, 1927 (XVI of 1927);

B "Divisional Forest officer "means,

1) Divisional Forest officer of a Forest Division
2) Divisional Manager of the Himachal Pradesh State Forest Corporation Ltd, and
3) Collector (in whose jurisdiction forest lines).

C "Forest "means a reserved Forest or protected –forest, duly notified as such under the act, and

D "Section "means Section of act, and

E "schedule "means Schedule appended to these rules.

(viii) The words and expression used, but not defined in these rules, shall have the meaning assigned to them in the act.

3. Prohibition of kindling of fire:-

(1) Kindling of fire with in one hundred meters from a forest without permission of the divisional forest officer, or his authorities representative shall prohibited.

(viii) Any person lighting a fire even beyond one hundred meters from the boundary of a forest shall take precaution, by clearing a fire path, not less than 10 meters in width between such place and such boundary, of by employing watchers or otherwise, to prevent the fire from spreading.

(ix) Precaution to be taken in burning agriculture residue or" ghasnies' or near forest .No person shall ignite agriculture residue or set fire to "ghasnies" or clear by fire any land, within a distance of one hundred meter from the boundary of the forest, unless;

(a) He gives notice of his intention to burn or clear the land by fire, at least one week before doing so, to the nearest forest range officer under whose jurisdiction such land lies; and
(b) There is between such boundary and the spot on which such material are ignited, a space at least ten meters in width which is clear of all vegetation capable of carrying fire from such spot to the forest.

4. Restriction on collection and stacking of inflammable forest produce of inflammable material outside the boundary of or the forest. Any person collecting such inflammable material, that is to say, forest produce such as grass, dried leaves and pine needles ,firewood, timber, bamboo and resin, on a land adjoining a forest or a holder of a pass or permit issued by a forest officer, or a person exercising his privilege or right to collect such produce from a forest, shall it at, as the case may be, in an general space

in the forest as the divisional forest officer, ay by general or special order, specify, and shall isolate such stacks in such manner that, it is catches fire, the fire shall not spread to the surrounding area to endanger the forests.

5. Precaution to be taken at camping places:

(1) No person shall camp in a forest, except in a camping place specially cleared and set apart and duly notified for the said purpose by the Divisional forest Officer.

(2) A person camping at such camping place may light fire the purpose of cooking or for any other purpose in such a manner as not to endanger the forest or any building, shed and property at the camping place.

(x) a person camping at the camping place shall, before vacating it, collect in the center of the camping place all inflammable material, which is to be left behind, and shall carefully extinguish all fire at the site.

By order
Commissioner – cum – secretary (Forests)
To the Government of himachal Pradesh.

APPENDEIX –VIII

HIMACHAL PRADESH GOVERNMENT FOREST DEPARTMENT

NOTIFICATION

No .ft. 29-241/b/C 49 Dated: Shimla -4, 1 the 25th February, 1952,.

In exercise of the powers conferred by section 30 (a) of the Indian Forest Act (xvi of 1927) as applied to H.P read with Govt. of India, Ministry of state notification No. 146 dated 6th December 1950, the chief commissioner, H.P is placed to declare all trees to be reserved in the forests declared protected by Himachal Pradesh Govt. Notification No.Ft.29-241-BB/49 dated the 25th February, 1952.

By order
Chief Conservator of forests,
And
Secy.(Forest Department) to
The chief commissionerH.P.Admn.

APPENDEIX –IX

HIMACHAL PRADESH GOVERNMENT FOREST DEPARTMENT

NOTIFICATION

No.Ft.43-241/E/49. Dated Shimla -4, the 25th February, 1952

In exercise of the powers conferred by section 30 (C) of the Indian Forest Act XVI of 1927) as Applied to H.P. read with the GOVT. of India, Ministry of State Notification No. 146-J dated the 6th December, 1950 the chief commissioner, H.P is placed to prohibit the breaking up or clearing for cultivation for Building, for heading cattle or any other purpose of land in the demarcated protected forests throughout Himachal Pradesh.

By order

Chief Conservator of forests
And Secy.(Forest Department) to
The chief commissioner of HP.

ANNEXURE -X

Copy of Notification empowering Divisional Forest Officers with the powers of Collector under the H.P Public Premises Act and Land (Eviction & rent Recovery) Act 1971

Authoritative English text of this Deptt. Notification No. 1-21/71-L.S.G dated 8.6.94 as required under clause (3) of Article 343 of the Constitution of India.

Government of Himachal Pradesh

Local Self Govt.Deptt.

NOTIFICATION

No.1-21/71-LSG dated Shimla-2 the, 8th June, 1994

In exercise of the powers conferred by clause (A) of section 2 of the H.P Public premises & Land Eviction & Rent recovery) Act, 1971(Act No.22 of 1971) the Governor, of Himachal Pradesh is placed to appoint all the Divisional Forest officer of the Forest Department to Perform the Functions of the Collector within their jurisdiction under the aforesaid Act in so far as the encroachments as well as unauthorized occupation of the Forest land is concerned, with immediate effect.

By order

Sd/-

Commissioner –cum-secretary (LSG)
To the Govt. of Himachal Pradesh.

APPENDIX-XI

Government of Himachal Pradesh.
Forest Department.

No. FFE.B. –A (10)-1/2009. Dated Shimla-2, the 25.09.2018.

NOTIFICATION

In supersession of all previous Notifications Nos. Fts. (F)6-7/82-Loose, Fts-B (B)-6-7/82-II, FFE-B-A(10)-2005 and FFE.B-A (10)-1/2009 dated 09.04.1996, 27.08.2001, 20.07.2006 and 04.03.2014 regarding relief due to losses caused to Human Beings and Domestic livestock by the wild animals as defined in Wild Life (Protection) Act, 1972, the Governor Himachal Pradesh is pleased to notify the following enhanced relief rates as under:

S. No.	Particulars	Rates (in Rupees)
1.	In case of death of Human being.	4,00,000/-
2.	In case of permanent disability to human being.	2,00,000/-
3.	In case of grievous injuries/ partial disability to human being.	75,000/-
4.	In case of simple injury to human being as per actual cost of medical treatment subject to maximum.	15,000/-
5.	In case of loss of Horse, Mule, Buffalo, Ox, Yak and Camel.	30,000/-
6.	In case of loss of Cow Jersey, and cross breed	15,000/-
7.	In case of loss of Cow (Local Breed), Donkey, Churu, Churi& Pashmina Goat	6,000/-
8.	In case of loss of Sheep, Goat and Pig.	3,000/-
9.	In case of loss of young ones of Buffalo, Cow Jersey and all other breeds, Mule, Yak, Horse, Camel, Churu, Churi, Donkey, Passmina Goat, Sheep and Goat.	1,500/-

The Following guidelines will be followed for grant of relief:-

i) Production of Postmortem Report in case of Loss of Human Life, Certificate in case of Grievious Injury, Partial & Permanent disability and prescription slip as well as verification of actual cost of Medical treatment in case of simple injury (including Monkey bites) from the Medical officer of a Government Institution/ Govt. recognized Medical Institution, as the case may be.

ii) The verification of loss of cattle that was actually caused by wild animal can be done by the Pradhan/ Up Pradhan of Panchayat/ Patwari/ President notified area committee/ Chairman, Municipal committee, Commissioner/ Mayor/ Deputy Mayor/ Municipal Corporation of the Area/ Elected member of the Cantonment Board Area/ Counciller of the Area, Range Forest Officer/ Deputy Ranger/ Forest Guard or other Forest Officer Higher in Rank than a Range Officer, Veterinary Officer or a Veterinary Pharmacist or Officer authorized by Veterinary Officer of the Area.

iii) All DFOs in HP shall be the final Authority to sanction all cases of relief claims on account of losses caused by the Wild Animals to humans and domestic livestock.

iv) The DFOs shall release 25% of the amount of relief prescribed for human loss / Permanent & partial disability/ grivious injury on receipt of report as interim relief immediately to the family of the deseased person after due verification in anticipation of formal sanction without delay. The balalnce amount will be released after receipt of the complete relief claims.

v) For immediate disbursement of relief claims, a corpus fund will be created at the level of Principal Chief Conservator of Forests (Wild Life)-cum- Chief Wild Life Warden. All the budget allocation from the State as well as from State CAMPA in respect of relief shall be deposited in the aforesaid corps fund. The PCCF (WL) will ensure the disbursement of relief amount in respect of aforesaid categories of losses on the same day on receipt of request from the concerned DFO. The DFO concerned will ensure to send such requestes by E-mail/ FAX asking for funds of relief amount on the same day of incident or on the day of receipt of information of the incident from the claimant. DFO will make payment of aforesaid 25% of the relief amount immediately from the budget available with him under any scheme and same will be recouped on receipt of funds from the Chief Wild Life Warden.

vi) All claims in respect of simple injury to humans shall be restricted to actual cost of medical treatment verified by the Medical Officer of a Government Institution/ Govt. recognized Medical Institution subject to maximum of Rs. 15,000/- as prescribed above in the categories of losses.

vii) All cases of losses caused by Wild animals should be reported by the applicant to the nearest Forest Office within Seven days of the incident and claims for relief is filed within one month to the nearest Range Forest Office under Control of Divisional Forest Officer (territorial or wildlife). The claim can be filed either at the place where the loss by wild animal has occurred/ reported or where the applicant resides. All time barred cases shall be sent to Govt. of Himachal Pradesh for approval.

viii) The relief will be granted in case of loss of livestock to the owner of the livestock. These rates would be applicable for killing of domestic animals by wild animals as defined in Wild Life (Protection) Act, 1972 in cattlesheds/ Cowsheds, Private land, private premises and Forests.

ix) The relief in case of the human beings will be granted in the order of preference given below:-

a) Wife or husband, as the case may be
b) Sons and unmarried or divorced daughters and children or predeceased son (equal share).
c) Daughters (equal share)
d) Grand children being children of his/ her sons or daughters who died before him/her (equal share.)
e) Father or mother
f) Brothers or sisters or children of deceased brothers (equal share).
g) Failing all above any other next of kin entitled to a share in the estate.

All the Prescribed Rates shall be made applicable with immediate effect.

By order,

Tarun Kapoor
Additional Chief Secretary (Forests) to the
Government of Himachal Pradesh.

Appendix-XII

COPY OF SUMMARY OF CONCLUSIONS

Of the team consisting of Sh. R.P. Khosla, IAS (Retd.) and Sh. Parameshwarappa, IFS (Retd.) constituted by the Govt. of India regarding

FIRE CONTROL IN FOREST AREAS

Vide office memorandum No. A. 34011/6/95-FF Dated 11th July 1995

CHAPTER-VIII- SUMMARY OF CONCLUSION

AREA AFFECTED BY FIRE:-

(i) Data regarding the fire affected area obtained through satellite imagery was used to cross check the date furnished by the state government.

(ii) In utter Pradesh the date furnished by the state govt. pertained to the reserve forests. No date was available regarding the fire affected area in civil and panchayat forests which comprise 31% of the forest area in the hills. Calculations of the affected area in these categories of forests therefore to be done through sample checks and extrapolation of other date.

(iii) The proximity of civil and panchayat forests to village habitations, their varietal composition and the absence of any organized agency for the protection has resulted in a much higher percentage of such areas being affected by fire then in reserve forests.

(iv) The total area affected by fire has been estimated as follows:

Name of the State	Area affected (Km2)
Himachal Pradesh	577
Uttar Pradesh	6220
Total	6777

CAUSES OF FIRES:

(i) The intense and prolonged heat and the virtual absence of rain in May and June in the hill areas of U.P and Himachal Pradesh brought about a situation where the pine needles and other undergrowth in the forest area become dry and highly combustible.

(ii) The heat also resulted in the fall of an unusually heavy quantity of pine needles in the area under pine forest, thus increasing substantially the combustible lying in the forests.

(iii) The ban on green felling together with the totally inadequate prevision of funds for the prevention measures resulted in the normal forestry practices for the protection of the forests such as control burning, cleaning of fire line etc. being discontinued.

(iv) A large number of fires originated from the road side and were caused by negligence of travelers and other visitors to the forest who discarded lighted matches and cigarettes in the highly combustible beds of pine needles.

(v) Fires were also caused by the villagers setting fire to their agricultural fields for cleaning dry material and to their pasture areas to bring about a regeneration of grass. These fires then spread to the contiguous forests.

(vi) Forest was sometime caused by rivalry among resin contractors.

(vii) There is no evidence to indicate that the timber mafia was responsible for setting fire to the forest or benefitted from it in any way.

(viii) There appears to be no truth in the allegation that the forest Department officials deliberately set fire to the forests in order to cover up their failure to do plantation work.

EXTENT OF DAMAGE TO FOREST WEATH:

{i} The fires caused extensive damages to plantations. Damage was also caused to standing trees resulting in triage and in loss of normal increment.

{ii} Considerable damage also caused to the resin blazes.

{iii} The valuation of damage which is capable of qualification has been assessed as follows:

	Rs. In Crores
U.P. Reserve Forest	1.93
Civil and Panchayat Forest	12.00
Total U.P.	13.93
Himachal Pradesh	3.51
Total Loss in U.P. and Himachal Pradesh	17.44

{iv} In addition to the quantifiable loss indicated above, there has been loss on account of loss of increment, loss in fertility of Soil, Soil erosion, loss of employment due to damage to resin channels, drying up of water sources.

{v} The FRI should undertake studies for proper assessment of all aspects of damage resulting from forest fires.

MEASURES OF PREVENTION AND CONTROL OF FIRE:

{i} Increased vigilance is necessary by appointment of an adequate number of fire watchers during the month of April, May and June as used to be the practice earlier.

{ii} Cleaning and maintenance of fire line which has been virtually abandoned due to shortage of funds must be carried out regularly.

{iii} The practice of controlled burning to deal with the accumulation of combustible pine needles on the forest floor which has been abandoned as a result of shortage of funds has to be reintroduced.

{iv} Proper forest management and silviculrural practice particularly in pine forest which have been abandoned as a result of the imposition of the ban on green felling must be reintroduced to ensure health and protection of the forest. For this purpose, ban on felling of pine should immediately be revoked and the forests worked as per Working Plans.

{v} Efforts for finding alternative user for pine needles should be supported by the government so as to demonstrate their economic viability. This will help reduce the accumulation of combustible material in the forest floor.

{vi} The forest department staff should be provided by the complete communication network through wireless to enable a quick response in dealing with forest fires and also with the problems of illicit felling.

{vii} The communication network has to be supported with improved mobility to enable quick transport of men and materials from one area to another. For this at least one additional jeep may be provided at the divisional level to the DFO in the hill areas.

{viii} Where villagers do not come to assist the forest department in extinguishing forest fires their rights should be curtailed if nor forfeited.

{ix} The state government must ensure that adequate funds are provided to the forest department for the proper care, maintenance and protection of the forest. The steady reduction in such funds has should be provided through a centrally sponsored scheme for this purpose.

A LONG TERM STRATEGY:

(i) Existing forest management policies have to change to a more participatory pattern of forest management in which village communities are more deeply involved.

(ii) The Civil forest in U.P. which today are no one's responsibility should be converted into Panchayat Forests as rapidly a possible and placed under the supervision of the Forest Department.

(iii) The forest Panchayat rules should be amended to ensure that the villages have more effective control over their forest and derive tangible benefits from them.

(iv) Mahila Mandals should actively promote and supported by the Forest Department as an agency for the care and protection of the forests.

(v) Integrated forestry development programmers should be adopted as the principal pattern of land related development programmer in the hills.

(vi) The genuine need of villagers for timber must be met. Additional quantities over and above their rights can be supplied to them as PD subject to a careful verification of genuineness of their requirements. The additional timber requited for the purpose can easily be met from a removal of the ban on green fellings in pine forests.

(vii) The Forest Department should be strengthened to enable it to discharge its traditional functions in the reserve forests more effectively. Beat sizes should be reduced, vehicles and wireless sets provided and personnel management improved.

(viii) Development responsibilities through adoption of integrated multi disciplinary programmers covering forestry, animal husbandry, soil conservation, fodder development, drinking water and fuel saving should be assigned to the ForestDepartment.

Appendix-XIII

Statement showing the detail of fire lines existing in Sri Renuka Ji Forest Division.

Sr . No.	Range	Block	Beat	Name of forest	Distance (Mtr)
1	Kaffota	Kaffota	Khajuri	Kaffota to Khajuri	7,225
2	Kaffota	Ambon	DhabPipli	Dhabpipli to Ranvidhar	2,450
3	Kaffota	Sataun	Nigali	Bohal to Shiva	4,000
4	Shillai	Ronhat	Khalando	Khalando to Kotibounch	1,500
5.	Shillai	Ronhat	Loza	Katardhar to Khaldhar	1,500
	Total length of Fire lines in Sri Renuka Ji Forest Division				**16,675 mtr.**

APPENDIX –XIV

GOVERENMENT OF HIMACHAL PRADESH FOREST DEPARTMENT

NO. FFE-B(G)9-6/99 **Dated shimla-2, the, 30th October,2002**

NOTIFICATION

The governor, HP is pleased to promulgate the following rules regulating payment of grant-in aid to the village forest development societies under the participatory forest management (PFM) schemes operative in himachal Pradesh

I. **Short title and extent** 1 (1) These rules may be called " rule regulating the grant –in aid the village forest development societies under PFM schemes in HP

Definitions 2 (ii) These rules shall come into force immediately. In these rules, unlessthere is anything repugnant in the subject or context.

(i) department ' means the Himachal Pradesh forest department
(ii) Government.' means the Government of Himachal Pradesh.
(iii) Revenue 'means the revenue administered by Himachal Pradesh government.
(iv) Secretary' means the secretary to the govt. of HP in the Himachal Pradesh forest department.
(v) Conservator' means the conservator of forest of the circle concerned.
(vi) DFO' means the divisional forest officer of the division concerned.
(vii) PFM' means participatory forest management.
(viii) Society' means village forest development society.

Purpose of the Grant-in-aid 3 The purpose of the grant-in-aid and is for the furtherance of implementation through the societies. The assistance in the shape of grant-in-aid would be meant for expenditure on plantation & pasture Improvement, soil & water conservation, income generation

Activates maintenance, fencing, protection etc. subject to the Availability of funds, and based on such norms and for such other Purposes, as may be decided by the government from the time to time All grant –in-aid disbursed will be funded by transparent norms , framed In advance, to govern not merely the unit of cost of different Activities, but to also specify maximum costing for amount for different Activates, and individual societies would be entitled to.

Mode of payment 4 The amount grant-in-aid shall be sanctioned and released quarterly By the DFO, keeping in view both the norms and, with in these,

The requirement of the society, as well as available funds, on receipt of A written request from the society, indicating the purpose for which it Is required. Normally a self contained proposal containing the demnd For the whole year shall be purpose by the society by 30 April every Year for scrutiny of the DFO, prior to section.

Conditions for section Of grant-in-aid 5

(I) that the DFo shall have right the to check the account of the society To satisfy himself that the grant-in-aid has been spend for the purpose For which it has been sanctioned. in case it is found that the grant-in -aid has been mis-utlized, it will be open to the DFO to recover the Aid from the society, and to stop further payment.

(II) The assest acquired wholly or substantially out of government Grant would not, without the prior sanction of the govt. be disposed Of, encumbered or utilized for purpose othr than those for which Grant is sanctioned. The society shall maintain a register in the from (As in annexure –A) in respect of the permanent and semi – permanent Assest acquired wholly or mainly out of govt. grant. This register Be maintained by the society separately in respect of each sanctioning Authority to whom a copy there of will be furnished annually for Permanent record. The assests would taken to mean all immovable And movable property of Capital nature where the value exceeds Rs. 10000/- library books and article of furniture will not, however, be Included in it.

Maintenance of accounts And submission of utilizing Certificates. 6

(I) the society shall maintain its accounts and recorded and the same will be open to inspection by the nominee (s) so deputed by the govt.

(II) an un-audited utilization certificate will be furnished by the Society in respect of grant-in-aid released to the society during a Particular year by 15 April of next year, as per from in annexure – B To the sanctioning authority, who will punish the same to the Accountant general HP. the account in respect of the grant-in-aid Released to the society for PFM activities during a particular years Under various PFM schemes, will be furnished by the DFO to the Accountant general (audit) HP by the end of September of the Next following year of sanction of grant-in-aid. The PFM account of The society will be audited by the qualified accountant, or any other

Agency approved by the govt. , before, December next , in order to Ensure proper utilization of the amount of the grant-in –aid released By the department of the society. There after the society will submit One copy of the audited utilization certificate in respect of each Project activities to the DFO. The quarterly installment in respect of the Grant-in-aid for a particular year will be released by the DFO on the Basis of un- audit utilization certificate furnished by the society.

Miscellaneous 7 in order to ascertain the utilizations of funds released to societies by DFOs under various micro plan activities, the conservators shall Prescribed format to the addl. PCCF, PFM.The expenditure on act. Of payment of grant-in –aid is to be charged under head 2406.

Head of account 8 forestry and wild life (plan (-01-forestry -800 other expenditure -06 -soon & 06-soos - under those schemes as may be included under PFM.

By Order

Principal Secretary (Forests)
To the Government of HP.

Appendix –XV

Participatory Forest Management rules – 2000

(Authoritative English text of this department notification number Fts-II (B)15-10/87dated 23.8.2001 as required under clause (3) of article 348 of the constitution of India)

Notification

No. Fts. II (B) 15-10/87 Dated 23.8.2001

In exercise of the powers conferred by section 80 read with section 81 of the Indian forest Act, 1927 (Act No. XVI of 1927), the governor, Himachal Pradesh is pleased to make the following regulations, namely:

1. Short title , application and commencement :

(1) These regulations may be called the Himachal Pradesh participatory forests Management regulation, 2001.

(2) They shall apply to such govt. forests and such govt. land including the common land, which shall be selected jointly for participatory forest management by the society and department.

{3} They shall come into force from the date of publication in Rajpatra , HP.

2. Definitions:

In these regulations, unless there is anything repugnant in the subject or context,

(a) "**Act** " means the Indian forest act 1927, (Act no.16of19270 as amended in this application of HP ;

(b) "**Conflict resolution group**" means a group consisting of a representative of the concerned gram panchayat ,a representative of the local non government organizations or local community based organizations and the concerned assistant conservator of forest;

(c) "**Common land ","Family**Gram **Panchayat","Panch","Pradhan","Village","**and**"War**d" shall have the meanings respectively assigned of them in the HP Panchayati Raj act, 1994(Act no.4of1994);

(d) **"Department"** means the HP forest Department;

(e) **"Divisional of forest officer"** means the forest officer in charge of territorial or wild life forest division of the department;

(f) **"Executive committee "** means executive body of the society ;

(g) **"forest officer"** means a forest officer as defined under sub session(2) of secsion2 of the act;

(h) **"General house"** means general house of the society;

(i) **"Government "** means govt. of HP;

(j) **"Grazier group"** means a group of persons, whether resident numbers or migratory graziers, who are dependent on the grazing resource of the selected area for meeting their livelihood needs;

(k) **"Microplan"** means holistic forests management of govt. Plan of the area selected for participatory management;

(l) **"Participatory forests management"** means management of govt. forest and govt. land including , common land managed jointly by the society and by the department ;

(m) **"Selected area "** means any govt. forest and govt. land including common land selected under regulation 3 these regulations ;

(n) **"Self help group"** means any orgenazed group of person, who collectively by mutual help are able to enhance their economic status through resource based activates;

(o) **"Site specific plan"** means a sub component of the micro plan which is a technically appropriate plan for the site;

(p) **"Society "** means village forest development society registered under section 3 of the societies registration act, 1860(Act no. 21 of 1860) for participatory forest management ;

(q) **" Sustainable forest management"** means management which is economically viable , environmentally benign and socially beneficial, and which balance is present and future needs ;

(r) **"User group "**means a group of person dependent upon a common natural resource for sustaining its livelihood needs.

3. Intent of participatory forest management:

1 On an application made to the divisional forest officer signed by at least 50% of the voters of a Grampanchayat Ward, any govt. forest and govt. Land including common land may be brought under participatory forest management. The land so identified shall be known as selected area.

2 In accordance with the wider objectives and plans of govt. for sustainable forest management, the selected area shall be managed jointly by the society and the department on the terms and condition of an agreement to be entered between the society and the department.

4. Village forest development society:

1 There shall be a society for a Gram panchayat Ward. However, where the ward is not compact and the hamlets within it do not have common forest, common grazing lands, common rights and concessions more than one society may be formed for each cluster of hamlets. The society shall be registered under section 3 of the societies 'Registration act, 1860.(Act no.21 of 1860) .

2 All voters of a Grampanchayat ward shall be entitled to be enrolled as members of the society .

5. Constitution of executive committees of the society:

The executive committee shall consist of –

A President to be elected by the general house ;

B vice president do

C four members do

D treasurer to be nominated by the elected members from amongst the members of the society ;

E joint secretaries (Woman) do

F ward punch ex-officio member;

G President – Mahila mandal -do-

H Representative - local woman group do

I Three members of to be co-opted from the vill. Level committees constituted by other departments of the govt., societies registered under the societies registration act, 1860, (act no. 21 of 1860), user groups,self help group and graziergroup ;

J Member – secretary to be elected by the general house.

Provided that at least 7 members of the executive committee shall be from amongst the woman. Joint secretary shall be assist the member – secretary.

6. Term of office of members of the executive committee:

Elected members of the executive committee shall hold office for a period of two years from the date of assumption of office.

7. Powers of the executive committee:

The executive committee shall exercise the powers of a "Forest officer" as assigned by the govt. under the act.

8. Usufruct sharing:

The society shall be entitled to the fowling benefits, namely:-

A. To collect the yield such as fallen twigs, branches lopping, grass, fruits, flowers, seeds , leaf fodder and non timber forest products free of cost.

B. To the sale proceeds of all intermediate harvest, subject to protection of forest and plantations for at least three year for the date of agreement.

C. To organize and promote vocational activates related to forest produce and land ; and other activates such as promotion of self help group which may provide direct benefits , Including micro landing to woman . None of the activities so promoted shall affect the legal status of the forest land.

D. Recorded rights over the forests shall not be affected by these benefits.

E. The govt. shall charge no royalty on the forest produce within the selected area;

F. After 5 years, the society may expend the area, on the basis of the fresh agreement did, by inclusion of adjoining of nearby areas.

G. After 20 year from the date of agreement and , based on the principles of sustained forest management, 75% of the net sale proceeds on the selected area shall be put into the account of society and the remaining 25% of the net sale proceeds shall go to the concerned Gram panchayat; and

H. To utilize at least 40% of the net sale proceed on forest regeneration activates including soil and water conservation.

Provided that for the purpose of usufruct sharing, family shall be one unit.

9. Funds:

Funds shall be generated by the society through contribution by the members and the sale of usufructs under these regulations. All funds, including those received from the government, Gram panchayat and non govt. source, shall be utilize through the microplanning process.

10. Maintenance of accounts:

The sum received by the society shall be deposited in the name of the concerned society in a nationalized bank of scheduled bank or co-operative bank of post office and the account shall be operated under the signatures of the President, Treasurer and member – secretary of the society.

11. Grant –in-aid:

The department shall releases grant –in Aid to the society under the grant –in-aid rules subject to the availability of funds and satisfactory performance of functions by the society.

12. Settlement of dispute:

In case of any dispute in relation to usufruct sharing in society, the duty rangers concerned of the department, shall takes steps to reconcile the dispute. In case the dispute is not resolved, the deputy ranger shall refer the dispute, along with his report to the range officer concerned of the department. The ranger officer, after hearing the parties, shall resolve the dispute within 30days from the date of receipt of report of the deputy ranger.

13. Appeal:

An appeal shall lie from the decision of the range officer to the conflict resolution group to be filed within 30 days from the date of dissuasion who shall decide the same within 60 days from the date of filling of appeal, after affording an opportunity of being heard to the parties. The decision of the conflict resolution group shall be final and binding on the parties. The conflict resolution group shall send a copy of the decision to the society and the divisional forest officer concerned free of coast.

14. Preparation of micro plans:

A micro plan shall be perspired for the holistic forest management and development of the selected areas, by the society . The department shall help the society in preparation of the micro plan. A micro plan shall be operative for a period of 5 years from the date of its approval by

the divisional forest officer and may be revised after 3 years. The micro plan shall be passed in general hose with at least 60 % majority of the members present.

The divisional forest officer may approve whole or part of the micro plan.

15. Powers of government:

Not withstanding anything contained in these regulations, the government shall have the powers to issue directions to the society on participatory forest management processes, micro planning, coordination, monitoring, and grant –in – aid and implementation mechanisms.

BY
FC-cum-Secretary {Forests} to the
Government of Himachal Pradesh

Appendix XVI

RULES OF MUSHTERQUA FORESTS

1. The Estate right holders are permitted to remove dry trees of all species except Deodar, Kail, Fir and Chil, and dry fuel wood as well as green trees of miscellaneous species.
2. They are permitted to cut Kokath and miscellaneous trees except Deodar, Kail, Fir and Chil for the construction and repair to their houses without permission and without the payment of any fees.
3. The Estate right holder requiring Deodar, Kail, Fir and Chil trees will apply to the Divisional Forest Officer for their grant. The assessment of number of trees to be granted will be based on the sole condition that the house to be constructed and repaired conforms to the usual pattern of building which tight holders generally use for their residence in the locality concerned. No trees will be grated to build houses to be given on rent. All permits granted for cutting the trees will be free of any payment of fee and shall remain in force for a period not exceeding the duration of 3 months from the dare of permit. If the trees are not removed from the forest within the grated period, the permit shall lapse and the trees may not be cut or removed unless the permit is renewed by the authority which granted it.
4. The revenue from the sale of green trees and Deodar, Kail, Fir and Chil trees shall vest in the Government.
5. No timber trees acquired under these rules by the Estate right holders in exercise of the concession shall be sold, bartered or in any way alienated nor may such timber or forest produce be applied to any but the purpose for which acquired.
6. The Estate right holders are permitted to lop only the crooked and deformed Kokath and Ban Oak trees subject to the following rates:-
   {a} Bo tree less than one and half feet in girth will be lopped.
   {b} Branches exceeding a finger in thickness are not lopped.
   {c} Trees may not be lopped to more than one half and their height from the ground level.
   {d} No trees near or around a water spring in the forest up to a distance of one chain from the spring be lopped.
7. The lopping of Sal, Sain, Shisham, Toon, Jaman, Harar, Amla, Khair, Kikar, Kakran, Deodar, Kail, Rai, Tosh and Chil is prohibited.
8. The removal of bark from green trees and their girding is prohibited
9. The extraction and removal of torchwood from standing coniferous trees is prohibited.
10. Kindling of fire without taking all reasonable precautions to prevent its spreading to any of the adjoining forests or to leave burning any fire in or in the vicinity of the Mushterqua forests is prohibited.
11. The Divisional Forest Officer may close a part of the forest for purposes of improvement provided, an equivalent area is provided from another nearest locality for the grazing of the cattle. Should the exercise at any time tend to endanger the safety of the forest, the Divisional Forest Officer may subject to the Sirmour Circle suspend the exercise in whole or in part.

Source: OP Sharma's Plan.

Appendix XVII

Copy of memo. No. Ft 116-84/71 {S} Part. Addl. Mob. From Pr.CCF HP, Shimla-I to CCF {Wildlife} HP, Shimla 171002 and all CFs {Territorial} in HP.

Subject: - Salvage Marking.

Instances are coming to the notice of this office where green trees were marked as Salvage markings contrary to the instructions issued from this office from time to time. This is very serious.

3. In view of the Hon'ble Supreme Court interim order dated 12.12.1996 passed in Writ Petition {Civil} No 202/65. Shri T.N. GodavermanThirumaldaped versus Union of India and others only marking of dry standing , dry fallen etc. trees are to be done for felling in areas in all the Forests {except the Wildlife Sanctuary and National Park areas } notified under Section 18 & 35 of the Wildlife {Protection} Act, 1972 as per the norms fixed by the Expert Committee. The Expert Committee has fixed the following qualitative and quantitative norms for making of dry standing fallen trees through the H.P.S.F.C. Ltd. As under:-

1. "Half broken and top broken green trees will not be marked under salvage Marking in order to form bio mass in the Forest.

2. With regard to fixation of qualitative norms the following kind of trees will be marked by the Forest Department and removed by the F.P.S.F.C. Ltd.:-

I} Fallen

ii} Dry

3. "So far as fixation of quantitative norms is concerned quantity of fallen and dry trees is available the same is too removed and no specific quantity can be fixed except that yield where prescribed under the Working Plans shall not be exceeded."

4. You are, therefore, requested to please mark dry standing and dry fallen trees only in salvage marking strictly in accordance with the qualitative and quantitative norms fixed by the Expert Committee as above. It may please also be noted that before handing over the Salvage lots for working to the Forest Corporation, necessary inspection of the markings may be endured to be carried out by the respective Forest functionaries as prescribed vide various instructions to check and contain any chance of marking of green trees in Salvage markings. These instructions may please be complied within letter and spirit and any laxity in this regard will be viewed seriously.

As no green trees can be felled, therefore, the requirement of fuel wood is to be met out of the Salvage marking of dry trees only. You are, therefore, requested to please ensure that no time is left to identify dry B.L. trees to be marked in Salvage lots and handing over to F.P.S.F.C. Ltd. for preparation of fuel wood/charcoal.

-----Sd-----
Pr. Chief Conservator of Forests
Himachal Pradesh

APPENDIX –XVIII

FOREST DEPARTMENTHIMACHAL PRADESH

STANDING ORDER

No. 2/2002 **Dated the, 28th March 2002.**

Subject: - Demarcation and Settlement operation in HIMACHAL PRADESH – Specification forBoundary Pillars-Reservation of the cost norms.

Vide standing Order No 1-2000 dated 4th March, 2000, the cost norms of main boundary pillars and chak boundary pillars were worked out on the basis of daily rates of unskilled labour @ Rs. 51/- per day and fixed as Rs. 910/- and Rs. 570/- per pillar respectively. Since the rates of wages of unskilled daily wages workers have been increased to Rs. 55/- per day w.e.f. 1st August, 2001, revised cost norms for the construction of the boundary pillars will be Rs, 960/- and Rs. 600/- per pillar for main and chak pillars respectively w.e.f. 1st August, 2001.

---Sd----
Principal Chief Conservator of Forests,
Himachal Pradesh.

APPENDIX - XIX			
LIST OF DIVISIONAL FOREST OFFICER OF RENUKA FOREST DIVISION			
Sr. No.	**Name of Officer**	**Period**	
		From	**To**
1	S/Sh. D.D. Sagotara, HPFS	12.09.78	03.04.80
2	R.N. Malhotra, HPFS	03.04.80	28.02.82
3	N.K. Bajpai, IFS	01.03.82	28.02.84
4	J.M. Nanda, HPFS	28.02.84	22.03.84
5	A.K. Gupta, IFS	11.06.85	10.06.85
6	J.M. Nanda, HPFS	17.06.85	18.06.85
7	R.P. Bharadwaj, HPFS	02.05.86	05.10.86
8	J.M. Nanda, HPFS	06.06.86	06.06.86
9	P.S. Thakur,IFS	11.07.89	10.07.89
10	Arvind Alipuria,IFS	22.10.91	22.10.91
11	S.D.Sharma IFS	05.02.93	05.02.93
12	G.C.Chauhan,HPFS	11.03.93	11.03.93
13	Y.S.Saini,HPFS	30.04.93	30.04.94
14	A.R.M.Reddy,IFS	31.07.95	31.07.95
15	T.D.Sharma, IFS	30.04.98	30.04.98
16	M.Narayanappa,IFSF	09.07.98	09.07.98
17	Tejinder Singh ,IFS	09.07.98	22.03.01
18	Sameer Rastogi , IFS	22.03.01	24.05.03
19	Ajay Kumar Lal, IFS	24.05.03	03.06.05
20	H.S. Dogra,IFS	16.07.05	02.01.06
21	Y.P.Gupta, IFS	02.01.06	30.04.06
22	R.S. Patial, IFS	01.05.06	22.05.10
23	Abhilash Damodran,IFS	22.05.10	04.04.15
24	Shreshtra Nand, HPFS	24.04.15	14.06.15
25	Sh. Sushil Kumar, HPFS	15.06.15	till date

APPENDIX – XX

LIST OF MINES AND QUARRRIES EXISTING IN RENUKA FOREST DIVISION

Sr. No.	Name of Range	Name of the mining lessee	STATUS OF LAND (In acres)			
			Private	Revenue	Forest	Partly Revenue / Private
1	KAFFOTA	Smt.Viplov Thakur	21.30	-	-	-
2		M/s Ram Narayan &brothers	21.03	-	-	-
3		Sh. Atma ram sharmadabra	-	-	7.63	-
4		Sh. Sheer Singh Thakur kamraoo	9.02	-	-	-
5		Sh. Arun Grover Lower Kaithu Shimla	-	9.43	-	-
6		Smt. Savita Chauhan , Nahan	7.43	-	-	-
7		M/s Friends Minral Shimla	13.01	-	-	-
8		M/s Dharma Singh , Mohar Singh Pamta	4.80	-	-	-
9		M/s Jai Singh Thakur	-	-	-	8.90
10		Sh. Yashwardhan Chauhan, Kando Cheog	-	-	-	22.24
11		Sh. Subha Chawala, Dehradun(UP)	-	-	-	6.60
12		M/s Mehar Singh, Laiq Ram	-	-	-	-
13		Sh. Subha Chand, Dehradun(UP)	-	34.81	-	-
14		NamrotaMinrals Nahan	20.00	-	-	-
15		Dharma Singh, S/o Sh. Dhiyan Singh, Kamaroo	21.04	-	-	-
16		Sh. Sohan Singh, Meet Singh of Kamaroo	10.82	-	-	-
17		Sh. Padam Singh, Shimla	-	40.00	-	-
18		Mam Chand Goel, Dehradun	-	50.00	-	-
19		Sh.Kush Parmar, Paonta	41.71	-	-	-
20		M/s Anand & Co. Paonta	-	-	43.00	-
21		M/s Anand & Co. Paonta	-	-	43.50	-
22		Sh. V.K. Walia, Dadahu	-	21.70	-	-
23		M/s Panjab Business Yamnagar	49.16	-	-	-
24		M/s A.Dean Co. Dehradun	-	-	-	160.00
25		KN Cement Chandigarh	131.00	-	-	-
26		Sh. Kanti Dogra, Shimla	37.00	-	-	-
27		CCI Rajban	-	-	-	366.01
28		M/s Himachal Mines	-	-	-	109.25
29		M/s Ram Narayan & Brothers	-	-	22.00	-
30		M/s Jai Singh Thakur & Sons	-	30.00	-	-
31		M/s AS Bhartari Dehradun	-	35.00	-	-
32		M/s AS Bhartari Dehradun	-	35.00	-	-
33		Sh. Subha Chand, Dehradun(UP)	-	-	-	69.83
34		Sh. Chuhi Ram, Kamaroo	-	7.03	-	-
35		Sh. Subha Chand Chawla,	-	7.00	-	-
36		M/s Mehar Singh of Kamaroo	3.90	-	-	-
37	NOHRA	Sh. Roop singhchauhan	-	20.24	-	-
38		Sh. S.S . Sethi Amritsar	11.40	-	-	-
39		M/s Kapoor Co. Mandi	4.46	-	-	-

40		Sh. Agia Ram of Paonta Sahib	-	21.36	-	-
41		Sh. Janak Raj Bansal of Parwanoo	3.80	-	-	-
42		Sh. Laiq Ram tomar of Kamaroo	0.80	-	-	-
43		Sh. Chattar Singh Tomer, Kamaroo	-	5.76	-	-
44		Sh. Kachan Chand Chowki Mirgwal	7.20	-	-	-
45	**RENUKA JI**	Sh. Nirmal Parmar , Bagthan	-	7.26	-	-
46		M/s Barwas Mines	17.62	-	-	-
47	**SANGRAH**	Sh. Virender Kumar Walia, Dadahu	-	77.34	-	-
48		Sh. Mrigendra Singh of Lana Mashoor	18.60	-	-	-
49		S. Lalit Kumar Dadahu	-	-	20.22	-
50		Sh. V.K. Walia, Dadahu	-	17.62	-	-
51		Sh. Chaman Lal S/o Sh. Mam Chand	48.01	-	-	-
52		M/s Shaw Wallace & Co.	-	157.61	-	-
53		M/s Gupta Associates, Dadahu	-	48.43	-	-
54		Sh. Sunder Singh of Ranfua	-	7.40	-	-
		TOTAL	503.11	632.99	136.35	742.83

APPENDIX - XXI

LIST OF PARAOS

Sr. No.	Name of Parao	Number & Name of Forest	Area (Ha.)	Capcity of Parao	Number of Cattle Allowed & the Rate							
					Buffalo		Cow & Bullock		Goat		Sheep	
					No.	Rate	No.	Rate	No.	Rate	No.	Rate
1	2	3	4	5	6	7	8	9	10	11	12	13
	NOHRA RANGE											
1	Sarayalta	R1 Nohra	12	10	10	7.5	-	-	-	-	-	-
2	Kuftu	R1 Nohra	28	30	30	6	-	-	-	-	-	-
3	Oridhar	R1 Nohra	40	40	40	9	-	-	-	-	-	-
4	Jogi	R1 Nohra	24	8	80	9	-	-	-	-	-	-
5	Pawri Arvan	R3 Bhog	60	20	20	6.5	-	-	-	-	-	-
6	Batuyuri	R3 Bhog	10	4	4	6	-	-	-	-	-	-
7	Bhetawal	R4 Churas	32	**15**	15	6	-	-	-	-	-	-
8	Talon	R4 Churas	100	75	48	10	-	-	-	-	-	-
9	Ani-Dhar	R4 Churas	16	15	15	6	-	-	-	-	-	-
10	Talangana - Janol	R5 Gandoori-talangana	16	12	12	7	-	-	-	-	-	-
11	Kelo-ka-Thatch	P1 Chur	61	30	30	12	-	-	-	-	-	-
	SANGRAH RANGE											
12	Doon-ka-Bag	R37 Art	20	20	14	7	-	-	-	-	-	-
13	Kufar Dhar	R37 Art	18	12	12	9	-	-	-	-	-	-
14	Bryalta	R37 Art	30	12	7	7.5	-	-	-	-	-	-
15	Dodahali/Thinabagh	R4 Thian	36	24	24	8	-	-	-	-	-	-
16	Kainth-ki-Teer	R39 Uncha-Tikar	32	20	12	6.5	-	-	-	-	-	-
17	DhankiChanari	R39 Uncha-Tikar	10	8	5	6	-	-	-	-	-	-
18	Chabdhar	R39 Uncha-Tikar	28	26	22	8	-	-	-	-	-	-

19	Tirola Bas	R39 Uncha-Tikar	8	2	-	10	-	-	-	-	-	-
20	Matiyari	R39 Uncha-Tikar	18	15	8	6	-	-	-	-	-	-
21	Matwa	R39 Uncha-Tikar	8	6	2	6	-	-	-	-	-	-
22	Deodi	P5 Dada	12	15	10		-	-	-	-	-	-
	SHILLAI RANGE											
23	Kufta	R60 Manal	60	25	6	6	1	0.75	-	-		
24	Chandpur	R61 Loja	60	15	8	7.5	2	0.75	-	-	5	0.5
25	Jamelt	R63 GataMandwaj	80	30	30	6.5	B4	0.75	-	-	-	-
26	Kuftu Dhang	R63 GataMandwaj	16	10	8	6	B4	0.75	-	-	8	0.5
27	jiunidhar	R63 GataMandwaj	38	15	9	9	B2	0.75	-	-	4	0.5
28	Chohant	R45 Ghaton	96	20	10	7.5	B2	0.75	-	-	-	-
29	Gangori	R45 Ghaton	88	15	10	7.5	B3	0.75	-	-	5	0.5
30	Khatna	R45 Ghaton	88	35	18	7.5	2	0.75	-	-	9	0.5
	RENUKA JI RANGE											
31	Mandi gori	R45 Ghaton	72	40	24	8.5	4	0.75	-	-	-	-
32	Bator thatch	R45 Ghaton	29	10	6	10	-	-	-	-	1	0.5
33	Pullilani	R45 Ghaton	72	15	13	7	2	0.75	-	-	-	-
34	Bharot	R45 Ghaton	16	10	6	7	-	-	-	-	-	-
35	Jaman Khula	R45 Ghaton	80	30	18	12	5	0.75	-	-	-	-
36	Kufardhar	R45 Ghaton	80	30	30	8.5	9	0.75	3	1	10	0.5
37	Charighati	R47 Chadi Ghati	38	10	10	10	-	-			-	
	NOTE:	1. The rates be revised keeping in view.										
		2. B Stand for bullock.										

Appendix-XXII

(Authoritative English Text of this Department Notification ·No. FFE-B-A (3) 4/2015 dated- as required under clause (3) of article 348 of the Constitution of India),

Government of Himachal Pradesh
Department of Forests

· No. FFE-B-A (3) 4/2015 **Dated: Shimla-2, the 26th February 2016**

Notification

Whereas, the draft Himachal Pradesh Forest (Timber Distribution to the Right Holders) Amendment Rules, 2015 were published in the Rajpatra, Himachal Pradesh on 15-09-2015 vide Notification of even No. dated 03-09-20 I 5 for inviting objection(s) and suggestion(s) from person(s) likely to be affected thereby within a period of 30 days from the date of their publication; ·

Whereas, no objection(s) or suggestion(s) from any interested person(s) has/have been received by the Principal Chief Conservator of Forests (HoFF) Himachal Pradesh within the above stipulated period;

Now, in exercise of the powers conferred b clause (L) of section 32 of the Indian Forest Act, 1927, the Governor of Himachal Pradesh is please to make the following Rules further to amend the Himachal Pradesh (Timber Distribution to the Right Holders) Rules, 2013 notified vide Notification No. FFE-B-E(3)43/2006-Vol-II, dated 26.12.2013 and published in the Rajpatra, Himachal Pradesh on 28-12-2013, namely:-

Short title commencement 1. (1) These rules m:\Y be called the Himachal PradeshForest (Timber Distribution to and the Right Holders) Amendment Rules, 2016.

(2) They shall come into force from the date of their publication in the Rajpatra, Himachal Pradesh.

Amendment of rule 2 2. In rule 2 of the Himachal Pradesh Forest (Timber Distribution to the Right Holders) Rules, 2013 (hereinafter referred to as the "said rules" , for clause(e), the following clause shall be substituted, namely:-

"(e) Timber Distribution Rights means right of a Right Holder having cultivated land, acquired only through inheritance, fro grant of timber for construction, repair and addition or alteration of residential house and cow shed for bonafied domestic use of the Right Holder as recorded in the Forest Settlement Report of the area concerned:

Provided that no person whon have purchased land for construction of residence, cultivation or any other allied purpose settled from outside in the Revenue estate shall be entitled for Timber Distribution Rights"

Amendment of Rule 3 3. In Rule-3 of the said Rules for clause (ii) and (vi), the following new clauses (ii) and (vi) shall respectively be substituted, namely:-

"(ii) in case Right Holder has land holding which qualifies him for grant of timber at more than one place, he may be granted timber only at one place where he actually resides;

"(v) Timber shall not be granted to the Right Holder, if salvage trees for the purpose are not available in the forests where concerned Right Holders have Timber Distribution Rights."

Amendment of Rule 4

4. In Rule 4 of the said Rules for sub Rule (2) the following sub rule shall be substituted, namely:-
"(2) Trees shall be given from salvage (Fallen, Dry standing) trees. No green standing trees shall be granted to the Right Holder"

Amendment of Rule 5

5. In Rule 5 of the said Rule, in clause (i) and (ii) for the words "fifteen years" and "five years" the words "twenty years" and "Ten Years" shall respectively be substituted.

Substitution of rule 7

6. For Rule 7 of the said Rules, the following rule shall be substituted namely:-
"7. Procedures for grant of trees. The Right holder may apply for grant of trees on annexure-I to the Gram Panchayat concerned after getting necessary Remarks from the Patwari concerned about his land holding acquired through inheritance and rights. The concerned Panchayat shall scrutinize the application for making recommendations after ascertaining the genuineness of the requirement of the Right Holder. The recommendations shall be made in the form of a resolution of the Gram Panchayat. Thereafter, Right Holder shall submit his application to the Forest Guard of the Area, who shall enter the same in the register maintained for the purpose and shall acknowledge the receipt of the application to the Right Holder and shall send application with his recommendation to the Block Officer after ascertaining genuineness of demand, who in turn shall submit the application alongwith his recommendations to the Range Officer. The Range Officer shall forward the same with his recommendation to the Divisional Forest Officer. After receipt of application from Range Officer, the Divisional Forest Officer shall take action for grant of the trees after satisfying himself about the genuineness of the requirement and availability of Salvage trees in the concerned Forest and intimate his decision to the Right Holder concerned as per annexure-II appended to these Rules."

Amendment 12

7. In rule 12 of the said Rules, after the words and sign "Thereafter, "another," the of rule word "salvage" shall be inserted.

Amendment of rule 14

8. For rule 14 of the said rules, the following rule shall be substituted, namely:-
"14 **Penalties.-** if any Right Holder, contravenes any of the provisions of these rules, except rule-3 (ii) in utilization of timber obtained, his rights shall be suspended for next twenty years. In the case of contravention of rule 3(ii) Timber Distribution rights shall be suspended permanently. The Right Holder, in addition to the above penalty; shall also be liable to pay the cost of the tree at the market rate.

Substitution of 9. For annexure-I annexed to the said Rules, the following Annexure shall be annexure-I substituted namely:-

"Annexure-I"

PERFORMA FOR APPLICATION FOR GRANT OF TIMBER DISTRIBUTION

(See rule-7)

(Delete whichever is not applicable)

1. Name of Applicant_____
2. Occupation _____
3. Father's name _____
4. No. of family members_____
5. Is the applicant head of the family_____
6. Village_____
7. Post Office_____
8. Tehsil_____
9. District_____
10. Panchayat_____
11. Year in which Timber Distribution was earlier granted and quantity/ No. of trees granted_____
12. Purpose for which TD required_____

(Whether for new construction, repair and addition of alteration of residential house / cow shed)

13. Detail of TD required

Species	Volume in Cubic Meter	Name of Forest where rights exists

14. I, hereby declare that :

(i) Trees to meet the requirement for construction, repair and addition or alteration of residential house/cow shed are not available on my land.

(ii) I have not sold any tree from my land under the 10 year felling programme during the last 10 years;

(iii) I have land holding at only one place i.e. at _____and at _____and I am actually residing at Place. The detail of TD already granted is as under:

_____

(iv) I am the original Right Holder and also the head of the family.

(v) I have not purchased land after obtaining permission of the Government under section 118 of the Himachal Pradesh Tenancy and Land Reforms Act, 1972.

(vi) I understand that rights of Right Holder are subject to the active cooperation and participation of Right Holders in Forest conservancy and I shall perform my duties for apprehending forest offenders, extinguishing fire etc. and

(vii) I shall not misuse the timber obtained in TD and abide by the rules/instructions of the Forest Department in this regard.

(Signature of the Applicant)

Date_____ Name in block letter_____

Recommendations in the form of a resolution of Gram Panchayat

It is certified that Sh._____ S/o Sh._____ is a permanent resident of village _ _____mauza_____ and is the head of the family as per Panchayat Record. The

requirement of trees of the applicant is genuine and he requires_____ Cubic Meter of Timber for construction, repair, addition, or alteration of his residential house/cow shed. His/her application is recommended vide Resolution No. _____ dated _____ in the Gram Panchayat.

Seal and Signature of Pradhan, Gram Panchayat.

Report of Patwari

Certified that Sh. _____S/o Sh_____ is a permanent resident of Mauza _____. The applicant is owner of the cultivable land acquired through inheritance comprising Khasra No. _____measuring _____ and pays an amount of Rs._____ per annum as land revenue and has recorded rights to obtain trees in TD. He is the head of the family.

Date:_____ **Seal and Signature of Halqua Patwari**

Report of Forest Guard

(i) The applicant has not obtained trees/ timber under Timber Distribution for construction of new residential house/ cow shed during last 20 years. The applicant has not obtained trees/timber under Timber Distribution for repair, addition, alteration of residential house/ cowshed for the last 10 years.
(ii) The applicant has not caused any loss/ Damage to the forest wealth/ encroached on Forest Land and no damage report /FIR/ Court Case relating to any Forest Offence is pending against him.
(iii) The requirement of the timber is for _____.
(iv) The applicant extends full cooperation in protection of the Forest; and
(v) The applicant may be sanctioned following trees:

Species	Class	Number	Volume	Forest	Salvage

Seal and Signature of Forest Guard
Date_____ Name of Forest Guard_____
Beat_____

Report of Block Officer (Deputy Ranger)

(i) Certified that the contents of the application and the certificate given by the beat Guard are correct.
(ii) I have inspected the site of construction, repair and addition or alteration of residential house/ cow shed, where TD grant is proposed to be utilized and the applicant may be granted following trees on spot:-

Species	Class	Number	Volume	Forest	Salvage

Which is available as salvage in _____ Forest; and
(iii) Applicant has not sold any trees from his land during the last ten years under 10 years felling programme.

Seal and Signature of Block Officer
Date_____ Name _____
Block_____

Report of Range Officer

The requirement of the applicant is genuine and he may be granted following trees:

Species	Class	Number	Volume	Forest	Salvage

Which is available as salvage in _____ Forest.

Seal and Signature of Range Officer

Date_____

Name _____

Block_____

Sanction by DFO

Following trees are sanctioned for construction, repair and addition or alteration of residential house/ cow shed to Sh. _____S/o Sh._____of village _____Gram Panchayat_____ Tehsil _____District_____.

Species	Class	Number	Volume	Forest	Salvage

Seal and Signature of
Divisional Forest Officer

Date_____

Forest Division _____

Substitution of II

10. For Annexure-II, annexed to the said Rules, the following Annexure shall be substituted, namely:-

"Annexure-II"

(see rule 7)

No.
Forest Department
Himachal Pradesh.

From

Divisional Forest Officer,
_____Forest Division.

To:

Sh/ Smt_____
Village_____Post Office_____
Tehsil_____District_____
Date_____

Subject: Sanction of trees under Timber Distribution Rights.

Dear Sirs/ Madam,

Please refer to your application dated _____for TD for construction, repair and addition or alteration.

2. Your application for grant of _____-cubic meter timber of _____spp. for construction, repair, addition or alteration of residential house/ cow shed has been considered by the undersigned and following trees have been sanctioned in your favour:

Species	Class	Number	Volume	Forest	Salvage

3. That your TD application has been considered and rejected on the following grounds:-

(i)_____
(ii)_____
(iii)_____

Yours faithfully,

Signature and Seal of
Divisional Forest Officer.

Date_____

By Order,

(R.D. Dhiman)
Pr. Secretary (Forests) to the
Government of Himachal Pradesh.

APPENDIX–XXIII

H .P Forest Department
Dated Shimla – 1, the 24 Sep .2001

From: - Pr. CCF H.P. Shimla**.** **To: -** CCF (WL) / ALL CFs (T& WL)
In Himachal Pradesh.

Subject: - Enumeration of chil tress in govt. forest for handing over to H.P.S.F.C .for resin tapping.

Memorandum:-

In continuation of this office memo of even no dated 03.09.2001.

2. In this context , it is clarified that the directions issued for conducting special drive for enumeration of chil tress should include, all chill tress that are presently under tapping or which were left out earlier (under rest) or which are to be tapped for the first time. In respect of tress to be tapped for the first time, the diameter shall be 32 cm, d.b.h.

3. However, for the old lots which are already under tapping ,or tress which have been tapped earlier but which were left out for enumeration (under rest) and can be tapped now, the trappable diameter shall continue to be 30 cm d.b.h. and above.

4. in this context , your attention is also invited to this office letter no. ft. 1259 -16 /67 (S)IV / Resin, dated 23-6-2k which is it be kept in min while enumeration is carried out or the new lots as well as for the old lots.

Necessary action may be taken under intimation to this office.

Encls: - As above --Sd ---

Principle CCF /HP SHIMLA

Endst No. of even No. Dated 03.09.2001 is forwarded to:

1. Managing director, H.P.S.F.C. Ltd Shimla for information.
2. Director North / south H.P.S.F.C. Ltd. For necessary action please.

--Sd---

Principle CCF /HP SHIMLA

Appendix-XXIV

LIST OF EXISTING FOREST BUILDING AS IT STOOD ON 31-03-2018.								
Circle/Division	**Particular of Buildings**	**Sr. No**	**Type:VI/V/IV/ III/II/I**	**No of Buildings**	**No of sets**	**Place where situated**	**Year of construction**	**Present condition of Building**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Nahan	**A- Residence**							
Renuka	DFO Residence	1	IV	1		Renuka Ji	1979-80	Good
	ACF Residence	2	III	1		Renuka Ji	1987-88	Good
	RO Residence							
	Ro Shri Renuka Ji	1	III	1		Renuka Ji	1992-93	Good
	Ro Sangrah	2	III	1		Sangrah	1956-57	Good
	Ro Nohra	3	III	1		Nohra	1965-66	Good
	Ro Shillai	4	III	1		Shillai	1960-61	Good
	Ro Kaffota	5	III	1		Kaffota	2003-04	Good
	BO Residence							
	BO Renuka Ji	1	II	1		Renuka Ji	1957-58	Good
	BO Renuka Ji	2	II	1		Renuka Ji	1992-93	Good
	BO Sangrah	3	II	1		Sangrah	1957-58	Good
	BO Shillai	4	II	1		Shillai	1969-70	Good
	BO Kaffota	5	II	1		Kaffota	1992-93	Good
		6	II	1		Sataun	1991-92	Good
	BO Nohra	7	II	1		Nohra	1965-66	Good
	Fgd Huts							
	Renuka Ji	1	II	1		Parara	1973-74	Disputed
		2	II	1		Swar	1991-92	Good
		3	II	1		Renuka Ji	1957-58	Good
		4	II	1		Ganog	Not Known	Good
		5	II	1		Fail	2017-18	Very Good
		6	II	1		Dadahu	1961-62	Good
		7	II	1		Rajana	1984-85	Good
	Sangrah	8	II	1		Sangrah	1957-58	Good
		9	II	1		Lajwa	1960-61	Good
		10	II	1		Mandoli	1988-89	Good
		11	II	1		Bhowai	1971-72	Good
	Nohra	12	II	1		Nohra	1965-66	Good
		13	II	1		Devemanal	1991-92	Good
		14	II	1		Charna	1971-72	Good
		15	II	1		Bogdhar	Not Know	

	Shillai	16	II	1		Shillai	1969-70	Good
		17	II	1		Bhatnol	1972-73	Good
		18	II	1		Khalando	Not Know	Good
		19	II	1		Chimu	1964-65	Require major repair
	Kaffota	20	II	1		Kaffota	1960-61	Good
		21	II	1		Tatiyana	1955-56	Good
		22	II	1		Kota Pab	1960-61	Good
		23	II	1		Nigali	1967-68	Good
		24	II	1		Chandani	1987-89	Good
	Ministerial Qtrs							
	Supdt. Qtr	1	III	1		Renuka Ji	1992-93	Good
	Clerks	2	II	1			1981-82	Good
		3	II	1			1981-82	Good
		4	II	1			1989-90	Good
		5	II	1			1989-91	Good
		6	II	1			1979-80	Good
		7	II	1			1979-81	Good
		8	II	1			1981-82	Good
		9	II	1			1981-83	Good
		10	II	1			1978-79	Good
		11	II	1			1978-79	Good
	Others	0	0	0	0	0	0	0
	B-Office							
	DFO	1		1		Renuka Ji	1979-80	Good
	RO Renuka Ji	2		1		Renuka Ji	192-93	Good
	RO Sangrah	3		1		Sangrah	1956-57	Good
	RO Nohra	4		1		Nohra	Not Know	Good
	RO Shillai	5		1		Shillai	1965-66	Good
	RO Kaffota	6		1		Kaffota	1960-61	Good
	C- Rest House							
	Range Sangrah	1		1	2	Haripudhar	2017-18	Good
	D-Inspection Huts							
	Renuka Ji	1		1	2	Renuka Ji	1993-94	Good

	Shillai	2		1	2	Nainidhar	2016-17	Good
	Nohra	3		1	3	Bogdhar	Not Know	Good
	Sangrah	4		1	1	Bhallar	2014-15	Good
		5		1	1	Badol	2010-13	Good
	E-Others							
	a} Seed Store	1		1		Bhatnol	2016-17	Good
	b} Sheds	2						
	c} Garages	3		1		Renuka Ji	1992-93	Good
	d} Godown etc.	4						

APPENDIX –XXV
GOVERNMENT OF HIMACHAL PRADESH
HIMACHAL PRADESH FOREST DEPARTMENT

Standing Order

No. 1/2000 **Dated SHIMLA -1, the 4.3.2000**

Subject: - Demarcation and Settlement operation in HIMACHAL PRADESH – specification for Boundary Pillars.

The Specification for construction of various types of boundary pillars was ordered vides Standing Order No. 2/1992 dated 16.09.92. During the course of discussions at various levels it was noted that these dry stone masonry B.Ps are easily damaged / disturbed by human beings and animals. Moreover the dry stone masonry boundary pillars require frequent repair. It is therefore necessary to construct the boundary pillars of permanent nature.

Therefore, in supersession of office order No. 2/1992 dated 16.09.1992 following specification is ordered. These will, however, be application to area where new boundary pillars are to be constructed. In forests where B. Ps already exists, the existing pattern will be continued.

1. **Specification:**

Kind of B. Ps	**Size of boundary pillars (in cm)**				**Remarks**
	Foundation	**Base**	**Top**	**height**	
					The foundation will be dug 25 cm deep. A layer of charcoal/lime will lie at the bottom of the pillar. After construction the foundation will be covered with earth. The B. P. number will be engraved on pillar when cement plastering is fresh. After whitewashing, the number will be painted black. The B.P. will be in random rubble stone masonry in 1:6 cement mortars. There will be an iron rod with triangular base in the center.
Chak pillar	**80x80X15**	**60x60**	**30X30**	**60**	As above except that the pillar will also be in cement concrete.

2. Procedure for construction of these Boundary Pillars:

The designs for construction of these boundary pillars are enclosed. The exact location as per Revenue (Settlement) maps will first be ascertained and clearance of site done. Then required foundations (25 cm) deep will be dug out. The 25 cm depth will be on the downhill side. The orientation of foundation will be in such a way that two sides are perpendicular to the line joining this pillar and next pillar. The thin layer (3-4 cm) of line and charcoal will be laid in bottom and some cement concrete (40cm) (1:6:12) will be laid (4-6 cm).On it the triangular shape base of iron rod will be erected in centre. The thickness of foundation be made up to 15 cm by 20 mm cement concrete (1:6:12) keeping iron rod straight.

Than the pillar will be construction after leaving a step of 10cm on all side. The main pillar will be constructed in random rubble stone masonry in 1:6 cement mortars as shown in design. The hummer dressing of stone will be done on one side i.e. outer, proper orientation of pillar will also be ensured. Iron rod will kept straight. The base of iron rod will be triangular as shown in design. After construction 15mm cement plaster (1:6 cement mortars) will be done on all four sides and on top. The B.P. number will be engraved on side opposite the next B.P. proper curing will ne ensured .Afterwards two oats of white washing will be done after preparing mixture properly. The B.P. No. will then be painted black. The ground will be leveled by filling earth in the left out excavated portion.

Same procedure will be followed in case of chalk pillar except that here the pillar will be laid by filling cement concrete (1:3:6) with 25mm concrete frame/shuttering of specified size. The plaster here will be 6mm in 1:4 cement mortars.

3. Orientation and numbering:

The orientation of the BPs will be in such a way that the one side faces the direction of next boundary pillar i.e. is perpendicular to the line joining this pillar and the next pillar. The BP number will be engraved on face opposite (backside) to which face the next B.P. later on the number will be painted black.

4. There will be no change in specification and size of existing B.Ps.

Sd/-

Principal Chief Conservator of Forests,
Himachal Pradesh.

Appendix-XXVI

Name of Existing Forest Roads/Bridle Paths/Inspection Paths as it Stood on 31.03.2018.							
Circle/Division	**Range**	**Motor able or jeepable road/Bridle path/Inspection path**	**Ftom**	**To**	**Whether metalled/un-metalled**	**Length {in kms}**	**Year of Construction**
1	2	3	4	5	6	7	8
Nahan	Sangrah	Bridle	Sangrah	Gandoori	un-metalled	25.7	Not Known
		Bridle	Sainj	Bhog	un-metalled	53	Not Known
		Bridle	Haripur	Sainj	un-metalled	30.5	Not Known
	Kaffota	Bridle	Khajuri	Kaffota	un-metalled	2	Not Known
	Shillai	Bridle	Khalando	Haripur	un-metalled	8	Not Known
	Renuka Ji	Bridle	Khala	Kair-Reth	un-metalled	17	Not Known
		Bridle	Renuka Ji		un-metalled	8	Not Known
	Nohra	Bridle	Bogdhar	Bhatnol Manal	un-metalled	4/000	Not Known
	Nohra	Road		Choras	un-metalled	0.66	Not Known
	Renuka Ji	Road	Renuka ji	Lake Cercular Road	un-metalled	3.82	Not Known
	Kaffota	Road	Kaffota	Khajuri	un-metalled	7	Not Known
	Sangrah	Road	Tehsil office Sangrah	Range office Sangrah	un-metalled	RD 0/504	Not Known
	Kaffota	Road	Khajuri	Nere Bas under EAS By D.C. Fund	un-metalled	0/500	Not Known

APPENDIX –XXVII

GOVERNMENT OF HIMACHAL PRADESH,

NO. FFE-B-A(10)-1/2005 **DATED. 15TH DEC. 2011**

NOTIFICATION:

In partial modification to this department notification no Fts (F) 6-7/82- loose, dated 9.4.1996 the governor of Himachal Pradesh is pleased to order that the condition at sr. No.III in the said notification shall be read as **"**ALL DFOs in HP shall be the final authority to sanction all cases of claims on account of losses done by the wild animals to domestic /pet animals and human beings in each case**"**

Other terms and conditions will remain the same

By order

Sudripta Roy
Addl. Chief Secretary (Forests)
To the govt. of HP

APPENDIX XXVIII

GROWTH OF KHAIR

1. Data of other places:

1.1 Original work done regarding collection of growth/yield data in H.P is available only in few working plans. However, the frequently referred working plan in which some attempts were made to collect the data is of Nurpur Forest Division (From 1.4.1976 to 31.3.1991) By Sh.NanakChand,IFS, concerned para 39 and 39.1 of this plan read as under :

"39. Khair is another economically important species of this tract for the manufacture of Katha. Khair crop found in the area is of seed and coppice origin. Plantations upto the age of 10 years could be easily distinguished. The measurements of 10 plants of Khair for each year upto 10 years are as under.

Age in years	D.B.H. in cms	Height in meters
1	-	0.40
2	-	0.90
3	0.7	1.50
4	1.2	2.60
5	2.5	3.40
6	4.0	4.20
7	5.6	5.80
8	7.4	6.30
9	7.8	7.30
10	8.5	8.90

Measurements taken for 10 khair trees for each year and of coppice origin are as under:

Age in years	Diameter Breast Height in cms.	Height in meters
1	2.5	2.30
2	4.2	3.50
3	4.8	4.50
4	5.7	6.10
5	6.4	6.50
6	7.2	6.90
7	8.3	7.50
8	9.2	8.10
9	10.4	8.80
10	11.5	9.50
13	13.0	10.40
15	14.4	11.00
20	17.0	11.40
24	18.8	13.10

From the above two tables it is clear that growth statistics of khair crop raised from seed and that of coppice origin differs considerably.

Keeping in view the heterogeneous nature of the crop, the data from Pandey's working plan for Haldwani Forest Division has been utilized as under:

Crop age (year)	**Average diameter Height (cms.)**	**Average height in(m)**
5	(3.5)	(3.3)
10	(7.6)	(6.0)
15	(11.1)	(8.5)
20	(13.9)	(10.9)
25	16.5	(13.1)
30	18.8	(14.9)
35	20.8	16.7
40	22.6	18.3
45	24.1	19.5
50	25.4	20.7
55	26.6	21.6
60	27.7	22.5

(The figures in brackets are extrapolated)

The age of khair trees cannot be determined from stumps. For the collection of growth statistics, linear plots have to be laid in the existing plantations and periodically measured. A specific recommendation in this regard is being made in miscellaneous regulations for future."

"39.1 Following table shows the average period in years taken by different diameter classes to center into the next higher diameter class. This has been derived from the above table.

Diameter class (cms)	**Total age on entering the class**	
25	47 years	14 years
20-25	33 years	
15-20	22 years	11 years
10-15	14 years	8 years

It is estimated that annual rate of mortality in passing from one diameter class to the next higher d iameter class is 2% figure for Haldwani being 1.87%"

1.2 some studies were done during preparation of Dharamshala and Dehra (part) Forest Division (1981- 82 to 1995-96) by M.P. singh. The result are summarized as follows :

Age	**Seed orogin**		**Coppice origin**	
	d.b.h.(cms)	**Height(m)**	**d.b.h(cms)**	**Height(m)**
1	-	0.42	2.40	2.30
2	-	0.94	4.20	3.50
3	0.70	1.48	4.70	4.50
4	1.20	2.57	5.70	6.00
5	2.50	3.40	6.45	6.50

6	3.95	4.20	7.10	6.85
7	5.60	5.82	8.30	7.40
8	7.45	6.30	9.00	8.00
9	7.80	7.35	10.20	8.50
10	8.50	8.85	11.40	9.50
11	N.A	N.A.	13.00	10.20
15	N.A.	N.A.	14.30	11.00
20	N.A.	N.A.	17.10	11.50
24	N.A.	N.A.	18.75	13.00

1.3 The growth rate as per sample plots of is as follows:

"the following statement shows the average rate of growth based on the measurements of 14 sample plots of Saharanpur, Rohikhand, Ramnagar,Lansdowne,Haldwani, Baharaich and Terai and Bhabar Forest Divisions of Uttar Pradesh :-

Age(years)	**Average rate of growth**	
	Crop Height(m)	**crop dia(cm)**
10	11.27	12.20
20	16.15	18.80
30	18.59	22.40
40	19.81	25.40
50	20.73	27.70
60	21.34	29.70
70	21.64	31.20

Source :- A monograph on khair by D.N. Tewari.

1.4 Yield table of Khair :

YIELD TABLE

(Before thinning statistics upto Col. 7)

Age	**Dominant**		**Mean dia by basal area method(cm)**	**No. of trees (P/ha)**	**Basal area(sqrm)**	**Total volume P/ha(cum)**	**Volume Thinned (cum)**	**M.A.I.(Cum)**
	Height(m)	**Diameter(cm)**						
Good Sites								
10	13.5	23.0	17.1	557	12.78	9.65	0.31	0.965
15	16.3	25.3	19.2	499	14.43	20.89	0.62	1.413
20	18.3	27.0	21.0	440	15.22	31.31	1.18	1.612
25	19.9	28.5	22.6	390	15.66	40.09	1.60	1.688
30	21.1	29.7	24.1	349	15.94	47.53	1.93	1.708
35	22.1	30.8	25.5	315	16.13	53.85	2.12	1.700
40	23.0	31.8	26.9	287	16.26	59.38	2.35	1.679
45	23.8	32.6	28.2	262	16.36	64.01	2.25	1.647
50	24.5	33.4	29.4	242	16.44	68.48	2.38	1.617
55	25.1	34.0	30.6	224	16.50	72.40	2.44	1.584
60	25.6	34.6	31.8	208	16.55	75.93	-	1.552
Moderate Sites								
10	10.6	21.1	15.8	557	10.94	3.23	0.01	0.323
15	13.3	23.5	17.9	504	12.64	9.96	0.14	.0665

20	15.3	25.4	19.6	460	13.92	18.00	0.39	0.907
25	16.8	26.9	21.2	416	14.67	26.00	0.72	1.061
30	18.1	28.3	22.6	376	15.15	33.34	1.07	1.153
35	19.2	29.4	24.0	341	15.49	39.64	1.27	1.199
40	20.1	30.5	25.3	312	15.72	45.47	1.54	1.227
45	20.9	31.4	26.6	286	15.90	50.52	1.65	1.237
50	21.6	32.2	27.8	264	16.04	55.12	1.82	2.238
55	22.3	32.9	29.0	244	16.15	59.15	1.84	1.232
60	22.8	33.5	30.1	227	16.24	62.97	-	1.224
Poor sites								
10	8.0	18.8	14.6	557	9.33	0.57	0.14	0.057
15	10.4	21.5	16.5	504	10.78	3.57	0.28	0.247
20	12.3	23.5	18.2	460	11.93	8.22	0.11	0.432
25	13.8	25.1	19.7	429	13.04	13.94	0.21	0.579
30	15.1	26.5	21.1	396	13.83	19.89	0.39	0.688
35	16.2	27.7	22.4	365	14.38	25.76	0.64	0.768
40	17.1	28.8	23.6	336	14.79	31.30	0.79	0.827
45	17.9	29.8	24.8	311	15.10	36.34	.099	0.864
50	18.7	30.7	26.0	288	15.34	40.96	1.11	0.890
55	19.3	31.5	27.1	268	15.53	45.29	1.25	0.908
60	19.9	32.2	28.2	250	15.69	49.25	-	0.919

CONCLUSION:

It has been generally observed that the stands are either under stocked or overstocked. There are very few cases where the stands are fully stocked. Thus the normal yield tables based on the assumptions that the stand is fully stocked does not indicate a correct assessment of the growing stock. To obviate this difficulty, basal area has been taken as basis to express relative stocking. It is easily and quickly determined and closely related to the volume. This approach has the advantage of not requiring samples to be fully stocked. Samples of any density can be used since the diameter is measured as a variable for the solution.

For the present study only 10 sample plots could be located which are distributed in Haldwani, Tarai and habhar, Shiwalik, Ramnagar, Landsdowne division and silviculture nursery at Clutterbuckganj (Bareilly).

The Yield tables for Good sites, Moderate sites and poor sites have been calculated with the help of regression. Two constraints were imposed in generating tables. These are that number for the same age in superior quality and secondly, that the preceding age class cannot have less trees than the succeeding one.

The study reveals that for maximum heartwood production there should be 557 trees at 10 years of age. The period of harvest should be kept 30, 50 and 60 years for good, moderate and poor sites respectively.

Source: A Monograph on Khair by D.N. Tewari.

APPENDIX –XXIX

Afforestation Programme

The areas which can be taken for reafforestation are as under:

Name of Range	Name of Beat	Name of Forest	Comptt. No.	Area of Comptt.	Area available for Plt.
RENUKA JI	KAIL	GHATTON	C-17	83.64	20
		GHATTON	C-24	57.50	8
		CHARAG	C-4	82.70	12
	PHAIL	CHHOW BHOGGAR	C-5	67.63	5
		CHHOW BHOGGAR	C-3	61.94	5
		CHHOW BHOGGAR	C-2	59.46	5
	BANDAL	CHARI GHATTI	C-3	78.21	20
		CHARI GHATTI	C-5	55.74	16
		CHARI GHATTI	C-4	38.15	5
	REJAINA	THANA KHEGWA	C-2	17.13	5
		UNGER	C-1	33.31	8
		UNGER	C-2	42.23	12
		THANA KHEGWA	C-1	65.09	10
Renuka Ji Range Total					**151 Ha.**
SANGRAH	SANGRAH	DADA	C-1	29.26	4
		MASHOOR	C-1	14.88	4
	KAZWA	GHATTON	C-2	37.12	5
		GHATTON	C-5	61.81	5
		GATA MANDWACH	C-3	74.13	4
		GATA MANDWACH	C-2	37.54	5
	MANDOLI	UNCHA TIKKAR	C-6	72.66	5
		UNCHA TIKKAR	C-2	49.28	15
		UNCHA TIKKAR	C-1	57.16	20
		UNCHA TIKKAR	C-4	35.59	15
		UNCHA TIKKAR	C-5	67.79	20
		UNCHA TIKKAR	C-7	54.51	20
	BHALAR	BALHAR	C-2	78.58	18
		BALHAR	C-3	138.74	25
		BALHAR	C-1	60.86	6
		GAHAL	C-4	151.88	16
		GAHAL	C-5	81.86	10
		GAWAHU	C-1	30.79	6
	HARIPUR DHAR	DASAKNA	C-1	39.33	5
		DIURI KAHDAHAN	C-2	31.22	10
		TIKARI	C-1	14.22	5

		DIURI KAHDAHAN	C-3	76.10	10
	LAZWA	ART	C-4	53.60	10
		LAZWA	C-2	123.14	10
		ART	C-2	57.87	10
		ART	C-1	86.68	10
Sangrah Range Total					**273 Ha.**
SHILLAI	PANOG	BINDOLI	C-1	56.50	5
		KINU PANOG	C-2	60.49	5
		AJROLI	C-2	66.31	8
		DAHAR	C-1	37.59	15
		DAHAR	C-5	29.04	8
		JASWI	C-2	198.79	20
		JASWI	C-1	82.32	5
	LOJA-MANAL	MANAL	C-2	49.92	15
		MANAL	C-4	35.22	5
		MANAL	C-7	68.57	4
		NAYA PANJORE	C-5	119.83	12
		LUJA	C-7	48.23	20
		LUJA	C-12	78.29	15
		LUJA	C-11	94.91	4
		LUJA	C-1	76.54	20
		LUJA	C-10	62.19	5
		LUJA	C-9	57.61	8
		LUJA	C-8	28.79	12
		LUJA	C-6	37.29	10
	JHAKANDO	JHAKANDO	C-2	76.83	5
		KHARKAHN	C-7	29.68	4
		KHARKAHN	C-5	26.67	8
		JHAKANDO	C-7	56.58	6
		JHAKANDO	C-6	84.37	5
		KHARKAHN	C-3	16.46	5
	KANDO-BHATNOL	BHATNOL	C-1	163.93	25
		BHATNOL	C-2	86.95	18
	SHILLAI	BALIKOTI	C-10	39.02	5
		BALIKOTI	C-17	81.24	12
		BALIKOTI	C-15	38.14	4
		BALIKOTI	C-16	46.85	12
		BALIKOTI	C-8	55.78	5
		BALIKOTI	C-9	36.37	10
		SHRI KAYARI	C-2	99.02	12
		BALIKOTI	C-14	75.06	6
	MILLA	MILLA	C-9	138.25	50
		MILLA	C-8	83.71	25

		MILLA	C-11	69.39	5
		MILLA	C-7	82.44	12
		MILLA	C-5	72.03	5
		MILLA	C-4	102.23	15
		MILLA	C-1	104.82	20
		MILLA	C-2	70.19	5
	KIYARI-GUNDAH	KHATNA	C-4	125.97	25
		KHATNA	C-1	134.54	30
		KHATNA	C-2	69.14	8
		KHATNA	C-6	125.76	30
		KHATNA	C-3	89.22	15
	KOTA PAB	KOTA BAB	C-5	57.53	5
	KHALLANDO	LANI BORAR	C-1	52.41	8
		KOTI BOUNCH	C-7	30.66	8
		KOTI BOUNCH	C-2	20.58	5
Shillai Range Total					**609 Ha.**
KAFFOTA	GABBER	GABER	C-2	246.06	15
		GABER	C-4	240.19	50
		GABER	C-5	71.81	20
		GABER	C-3	147.00	25
		GABER	C-1	159.57	45
		SAKHAULI	WHOLE	695.45	80
	JAMNA	JAMANA PABBAR	C-9	89.02	6
		SHARLI MZNPUR	C-4	46.49	4
		SHARLI MZNPUR	C-3	51.24	4
		JAMANA PABBAR	C-8	76.03	13
		JAMANA PABBAR	C-7	57.24	15
	NEGALI	NEGALI	C-1	57.61	5
		NEGALI	C-3	56.02	10
		NEGALI	C-4	27.28	6
	SATAUN	MANAL	C-3	110.55	20
		SATAUN	C-1	166.48	25
		MANAL	C-4	31.78	18
		MANAL	C-2	77.86	12
		SATAUN	C-4	74.71	20
		SATAUN	C-3	138.15	30
		SATAUN	C-2	125.18	40
		SALEG	C-1	134.40	25
		SALEG	C-4	152.79	18
		SALEG	C-3	146.13	20
		SALEG	C-2	100.52	30
	DAB PIPLI	DAB PIPLI	C-4	117.52	12
		DAB PIPLI	C-6	98.76	25

		DAB PIPLI	C-6	47.91	8
		DAB PIPLI	C-7	49.97	20
	KHAJURI	MAILANI	C-1	56.91	10
		MAILANI	C -2	30.23	6
		KHAJURI	C-14	41.25	8
	CHANDNI	KATHER	C-4	229.52	50
		CHANDNI	C-2	150.81	15
		KATHER	C-5	152.40	40
		KATHER	C-2	99.51	35
		KATHER	C-1	90.41	25
		KATHER	C-3	53.50	20
		CHANDNI	C-3	119.60	30
		CHANDNI	C-1	143.80	12
		CHANDNI	C-4	80.56	20
	JANJLI	JANJLI	C-6	201.29	12
		JANJLI	C-5	208.65	40
		JANJLI	C-7	245.23	8
		JANJLI	C-8	219.84	50
		JANJLI	C-2	139.54	40
		JANJLI	C-1	192.59	35
		JANJLI	C-3	57.51	5
		JANJLI	C-4	99.54	35
Kaffota Range Total					**1117 Ha.**
NOHRA	SIUN	GAWAHI	C-3	78.46	25
		KUFFER KAIRA	C-2	73.79	30
		KUFFER KAIRA	C-3	68.66	18
		KUFFER KAIRA	C-1	72.15	25
		GAWAHI	C-4	25.07	10
		GAWAHI	C-2	52.28	12
	NOHRA	THANAGA	C-2	58.56	14
		THANAGA	C-1	51.26	12
		BHOG	C-3	29.81	5
		CHAURAS	C-1	45.12	14
	BANDAL	BANDAL	C-4	97.60	18
		PIPLI	C1	79.70	5
	BHAJOND	GATLOG	C-2	63.07	14
		GATLOG	C-5	58.30	14
		GATLOG	C-4	60.94	20
		GATLOG	C-3	32.82	10
		GATLOG	C-6	46.04	5
		GATLOG	C-1	71.42	16
		BHAJOND	C-1	38.31	12
	CHARNA	CHARNA	C-1	46.03	10

	CHUNVI	CHUNVI	C-4	51.89	12
		CHUNVI	C-5	83.59	20
		CHUNVI	C-1	45.14	10
		SAIL	C-3	57.92	20
		SAIL	C-2	70.14	18
		SAIL	C-1	78.06	25
		CHUNVI	C-2	35.91	5
	DEVAMANAL	BHAGARI	C-3	72.44	12
		SHILLI BHAGANI	C-1	86.41	5
		SHILLI BHAGANI	C-2	83.63	10
		PUNNAR	C-1	63.37	8
	PIRIYADHAR	TANDULA BRASLI	C-1	33.85	5
		ANU KOTI	C-1	45.57	15
		ANU KOTI	C-2	52.27	15
		ANU KOTI	C-3	35.08	12
		JAMAL NIHOG	C-2	52.49	18
		JAMAL NIHOG	C-1	36.21	6
	BOGDHAR	CHOKAR	C-3	89.24	13
		MANAL	C-1	48.37	5
		MANAL	C-2	64.10	12
		GARARI	C-1	75.16	15
		GARARI	C-2	70.47	8
		GARARI	C-6	50.64	5
		GARARI	C-4	50.83	10
Nohra Range Total					**573 Ha.**
Division Total					**2723 Ha.**

Annexure -XXX

Lantana estimation in Sri Renuka Ji Forest Division

***Lantana camara* (An ObnoxiousWeed)**

Cut root stock method is used for the Lantana eradication in the past of this division. Generally the eradication work of the Lantana is done in November to January as suggested by the guidelines issued by the department. The detail of lantana eradication carried out so far in this division wrt to present situation is as follow:

Sr. No.	Year	Division	Range	Year of treatment	Name of area treated	Area in Ha.	% infestation before treatment
	2009-10	Renuka Ji	Nohra	2009	RF Gawahi, C3	5 Ha.	75%
	2011-12	Renuka Ji	Nohra	2011	RF Gawahi, C2	10 Ha.	75%
	2012-13	Renuka Ji	Renuka Ji	2012	RF Thana Khegwa, C2	10 Ha.	25%
					RF Charighatti, C5	10 Ha.	50%
			Nohra	2012	RF Jamal Nihog, C2	10 Ha.	45%
			Kaffota	2012	RF Sataun C1	5Ha	25%
			Kaffota	2012	RF Gabbar C4	10Ha	25%
			Kaffota	2012	RF Janjli C4	20Ha	25%
			Kaffota	2012	RF Shiva C4	20Ha	50%
	2013-14	Renuka Ji	Renuka Ji	2013	RF Unger, C2	10 Ha.	25%
				2013	RF Charighatti,	20 Ha.	25%

					C3		
			Kaffota	2013	RF Sataun C1	10Ha	50%
			Kaffota	2013	RF Manal C3	20Ha	25%
	2014-15	Renukaj i	Kaffota	2014	RF Sataun C1	40Ha	50%
			Kaffota	2014	RF Gabber C4	40Ha	25%
			Kaffota	2014	RF Shiva C6	20Ha	50%
	2014-15	Renuka Ji	Renuka Ji	2014	RF Unger, C1	23 Ha.	25%
					RF Charighatti, C3	20 Ha.	25%
			Nohra	2014	RF Gatlog, C6	25 Ha.	50%
	2015-16	Renuka Ji	Renuka Ji	2015	RF Charighatti, C3	20 Ha.	25%
			Nohra	2015	RF Gatlog, C2	10 Ha.	75%
			Kaffota	2015	RF Sataun C2	40Ha	50%
			Kaffota	2015	RF Gabbar C4	40Ha	25%
	2016-17	Renuka Ji		2016		135ha	

A detailed estimation of Lantana of the whole division was carried out during February 2016. Lantana is mostly confined to the Kaffota range of the Sri Renuka Ji Forest division. It is also available in some parts of the Nohra and Renuka Ji range. Though the estimation was done only on the forest land but there is enough lantana available on the adjoining private lands. In district Sirmourshamlat lands have been handed back to the owners in 2002, so private land is available in plenty in district Sirmour having Lantana infestation. Report of Lantana infestation in Renuka Ji forest division on the forest land is as below:

Range	Intensity of Infestation (ha)					Area treated during the year(ha)					Balance(ha)				
	upto 25%	26-50%	51-75%	>75%	Total	upto 25%	26-50%	51-75%	>75%	Total	upto 25%	26-50%	51-75%	>75%	Total
Renuka Ji	20	--	200	--	220	20	--	--	--	20	--	--	200	--	200
Nohra	26	137.40	172.45	--	335.85	10	--	--	--	10	16	137.4	172.45	--	325.85
Kaffota	133.37	377	640	--	1160.31	40	40	--	--	80	133.31	497	640	-	1260.31
	219.31	664.4	1012.45	--	1881.96	70	40	--	--	110	149.31	634.4	1012.45		1786.16

Protocol to be followedw.r.t. Lantana eradication:

1. Timing of lantana eradication should be strictly adhered as suggested in the guidelines.

Lantana eradication work should done in between November to January and results of the treated areas very satisfactory.

2. On the slopes infested areas, treatment should be from top to bottom. Seeds of the Lantana will be disseminating by air from top to bottom very easily. So if upper areas are taken first then the chances of dissemination of treated areas from the lower areas is very low.

3. Whole of the compartment should be treated before taking any new area for the lantana eradication.

4. Sprouts uprooting is required to be done strictly thrice in a year as specified in the policy. Range Officer should personally check the work of sprouts uprooting and ensure timely and complete uprooting of the lantana sprouts.

5. Proper documentation is required to be done for each area taken up. KML file of the areas to be treated be prepared. All the treatments carried out should be recorded with photographs.

APPENDIX-XXXI

LIST OF ENCROACHMENT CASES IN SRI RENUKA JI FOREST DIVISION

More than 10 Bigha Encroachment in Renuka ji Forest Division												
Sr. No.	**Name and Father's Name**	**Date of Institution of case**	**District**	**Tehsil**	**village**	**Division**	**Range**	**Forest area in Bigha**	**Action Taken**		**Date of Eviction**	**Remarks**
									Date of Decision by the collector	**whether Appeal filed or not; If so Date of Decision of Div. Comm.**		
1	Ramsa S/o Sh. Kali Ram	1994-95	Sirmour	Shillai	Ajrolli	Renuka Ji	Shillai	40.3	18.03.1998		20.4.2007	
2	Sunder Singh S/o Bhajju	1995-96	Sirmour	Shillai	Kanadi	Renuka Ji	Shillai	14.6	10.03.1998		20.4.2007	certificate
3	Basti Ram S/o sh. Jattu	1995-96	Sirmour	Shillai	chiyali	Renuka Ji	Shillai	11.3	04.09.1995			certificate
4	Mauji Ram S/o Subru	1996-97	Sirmour	Kaffota	Rangwa	Renuka Ji	Kaffota	10	04.01.1996			certificate
5	Raju S/o Sh. Dhanna	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	11.8	26.5.2005			certificate
6	Saniya s/o Sh. Kaliya	2006-07	Sirmour	Sangrah	Doom Ka Bag	Renuka Ji	Sangrah	10.7	21.01.2011			certificate
7	Ramsa S/o Sh. Tuliya	2006-07	Sirmour	Sangrah	Kainther	Renuka Ji	Sangrah	25.3	22.01.2011		30.12.12	certificate
8	Hari Ram S/o Sh. Molu Ram	2007-08	Sirmour	shillai	Chimu	Renuka Ji	shillai	14	11.7.2013		20.8.13	certificate
9	Sant Ram S/o Sh. Ramsa	2007-08	Sirmour	shillai	Ajroli	Renuka Ji	shillai	39.01			20.4.2007	certificate
10	Dhongu S/o Sh. Premu	2001-02	Sirmour	shillai	Ghundvi	Renuka Ji	Shillai	16.06	11.7.2013		15.8.2013	certificate
11	Kanshi Ram s/o Sunnu		Sirmour	shillai	Ghundvi	Renuka Ji	Shillai	156.2			24.12.2010	
12	Gian Singh s/o Sh. Ram Lal	2011-12	Sirmour	Sangrah	Charna	Renuka Ji	Nohra	11.17	29.12.2012		**jmic court**	certificate
13	Jeet SinghS/o Sh. Harkishan Singh	1996-97	Sirmour	Nohra	Blain dhar	Renuka Ji	Nohra	36.12			10.06.1999	Certificate

14	Dharam Singh S/o Sh. Gulab Singh	2007-08	Sirmour	Sangrah	Chhow - Bhogar	Renuka Ji	renuka Ji	14.18	18.10.2010		16.06.2011	certificate

Less than 5 bigha cases in Renuka ji Forest Division

Sr. No.	Name	Date of Insttitution of case	District	tehsil	village	Division	Range	Forest area in Bigha	Action Taken		Date of Eviction	Remarks
									Date of Decision by the collector	whether Appeal filed or not; If so Date of Decision of Div. Comm.		
1	Premu S/o Chichlu	1996-97	Sirmour	Kaffota	Rangwa	Renuka Ji	Kaffota	3	2.07.1997			certificate
2	Jalam Singh S/o Kali Ram	1996-97	Sirmour	Kaffota	Pabar	Renuka Ji	Kaffota	5.1	1997			certificate
3	Punia Ram S/o Mohar Singh	1996-97	Sirmour	Kamroo	Tatiyana	Renuka Ji	Kaffota	2.1	30.09.1996			certificate
4	Ratnu s/o Chetu	1996-97	Sirmour	Kamroo	Kumbli	Renuka Ji	Kaffota	2.1	2.7.1997			certificate
5	Mani Ram S/o Hardan	1996-97	Sirmour	Kamroo	Rangwa	Renuka Ji	Kaffota	0.12	03.12.1996			certificate
6	Kalu s/o Dilmi	1996-97	Sirmour	Kamroo	Rangwa	Renuka Ji	Kaffota	2	03.12.1996			certificate
7	Bhajanu S/o Kalu	1999-2000	Sirmour	Kamroo	Jatyari	Renuka Ji	Kaffota	2.1	14.2.2000			certificate
8	Bal Bahadur S/o Dal Bahadur	1999-2000	Sirmour	Kamroo	Jatyari/tatiyana	Renuka Ji	Kaffota	5.5	14.2.2000			certificate
9	Bhajnu s/o Kamhui Ram	1999-2000	Sirmour	Kamroo	Jimtwar	Renuka Ji	Kaffota	0.16				certificate
10	Baru Ram S/o Devi Ram	1999-2000	Sirmour	Kamroo	Sanyari/tatiyana	Renuka Ji	Kaffota	1.6	written statement			certificate
11	Kanthi Ram S/o Sobha Ram	1999-2000	Sirmour	Kamroo	Sanyari	Renuka Ji	Kaffota	3.6	written statement			certificate
12	Bali Ram s/o Ratti Ram	1999-2000	Sirmour	Kamroo	Jimtwar	Renuka Ji	Kaffota	3.4				certificate
13	Layak Ram S/o Khatri Ram	1999-2000	Sirmour	Kamroo	Sanyari	Renuka Ji	Kaffota	4.1				certificate
14	Kanthi Ram S/o Sh. Sobha ram	2003-04	Sirmour	Paonta Sahib	Bhajon	Renuka Ji	Kaffota	0.1				certificate
15	Pradhan Gram Panchayat Bhajon(Smt. Seema Devi)	2008-09	Sirmour	Paonta Sahib	Bhajon	Renuka Ji	Kaffota	0.2	23.06.2012			certificate

16	Pati Ram & Puni Ram S/o Jwala	1996-97	Sirmour	Kaffota	Rangwa	Renuka Ji	Kaffota	0.11	23.06.1997			certificate
17	Kamlesh S/o Sh. Daulat Ram	2011-12	Sirmour	Nohra	Charna	Renuka Ji	Nohra	1	29.12.2012			certificate
18	Jeet Singh S/o Sh. Meena Ram	2011-12	Sirmour	Nohra	Charna	Renuka Ji	Nohra	4.01	29.12.2012			certificate
19	Sh. Inder singh s/o sh Nand Ram	2018-19	Sirmour	Sangrah	Bandal	Renuka ji	Nohra	00.02.	16.08.2018			appeal in DC.
20	Krishan K.Sood	1994-95	Sirmour	Renuka ji	Dadahu	Renuka Ji	Renuka Ji	3.13	8.2.2000			JMIC
21	Randeep Singh S/o Sh. Jeet Singh	1995-96	Sirmour	Renuka Ji	chhowBhogar	Renuka Ji	Renuka Ji	0.13	22.04.1996		1996	certificate
22	Ganga Ram s/o kumna	1994-95	Sirmour	Shillai	Jabyalidhar	Renuka Ji	Shillai	2	6.4.1995		1995	certificate
23	Jeetu s/o Kanshi	1994-95	Sirmour	Shillai	Ajroli	Renuka Ji	Shillai	4.1	13.03.1998		15.6.10	certificate
24	Kedia s/o Naenu	1995-96	Sirmour	Shillai	Bohal	Renuka Ji	Shillai	3.4	18.03.1998		18.03.98	certificate
25	Beni Ram s/o Sh. Meena Ram	1995-96	Sirmour	Shillai	Gujrot	Renuka Ji	Shillai	3.4	17.04.1996		1996	certificate
26	Panch Ram s/o shKanshi Ram	1995-96	Sirmour	Shillai	Bhatveri/jhakando	Renuka Ji	Shillai	3	04.09.1995		1995	certificate
27	Lagnu S/o Khonkru	1995-96	Sirmour	Shillai	Panog	Renuka Ji	Shillai	2.15	04.09.1995		1995	cerificate
28	Madan Singh S/o Sh. Jeet singh	1995-96	Sirmour	Shillai	Chench	Renuka Ji	Shillai	2.16	01.05.1997			certificate
29	Dharam Singh S/o Sh. Budhiya Ram	2000-01	Sirmour	Shillai	Diando	Renuka Ji	Shillai	0.1			26.05.2005	certificate
30	Chet Ram s/o Kaliya ,Sobha Ram S/o Dhongu	2000-01	Sirmour	Shillai	Lani	Renuka Ji	Shillai	1.08			28.12.2001	
31	Daulat Ram s/o Ram Singh	2000-01	Sirmour	Shillai	Lani	Renuka Ji	Shillai	1.04			21.12.2000	
32	Bhoop Singh S/o sh. Budhiya	2000-01	Sirmour	Shillai	Ajroli	Renuka Ji	Shillai	6.01			16.09.2000	
33	Kumbiya Ram & Chandan Singh S/o Tholu	2001-02	Sirmour	Shillai	Ajroli	Renuka Ji	Shillai	5.07				JMIC
34	Kamna Ram S/o Harku	2001-02	Sirmour	Shillai	Gundah	Renuka Ji	Shillai	9.7				E.O.N.P
35	Ramsa S/o Sh. Bhoop Singh	2001-02	Sirmour	Shillai	Kinnu	Renuka Ji	Shillai	7.4				E.O.N.P

36	Tulsi Ram S/o Sh. Kaliya Ram	2003-04	Sirmour	Shillai	Panog	Renuka Ji	Shillai	1.9	27.02.2013		20.5.13	certificate
37	Puniya S/o Sh. Devi Singh	2003-04	Sirmour	Shillai	Panjore	Renuka Ji	Shillai	2.12	8.6.2012		15.8.12	certificate
38	Devi ram S/o Sh. Mohtu	2003-04	Sirmour	Shillai	Panjore	Renuka Ji	Shillai	2.12	8.6.2012		15.8.12	certificate
39	Jeet S/o Sh. Dhandu Ram	2003-04	Sirmour	Shillai	Kharkahan	Renuka Ji	Shillai	0.3	25.5.11		15.8.12	certificate
40	Sunder Singh S/o Sh. Kedar Singh	2003-04	Sirmour	Shillai	Kharkahan	Renuka Ji	Shillai	0.2	15.01.2004		18.2.13	certificate
41	Kirpa Ram S/o Sh. Tholu	2003-04	Sirmour	Shillai	Kharkahan	Renuka Ji	Shillai	0.2	19.01.2013		18.2.13	certificate
42	Mohinder Singh S/o Sh.Anant Ram	2003-04	Sirmour	Shillai	Kharkahan	Renuka Ji	Shillai	0.5	19.01.2013		18.2.13	certificate
43	Nag Chand S/o ShJangli Ram	2003-04	Sirmour	Shillai	Kharkahan	Renuka Ji	Shillai	0.1	19.01.2013			Affidavit
44	Hari Singh S/o Sh. Sohan Singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	17.12.2012			certificate
45	Sunder Singh S/o Sh. Budhiya	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	19.01.2013			certificate
46	Jeet Singh S/o Nati Ram	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	17.12.2012		15.4.13	certificate
47	Basant Ram S/o Sh. Devi Ram	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	8.6.2012		15.4.13	certificate
48	sant Ram S/o Sh. Amar Singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.2	17.12.2012		20.3.13	certificate
49	Kedar Singh S/o Sh.Patti Ram	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	19.1.2013		15.4.13	certificate
50	Beer Singh S/o Sh Chandan singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	8.6.2012		15.4.13	certificate
51	Surat Singh S/o Sh.Panji Ram	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.2	17.12.2012		15.4.13	certificate
52	Sukh Ram S/o Sh. Chandan Singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	17.12.2012		15.4.13	certificate
53	Ram Bhaj S/o Sh.Lal Singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.2	19.1.2013			Divisional commissioner shimla
54	Sahi Ram S/o Sh. Chandan Singh	2003-04	Sirmour	Shillai	kando	Renuka Ji	Shillai	0.1	19.1.2013		16.9.13	Divisional commissioner shimla

55	Lal Singh s/o Sh. Meena ram	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.3	23.06.2012			Divisional commissioner shimla
56	Dharam Singh S/o Sh. Jalam Singh	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	8.06.2012		15.4.13	certificate
57	Sobha Ram S/o Sh.Maniya	2003-04	Sirmour	Shillai	Bali	Renuka Ji	Shillai	0.1	19.1.2013		15.4.13	certificate
58	Dharam Singh S/o Sh.Tuliya	2003-04	Sirmour	Shillai	Arana	Renuka Ji	Shillai	0.9	29.12.2012		8.1.13	certificate
59	Kalyan Singh S/o Sh.Achhboo	2003-04	Sirmour	Shillai	Durech	Renuka Ji	Shillai	1.5	29.12.2012		14.1.13	certificate
60	Amar Singh & Ran SinghS/o Sh. Zalam Singh	2003-04	Sirmour	Shillai	Kuraya	Renuka Ji	Shillai	2.1	29.12.2012		14.1.13	certificate
61	Bini ram S/o Sh. Meena Ram	2003-04	Sirmour	Shillai	Gujrot	Renuka Ji	Shillai	4	17.4.1996			
62	Dula Ram ,Sant Ram S/o Sh. Jalam Singh	2003-04	Sirmour	Shillai	Gujrot	Renuka Ji	Shillai	2.1	4.6.2005			
63	Ratti Ram S/o Sh. Baliya&Baliya S/o Sh. Agri	2004-05	Sirmour	Shillai	Dahar	Renuka Ji	Shillai	4003 sq.m	23.09.2008			Notice
64	Ganga Ram S/o ShKumna	2003-04	Sirmour	Shillai	Jabiyali(Pan og)	Renuka Ji	Shillai	2	13.05.1995			certificate
65	Geeta Ram S/o sh. Tulsi Ram	2004-05	Sirmour	Shillai	Tandio(Mal gaoh)	Renuka Ji	Shillai	2000 Sq.m	23.09.2008			certificate
66	Mohi Ram S/o Sh.Sehdhu Ram	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	5.02	04.06.2005			
67	Dei Ram S/o Sh. Bhajju	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	3.3	23.09.2008		5.1.13	certificate
68	Layak Ram S/o Sh. Nain singh	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	4.16	23.09.2008		24.12.10	certificate
69	Singha S/o Sh. Diudu	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	1	23.09.2008		16.12.09	certificate
70	Jalmu S/o Sh. Mangu	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	1.15	04.06.2005			
71	Amar Singh s/o Sh. Takka, Shahi Ram S/o Meena Ram	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	9.04	04.06.2005			

72	Jawalu S/o Sh. Diudu	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	1.11				
73	Nain Singh S/o Sh. Hariya	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	0.17	04.06.2005			
74	Ramiya S/o Sh. Haria	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	0.11	23.09.2008		15.8.12	certificate
75	Kanshi Ram S/o Sh. Sunnu	2004-05	Sirmour	Shillai	Ghundvi(G humkhar)	Renuka Ji	Shillai	1.14	23.09.2008		24.12.10	certificate
76	Sobha Ram S/o Sh. Shedhu	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	2.15	04.6.2005			
77	Gulab singh S/o Sh. Mohi Ram	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	0.4	26.5.2005			was in appeal
78	Ran Singh S/o Sh. Chanan Singh	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	1.1	26.5.2005			remanded back
79	Devi Ram S/o Sh. Kalu Ram	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	0.12	27.2.2013		10.8.14	certificate
80	Dalip Singh S/o Sh. Mehar Singh	2004-05	Sirmour	Shillai	Manal	Renuka Ji	Shillai	0.12	26.5.2005		10.8.14	certificate
81	Basti Ram S/o Sh. Sobha Ram	2004-05	Sirmour	Shillai	Manal	Renuka Ji	Shillai	1.16	26.05.2005			remanded back
82	Dharam singh S/o Sh. Baliya Ram	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	1.7	26.5.2005			remanded back
83	Bija Ram S/o Sh. Saju Ram	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	1.1.17	26.05.2005			certificate
84	Hira Singh s/o Sh. Nain singh	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	0.8	23.09.2008		23.9.08	certificate
85	Kalyan Singh S/o Sh. Bhajju Ram	2004-05	Sirmour	Shillai	Manal	Renuka Ji	Shillai	0.8	23.09.2008		10.8.14	certificate
86	Bir SinghS/o Mauzi	2004-05	Sirmour	Shillai	Kuhant	Renuka Ji	Shillai	1.1	23.9.2008		10.8.14	certificate
87	Amar SinghS/o Sh.Hari Ram	2004-05	Sirmour	Shillai	Serkhi	Renuka Ji	Shillai	1.1	28.5.2005			remanded back
88	Guman Singh S/o sh. Mehar Singh	2004-05	Sirmour	Shillai	Manal	Renuka Ji	Shillai	1	26.5.2005			remanded back
89	Telu Ram S/o Sh. Kaliya Ram	2004-05	Sirmour	Shillai	Serkhi	Renuka Ji	Shillai	0.18	26.5.2005			remanded back
90	Atter Singh S/o Ramiya	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	0.11	16.12.09			certificate
91	Kanshi Ram S/o Sh. Lagnu Ram	2008-09	Sirmour	Shillai	Kukrach	Renuka Ji	Shillai	1.7	16.6.2011		26.6.14	certificate

92	Ran Singh S/o Sh. Shibia	2008-09	Sirmour	Shillai	Panjore	Renuka Ji	Shillai	1.6	23.6.2012		5.12.12	certificate
93	Babu Ram S/o sh. Dhongu Ram	2008-09	Sirmour	Shillai	Panjore	Renuka Ji	Shillai	1.14	23.6.2012		5.12.12	certificate
94	Bansi Ram s/o Sh. Mohi Ram	2008-09	Sirmour	Ronhat	Kukrach	Renuka Ji	Shillai	1.7	28.5.2011	04.03.2014	15.8.2012	certificate
95	Jogi Ram s/o Sh. Dhangu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.7	28.5.2011		5.7.13	certificate
96	Shiv Ram S/o Sh. Devi Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.19	28.5.2011		5.12.12	certificate
97	Dula Ram S/o Sh. Dhongu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.1	23.6.2012		5.5.13	certificate
98	Daya Ram S/o sh. Dhana Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.5	16.6.2011	04.03.2014	26.6.14	certificate
99	Dulla Ram s/o Sh. Kundan Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.19	16.10.2010			certificate
100	Bahadur Singh S/o Sh. Shibiya	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.15	16.6.2011		04.03.2014	certificate
101	Ramu s/o sh. Motu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.5	29.12.2012		5.12.12	certificate
102	Sh. Bishan Singh S/o Sh. Dhanna	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.19	28.5.2011			certificate
103	Chandan Singh s/o Sh. Shupa Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.13	16.6.2011		16.9.13	certificate
104	Ratti Ram s/o Sh. Mohtu Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.15	21.06.2011			certificate
105	Bansi Ram s/o Sh. Mohi Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.19	23.6.2012		26.6.14	certificate
106	Kumbiya Ram S/o Sh. Roop Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	2.8	28.5.2011			certificate
107	Ram Bhaj s/o Sh. Mohi Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.17	30.7.2011			certificate
108	Sher Singh s/o Nargoo	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.14	16.10.2010			certificate
109	Jalam Singh S/o Dhirju	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.7	16.6.2009		6.7.13	certificate
110	Bhoop Singh alias Bhupia s/o Sh. Nainu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	2.3	16.6.2011			cerificate

111	Bir Singh S/o Sh. Kanshi Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.17	16.6.2011		5.1.13	certificate
112	Laik Ram s/o Sh. Molu Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.9	16.10.2010			certificate
113	Guman S/o Sh. Ratti Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.14	16.6.2011			certificate
114	Sant Ram S/o sh. Dhangu Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.1	16.10.2010			certificate
115	Dileep singh S/o Sh. Lal singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.06	16.6.2011		5.12.12	certificate
116	Saniya S/o Sh. Fadoo	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.8	16.6.2011		5.12.12	certificate
117	Kali Ram s/o Sh. Shibiya Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	2.19	16.6.2011	04.03.2014		certificate
118	Bini ram S/o Sh. Motu Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	3	23.06.2012			certificate
119	Ganga Ram S/o Kanha Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.12	16.10.2010			certificate
120	Sandeep s/o Sh. Chandan Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.1	16.06.2011			certificate
121	Partap Singh s/o Sh. Sunder Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.7	16.06.2011	04.03.2014	26.6.14	certificate
122	Kaltu Ram S/o Sh. Nirmi	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.12	16.06.2011	04.03.2014	26.6.14	certificate
123	Lal Singh S/o Sh. Mohi Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.2	16.06.2011	04.03.2014	26.6.14	certificate
124	Jeet Singh S/o Sh. Dhana	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.19	16.10.2010			certificate
125	Kediya Ram S/o Sh. Jati Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.7	16.06.2011			certificate
126	Khaiya Ram S/o Sh.Motiya Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.8	28.05.2011			certificate
127	Kaltu Ram S/o Sh. Roop Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.8	28.05.2011			certificate
128	Nain Singh S/o Sh. Dhomu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.12	28.05.2011			certificate
129	Laik Ram S/o Sh. Ramu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.12	30.07.2011			certificate
130	Telu Ram S/o Sh. Bhoop Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.1	30.07.2011		15.9.13	certificate

131	Hukmi Ram S/o Sh.Bali Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.9	23.06.2012		5.12.12	certificate
132	Man Singh S/o Sh. Shivia	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.2	23.06.2012			certificate
133	Devi Ram S/o Sh. Roopu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.5	28.05.2011		15.9.13	certificate
134	Panch Ram S/o Sh. Lal Singh	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.14	28.05.2011		16.9.13	certificate
135	Kaltu Ram S/o Sh. Sobha Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.1	28.05.2011		5.7.13	certificate
136	Salik Ram S/o Sh. Dabhu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	0.14	28.05.2011		15.9.13	certificate
137	Devi Ram S/o Sh. Bhajnu	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	2.5	28.05.2011		5.1.13	certificate
138	Sahi Ram S/o sh. Khayalu Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	2.08	28.05.2011			certificate
139	Baru Ram S/o Sh. Bali Ram	2008-09	Sirmour	Ronhat	Panjore	Renuka Ji	Shillai	1.12	28.5.2011		16.9.13	certificate
140	Daulat Ram S/o Sh. Panji Ram	2008-09	Sirmour	Ronhat	Hallanhan	Renuka Ji	Shillai	0.11	25.3.2011		15.9.13	certificate
141	Bija Ram S/o Sh. Ramu	2008-09	Sirmour	Ronhat	Ghundvi	Renuka Ji	Shillai	0.18	16.06.2011		15.9.13	certificate
142	Kaliya Ram S/o Sh. Ramu	2008-09	Sirmour	Ronhat	Ghundvi	Renuka Ji	Shillai	0.15	25.03.2009		15.9.13	certificate
143	Mani Ram S/o Sh. Mehru	2008-09	Sirmour	Ronhat	Nagva	Renuka Ji	Shillai	1.1	25.03.2009			certificate
144	Mohi Ram S/o Sh. Mehru	2008-09	Sirmour	Ronhat	Nagva	Renuka Ji	Shillai	1.1	25.03.2009		15.9.13	certificate
145	Bansi Ram S/o Sh. Nandaru	2008-09	Sirmour	Ronhat	Hallanhan	Renuka Ji	Shillai	1.1	25.03.2009		15.9.13	certificate
146	Amar Singh S/o Sh. Dhanna	2008-09	Sirmour	Ronhat	Hallanhan	Renuka Ji	Shillai	0.14	25.03.2009		15.9.13	certificate
147	Nain Singh S/o Sh. Mohi Ram	2008-09	Sirmour	Ronhat	Hallanhan	Renuka Ji	Shillai	1.3	25.03.2009		15.9.13	certificate
148	Surat S/o Sh. Kamna	2008-09	Sirmour	Ronhat	Ghundvi	Renuka Ji	Shillai	1	28.5.2011		15.9.13	certificate
149	Jalam Singh S/o Sh. Mansa Ram	2008-09	Sirmour	Ronhat	Loza	Renuka Ji	Shillai	6.08	30.07.2011		5.12.12	certificate
150	Dhungu Ram S/o Sh. Premu	2008-09	Sirmour	Ronhat	Ghundvi	Renuka Ji	Shillai	5.17	16.06.2011		14.7.11	certificate

151	Bali Ram S/o Sh. Magu Ram	2008-09	Sirmour	Ronhat	Ghundvi	Renuka Ji	Shillai	0.13	30.07.2011		15.9.13	certificate
152	Kedar singh S/o Sh. Nain singh	2008-09	Sirmour	Ronhat	BaalDhar	Renuka Ji	Shillai	0.16	FIR 14/2009			
153	Bhittu Ram S/o Hari Ram	1995-96	Sirmour	Sangrah	Beyong	Renuka Ji	Sangrah	1.9				
154	Dhirju ,Mimtu etc.(Dhaju,Khimtu)	1995-96	Sirmour	Sangrah	Beyong	Renuka Ji	Sangrah	3.5				
155	Nettar Singh S/o Sh. Sertana	1995-96	Sirmour	Sangrah	Jabrog	Renuka Ji	Sangrah	1.5	03.07.1997			certificate
156	Ramesh Kumar s/o Chandnu	1995-96	Sirmour	Sangrah	Jabrog	Renuka Ji	Sangrah	2.3	03.12.1996		1997	
157	Sania S/o Kalia	1995-96	Sirmour	Sangrah	Sofar	Renuka Ji	Sangrah	2.3	03.7.1996		1997	Certificate
158	Bahadur Singh S/o Hukmi Ram	1995-96	Sirmour	Sangrah	Demaina	Renuka Ji	Sangrah	0.12	06.07.1996		1997	Certificate
159	Ramesh Kumar Gupta ,Gupta Associate	1997-98	Sirmour	Nahan	Dadahu	Renuka Ji	Sangrah	1.8			1998	
160	Jeet Singh S/o Hukmi Ram	2006-07	Sirmour	Sangrah	Doom Ka Bag	Renuka Ji	Sangrah	1.9	21.01.2011			certificate
161	Gopal singh S/o Sh Banshi Ram	2006-07	Sirmour	Sangrah	Doom Ka Bag	Renuka Ji	Sangrah	1.15	21.01.2011			certificate
162	Bahadur Singh S/o Sh. Hukmi Ram	2006-07	Sirmour	Sangrah	Doom Ka Bag	Renuka Ji	Sangrah	3.12	21.01.2011			certificate
163	Nettar Singh S/o Sh. Nirmi	2006-07	Sirmour	Sangrah	Kuffer	Renuka Ji	Sangrah	2.14	15.01.2013			certificate
164	Smt. Soda Devi w/o Sh. Shobha Ram	2006-07	Sirmour	Sangrah	Kuffer	Renuka Ji	Sangrah	2.17	21.01.2011			certificate
165	Basti Ram S/o Sh. Jeewan	2006-07	Sirmour	Sangrah	Kuffer	Renuka Ji	Sangrah	3	21.01.2011			certificate
166	Salku Ram S/o Sh. Khinkru	2006-07	Sirmour	Sangrah	Kuffer	Renuka Ji	Sangrah	2.02	21.01.2011			certificate
167	Kirpa Ram S/o Sh. Veer Singh	2012-13	Sirmour	Sangrah	GataBagari	Renuka Ji	Sangrah	9	17.12.2012			Appeal Rejected
168	Daya Ram s/o Sh. Veer Singh	2012-13	Sirmour	Sangrah	GataBagari	Renuka Ji	Sangrah	9.05	17.12.2012			Appeal Rejected
169	Sunder Singh S/o Sh. Sahi Ram	2012-13	Sirmour	Sangrah	Gata	Renuka Ji	Sangrah	7.03	17.12.2012			certificate

170	Sant Ram S/o Sh. Mohi Ram	2012-13	Sirmour	Sangrah	GataBagari	Renuka Ji	Sangrah	7.05	17.12.2012			Appeal Rejected
171	Baldev singh s/o Sunder singh	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-01-00, 00-04-00	30.4.16		27.4.17	Appeal Dissmised by DC but not evict on spot.
172	Nettarsingh s/o Sahiya	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-04, 00-00-04	30.4.16		22.4.17	Appeal Dissmised by DC but not evict on spot.
173	Dinesh Rana s/o Jeevan singh R/o village Tikkri	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-01-00	30.4.16		27.4.17	Appeal Dissmised by DC but not evict on spot.
174	Balbir singh s/o Kamna ram R/o village Tikkri	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-01-00	30.4.16		27.4.17	Appeal Dissmised by DC but not evict on spot.
175	Ved Prakash s/o jalamsingh R/o village Tikkri	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-04	5.8.16			Evicted on spot on dt. 6.10.2016
176	Stya w/o layak ram	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-06	5.8.16		29.12.16	Appeal Dissmised by DC but not evict on spot.
177	Basti ram s/o Kanshi ram	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-04	30.4.16		27.4.17	Appeal Dissmised by DC but not evict on spot.
178	Kuldeep singh s/o Ran singh	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-04	30.4.16			Evicted on spot on dt. 6.10.2016
179	Bhadur sing s/o Basti ram	2015-16	Sirmour	Sangrah	Tikkri	Renuka ji	Sangrah	00-00-09	30.4.16		27.4.17	Appeal Dissmised by DC but not evict on spot.
180	Dharam singh s/o Nainu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	05.12.00	31.8.16		27.4.17	Stay granted < 5 bigha, >5 bigha evicted on dt. 9.3.18 in CPW No. 1947
181	Chandnu s/o budhiya	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	02.00.00	31.8.16		27.4.17	CWP No. 1975 Stay granted by HHC dt 31.8.17
182	Kanshi ram S/o Mohi ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	05.19.00	31.8.16	27.4.17	31.8.17	Stay granted < 5 bigha, >5 bigha evicted on dt. 9.3.18 in CPW No. 1974
183	Dharam singh s/o Uda ram R/o village Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	05.18.00	30.4.16		27.4.17	CWP No. 2071 Pending with JMIC Court Nahan
184	Sant Ram S/o Daya ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	03.18.00	30.4.16			Evicted on spot on dt. 7.6.17

185	Rambhaj s/o Mohi ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	03.18.00	18.3.16			Evicted on spot on dt. 7.6.17
186	Roop singh s/o Runna	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	02.05.00	18.3.16			Evicted on spot on dt. 7.6.17
187	Daulat ram s/o Devi ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	04.10.00	18.3.16	27.4.17	29.8.17	CWP No. 1950 Stay granted by HHC
188	Rajender singh s/o sunder singh R/o village Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	02.05.00	31.8.16	27.4.17	8.8.17	CWP No. 1795 Stay granted by HHC
189	Bali ram s/o Chandnu R/o village Satahan	2015-16	Sirmour	Sangrah	satahan	Renuka ji	Sangrah	04.00.00	31.8.16	Appeal No. 651/2016		Appeal has been dismissed by DC shimla dt. 02.11.2019 and the case has been forwarded to RO Sangrah for eviction.
190	Pratap singh s/o Meena ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	03.15.00	31.8.16	27.4.17	31.8.17	CWP No. 1976 Stay granted by HHC
191	Randeep singh s/o Nainu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	03.05.00	18.3.16			Evicted on spot on dt. 7.6.17
192	Balbir singh s/o Basti Ram	2015-16	Sirmour	Sangrah	Original	Renuka ji	Sangrah	02.12.00	18.3.16	27.10.18	27.12.18	Stay granted by HHC In CWP No.2948 dt.27.12.18
193	Badhur singh s/o Rambhaj	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	10.13.00	31.8.16	27.4.17	31.8.17	Stay granted < 5 bigha, >5 bigha evicted on dt. 9.3.18 in CPW No. 1973
194	Jagar singh s/o Mohi ram S/o Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	14.00.00	31.8.16	27.4.17	18.9.17	Evicted on spot >5 bigha dt 6.3.18 in CPW No. 2133
195	Yashpal s/o Salku R/o village Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	02.14.00	30.4.16	27.4.17	1.9.17	Stay granted by HHC dt 1.9.17 in CWP No. 1991
196	Inder singh s/o Puniya ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	04.00.00	31.8.16	27.4.17		Stay granted by HHC in CWP No. 1970
197	Mohar singh s/o Isru	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	06.01.00	30.4.16	27.4.17	12.9.17	Stay granted by HHC >5 evicted on 9.3.18 in CWP No. 2072
198	Kundnu s/o Mohi ram R/o village Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	05.14.00	30.4.16	27.4.17	12.9.17	Stay granted by HHC >5 evicted on 9.3.18 in CWP No. 2073
199	Deep ram s/o sunder R/o village Kajwa	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	09.16.00	30.4.16			Evicted on spot dt 7.6.17
200	Dharam singh s/o Sahi ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	06.16.00	31.8.16	31.5.17	1.9.17	Stay granted by HHC >5 evicted on 9.3.18 in CWP No. 1978

201	Kalyan singh s/o Bhagwan singh,	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	07.10.00	18.3.16	27.10.18	27.12.18	Stay granted by HHC in CWP No. 2947 dt. 27.12.18
202	Chandnu s/o Bhajnu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	06.07.00	30.4.16	27.10.18	12.9.18	Stay granted by HHC >5 evicted on 9.3.18 in CWP No. 2070
203	Ratti ram s/o Devi ram	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	01.05.00	18.3.16	27.10.18	27.12.18	Evicted on spot dt 7.6.17
204	Nain singh s/o Chandnu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	05.15.00	30.4.16	27.10.18	1.9.17	Stay granted by HHC >5 evicted on 9.3.18 in CWP No. 1990
205	Hari ram s/o Chandnu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji	Sangrah	03.09.00	30.4.16	27.10.18	1.9.17	Stay granted by HHC in CWP No. 1988
206	Raj kumar s/o surtu	2015-16	Sirmour	Sangrah	Kajwa	Renuka ji		03.01.00	30.4.16	27.10.18		
207	Daulat Ram S/O Sh. Jalam Singh	2016-17	Sirmour	Sangrah	Gata	Renuka ji	Sangarah	03.01.00	17.02.18	No	No	Laible to evict the land
208	Devi Ram S/O Sh. Mani Ram	2016-17	Sirmour	Sangrah	Gata	Renuka ji	Sangarah	02.10.00	02.01.18	No	No	Laible to evict the land
209	Nater Singh S/O Sh. Jeet Ram	2016-17	Sirmour	Sangrah	Gata	Renuka ji	Sangarah	02.05.00	17.02.18	No	No	Laible to evict the land
210	Kundan Singh S/O Sh. Jai Singh	2016-17	Sirmour	Sangrah	Gata	Renuka ji	Sangarah	03.05.00	12.04.18	No	No	Laible to evict the land
211	Jati Ram S/O Sh. Mohi Ram R/o Banvani.	2016-17	Sirmour	Sangrah	Banvani	Renuka ji	Sangarah	02.03.00	08.01.18	No	No	Laible to evict the land
212	Kedar singh S/o sh Devi ram R/o Banvani	2016-17	Sirmour	Sangrah	Banvani	Renuka ji	Sangarah	05.12.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
213	Ramsa S/o shKalmu R/o Banvani	2016-17	Sirmour	Sangrah	Banvani	Renuka ji	Sangarah	06.03.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
214	Sant Ram s/o shNattu R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	06.05.00	13.03.18	No	10.3.2018	Evicted on spot dt. 10.3.2018
215	Man singh s/o sh Sunder singh R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	19.03.00	26.12.17	No	2.3.2018	Evicted on spot dt. 2.3.2018

216	Daleepsingh s/o Roop singh R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	08.05.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
217	Layak ram S/o Nain singh R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	02.19.00, 02.04.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
218	Shiv ram S/o Chandnu R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	04.06.00	12.04.18	No	No	Laible to evict the land
219	Bali ram S/o Bholar R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	03.18.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
220	Inder singh s/o shLagnu R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	07.00.00	110.6.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
221	Bahadur singh s/o Salku	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	01.01.00	26.12.17	No	No	Laible to evict the land
222	Bishan singh s/o Molu R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	01.12.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
223	Kundan singh S/o sh Nain singh R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	01.00.00	11.06.18	Appeal No 243/18	No	Appeal has been dismissed by DC shimla dt. 02.11.2019 and the case has been forwarded to RO Sangrah for eviction.
224	Meena ram s/o sh Musha R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	00.11.00, 00.13.00	30.07.18	Appeal No. 301/18	No	Appeal in Divisional Commisioner Shimla and pending.
225	Hira singh s/o Bholar R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	11.07.00	11.06.18	30.11.18	26.09.2018	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.

226	Surtu S/o Bhagwan R/o Banvani	2016-17	Sirmour	Sangrah	Banvani	Renuka ji	Sangarah	08.06.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
227	Sahi Ram S/O Sh. Chandnu Ram R/o Gajwa	2016-17	Sirmour	Sangrah	Gajwa	Renuka ji	Sangarah	03.00.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
228	Bhoop Singh S/O Sh. Dai Singh R/o Gajwa	2016-17	Sirmour	Sangrah	Gajwa	Renuka ji	Sangarah	02.06.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
229	Dev Raj S/O Sh. Kundan Singh R/o Banvani.	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	02.02.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
230	Ran singh s/o Hukmi	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	06.02.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
231	Balbir singh s/o Hukmi	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	06.06.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
232	Surtu S/o Dhontu	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	02.11.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
233	Guman singh s/o Rambhaj R/o Satahan	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	02.07.00	16.01.18	No	No	Laible to evict the land
234	Bali ram s/o Chandnu R/o	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	02.06.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
235	Sant Ram s/o shRamsa R/o	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	03.01.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018

	Satahan											and the case has been forwarded to RO Sangrah for eviction.
236	Baliya Ram S/O Sh. Tholu Ram R/o Satahan.	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	03.11.00	11.06.18	Appeal No. 130/18	No	Appeal has been dismissed by DC shimla dt. 02.11.2019 and the case has been forwarded to RO Sangrah for eviction.
237	Raiya s/o shDhonkru R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	05.17.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
238	Amar singh s/o Sobha ram R/o Satahan	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	04.01.00	17.02.18	No	No	Laible to evict the land
239	Pradeep kumar s/o shDhongu	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	03.07.00	11.06.18	No	No	Laible to evict the land
240	Tulsi ram S/o Jalam singh	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	01.09.00	16.01.18	No	No	Laible to evict the land
241	Pratap singh s/o Surat singh	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	01.07.00	11.01.18	No	No	Laible to evict the land
242	Nain singh s/o shNattu	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	00.15.00	12.04.18	No	No	Laible to evict the land
243	Hira singh s/o Sobha ram	2016-17	Sirmour	Sangrah	Satahan	Renuka ji	Sangarah	00.14.00	16.01.18	No	No	Laible to evict the land
244	Guman singh s/o Rambhaj	2016-17	Sirmour	Sangrah		Renuka ji	Sangarah	01.12.00	16.01.18	No	No	Laible to evict the land
245	Dhongu s/o shIsru	2016-17	Sirmour	Sangrah	Banvani	Renuka ji	Sangarah	02.08.00	11.06.18	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
246	Sh sunder singh s/o Baliya ram	2018-19	Sirmour	Sangrah	Bhalona	Renuka ji	Sangarah	06.10.00	30.07.2018	-	No	Laibel to evicted
247	Sh. Jai Pal S/o shBhadarsingh,	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	15.15.00	Under trail with Collector-Cum-DFO Renuka ji			
248	Sh Jalam singh s/o sh Roop singh,	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	08.02.00	15.05.2018	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.

249	Sh. Rajender singh s/o sh Devi ram	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	01.00.00	15.05.2018	-	No	Laibel to evicted
250	Sh. Budh singh s/o sh Kaliya	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	02.10.00	16.05.2018	-	No	Laibel to evicted
251	Sh. Tulsi ram s/o sh Nanku	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	09.07.00	15.05.2018	-	No	Laibel to evicted
252	Sh. Narayan singh s/o shGodu ram	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	04.16.00	15.05.2018	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
253	Sh. Sher singh s/o sh Surat singh	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	06.02.00	15.05.2018	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
254	Sh. Ramlal s/o shMohtu	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	11.14.00	15.05.2018	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
255	Sh. Surtu S/o shkhuliya	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	10.03.00	19.05.2018	-	No	Laibel to evicted
256	Sh. Nain singh s/o shTholiya	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	08.15.00	19.05.2018	30.11.18	No	Appeal has been dismissed by DC shimla dt. 30.11.2018 and the case has been forwarded to RO Sangrah for eviction.
257	Sh. Ran singh s/o shSurtu	2018-19	Sirmour	Sangrah	Bhallar	Renuka ji	Sangarah	01.00.00	15.05.2018	-	No	Liable to evicted
258	Virender Singh s/o Nariya UrfJhinu	2020-21	Sirmour	Sangrah	Chiyali	Renuka ji	Sangarah	00.01.00	Under trail with Collector-Cum-DFO Renuka ji			

259	Ranveer Singh s/o Jaati Ram & Dharampal s/o Maan Singh	2020-21	Sirmour	Sangrah	Chiyali	Renuka ji	Sangarah	00.01.00				
260	Ramlal s/o Roop Singh	2020-21	Sirmour	Sangrah	Chiyali	Renuka ji	Sangarah	06.01.00				
261	Mehar Singh &Kharku s/o Nakta	1994-95	Sirmour	Shillai	Ajrolli	Renuka Ji	Shillai	0	22.11	25.04.1997	13.4.2007	
262	Ramsa S/o Sh. Kali Ram	1994-95	Sirmour	Shillai	Ajrolli	Renuka Ji	Shillai	0	40.3	18.03.1998	20.4.2007	
263	Sunder Singh S/o Bhajju	1995-96	Sirmour	Shillai	Kanadi	Renuka Ji	Shillai	0	14.6	10.03.1998	20.4.2007	certificate
264	Basti Ram S/o sh. Jattu	1995-96	Sirmour	Shillai	chiyali	Renuka Ji	Shillai	0	11.3	04.09.1995		certificate
265	Mauji Ram S/o Subru	1996-97	Sirmour	Kaffota	Rangwa	Renuka Ji	Kaffota	0	10	04.01.1996		certificate
266	Raju S/o Sh. Dhanna	2004-05	Sirmour	Shillai	Ghundvi	Renuka Ji	Shillai	0	11.8	26.5.2005		certificate
267	Saniya s/o Sh. Kaliya	2006-07	Sirmour	Sangrah	Doom Ka Bag	Renuka Ji	Sangrah	0	10.7	21.01.2011		certificate
268	Ramsa S/o Sh. Tuliya	2006-07	Sirmour	Sangrah	Kainther	Renuka Ji	Sangrah		25.3	22.01.2011	30.12.12	certificate
269	Hari Ram S/o Sh. Molu Ram	2007-08	Sirmour	shillai	Chimu	Renuka Ji	shillai	0	14	11.7.2013	20.8.13	certificate
270	Sant Ram S/o Sh. Ramsa	2007-08	Sirmour	shillai	Ajroli	Renuka Ji	shillai	0	39.01		20.4.2007	certificate
271	Dhongu S/o Sh. Premu	2001-02	Sirmour	shillai	Ghundvi	Renuka Ji	Shillai	0	16.06	11.7.2013	15.8.2013	certificate
272	Kanshi Ram s/o Sunnu		Sirmour	shillai	Ghundvi	Renuka Ji	Shillai		156.2		24.12.2010	
273	Gian Singh s/o Sh. Ram Lal	2011-12	Sirmour	Sangrah	Charna	Renuka Ji	Nohra	0	11.17	29.12.2012	jmic court	certificate
274	Jeet SinghS/o Sh. Harkishan Singh	1996-97	Sirmour	Nohra	Blain dhar	Renuka Ji	Nohra	0	36.12		10.06.1999	Certificate
275	Dharam Singh S/o Sh. Gulab Singh	2007-08	Sirmour	Sangrah	Chhow - Bhogar	Renuka Ji	renuka Ji	0	14.18	18.10.2010	16.06.2011	certificate

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क्रमांक 13–7(23)/1999–ROC/193 दिनांक– 12.04.2022

सेवा में,

अतिरिक्त मुख्य सचिव (वन)
हिमाचल प्रदेश सरकार
आर्मसडेल बिल्डिंग, शिमला
हिमाचल प्रदेश–171002

विषयः– रेणुकाजी वन मण्डल की कार्य योजना आलेख के संबंध में।

संदर्भः–
(1) मुख्य अरण्यपाल (कार्य योजना एवं बंदोबस्त), हिमाचल प्रदेश के पत्रांक WP/65/Renukaji F.D./1368, दिनांक 26.11.2021 – पृष्ठ-143
(2) इस कार्यालय के पत्रांक 13–7(23)/1999–ROC/456 दिनांक 13.12.2021
(3) वन मण्डल अधिकारी, रेणुकाजी वन मण्डल कार्यालय का पृष्ठांकन पत्र संख्या 9891, दिनांक 19.03.2022
(4) मुख्य अरण्यपाल (कार्य योजना एवं बंदोबस्त), हिमाचल प्रदेश के पत्रांक WP/65/Renukaji F.D./1/W.P. दिनांक 01.04.2022 पृष्ठ-152

महोदय,

इस कार्यालय को मुख्य अरण्यपाल (Working Plan and Settlement) मण्डी,