GOVERNMENT OF HIMACHAL PRADESH
FOREST DEPARTMENT

WORKING PLAN FOR THE FORESTS OF HAMIRPUR FOREST DIVISION
(2013-14 TO 2027-28)
Volume – I

BY

ANIL JOSHI, IFS

DFO-CUM WPO HAMIRPUR

CHAPTER-I
THE TRACT DEALT WITH

1.1 NAME AND SITUATION: This working plan covers the forest of Hamirpur Forest Division and revise the Working Plan (1999-2013) of Dr. Rakesh Kumar and Part of area merged with Hamirpur Forest Division from Kutlehar Working Plan area of Una Forest Division. It deals with all protected forests and some Shamlat areas which are presently being managed by the Forest Department. The tract lies between longitudes 76º 18' 20" to 76º 43' 45" E and latitudes 31º 24' 30" to 31º 53' 30" N. it is bound in north by River Beas; in the east by Baker Khad and Seer Khad and Mandi district; in the south by Sukar Khad and Bilaspur District and in the west by Sola Singhi Dhar. Forests of different ranges are depicted on the survey sheets which have been included in Chapter – XII (Para – 12.11)

The geographical Area of the division is 1118 km^2 and the boundary of Hamirpur Forest Division is co-terminus with geographical boundary of Hamirpur District. The forests do not form a continuous and compact belt but are scattered throughout the division.

The Division is divided into FiveRanges namely Hamirpur, Nadaun, Aghar, Bijhar and Barsar.

1.2CONFIGURATION OF THE GROUNDS: The country varies in elevation from 570 to 1150m; and in configuration from almost flat land bordering Beas River to the broken and precipitous slopes in higher reaches. Following principal hill ranges traverse the region.

1.2.1 THE JAKH DHAR: It runs in continuation of the Kali dhar ranges in the Kangra district. It enters Hamirpur near Nadaun and traverses it in a south eastern direction. The town of Hamirpur lies to the east of this range where the country is undulating. However, in north and north east bare and rugged hills and deep ravines with precipitous sides transform the landscape in to but has been described as "an agitated sea suddenly arrested and fixed in to stone." The Chabutra hills have the

same deep and strike as in the Jakh dhar and are continued beyond the Beas to what is known as the changer, a mass of rugged and broken hills.

1.2.2 THE SOLA SINGHI DHAR: It is the longest range of the tract and is known by various names; by Chintpurni and Jaswan dhar in Una and by Sola Singhi in Hamirpur. It commences near ghati on the Beas and running south eastwards forms the boundary of the Kangra and Una districts. On its southwards passage, it increase in width and height and attains a width of some 20 miles.

Up to Bharwain in Una, the formation is tolerably uniform – the hills sloping down to the swan in a series of undulating valleys. But the configuration after Bharwain is peculiar. From the boundary ridge, the tract drops sharply for several hundred feet and then as viewed from above, appears to be a gently sloping tableland running down to the Swan khad. Actually it is a tangled mass of hills, with tops varying from flat plateau to sharp ridges, cut up by deep nallahs with precipitous sides. This condition is more pronounced in the centre and west than in the east, where the slopes are easier. On entering Hamirpur district, the Sola Singhi traverses in a south -eastern direction and separates Kutlehar (Una district) from Nadaun (Hamirpur district). It runs more or less parallel to the Jakh Dhar and terminates on the Sutlej. The portion to the north of the ridge and south of the Beas generally consists of long easy slopes cut into by a number of broad stoney nallahs.

The Jakh and Sola Singhi Dhars in Hamirpur surround this valley which is constituted by the northern and southern branches of the Sukar Khad; the former is situated on the basin of Beas and the latter of the Sutlej. There is no well pronounced single watershed between the two rivers. The ground in the northern, North-eastern and central part of this valley on either side of the watershed is extra-ordinarily broken and subject to severe erosion. Landslips are common, ridges are generally knife edged and run in different directions. The country immediate to the north-east of the Sola Singhi is undulating in character.

As a general rule, the southern and south-western slopes of the main ranges are precipitous while elsewhere the gradient varies from moderate to very steep.

1.3 GEOLOGY, ROCK AND SOIL: The geological formation is represented by the Shiwalik beds of the sub Himalayan Series. The Jakh Dhar has been formed by an up throw on north-east side. This is known as Gumbar fault. It is composed of alternating strata of a blue, softish sand stone and red clay. The sand stone dips at an angle of about 20^{o} to the north-east and is generally expose in sheets

where the soil has been washed away due to evenness of the slop. The south-western slope of the ridge is for sharper and usually descends by a series of precipitous sandstone scarps between which the clay strata outcrops. The Sola Singhi ridge is an upthrow between two faults. The undulating land between two ridges is composed of gravels, possibly of post Shiwalik time, or pebbly sandstone of the higher Shiwalik beds. The sandstone belt is fertile and supports good chil forest.

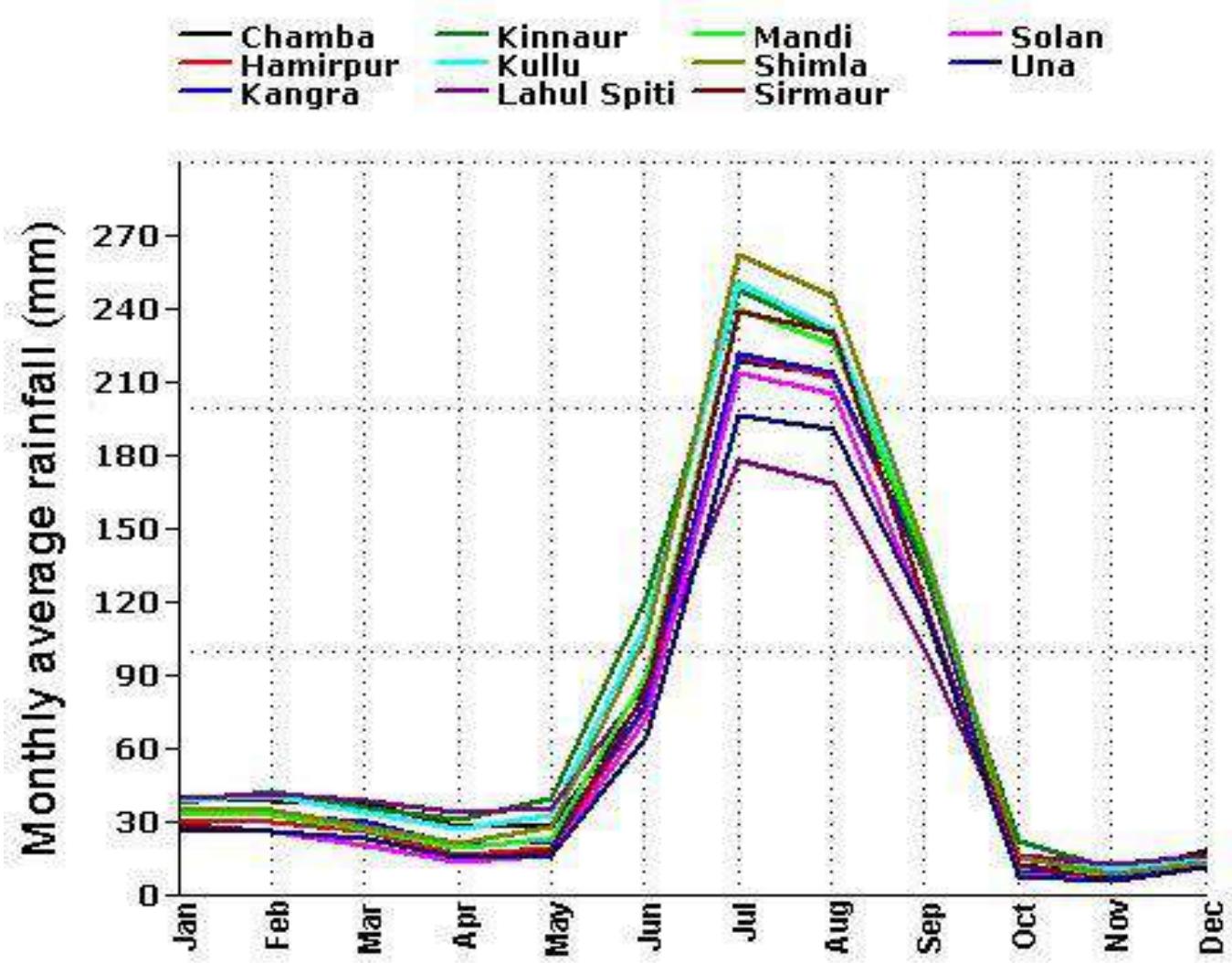
The composition of the vegetation is determined by the depth of soil and the softness of rocks permitting penetration of roots. The sandstone formations in most parts become soft during rains and permits penetration of roots thus becoming suitable for good chil forests. Along the river Beas and other khads, riverine gravels predominate which support scrub forests.

1.4 CLIMATE AND RAINFALL: The climate of the area is subtropical characterized by rainfall during monsoon season from July to September. Winter rains are scanty. Main drought periods are from May to June and October to mid December. Drought in May, June is generally acute. Frost is common in December-January. However, updated data be collected with regard torainfall, number of rainy days, temperature, humidity etc., reflecting its influence on the vegetative cover and soil erosion. It may be very useful to have a plan to install rain gauges at least in selected FRHs and some permanent nursery sites. Mention should also be made of nearest meteorological stations in the area. Data of rainfall in Hamirpur district from 1999-2012 shown in table below.

Year	Jan. (mm.)	Feb. (mm.)	Mar. (mm.)	Apr. (mm.)	May (mm.)	June (mm.)	July (mm.)	Aug. (mm.)	Sep. (mm.)	Oct. (mm.)	Nov. (mm.)	Dec. (mm.)
1993	48.4	33.8	92.2	10.3	14.2	85.2	658.8	126.8	128.7	0	4	0
1994	50.3	105.1	7	96.3	65.8	41	614.3	555	229.1	1	0	24.8
1995	57.2	133.4	46.4	26.4	3.4	96.4	617.1	578.6	276	0	12	7
1996	98.1	123.3	58.2	16.6	41	243.7	466.6	462.6	94	41.2	0	0
1997	58	29	95.2	114	99.6	88.8	485.6	359.6	265.2	23.6	135	116
1998	9	182	214.7	121.2	17	247.8	257.8	315.6	323.4	126.2	56	0
1999	61.6	14.2	10.6	0	95.2	122.5	402.5	314.6	62.4	0	0	0
2000	124.6	88.2	38.2	7	128.7	95.6	334.4	188	86	0	0	0
2001	22	11.6	79.2	61.6	124.4	250.4	605.6	436.6	61.2	0	0	17
2002	87.8	55.4	30.8	58.4	36.6	92.6	313.4	470.4	352.2	5	0	0
2003	29.8	79	85.2	25.6	13.2	86.7	688.3	367	299.5	0	5	13.5
2004	131.9	7	0	38.4	41.5	132.9	146	492.4	117.5	137.4	1	78.2
2005	75.2	132.2	79.2	4	42.4	21.6	425.1	281.5	39.7	2	0	0
2006	79.2	2	95	283	101.4	177	329.7	430.5	149.5	23.6	10	30.4
2007	0	121.5	177.1	16	25.8	140.6	207.9	541.8	77.9	5.6	5.6	40.4
2008	46	33.9	6	29.2	27.8	493	388.7	446.3	95	25.6	0	0

2009	14	26.5	34.8	35	70.8	39.4	348	388.6	202.8	23.2	12.7	0
2010	9.2	36	0	11	39.8	102.8	273.8	336.2	199.4	35	16.4	95.2
2011	43.4	127.8	68.6	47.6	65.4	304.4	139	377.6	166.2	16.8	0	16
2012	124.6	25.4	0	27.8	4	10.2	305.4	556.4	261.2	0	7.4	27.4

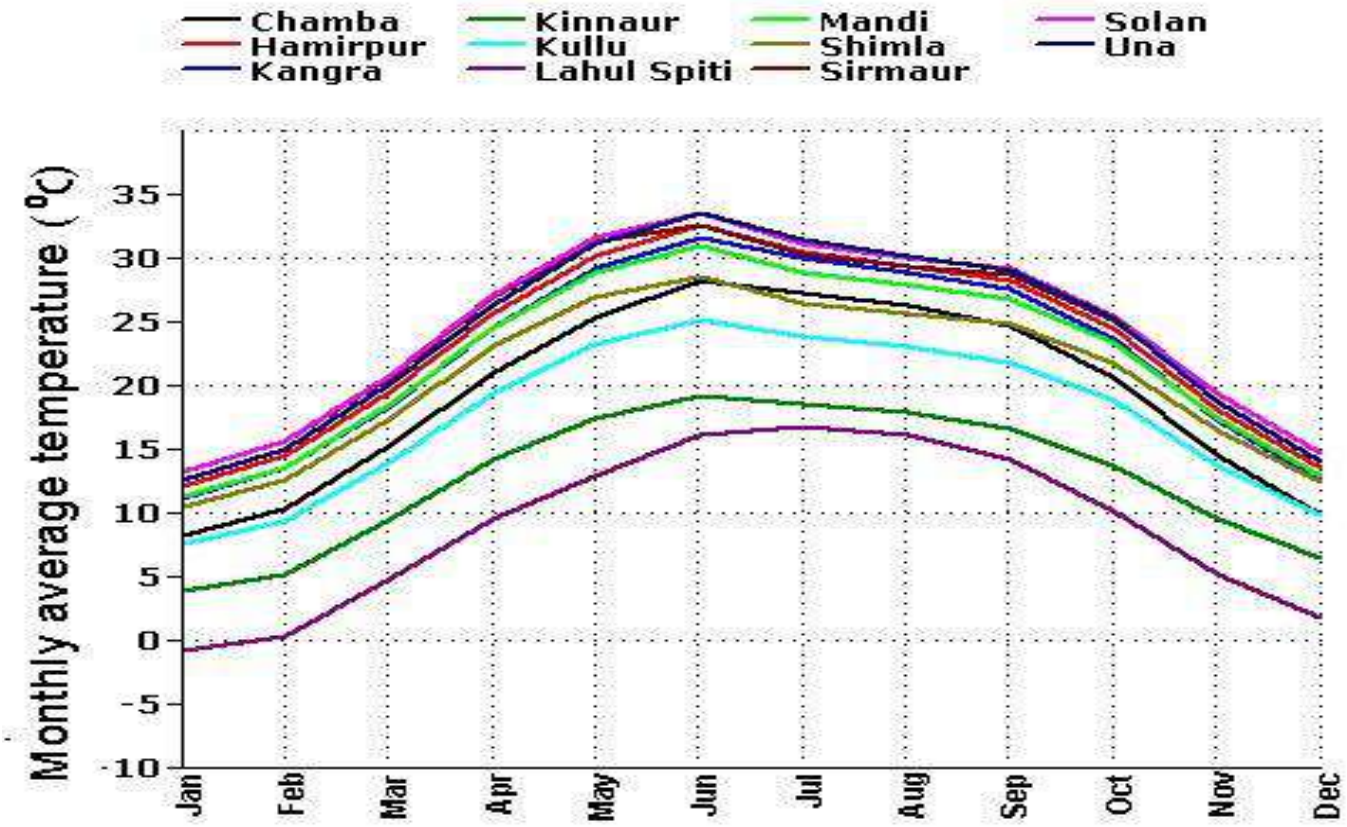
(Source: D.C. Office Hamirpur)



This graph shows monthly average rainfall (mm) in Hamirpur district in comparison to other districts of Himachal Pradesh. ***(Source: Metereological Deptt.)***

1.4.1 TEMPRATURE: It is not a typical "Hilly & Chilly" type of climate in district Hamirpur, as it is closer to the plains. During winter, the climate is cold but pleasant. During summer the temperature is hot and temperature does sometimes cross the 44 degree Celsius mark in summers. The graph below

shows monthly average temperature in Hamirpur district in comparison with the other districts of Himachal Pradesh.



(Source: Metereological department)

1.5 WATER SUPPLY: The availability of water in the streams like Kunah Khad, Shukar Khad, Man Khad, Seer Khad and Pung Khad etc is highly variable, maximum in the months of Monsoon when all of these are in spade and minimum in the months of May and June. All the major Khads of the region drain into River Beas except Seer Khad. The streams like Kunah, Pung and Seer are more or less perennial because the catchment of these streams is less degraded as compared to Mann or other streams. Mann Khad runs all along the length of the district starting near Barsar and ending up in Nadaun. The details of irrigation schemes including lift irrigation schemes are appended in appendix IX.

1.5.1 The tract in the past used to face an acute shortage of water throughout the summer season but large number of water supply schemes are in operation to meet the shortage of water. In addition to

these, large number of hand pumps have been installed to supplement the supply of portable water. A Number of medium irrigation scheme are also coming up.

1.5.2 The traditional methods of storing water by constructing ***Khatri*** in Tounidevi, Bamsan, Awahdevi and Sujanpur area is still prevalent and Rainwater is harvested in by digging out the rock of size **5m x 5m x 5m.** Inlet channels are also constructed to divert surface runoff towards ***Khatri.*** Such structures should be encouraged to harvest rain water, wherever possible.

1.6 DISTRIBUTION OF AREA: The forests do not form a continuous and compact belt but are scattered. Category wise area which this division as under.

TABLE – I	
1	**2**
1. RESERVE FORESTS	Nil
2. PROTECTED FORESTS	
a) Demarcated Protected Forests	9,909.72 ha.
b) Un-demarcated Protected Forests	6,624.80 ha.
G.Total	**16,534.52 ha.**

(Source: DFO Office Hamirpur)

The total forest area dealt with under this working plan is 16534.52 ha. (DPF 9909.72 + UPF 6624.80).

Forest area mentioned in Dr. Rakesh Plan (para 1.6) was 15581.63 ha. Whereas the area in the current plan is 16534.52 ha. (15581.63+952.49(Area transferred from Kutlehar Forest Jagir, Una Forest Division as per compartment history files) +0.40 hac (due to typing mistake in previous working plan). Thus there is a difference of 952.89 ha. This difference is due to totaling mistakes in Dr. Rakesh plan and area transeferred from Kutlehar Forest Jagir, Una Forest Division. Further the areas in current plan have been picked from the compartment history files. Rangewise distribution of various categories of forest (ha.) is tabulated below:-

Table 1: Forest area of Hamirpur Forest Division based on legal status

Sr.No.	Range	D.P.F.	U.P.F.	Total
1.	Aghar	2105.72	1108.39	3214.11
2.	Barsar	1920.37	2056.34	3976.71
3.	Bijhri	2219.69	984.27	3203.96
4.	Hamirpur	991.94	1309.94	2301.88
5.	Nadaun	2672.00	1165.86	3837.86
	TOTAL	**9909.72**	**6624.80**	**16534.52**

1.7STATE OF BOUNDARIES: The condition of boundary pillars by and large is not in a good state due to lack of repairs. The boundary pillar registers are maintained. The boundary pillars required to be checked in the field and correction be made where ever needed. Boundary pillars sequence of repair may be given by WPOis annexed as appendix – X.

1.7.1 Encroachments: The detail of encroachment cases up to 31.03.2013 is as under:

Total cases	Cases decided by DFO cum collector	Cases evicted on spot	Cases to be evicted	Balance cases as on 31.3.2013
39	23	7	16	16

1.8LEGAL POSITION:

1.8.1 OF AREAS OF ERSTWHILE HAMIRPUR TEHSIL OF KANGRA DISTRICT: In order to have a fair idea about the present legal status of the forests, a detailed historical background of various measures taken in Kangra district, of which these area were a part earlier, is considered appropriate and is, therefore, discussed as under;

Under the Raja's i.e. long before the Moghul period, the theory of proprietary rights over land was very simple based on ethnological and physiographical grounds.

The Raja was the manorial lord of his whole principality which was a single estate divided for the purpose of management in to circuits, which were mere groupings of holdings under a collector of rents. All waste lands were Raja's waste and every interest in land was held directly from the Raja as a separate tenancy. Every right was supposed to come from him; holding of land derived from his grant; and the user of the waste was dependent upon his sufferance. This system of land tenures continued unchanged under the Moghul and Sikh rulers and in 1846, when the tract was coded to the British Government, the forest laws were still based on the proprietary rights of the state in all waste lands; the usufruct there of the land holders, cultivators and other was a usufruct of sufferance ('bartan" in the parlance of the country).

1.8.1.1 BARNES LAND REVENUE SETTLEMENT (1849-1852): After the cession of the territory in 1846, to British, a summary settlement was carried out by John Lawrence. Regular settlement was conducted by Barnes during the years 1849-52. Barnes converted each circuit, which were collection of hamlets with patches of cultivation and undefined rights of user in the surrounding wastes, in to

mauzas and demarcated their boundaries. Land holders of each mauza were converted into a co-proprietary body and land revenue was assessed at a lump-sum for the entire mauza the payment of which was made the joint responsibility of all the land holders of the mauza. In order to balance the responsibility so imposed, these village co-proprietary communities were conferred with the right to collect and divide amongst themselves certain items of misc revenue. The most important result of the settlement from forest point of view was that the ownership of the soil of the forests and the wastes was transferred to the village co-proprietary body with certain reservations of the rights of "Gaddi" shephards and "Gujjar" herdsmen; Government retaining only the ownership of the trees of spontaneous growth of planted by it and the right to collect grazing dues from gaddis.

1.8.1.2 LYALL'S REVISED LAND REVENUE SETTLEMENT (1865-1869): Lyall (Seer James) sub divided the Mauzas into Tikas, consisting of one or more hamlets with surrounding waste over which rights were claimed, defined and fixed the boundaries of the tikas (Tikabandi) and thus, tika became the unit of management. This was the most important feature of Lyall's operations. A large proportion of waste was included within the tika boundaries (on the basis of mutual agreement) the ownership of which was vested in the Khewatdars of that tika and was recorded as "Shamlat Tika".

The waste that was not so partitioned remained the joint property of the whole mauza and was recorded as "Shamlat Deh". Under the latter category fell (i) all or almost all the larger blocks of waste which were generally formed in to separate tika known as "Chakban" followed by the name of the mauza (chakbans are tikas containing nothing but or very little else than forest, and are property of the whole mauza) and (ii) certain small blocks of specially valuable forests which are shown in the maps of the tikas in which they fall. The proprietary right in "Shamlat Deh" was in proportion to the revenue paid by each tika whereas; in "Shamlat Tika" it is, as a rule, proportional to the revenue paid by each Khewatdar. However, there is an intermediate case, though not quit common, where the waste is the joint property of a few and not of all the tikas of the mauza.Lyall made certain proposal for forest conservancy which were never sanctioned and thus, apart from an ambiguous definition of the lands under government forests and the conservancy clauses of the administration papers his settlement had little effect upon forests.

1.8.1.3 SCHEME OF ROE AND DUFF (1872-1875): On representation made by the conservator of Forests in 1869, the Government appointed Roe (Settlement Officer) along with (Deputy Conservator

of Forests) for demarcating absolute Government forest areas. The basis of the arrangement was that certain tracts should become the absolute property of the Government; and the Government in return should give up or considerably modify its rights in other tracts. In order to acquire full proprietary rights in the demarcated areas, following concessions were made to the village proprietary:

i) The villages should in future receive one third, instead of one fourth, of the sale proceeds of the timber from the undemarcated waste.

ii) The villages should in future receive one third of the grazing fees collected from Gaddi shepherds, whereas these fees had formally been all credited to Government.

iii) There was no further closing of forest waste or demarcation in these villages without the consent of the people.

The area demarcated on this give and take principal was 9710 acres (3931.17 ha) in 21 villages in Nurpur tehsil and 11066 acres (4480.16 ha) in 38 villages in Dehra tehsil. It resulted in acquisition of complete rights over 8477 acres (3430.52 ha) in 21 villages in Nurpur tehsil and 7648 acres (3095.00ha) in 29 villages in Dehra tehsil. The land so acquired was notified Reserved Forests vide notification no. 111/F and 112/F dated 6th March, 1879 and the remaining wastes over which the right of closure was abandoned were designated as Unclassed Forests. Rule for preservation, protection etc. of trees in unclassed forests were later on notified vide Notification No. 61 dated 26thJanuary, 1897, subsequently amended vide no. 994 dated 11th January, 1919.

But the result of demarcation in these two tehsils was not considered satisfactory. Considering the abrogation of important right of closures in unclassed forests, the result can only be termed disastrous to the forest conservancy.

1.8.1.4 ANDERSON'S FOREST SETTLEMENT (1883-1887): In 1879, the conservator of Forests proposed that the demarcation should be so done as to secure good continuous belt of forests on the crests and slopes of the hills, and on this proposal a preliminary demarcation was ordered. It formed the basis of regular forest settlement in Anderson in Kangra proper from 1883 to 1887 which was sanctioned in 1897. The principals on which the demarcation was carried out were laid down by Lyall and find mentioned in para 5 of the report on forest settlement in the Kangra Valley by Anderson and are as under.

1. No change was to be made in the forest management of the forest land either inside or outside the demarcation.

2. Forest land which should be permanently maintained as such was to be separated by demarcation from forest land in which clearance for cultivation might at some time be permitted.
3. There were to be no "give and take" negotiations with the zamindars nor was the demarcation to proceed with the idea that the forests excluded from it would be made over to the zamindars and Released from all control.

Upon these principals a preliminary demarcation was made in Kangra and Hamirpur tehsils, and the Government declared its intension to constitute the forest and waste of Kangra and Hamirpur tehsils as protected forests vide notification no. 207 dated 27th April, 1885.

Anderson did not deal with the reserved and the unclassed forests. The remaining forests were declared protected and in these, he demarcated large number of more important more areas including the majority of the old Trihais (closed in 1860) which were termed as the "Demarcated Protected Forests", while the areas outside his demarcation came to be known as "Undemarcated Protected Forests". The salient features of Anderson's settlement may be summarized as under:

i. The formation of 138 blocks covering 54802 ha of Demarcated Protected Forests: These were to be maintained permanently as forest (Notification No. 57 dated 26th January, 1897 amended by No. 991 dated 11th January, 1919). Out of these, 57 blocks covering 6898 ha fall in Hamirpur.

ii. The formation of Undemarcated Protected Forests by application of chapter-IV of the Indian Forest Act, (Notification No. 58 dated 26th January, 1897 amended by No. 992 dated 11th January, 1919 and No. 57 dated 6th February, 1904 amended by No.22676 dated 28th October, 1919) to all forests and wastelands. In respect of these it is declared in the standing record of revenue Settlement of 1910-1919 that trees of spontaneous growth standing on them belong to Government except.

- The Demarcated Protected Forests,
- The Reserved and Unclassed Forests,
- Areas in the taluqa of the Dada Siba and the Jagirs of the Rajas of Nadaun and Kutlehar, and
- Those areas in which the Deputy Commissioner from time to time sanction appropriation for cultivation or for any other purpose after payment to Government the value of trees standing thereon.

iii. 62 species of trees were declared as reserved under section 30 (a) of the Indian Forest Act in the Protected Forest vide Notification No. 59 dated 26th January, 1897 (amended vide 993 dated 11th January, 1919). These 62 species are as under:

Sr. No.	Local Name	Scientific Name	Sr. No.	Local Name	Scientific Name
1	Chil	*Pinus roxburghii*	32	Ber	*Zizyphus jujuba*
2	Harar	*Terminalia chebula*	33	Aisan	*Terminalia tomentosa*
3	Dhao or Chal	*Anogeissus latifolia*	34	Amla	*Emblica officinalis*
4	Kakoran	*Pistacia integerrima*	35	Lasora	*Cordia myxa*
5	Box	*Buxus sempervirens*	36	Patajan	*Putranjiva roxburghii*
6	Walnut	*Juglans regia*	37	Dhaman	*Grewia spp.*
7	Chestnut	*Aesculus indica*	38	Pariara	*Erythrina suberosa*
8	Elm	*Ulmus wallichiana*	39	Ohi	*Albizzia stipulata*
9	Khair	*Acacia catechu*	40	Phula	*Acacia modesta*
10	Tali or Shisham	*Dalbergia sissoo*	41	Kahu	*Olea cuspidate*
11	Oak	*Quercus spp.*	42	Kikar	*Acacia arabica*
12	Kinu	*Diospyros tomentosa*	43	Karmaru	*Albizzia odoratissima*
13	Tun	*Cedrela toona*	44	Kathaman	*Eugenia jambolana,*
14	Sal	*Shorea ro*	45	Kachnar	*Bauhinia veriegata*
15	Bamboo	*Dendrocalamus spp.*	46	Maple	*Acer spp.*
16	Kalam	*Stephegyne parvifolia*	47	Spruce	*Picea morinda*
17	Kendu	*Diospyros cordifolia*	48	Silve Fir	*Abies webbiana*
18	Rajain	*Holoptelea integrifolia*	49	Mulberry	*Morus spp.*
19	Behera	*Terminalia belerica*	50	Rhododendron/Barans Barah	*Rhododendron spp.*
20	Mahwa	*Bassia latifolia*	51	Kirk	*Celtis australis*
21	Keor	*Holarrhena antidysenterica*	52	Duri	*Cedrela serrata*
22	Barna	*Crataeva religeosa*	53	Jamu	*Prunus cerasoides*
23	Sanan	*Ougeinia dalbergioides*	54	Haleo	*Cornus macrophylla*
24	kamal	*Mallotus philippinensis*	55	Guj	*Viburnum nervosum*
25	Sarin	*Albizzia lebbek*	56	Bado	*Salix spp.*
26	Jaman	*Eugenia jambolana*	57	Puna	*Ehretia laevis*
27	Simal	*Bombax malabaricum*	58	Badrin	*Wikstroemia canescens*
28	Bil	*Aegle marmelos*	59	Burj	*Betula spp.*
29	Kembal	*Lannea grandis*	60	Kurumb	*Machilus spp.*
30	Kilawa	*Wrightia tomentosa*	61	Doden	*Sapindus detergens*
31	Arjan	*Terminalia arjuna*	62	Deodar	*Cedrus deodara*

iv) A detailed record of rights and notifications of rules for the exercise and regulation of these rights was compiled.

v) The rules applicable to the unclassed forest under section 76 of the Indian Forest Act, were notified vide notification no. 61 dated 26th January, 1897 amended by no. 994 dated 11th January 1919.

It may be emphasized that Demarcated Protected Forests were composed of the wastes of one or more tikas or mauzas but the Undemarcated Protected Forests were composed only of the waste of one particular tika concerned.

1.8.1.5 MIDDLETON'S REVISED LAND REVENUE SETTLEMENT (1913-1919): The identification and the record of the areas on which the trees were the property of the state was the most important forest matter dealt within the course of the settlement. Inspite of attention to details which characterized the earlier land revenue settlement, the records showing the field's numbers on which the trees belonged to the government were not clear. Anderson's Forest Settlement was not complete in itself as it posed the difficulty to ascertain the areas outside demarcation where the trees were the property of the Government. This exercise was carried out by Middleton with the assistance of Mitchell, who prepared "Tree Files" by linking each field number to old Lyall's record and defining the proprietary right of government of otherwise in terms of new field numbers. The title of government to trees in small-scattered areas not exceeding 4 acres (4-acre rule) was generally abandoned. The government forest (Ban Sarkar) areas were, thus, clearly defined and the matters were brought on a far more satisfactory footing then ever before. Thus, one of the main difficulties of Revenue and Forest administration was removed.

In the body of the "Record of the rights", wherever a field number in which the government owns the trees occurs, a note to that effect was recorded in the remarks column at the end of the record forming part of the Zamabandi. In addition, a Forest Register for each Tehsil showing the field numbers and the area of each class of forest in every tika was drawn up.

A forest register showing the field numbers and area of every class of forest in every tika was drawn up by Middleton in order to assist the Forest Department and Deputy Commissioner in the control of forests, and also to prevent any tempering with these records. It was intended that each forest official should be provided with a copy of these registers as refers to his beat, thus eliminating the constant reference to the patwari which was felt at that time to the one of the hindrances in forest administration. Unfortunately it has not been done.

1.8.1.6 MITCHELL AND WALTERS ROTAIONAL CLOSURE SCHEME (1919): One-third area of most of the forest was closed to the grazing etc. under Bailey's rules during 1859-1860. These closures known as trihais were the first to the demarcated. These trihais were not changed, except in exceptional instances, and in 1897, after they had been closed for 37 years were notified for closure under section 29 (b) of the Forest Act to be closed for further period of 20 years. This notification expired in 1917, after these had been closed for 57 years. These closures resulted in very good forest

cover but the areas outside closure deteriorated and it was recognized that many of such open forests are in danger of extinction. Local Government in their letter No. 181 (Forest) dated 16th April, 1913 ordered the preparation of scheme of rotational closures of the forests. The Inspector General of Forests who toured the district in 1915 also suggested to the Government that the whole area which was ever proposed to be closed under forest act should be delimited by a special revenue officer along with a forest officer. Accordingly, Mitchell and Walters were appointed for the purpose and their operations resulted in a scheme known as "Mitchell and Walters Rotational Closure Scheme"

A question may be raised as to why a fresh delimitation of area to be subjected to rotational closure was felt necessary when already there existed a good number of Demarcated Protected Forests. It was not possible to apply the scheme of rotational closure to existing demarcated protected forests because of the following reasons:

i) Contiguous to the demarcated forests, there were pieces of undemarcated protected forests. Over these forests, the Government had right and there was no objection to the local people for their closures.

ii) The demarcated forests were, in many cases, large and included wastes taken from many tikas and often from more than one mauza. Since the tikabandi was already done, so it was desirable that the closure series should not extend preferably beyond the waste land of particular tika. In other words one closure series should preferably not overlap the waste of more than one tika.

iii) The demarcated forests included a considerable extent of forests which could never be closed without great hardship to the right-holders. The best instance is that of the large 'chakbans' which are the property of the whole mauza and not merely of the Khewatdars of the nearest cultivated land. They were, as a rule, accepted as Demarcated Protected Forests as they stood. But when the boundaries had been fixed at Lyall's settlement, in the majority of the cases, the tikas bordering the chakbans were given no waste at all, so that their cattle entered direct from the houses in to the demarcated forests which contained all the paths from the one part of the grazing to another and all the watering places. In view of the above, the closure series had to be constructed without reference to the old demarcation. Some undemarcated forests had to be included and some demarcated forests had to be excluded from the new delimination. Thus, for the selection of the new areas to be subjected to the scheme of rotational closures, an amalgamation of the Demarcated and UndemarcatedProtectedForests took place. The areas so

delimited which composed entirely either of Demarcated Protected or of Undemarcated Protected Forests, or of both were termed delimited protected Forests (D.P.F.).

There exists some misunderstanding as to the term "Delimitation" or "Delimited" Forests. The term "Delimitation" was used only to avoid any confusion with the previous "demarcation". The later connotes a legal difference between the two classes of forests (demarcated and undemarcated), while the former is merely an executive act having no legal significance whatsoever. However, a summary enquiry into special rights such as rights of way and to water likely to be interfered by the new delimitation was made by Mitchell and Walters for each forest and the results recorded in the forest journals.

The "Delimited Protected Forests" remained under the charge of the Forest Department while some legally demarcated forests excluded from the delimitation were transferred to the Deputy Commissioner's control along with other remaining forests.

The rotational closure scheme of Mitchell and Walters resulted in the formation of 1,44,857 acres of Delimited Protected Forests (of which 15609 acres was in the then Hamirpur Tehsil).

As far as Hamirpur is concerned, there is no difference in the demarcated protected and delimited protected forests because no undemarcated protected forest was included in the rotational closure scheme and likewise all the demarcated protected forests were completely covered by it.

1.8.2 OF AREAS OF NADAUN EX-JAGIR: The forests had always been under the management of the Rajas, who prior to the British rule, managed these as game reserved. Even after annexation by the British, the management continued in the hands of the Rajas, because the question of the title to the trees was not decided for a long time. There was neither any supervision on the part of the forest department nor any direct interference of the district authorities. By terms of his sanad, the Raja was allowed to cut timber for his own use, to graze his own cattle, to allow zamindars to cut timber and to graze their cattle, and he was forbidden to levy any grazing fee (Wan-Waziri) from the zamindars. These conditions, however, did not distinctly forbid him to realize grazing dues except from zamindars, and he collected such dues from gaddis. The Rajas also enjoyed a customary right to give leases for reclaiming the waste lands in all the forests except Jihn.

The Government sought for a report on the Jagir forests in Kangra vide letterm Nos. 196-F dated 3rd May, 1880 and 368-F dated 29th August, 1881. Based on this report prepared by Stenhouse and

Anderson and submitted vide letter No. 60 dated 29th July, 1882, the Government passed orders vide letter No. 567 dated 27th December, 1884, laying down the conditions under which the management of these forests was entrusted to the Rajas. These were that the Rajas would abide strictly by the direction and advice of the officers of the Forest Department and breach of these conditions would deprive the Rajas of this privilege. It appears that the management of these forests was left with Rajas on account of the fact that they had quite good influence over the local population. It was also in keeping with the policy of the Government of the time to utilize as for as possible, the services of these people whose local influence and knowledge made them most useful to the states.

1.8.2.1 AGGARWAL AND AHUJA'S ROTATIONAL CLOSURE SCHEME (1928): Mitchell and Walters completed the scheme of rotational closure for Kangra proper and left out the Jagirs. The scheme of rotational closure in Jagirs including Nadaun was undertaken by K.L. Aggarwal and Kundan Singh Ahuja, who submitted their report in September, 1928. This scheme was later sanctioned by the Government vide letter No. 28863-Fts, dated 13th October, 1930. A total of 27288 acres of forest was selected for the scheme in all the Jagirs, of which 7635 acres comprised in 39 different forests, belonged to Nadaun Jagir. Blazes and temporary pillars were put to indicate the boundaries of the forest areas of the first closures (trihais). The scheme prescribed closure of a part (1/3rd in case of scrub forests and 1/4th in case of chil forests) of the forests delimited for the purpose in such a manner as not to cause villagers any great inconvenience while assuring the permanency of the forests. This scheme was based on the grazing requirement of each individual tika or a number of tikas with interchangeable grazing rights. Chil forests were to be closed for a period of 30 years and the scrub forests for 10 years. 370 acres of chil and 1494 acres of scrub were closed in the first period of closures.

1.8.2.2 EFFECT OF AGRARIAN REFORMS: Originally the Jagirdars were the owners of the soil and the trees belonged to the Government. With the enactment of the Punjab Abolition of Ala Malkiat rights Act (Punjab Act IX of 1953), the ownership of the soil has been transferred from Ala Malik to Adna Malik who now owns the soil. However, all the Ghasnis, Shamlat deh, godams continue to be Malkiat of the Jagirdars and the individual right holders of the Panchayats enjoy their right of user, if any. The matter of ownership of soil in Nadaun is still under dispute. All trees growing in the protected forests belong to the Government subject to the rights of the bartandar and to other limitations and exceptions here-in-after specified.

1. Fruit trees or trees which give shade, such as Pipal and Bar planted for public convenience and, at present, standing in protected forests, belong to the person, who planted it, provided he is recorded as the planter in Jamabandi and he may cut and remove them when dry to fallen.
2. Trees of any kind may be planted in protected forests by Khewatdar or bartandar and such trees will belong to the person who planted them, provided he is recorded as the planter in jamabandi and he and his descendants may cut and remove them when dry or fallen.

1.8.2.3TAKING OVER OF MANAGEMENT: In 1950 the management of Dada Siba Estate was taken over by the court of wards and it was ordered by the Government (vide memorandum No. 738-D-50-768 dated the 7th march, 1950) that the management of these forests in the estate be taken over by the Forest Department. The question for the rights of the Jagirdar of Dada Siba over forests was considered by the Government and (vide Punjab Government memorandum No. 3043-ft-55/1829 dated 9th July, 1955) it was ordered that the ownership of the ex-Jagir forests vests in the Government. Though the property of the Dada Siba Estate was released from the superintendence of the court of wards vide Punjab Government Notification No. 1563-JC-56/2203(C.H.) dated the 12th April, 1956, yet the ex-Jagir forests being the property of the Government continued to be managed by the Forest Department as other Government forests.

An enquiry, to look in to the affairs of Nadaun ex-Jagir forests, was instituted in 1956 and gross mismanagement of these forests came to light. The Raja did not respect the conditions under which the privelige of the management of these forests was granted and vide Punjab Government Notification No. 1627-Ft-58/2224, dated 18th July, 1958, this previlege was withdrawn.

1.8.3 LATER DEVELOPMENTS: With the growing concern about protecting the existing forest cover and bringing more areas under forest, a number of enactments have come up in the recent past which has altered the legal status of the forest land significantelly. These are:

1.8.3.1 THE H.P.VILLAGE COMMON LANDS (VESTING AND UTILIZATION) ACT, 1974: With the enactment of "The H.P. Village Common Lands (Vesting and Utilization) Act, 1974, the ownership of the soil which was earlier with the village co-properietary bodies have vested in the Government. As a result of this the Ban-Maufi forests which were the property of the villagers have now become the Government property. Similerly, the soil of the unclassed and the protected forest

which belonged to the people (Government have properietary rights only the trees of spontanious growth of planted by it) has also vested in the Government, and these forests have also become the absolute property of the Government, though burdened with rights.

1.8.3.2 FOREST SETTLEMENT OPERATIONS IN HAMIRPUR DISTRICT-No forest settlement operation are being carried out in Hamirpur Forest Division. It is suggested that as and When the settlement operation is started in Hamirpur District, the other Govt. land which is in the possession of forest department may be got converted in to UPF/ DPF. Total area vested with the Govt. under H. P. Village Common land (Vesting and Utilization) Act, 1974 has been allotted to reserve pool (50%) and allotable pool (50%). Forest lands have been allotted to reserve pool. Forest department has raised plantations over waste lands before the promulgation of this act and these areas have become very well stocked forests. But these do not come under the purview of Indian Forest Act.

1.8.3.3 FOREST CONSERVATION ACT. 1980: With enactment of the FCA 1980 no forest land can now be diverted for non forestry purpose without the permission of Govt. of India. As consequence of this the position regarding breaking up of land for cultivation in the unclassed and undemarcated protected forests with the permission of Deputy Commissioner has been completely altered. Thus the distinction amongst the demarcated protected/ undemarcated protected and unclassed forest as for as the breaking up of land is concerned has disappeared. So for as total of 43.25 ha. land has been diverted for non forestry purpose in this division in 22 cases. Detail has been appended as Appendix No. XXIX.

1.9 CHANGE OF LAND USE IN THE TRACT: Land use pattern has undergone a change on mainly two counts in Hamirpur District:

1.9.1 Agriculture itself has undergone a change, with many farmers shifting from raising wheat and maize to rising of off season vegetables, orchards and construction of poly houses for off-season vegetables and floriculture in big way.

1.9.2 Change of land use due to diversion of forest land:Diversion of forest land for developmental purposes results in change of land use and sometimes may have affect on the landscape.

Road construction activity has a major impact on the hydrology and ecology of the area. Forests may become fragmented and wildlife corridors threatened.

Range wise detail of Forest land diverted for non- forestry purpose from 1983 to date in the Jurisdiction of Hamirpur Forest Division.

Range wise detail of area diverted under FCA (1983-2013)

S.No.	Range	Area diverted (HA)
1	Hamirpur	34.9729
2	Bijhari	0.8800
3	Nadaun	0.7922
4	Barsar	0.0681
5	Aghar	6.55
	Total	**43.2632**

1.10KHUDRO DRAKHTAN MALKIAT SARKAR AREAS:Gist of important notifications/letters: As per **GOHP, Revenue department order No rev D (D) 12-16/94 dt 11/03/99, while special revising the record of rights of local people in context of the entry" khudrao drakhtian malkiti sarkar",** the entry "Khudrao drakhtian malkiti sarkar" appearing in khannaKafiat in the state of HP was deleted and further notified that the felling of trees shall continue to be regulated under the prevailing forest laws. Further, The commissioner cum Secretary Fts GOHP vide office letter No Fts-B-a (4)-2/86-11 dt 16th Dec 1999 clarified that by deleting the entries from the khanna Kafiat of the Jamabandi as per the notification dt 11/03/99, the land owner would automatically become the owners of the trees standing theron for all intents and purpose and in order to implement the decision of the Govt, the trees for extraction would be dealt with as below:-

(1) LPA 1978 and rule made thereafter will be applicable in cases which are not covered under para(2) and (3) under

(2) In cases where classification of land is DPF, the extraction will not be allowed

(3) In cases where the land classification is "Van" and is expected that land use will change after extraction of trees, provision of sec 2of FCA-1980 will apply.

CF central vide his office letter 12-22/97-RCC dt 18/05/99 addressed to the Secretary Forests GOHP directed_ to withdraw the notification dated 11/03/99 on the ground that prior permission of GOI under FCA is mandatory which the state govt had not taken .

Central empowered Committee letter 1-26/CEC/SC/2012 dated 18/01/2013_ Vide its letter dt 18/01/2013, with regard to the clarification on CWP No 11034/2011- Anant ram vs State of HP and CWP No 11191/2011- Sukhdev singh vs state of HP and others pertaining to Nurpur Division, CEC endorsing the perception of GOI, stated that as the revenue entry of the petitioner's (Nurpur division)land is Khudrao drakhtian malkiti sarkar and this type of land comes under the definition of "Forest" as per Honb'le Supreme court order 12/12/1996- TN Godavarman vs Union of india and thus the provision of FCA -1980 will be automatically applicable to it even if such land is excluded from Working plan of Nurpur division . The state Govt is at the liberty to ensure its management as per provision of existing working plan or exclude this type of land from working plan and prepare a separate management plan and get the same approved from competent authority.

1.11 RIGHTS AND CONCESSIONS: The admitted rights are embodied in:

a. Anderson's detailed tika war record of rights for each Demarcated Protected Forests.
b. the vernacular khewat of 1868 for Undemarcated Protected Forests.
c. the general provisions of the forest records of rights applicable to both Demarcated and UndemarcatedProtectedForests, and
d. a special record of rights prepared by Mitchell and Walters for each DelimittedProtectedForest.

All rights of user (except those of gaddi and gujjar pastoralists and customary rights holders) are appendent to cultivated land which is assessed to land revenue; are aquired and alienated with such land; and are exercised only for bonafied agricultural and domestic purpose (as distinct from pastoral and industrial). All rights are subject to the condition that the right-holders shall be responsible for the pay of the rakhas, shall maintain in proper repair the boundary pillers of the forests in which they have rights and subject to the limitation that the rights will not be exercised to an extent which will endanger the existance of the forests. Government retains the power to limit or suspend rights for suficient reasons.

1.12 SUMMARY OF PRINCIPAL RIGHTS: The pincipal rights recognised at the time of forest settlement and breaking up of land for cultivation; timber for building purposes; wood for burning of dead bodies, funeral rites and for marriage ceramonies; wood for agriculture implements; grazing; grass cutting and lopping; collection of medicinal herbs, flowers and fruits etc. The proceeds from the sales of grass from the areas closed by the Government and fruit of trees belong to the village

proprieters. Government ownes the trees ofspontaneous growth or planted by itand subject to rights, is entitled to protect, improve and reproduce the forest growth and to sell trees to the traders and non right holders, but only after meeting legitimate requirment of the right holder in full. The exercise of the rights is regulated by rules framed under section 32 of the Indian Forest Act and gazetted in notification number 416 dated 14th August, 1897 as amended by nos. 55 dated 6th February, 1904 and 995 dated 11th January, 1919.

1.12.1 BREAKING UP OF LAND FOR CULTIVATION: Under the rules, no land can be broken up in Demarcated Protected Forests, but it can be done with permission of Deputy Commissioner in the Undermarcated Forests. The Delimited Protected Forests can comprise both these classes, but it may be presumed that the Deputy Commissioner's permission will not be granted with respect to any land included in them, even though a part of it may be legally undemarcated protected forests. However, with the enactment of "The Forest (Conservation) Act, 1980", this power of Deputy Commissioner has been curtailed since it amounts to diversion of forest land for non-forestry Purposes.

1.12.2 TIMBER FOR BUILDINGS: The right to building timber has not been properly defined. The provision prior to 2013 was that right holders would get timber for building from forests at fixed rates on application. Generally the T.D. was granted to the right holders ordinarily after an interval of 10 years except in case of emergencies. Now, T.D. Rules, 2013 notified vide GoHP Notification No. FFE-B-E(3)-43/2006-Vol-I dated 26 Dec. 2013 are being followed. The timber granted to the right holders from 1993-94 to 2009-10 either free or on concessional rates are given in table. Since the inception of the new TD rule, no TD has been granted to the right holders. However the TD granted before 2006, when the ban was made on the traditional TD system is as under.

Forest Produce granted to the right holders free or concession rates from 1999-2000 to 2012-13						
Year	**No. of trees granted Volume in Cum**				**Total**	
	Conifer	**Vol.**	**B.L.**	**Vol.**	**Tree**	**Volume**
1999-2000	5901	11034.49	455	362.949	6356	11397.439
2000-2001	6593	11436	403	328.613	6996	11764.593
2001-2002	5757	7981.23	295	115.514	6052	8096.746
2002-2003	5649	6281.43	292	150.437	5940	6431.867
2003-2004	5282	7047.86	381	286.743	5663	7334.603
2004-2005	3926	4777.07	144	54.2012	4070	4831.2712
2005-2006	3669	4790.8	200	120.709	3876	4908.152
2006-2007	1302	1685.69	90	55.338	1392	1741.028
2007-2008	451	427.007	7	1.522	458	428.529
2008-2009	0	0	0	0	0	0

2009-2010	0	0	0	0	0	0
2010-2011	0	0	0	0	0	0
2011-2012	0	0	0	0	0	0
2012-2013	0	0	0	0	0	0

(Source: DFO Office Hamirpur)

1.12.3 NEW TD POLICY: Under the traditional rights prior to the ban by the Honb'le High court, HP, in 2006, people used to get the benefit of timber for house construction once in five years at nominal price. Now, T.D. Rules, 2013 notified vide GoHP Notification No. FFE-B-E (3)-43/2006-Vol-I dated 26 Dec. 2013 is being followed. These rules cover the Timber Distribution (T.D.) Rights for construction and maintenance of residential house, cowshed that too for bonafide domestic use without affecting the other rights contained in the Forest Settlements in operation. These rules are Forest centered based on the principle that if the forests will remain with them only people will be able to exercise rights namely of Timber distribution (TD). Further these rights are People centered more so rural poor centered.The rights recorded in settlement other than Timber distribution (TD) like free grant for last rites of the dead, collection of medicinal herbs, grazing etc. have not been touched upon and would remain to be exercised as they were in the past.

Hon'ble High Court before deliberating and deciding the issue under consideration of PIL with them directed the State Govt. to rationalize the timber distribution process which took into account the following aspects.

- As the TD is concerned with Land holding in rural areas that too for construction of house/cowshed for domestic purpose the TD in Urban areas has been done away with.
- If the Right Holders have land holding at more than one place then TD may be granted at both places. But the rates of trees shall be doubled at the 2nd place.
- TD will only be enjoyed by original Right Holder and not by those who have purchased land after taking permission under Section 118 of the HP Tenancy and Land Reforms Act, 1972 from now onwards.
- The ratio of TD rates of Chil, Deodar and Kail at the time of Forest Settlement when their rates of TD were initially fixed was 1:5 to 1:8, which has now gone to 1:8,8700 in case of Deodar, 1:30,000 in Kail, and 1:15,000 in Chil, thus requiring rationalization, which has been affected after about more than 100 years.
- The people will be given 7 m3 standing volume for construction of new houses and up to 3 m3 standing volume for repair and addition or alteration.

- Tree shall be given from salvage (fallen, dry standing) trees. If salvage trees are not available then only silvicuturlly available green trees shall be given.

The various settlement reports mention that 'if the exercise of rights as admitted in any forest, would endanger the existence of forest, the extent to which the rights will be exercisable can be re-determined and should the exercise of rights become detrimental to the exercise of the forests over which these are exercised, the extent to which the rights will be exercisable can be re-determined'.

Yet this option has seldom been exercised in the past for conservation of forests. H.P.Forest Settlement Rules, 1965 have been framed under Section 76 of IFA, 1927. The guiding principle laid down for determining the rights and concessions under these rules was:

"All these rights and concessions are meant for the satisfaction of personal bonafide requirements and subject to condition that forests are to be maintained in perpetuity. The right of user of easement is always a limited one; it can never extend so as to destroy the servient estate. The right exists so long as the (servient) property is safe or continues to exist, because if the (servient) estate cases to exist, the right ceases with it. So while dealing with the claims, the Forest Settlement Officer should see that the forests are not unduly burdened".

Keeping into consideration the powers delegated to the state Govt. under Section 32 of IFA, 1927, based on the guiding principles under HP Forest (Settlement) Rules, 1965 and the orders passed by Hon'ble HP High Court the HP Forest (Timber Distribution of Right Holders) 2010 have been formulated and notified.

These rules in brief contain the followingQuantity.-

(1) Timber Distribution shall be granted as under.

i) For construction of new house = Up to 7 m3 standing volume; and

ii) For repair and addition or alteration = up to 3 m3 standing volume.

(2) Timber Distribution shall be given from salvage (fallen, dry standing),silviculturally available green trees in the order of preference.

PERIODICITY:The periodicity for grant of Timber Distribution to the Right Holders will be as under:-

(i) For new construction once in 15 years;

(ii) For additions/alterations – once in 5 years; and

(iii) sufferers of natural calamities/fire sufferers: as per actual requirement as recommended by the Sub Divisional Officer (Civil) and after personal verification by the ACF/DFO concerned subject to the grant not exceeding the maximum limit prescribed under rule-4.

RATES: The rates to be charged from the different types of Right Holders for grant ofTimber Distribution will be as under:-

i) Rs. 500 per m3 standing volume for Deodar and Rs. 250 per m3 standing volume for other species.

ii) Right holder suffering from natural calamities shall be given trees free of cost.

iii) Rates once fixed shall remain valid for 5 years.

PRIORITY FOR GRANT OF TIMBER DISTRIBUTION: Priority for grant of Timber Distribution shallbe given to be all the Right Holders. However if the trees are not available silviculturaly in the forest where concerned right holders have TD rights. TD shall be given from other forest at 50% of the market rate. Provided right holders of those forests have no objections.

PROCEDURE FOR GRANT OF TIMBER DISTRIBUTION:i) Application for grant of Timber Distribution, on the form appended to these rules as‘Annexure-I’ shall be submitted by Right Holder (s) to the Panchayat concerned after getting necessary remarks from the Patwari concerned.

ii) The pardhan of concerned gram panchayat after ascertaining genuineness of the requirement of the right holder shall give recommendation indicating actual quantity of requirement of timber.

iii) There after right holder shall submit 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

iv) He shall send his recommendations to the Block Officer after ascertaining the genuineness of demand, who in turn shall submit his recommendations to the Range Officer.

v) After receipt of Timber Distribution application from the Range Officer, the Divisional Forest Officer shall take action for sanction of the Timber Distribution after satisfying himself about the genuineness of the requirement and silvicultural availability of trees/timber in the concerned forest and intimate his decision/ Timber Distribution grant to the Right Holder concerned on the prescribed proforma.

MERIT OF THESE RULES OVER PREVIOUS PROVISIONS OF T.D. IN VARIOUS SETTLEMENTS: The advantage of these rules have provision for grant of TD under various settlements are as under:-

i) These Rules of TD have been integrated and unified for whole of the state.

ii) The rules are forest centered as well as right holder centered based on the guiding principles of HP Forest Settlement Rules, 1965 as indicated in point 3 which will help in conservation of forests and so also catering to the demand of TD to the present and future generations.

iii) A detailed procedure for grant is enshrined in the Rules.

iv) The right holder now has to simply give application duly authenticated by the Panchyat to the FG which will pass through the various chanels of the Forest Deptt. and the applicants would get their TD.

1.12.4 WOOD FOR BURNING THE DEAD, FUNERAL RITES, MARRIAGE CEREMONY, AGRICULTURAL IMPLEMENTS ETC: For the regulation of grant of wood for these purposes, trees have been divided in to classes; the first class comprising of the 62 reserved species given in para 1.8.1.4 and the second class containing all other species. The trees of second class containing all other species. The trees of second class may be granted by the Range Officer (previously this power wasvested with Lambardars) so long as these are not used for building purposes of any kind, whatsoever, and where trees of second class are not available, croocked or unsound trees of the first classwith the exception of 19 species can be granted. These species are: *Cedrus deodara, Abies webbiana, Picea morinda, Juglans regia, Buxus sempervience, Ulmus wallichiana, Cedrela toona, C. serratta, Dalbergia sissoo, Shorea robusta, Acacia arabica, Celtis australis, Aesculus indica, Accer spp., Olea cuspidata, Pistacia integerrima, Terminalia chebula, T.belerica and Bassia latifolia*. Provided that the reserved trees can not be felled until these are first marked by a dulyauthorised forest official. However, for actual burning of dead, a sufficient quantity of wood, except of the above mentioned 19 species, may be cut without being first marked provided that the notice is given to local forest official within ten days**.**

1.12.5 GRAZING: Inthe Demarcated Protected Forests, only the persons having recorded rights may graze their cattle, other than sheep and goats. In Undemarcated Protected Forests, proprietors as well as the tenants of the agricultural land may graze only their own cattle. However, there is no limit to the

number of the cattle to be grazed. The only important exception is that the owners of the soil of "Sawanas" may allow others to graze and may take from the occupants such dues as are recorded in the land Revenue Settlement records. As to sheep and goat grazing, the right holder may graze any number of such animals as are required for his domestic and agricultural (excluding pastoral) purposes, or a number equal to 30% more than the number recorded at O'Briens' assesment of land revenue in 1892, whichever is greater. With the exception mentioned above, the resident non right holders may graze their own domestic cattle free if the right holders do not object.

1.12.5.1 GADDI GRAZING: The gaddis, who generally belong to Chamba but, in some cases, have settled in Kangra to become entitled to all the rights of user, are true shephards. The rich pastures on the southern slopes of Dhauladhar provide autumn and summer grazing, but winters the flocks move down to the lower hills in their recorded runs which provide only insufficient and poor grazing. In rainy session, they take shelter across the main range in Bara Banghal, Chamba and
Lahaul where grazing of very fine quaility is available in alpine pastures. The gaddis are, however, permitted to graze their flocks in their hereditary runs in Nadaun area on payment of dues fixed from time to time. Govt. of H.P. on the recommendation of grazing advisery commitee have vide their memo. No .6-2769-SF-II dated 29-4-1975 fixed the following rates to be charged per animal from the graziers throughout the state:-

i) Sheep : Raised from 19 paisa to 20 paisa
ii) Goat : Raised from 37 paisa to 40 paisa
iii) Buffalo : Rs. 8/-

The grazing of the flock is governed by the following rules:

i) The graziers are charged grazing dues (trini) @19 paisa per sheep and 37 paise per goat once a year. The permissible number is limited to that of the year 1970-71. All excess goats are charged a penal rate of Rs. 5/- per head. No such penal rates/ charges are levied for extra sheep.
ii) For purposes of enumeration lambs and kids born in the spring are counted.
iii) Daily stages must be atleast 8 Kms. apart.
iv) No halt may ordinarily be made for more than one night at any halting place, but when delayed by rain or by necessity of giving salt to the flocks, a halt for two nights is allowed. If these limits are exceeded, a halting fee equal to the full grazing fee is leviable but the Deputy Commissioner, at his discretion in special cases, may reduce it in case of goats to not less than Rs. 4.69 per

hundred. A halting fee of Rs. 4.69 per hundred should be charged for halting for more than two days, but less than six days unless the halt is for manuring the fields of the right holders when no such fee is leviable; Rs. 6.25 per hundred for goats and Rs. 4.69per hundred for sheep if the stay exceeds 9 days, but does not exceed 15 days (excluding the days allowed for manuring). No flocks are permitted to halt at the place for more than 15 days. The period of halt for manuring should not exceed 3 nights at one place and halting fee is leviable for excesses even if the halt is for manuring purpose.

v) In spring, a halt of three weeks in the higher ranges in excess of the period actually necessary for the journey across the passes is permitted.

vi) No halting fee is to be charged for halting in tikas where the gaddis own land and are, thus, ordinary right holders provided they confine their grazing to the forest in which they have rights as owner of land. Gaddis and Zamindars must make their own arrangements with regard to manuring fields but the Zamindars may not interfere with the gaddis even if they refuse to manure.

1.12.5.2 GUJJAR GRAZING (BUFFALO GRAZING): Gujjars are of two classes: (I) Ban Gujjar and (II) Sawanadars. The former were originally nomads, but the latter are invariably permanent residents of the district and co-proprietors of the villages and have sawanas or dhars recorded in their names which can be transferred only through inheritence. The sawandars gujjars may graze their cattle in the sawanas recorded in their names to the exclusion of cattle of all other right holders during the 3-4 months of monsoon. The Ban gujjars, on the other hand, have got no recorded rights in the division.

1.12.5.3 MIGRATORY GRAZIERS: They are mostly Gaddies and there are no Gujjar grazier in this Division. Following statement shows the number of migratory cattle in this division:-

Detail of grazing permits issued in respect of Hamirpur Forest Division.

Year.	No. of sheep and goats	No. of kids	No. of Horse
1998-1999	5555	2914	-
1999-2000	5738	3046	-
2000-2001	6126	3310	-
2001-2002	5914	2998	-
2002-2003	5636	2874	-
2003-2004	5431	2767	-
2004-2005	6472	3353	-
2005-2006	5910	3225	-
2006-2007	6984	3746	-
2007-2008	6552	3836	-

2008-2009	4448	2799	-
2009-2010	5565	3470	-
2010-2011	5565	3470	-
2011-2012	4140	2618	-
2012-2013	4140	2618	-

(DFO Office Hamirpur)

1.13 LOPPING: Lopping of 13 species is prohibited. All other trees may be lopped for fodder, bedding and manuring by the ordinary right holders, by sawanadars gujjars whithin their sawanas, and by gaddis within their grazing runs (for kids and lambs only). No tree less than 45 cms. (one hath) in girth is to be lopped. The branches lopped should not exceed a finger in thickness and the trees are not to be lopped to more than one half of their height. Out of the thirteen species whose lopping is banned, only six namely *Toona ciliata, Dalbergia sisso, Shorea robusta, Acacia nilotica, Olea cuspidata, Pistacia integerrima* are met in this division. The enforcement of these rules has however, been very difficult especially near the settlements of gaddis or gujjars.

1.13.1 GRASS CUTTING: Grass cutting is allowed except in the regeneration/plantation areas where it is permitted at the discretion of Divisional Forest Officer.

1.13.2 ZAMINDARI SHARE: Fromearly times (1859) a part of the revenue obtained from the sale of the trees is paid to village communities, to be divided between the village proprietors and certain specified village servants. To quota para 61 of the Anderson's settlement report, "This was not a malkhana paid in recognition of their properety in soil, but was a voluntary grant of secure their interest and cooperation in forest conservation. If the village does not render assistance in enforcing forest rules, this grant can be taken away as punishment".

The Deputy Commissioner can disallow this share upto one year but for longer period commissioner's sanction is needed. In protected forests, one half of the sale proceeds of trees at zamindari rates, one quarter of the sale revenue from the sale of the trees at other than zamindari rates and one quarter of the net revenue (calculated by deducting all working charges except the cost of estaiblishment from the gross revenue and departmental works) are paid to the village proprietors, Lambardars and Rakhas to secure their interest and cooperation in forest conservency. In Delimited Protected Forests this amount was divided amongst the constituent tikas in the proportions given in the compartment descriptions of the expired working plan, which too have been retained alongwith, the new descriptions. However, in Undemarcated Forests the whole amount went to the tika from which the trees were sold. The internal

distribution in each tika is used to be 50% to the village proprietors, 18.75% to the rakha and 18.75% to the lambardars while patwari share of 12.5% has been resumed by the Govt. the share of the village proprietors used to be paid through tehsildars whereas the rakhas and lambardars got the payment directly from the forest department. The grant was purely a concession and could be withheld for one year with the approval of the Deputy Commissioner and with the Commissioner's for a longer period if the villagers did not cooperate with the authorities in the protection of forest. In pactice, however, payment has only been withheld in case of incendiarism.

After coming in to force of notification no. 3-61/69-SF (III) dated 13.12.1976, no payments of haq chuharam has been made to Khewatdars and Lambardars after 29.8.1974.

H.P. Govt. vide bill namely the HIMACHAL PRADESH ABOILATION OF PAYMENT OF HAQ CHUHARAM BILL, 2011 has abolished the system of payment of haq chauharam to the rakha as per clause (2) which is reproduced as under.

The system of payment of Haq Chuharam to the Rakhas shall stand abolished with effect from 1st April, 2010 and they shall stand relieved of the duties and obligations attached to them and shall have no liability in this behalf.

****

CHAPTER-II

FLORA AND FAUNA

Chapter – II A

Forest Flora

2A.1 COMPOSITION AND CONDITION OF THE CROP: The forests of this division scattered as they are, over a vast area, support Chil and Scrub forests depending upon the altitude, rainfall, aspect, geological formatiom and their locality factors. The forests are of low hills or outer Shiwalik type. Chil is the most important species.

The forests may be grouped into the following types and subtypes as per Champion and Seth's classification. (A revised survey of the forest types of India, 1962:

Group 5: DRY TROPICAL FORESTS

5/B C2: Northern Dry Mixed Deciduous forests.

5/B D.S.I.: Dry Deciduous Scrub.

Group9: SUB TROPICAL PINE FORESTS

9/C la: Lower or ShiwalikChil Pine Forests.

2A.1.1 5/B C2 – NORTHERN DRY MIXED DECIDUOUS FORESTS: These are found mainly between the elevations of approximately 600m to 1000m with annual rainfall varying from 600mm to 900mm. The rock formation is mainly conglomerates.

The general appearance of the forests is determined by the different physiography and soils which affect the composition and structure to some extent. The upper canopy is light but fairly even and continuous in the climax form. The later condition is, however, rarely encountered and an irregular, often brocken, canopy is normally met with. The trees have relatively short boles and poor form and a height rarely 15m and often much less. This canopy is formed entirely of deciduous trees and there is a considerable intermixture of smaller trees. There is usually thin shrubby undergrowth. A

feature of these forests is the contrast between the hot weather condition when it is entirely leafless and the soil fully exposed and the monsoon condition when it takes on an almost luxuriant apearance from the growth of ephemeral herbaceous vegetation coupled with leafing out of the trees and shrubs. The forests are generally open, degraded and getting eroded due to overgrazing and excessive exercise of various rights. There are frequent blanks Present carrying no vegetation worth the name. Most of the species, except *Acacia catechu,* are of little economic importance.

These forests are at their best upon the newerconglomerates, being largly replaced by Chil forest where sand stone is exposed especially at higher elevations.

FLORISTIC COMPOSITION:

i. **Trees:***Acacia catechu, Anogeissus latifolia, Lannea grandis, Aegle marmelos, Limonia acidissima, Ehretia laevis, Mallotus philipinensis, Zizyphus jujuga, Ougenia dalbergioides, Stephegyna parvifolia, Butea frondosa, Acacia modesta, Holoptelia integrifolia, Diospyros montana, Flacourtia, ramontohi, Litsea chinensis, Eugenia jambolina, Shorea robusta* and occassional clumps of bamboos.

ii. **Bushes:***Carissa spinarum, Mimosa rubicaulis, Nyctanthes arbortristis, Dodonaea viscosa, Woodfordia floribunda, Adhatoda vasica, Zizyphus spp., Murraya koenigii and Holarrhena antidysenterica.*

iii. **Grasses:***Chrysopogon montanus (Dholoo), Heteropogon contortus (Lamboo), Chloris incompleta (Takermadhana), Themada anathera (Lunji), Bothrcochloa perlusa, Brachavise spp., Eulaliopsis binata (Bhabbar), Aristida spp.*

iv. **Climbers:** *Pueraria tuberosa, Bauhinia vahlii, Clematis gouriana, and Cuscuta reflexa.*

This type of forests are met with on the Western and South-Western aspects of Dhar Jajjar Jakh and Dhar Chabutra, parts of P.36 Dhar Kangar, P-I Kitpal, P-II Bhadauli bhagaur, P-III Bharartha, P-VIII Bhandhera, P-IX Mansai, P-X Sadoli, Part of P-XI Raisara Panjahra, P-XXXI Amlehar, P-XXXVI Jihn, P-XXXVII Kuthera, P-XXXVIII Kuthar, P-XXXIX Tillu and the undemarcated forests of Nadaun range.

2A.1.2 5/B D.S.I – DRY DECIDUOUS SCRUB FORESTS: Locality factors viz. rainfall, temperature, altitude, where these forests are found are almost similar to that of Northern dry mixed deciduous forests with the difference that conditions are far more drier.

A low broken soil cover of shrubby growth, 3 to 6 m high including some tree species reduced to similar conditions is the common vegetation met with. Many of the shrubs are distasteful to the cattle and thorny. Thin grass occurs throughout. The growth of the trees is generally slow and quality poor; the forests being incapable of producing large sized and good quality timber. The diameter growth is also slow. These forests owe their stunted condition to both drier conditions and maltreatment, usually directly or indirectly connected with felling, lopping, grazing and frequent fires.

FLORISTIC COMPOSITION:

i. **Trees:***Lannea grandis, Aegle marmelos, Acacia catechu, Butea monosperma*

ii. **Bushes:** *Nyctanthes arbortristis, Dodonaea viscosa, Woodfordia floribunda, Carissa opaca, Flacourtia indica, Randia dumetorum, Euphorbia, Phoenix sylvestris, Holarrhena antidysenterica, Adhatoda vasica, Lantana camara.*

iii. **Grasses:** *Heterepogon contortus, Ischaemum angustifolium, Eulaliopsis binata.*

This type of forests are met with in P-IV Sitlabag, P-V Bathrun Bassi, P-IV Badrun and parts of P-XI Raisara-Panjahra, P-XXXVII Basaral, P-XXXVIII Naungi, P-XXXV Rira Jouri and P-XXXVI Jihn.

2A.1.3 9/C.1a - LOWER OR SHIWALIK PINE FORESTS: These Chil forests occur between the elevations of 500m to 1200m, their quality being markedly affected by variation in elevation. At lower elevations, it confines itself more to the cooler, northerly and sheltered aspects. It generally occurs as pure crop but on the western and eastern aspect of the Jakh Dhar and Chabutra hills and in a few localities adjoining the Nadaun ex-Jagir, the proportion of chil trees is reduced and scrub of miscellanious broad leaved species of varying density cover the ground.

The pole crop is promising; trees have fine boles and exhibit good height growth. The old and over mature trees are branchy and fall below that quality; the site quality is generally II/III. The site quality in the lower reaches around Nadaun is III, the form and growth of the crop is generally inferior and it often exhibits left handed twist (which runs from right to left) especially in areas which are liable to frequent fires. Poor rocky soil and heavy grazing also seem to increase the intensity of the twist.

Chil in this division belongs to the middle or intermidiate sub type as classified by Mohan. Natural regeneration lower reaches say below 700m altitude i.e. Nadaun range chil areas is slightly

difficult to obtain and proportion of tree species especially *Acacia catechu* is increasing in chil areas primarily due to dry conditions induced by fires. A large number of trees of chill dry up due to fires or drought and have to be removed in salvage removals. This premature opening of canopy leads to the appearance of rank bush growth and *Acacia catechu*. In case of fires, heat generated is so intense that all seedlings including those of chil are wiped out. Khair also gets burnt repeatedly but in a period of 4-5 years free from fires, shoots up due to intense coppicing power. However, natural regeneration above 700m is not difficult to obtain; in fact it is met with under all conditions of light and shade except where the opening is very heavy.

Floristic Composition:

i. **Trees:***Pinus roxburghii, Terminalia chebula, Mallotus philippinensis, Pyrus pashia, Syzigium cumini, Albizzia spp., Emblica officinalis, Acacia catechu.*

ii. **Bushes:** *Carissa spinarum, Dodonaea viscosa, Rubus ellipticus, Flacourtia spp., Murraya koenigii.*

iii. **Grasses:** *Heterepogon contortus, Themeda anathera, Cymbopogon martinii, Chrysopogon montana.*

All the chil forests of this division belong to this type.

Rangewise distribution of forests area (D.P.F.s) under various types and subtypes is as under (in ha.):

S.No.	Range	5/ BC2	5/B D.S.I.	9/C la
1.	Aghar	5.00	0	2060.72
2.	Barsar	197.43	70.00	1652.94
3.	Bijhri	0	0	2219.69
4.	Hamirpur	47.00	0	944.54
5.	Nadaun	590.08	1009.42	1072.50
	Total	**839.51**	**1079.42**	**7950.39**

2A.1.4 NATURAL REGENERATION: The natural regenerations of principal species like Khair, Shisham, Siris, Jaman, Simbal, Drek, Emblica, Pansara species are coming up in forest which have been described in respective compartment history files under description of growing stock. The undergrowth coming up in the forest mainly consists of Carrisa, Mallotus, Murraya, Kangoo, Jasmine, Rubus, Ada-toda-vasica, Colebrookia, Woodfordia, Berberies.

Lantana weed has invaded all the forest and suppressed undergrowth and created hindrance in coming up of regeneration. During 2012 – 13 and 2013 – 14, 165.00 hac. of weed infested area was treated using cut root stock method and it was followed up by plantation. It is proposed to tackle more such areas for weed eradication for opening up space for the natural regeneration.

2A.2 INJURIES TO WHICH CROP IS LIABLE: The main agencies causing injuries to the forest are discussed below:

2A.2.1 FIRE: Chil has great power of resisting fire than any other Himalayan conifer and yet owing to the fact that it is found on hot, dry inflammable slopes, the actual damage done by fire in chil forests is very serious. The tree owes its fire resisting power to the exceptionally thick bark produced alike on young saplings and on older trees, to the thickened and sometimes almost fleshy top root developed in the seedling and young sapling stage, and to the power exhibited in the younger stages of recovering from injury by means of sheets from collum buds. The trees are though blackened at the base and the outer bark is scorched, but the inner living cortex and the cambiun suffers no injury.

The extent of damage caused by fire depends on condition of the forest and nature of the soil. It causes great havoc in regeneration areas and young plantation areas, where young regeneration is completely wiped out by fires. In even aged crops of above middle age, with little or no undergrowth, the conflagration is confined to ground and results in retarding theincrement and hastening druing of trees. In crops with considerable number of young poles with scattered mature trees or in an irregular forest with a fair amount of undergrowth, the damage caused is enormous. Large numbers of young poles have been killed, patches of poles have been completely wiped out, and dense crops have become open. The damage near the ridges and at the heads of the nullahs has materially reduced the stocking. Erosion in the fire burnt areas is so much accelerated that, where ever the rock has been exposed, the immediate cause has been found to be fire. Incendiarism encourages the recession of chil to higher elevations and is certainly one factor in restricting chil to northern aspects. As discussed in para 2.1.3 supra, the invasion of chil forests by scrub species in lower reaches is also attributable to fires.

It may be emphasized that fires are periodical and not annual. Years may elapse before a conflagration breaks out and yet, a single year of incendiarism may devastate the work of decades. Pre-disposing causes are accumulation of dry pine needles, thick undergrowth, dry grass, felling debris,

drought, resin tapping etc. Cause of a conflagration is many times not easy to ascertain. Sometimes fires are vindictive in origin while at other times they are set to obtain fresh grass or drive away wild animals or to involve a forest subordinate in trouble. Possibility of fires caused/encouraged by the rakhas to get their share of sale proceeds cannot be totally ruled out. Rangewise extent of areas burnt by fire is as under

2A.2.2 CLIMATE:

2A.2.2.1 FROST: The damage by frost is confined to mainly December-January and is sometimes very severe for bamboo as it strips bamboo sheets which are naked of their foliage. Mango, Jacaranda, Silver Oak, Drek, Siris etc. are other frost tender species. Plants suffer from frost when young. Maximum damage is caused to the seedlings due to "frost lift" especially in nurseries. It does little damage to chil, but when exceptionally severe, affects seed production adsevely.

2A.2.2.2 DROUGHT: The long summer drought causes a heavy mortality among seedling of all kinds. Its severity adversely affects the production and growth of coppice shoots and young plants. Drought cannot however, be considered a menace to estaiblished regeneration except indirectly, when extreme dryness increases the fire hazard.

2A.2.2.3 HAILSTORM: Severe hailstorm can strip off the leaves and needles of trees and can cause a temporary set back.

2A.2.3 MAN

2A.2.3.1 LOPPING: Lopping causes a great damage to broad-leaved fodder species specially in the vicinity of villages. Rules regulating the exercise of this right are adequate, but enforcement is generally lax. A Dho tree in forests is lopped so mercilessly that it is reduced just to a telegraph post and gives a very shabby look. It is one most important factor for significant reduction in proportion of fodder species (especiaally Dho) in broad leaved scrub forests, since seed production and consequently natural reproduction of these species is adversely affected due to heavy unscientific lopping. Besides, it is predisposing cause of fungle attack and accelerated erosion as heavily lopped trees are incapable of protecting the soil from the splash efect of rain drops.

2A.2.3.2 GRASS CUTTING: Grass cutting is generally favoured as it reduces fire hazards in the forests closed for regeneration. But damage is caused to seedling by cutting them along with grass. It is done rather intentionally with chil seedlings as once the chil is established, grass production is adversely affected and hence, grass cutting if done under the supervision of staff and with care is not a problem.

2A.2.3.3 ENCROACHMENT: Illicit encroachments on forests lands are a common feature. The Undemarcated Protected Forests, having no definite delineation of boundary on the ground, are much subjected to this menace. The nautors granted in these forests serve as a foot hold for further encroachments as these nautors as granted in a haphazard-manner, and are not properly defined.

2A.2.3.4 DEFECTIVE CULTIVATION: Defective Cultivation practices on steep slopes without proper terracing and bunding are source of erosion and land-slips, which damage the adjoining forests. Young plantations and other regeneration areas are the worst sufferers.

2A.2.3.5 DEVELOPMENTAL ACTIVITIES: Construction of roads, buildings, hydroelectric projects and their reservoirs, electric transmission lines, laying of water – supply pipe lines etc. are, undoubtedly important activities for the economic development and well – being of the population of any area, but these activities are major source of loss/shrinkage of area under forest vegetation. These constructions cause severe damage to forests not only by way of submergence and clearing of forests areas but also by completely changing the ecological status of the adjoining forests.

2A.2.4 ANIMALS:

2.2.4.1 GRAZING: Grazing in the chil forests is confined generally to the horned cattle belonging to the neighboring villages, for neither the residents nor the ‘gaddis’ visit these areas with their sheep and goats, as there is little in them for these animals to feed on. The goats no doubt are partial to *Carissa opaca*, the principal undergrowth species in the chil forest, but the bushes become so covered with dry pine needles as to be useless for browsing, consequently sheep and goats are only grazed in chil forests with dense scrub and when there is no true scrub forest available. Cattle gazing is heavy only in the vicinity of the villages and in the parts near the nallas. No cattle grazing takes place in summer in

forests when the ground is covered with a dense layer of needles. But forests with undergrowth are grazed throughout the year.

Injury being caused to the pine forests by heavy grazing amounts to the absence of regeneration, to the lowering of the moisture content of the soil and making the raising of the climax type of vegetation difficult.

Grazing and browsing in the scrub forests are permitted to village cattle and to 'gaddi' flocks. The village cattle graze throughuot the year while the 'gaddi' flocks only visit the forests during the cold winter. Detail of 'gaddi' graziers, their flocks and forests have been included in Ann. XI. The incidence of grazing is heavier than the forests can bear and there is no doubt that the ever increasing denudation of the greater part of the low hills is due to this cause alone. A glance at any scrub – clothed hills in this division, not protected from continuos and almost always excessive grazing, is sufficient to so the steady deterioration of the vegetation, which in many cases must disappeare eventually. Nutritious and annual varieties of grasses are rare; *Aristida depressa* and *Iseilma laxum*, both of poor fodder value are the two principal grasses that are met with.

The grazing incidence is much above the carrying capacity of the forests and therefore effective closures, a necessity for natural/artificial regeneration, is very difficult to obtain.

2A.2.4.2 WILD ANIMALS: Porcupines and monkeys to a considerable damage in chil regeneration areas. These uproot young chil seedlings and damage has been noted to be as high as 90% or more in the affected patches. Wild pigs are also known to dig the roots of young plants. Pheasants, rats, squirrels, also contribute their bit by destroying and eating away seed sown in nurseries and plantations. Woodpeckers bore hole into chil trees which becomes the source of insects and fungal attack.

2A.2.5 PLANTS:

2A.2.5.1 CLIMBERS: These are not very harmful except in scrub forests where the two chief climbers *Bauhinia vahlii* and *Pueraria tuberosa* often completely envelop the trees and their by retard their growth. The climber however, is a minor forest produce also as 'pattals' are made from its leaves.

2A.2.5.2 WEEDS: Weeds like *Ageratum, Adhatoda, Lantana* invade the coppice coupes and regeneration areas. *Lantana* in some areas has assumed menacing proportion affecting plantations and chil regeneration very adversely.

2A.2.6 INSECTS AND FUNGI

2A.2.6.1 INSECTS: Insects cause damage at nursery stage and young artificially stocked chil areas. Cut worm *(Agrostis vpsilon larvae)* and cock chaffers (Lechnosternne *impressa*) nibbleyoung seedlings at the collar just after germination. *Mypophyla robusta* is a chil bark borer.

2A.2.6.2 FUNGI:*Pteridium campanulatum* is a chil needle fungi. Isolated chil trees are attacked by "*Witches broom*". Khair trees are attacked by *Fomes pinni* and are hollowed out.

2A.2.7 EROSION: Erosion caused due to misuse of land by adopting faulty agricultural practices, continued over grazing much above the carrying capacity, repeated forest fires, intense unscientific lopping, is a serious problem and causes denudation to an extent which seriously threatens the welfare of an overwhelming agricultural district like Hamirpur. The denuded hils of once thickly forested area are being rapidly carried away and the hill sides are reduced to barren, stony wastes.

Chapter – II B

Forest Fauna

2B.1 General Description:- Hamirpur Forest Division lies in the shiwaliks and Sub Himalayan Zones. Existence of a variety of vegetation, numerous rivers, streams, nallas provide an ideal habitat for a great variety of wild animals, birds. This tract at the same time is very thickly populated. A large number of gun licenses have been issued by the district authorities to local people for the protection of crops. This had adversely affected the wild life tract. With the imposition of complete shooting vide H.P. Notification F.No. 1-2/91-W.L.-I dated 27.09.91 an appreciable increase has been noticed in the number of wild animals and birds in the forests.

2B.1.1 The important animals, birds which are common occurance in this division are described briefly as under:-

(a) ANIMALS (MAMMALS)

(i) CARNIVORA

2B.2 The Panther (Panthera Pardus):- Locally known as Bagh is occasionally met with all over the division .

It is a sleek, short haired animal with a fulvous or bright fulvous coat marked with small close-set black rosettes. Average male is about 2 meters long weighing about 56 kgs. This animal generally

remains in the neighbor-hood of villages carrying off sheep, goats and especially dogs at night. It seldom attacks human beings without provocation.

(ii) HARBIVORA

(a) Goat Antelope Group.

2B.3 The Ghoral (Nemor haedus goral): It is a stocky goat like animal without stout limbs and coarse hair. Ghoral is generally found on rugged grassy hillsides or rocky ground in the forests. The animal has suffered very much at the hands of poachers because of its meat.

2B.4 The barking Deer (Muntiacus munt-jak):- It is locally known as kakar and is a sought after animal for its meat. Its colour is deep chestnut becoming darker on the back and pale and dull below. Its height at shoulder is about 50-75 cms. The horns rarely exceed 13 cms. Generally it utters a subdued clicking noise but when alarmed and in fight the sound becomes a bark like cry for which the name barking deer is derived. It occurs throughout the division.

2B.5 The Sambar (Cervus unicoeor niger):- This is the largest deer, carrying magnificent horns. Its coat is coarse and shaggy and general colour is brown with a yellowish or grayish tinge. A full grown average male weighs about 230-240 kgs. The horns are about 90 cms. It is found in all over the division.

(c) Pigs.

2B.6 The Indian Wild Boar (Sus scorfa cristatus):-Locally known as Jungli Suar, is a notorious and an omnivorous wild animal living in grassy, bushy and also thickly wooded areas. It feeds on field crops, wild roots, tubers and even insects and snakes. It is grayish black, the skin being covered with a sparse growth of bristles which forms a conspicuous mane. Wild boar is a prolific animal giving at least two litters every year, one in the beginning of rains and second after the rains. A well grown male is about 80-90 cms at shoulder and may weigh up to 200 kgs. It is found in Nadaun, Hamirpur, Bijhri and Aghar forest Ranges.

(d) Weasels.

2B.7 Gothuor Himalayan Pine Martin: The animal is very much valued for its fur. It is a predator and prays upon birds and their eggs and young ones of the deer and goat antelope family. It has been declared as a vermin.

(e) Rodents.

2B.8 Common Indian Hare (Lepus nigricollis):- Locally known as Khargosh or serru is found everywhere. It feeds on grasses, seeds and fruits. Its head and body measures 40-50 cms and it weighs about 2 kgs. Though small, it is hunted for its meat.

2B.9 The Indian Crested Porcupine, (Hystrix Indica):- Locally known as Seh or Sehl, it is found-throughout the tract. It is robust, heavy and terrestrial. The whole of its back is covered with long and well developed quils which may be nearly 60-70 cms. long. It feeds on vegetables, principally on roots and is destructive to plantations. The animals is fond of gnawing bones and when alarmed it utters a grunting sound, erects its spines and inflicts injuries. It weighs 11-18 kgs. and is locally very much valued for its meat.

2B.10 The Large Red Flying Squirrel (Petaurista-Albivener):- It is valued and hunted for its fir. It flys from tree to tree eating fruits and also insects, hiding under the bark. The damage it does to the forest crop is thus compensated by the help it renders by eating injurious insects.

NON-GAME ANIMALS

(i) Dog family.

2B.11 The Himalayan Fox (Vuloes bengalensis): Locally known as Loomri, it is found throughout and lives in brushwood and cultivated lands.

2B.12 The Jackal (Conis indicus):- Locally called Sear or geedar, it is found singly or in large numbers at night. It is one of the common scavenger.

(ii) Cat Family.

2B.13 The Jungle cat (Felis chans):- It is locally known as jungle billi or ban billa. It inhabits the drier and open scrub part. It preys on small mammals and birds.

(iii) Mongoose.

2B.14 The common mongoose (Hepestes edwardsi):- It is light grey to dusty brown animal locally called neola. It eats rats, snakes and birds.

(iv) Weasels.

2B.15 The common otter (Lutra lutra):- Locally known as udbilao, it is quite active along the Sir, Sukar, Sarihali Khads and Govind Sagar.

(v) Monkeys and Langurs.

2B.16 The monkey (Macaca Muletta): Locally known as bander, it is found every where, generally in herds.

2B.17 The Langur (Presbytis entellus): It is found throughout.

2B.18

(vi) Bats locally called chamgaders can be seen in the evening amongst the trees, in search of insects.

BIRDS

Game Birds

Land Birds

(i) Pheasants and Fowls.

2B.19 The Red jungle Fowl (Gallus ferrugiens), locally known as Jangli murghi or Kukar is found everywhere in Division . It is one of the most important game birds of the tract.

2B.20 The Pea Fowl (pava cristatus): Locally known as mor is the national bird and is protected throughout the country.

2B.21 The White Crested Kaleej Pheasant (Lophura leucome-lana), locally known as Kolsa, favours thick bushes and shrubs. The male is blackish above with gloss of steel blue and has a white rumo, long white crest and scarlet patch around eyes; female is reddish brown.

(ii) Patridges and Quils.

2B.22 The Chakor (Alectoris gracia): It is a large, plump, pinkish, grey brown patridge with rib like bars on flanks. Bill and legs are crimson. It is found on open hill sides and rocky slopes dotted with bushes and grass. Generally it lives in groups of 5-20 and keeps in neighbourhood of fields. It is common at Sujanpur, Bijhri, Kangu, Dhaneta and Hareta.

2B.23 The Black Patridge (Franco-linus francolinus): commonly known as kala teetar, is a small game bird, about half size of a village hen, generally black and spotted white. The hens are pale and speckled black and white. It feeds on grass seeds, grains, white ants and other insects. It is a fast running bird, relying upon its legs to escape, and lives singly or in pairs. It is found throughout.

2B.24 The Grey Patridge (Francolinus pondi-cerianus) locally known as safed or dhaula teetar is less common than kala teetar but is occasionally found in dry scrub country. It frequents bushy jungle and cultivated lands.

2B.25 The Mountain Quail (Ophrysia supper-cilliosa):- Bater and rain quail (conturnix coromendelica) are rather very rare.

2B.26 Jungle Bush Quail (Perdicula asiatica) also known as bater, is found more commonly in all areas upto 1200 meters altitude. It is of the size of a rain quail. The male is fulvous brown above and white below while female has pale pinkish rufous lower part. It lives in coveys of 5-20 which rest together and rise suddenly when almost trodden. It feeds on grass seeds, tender shoots and grains.

(iii) Doves and pigeons:

2B.27 The Blue Rock Pigeon (Columba Livia): commonly known as kabutar has a grey colour with glistening metallic green and purple sheen on the neck and breast. It lives gregariously on cliffs and precipices. Large flocks regularly visit cultivated fields in search of food during winters.

2B.28 Dove (Streptopelia spp.): commonly known as ghugee is found generally in groups in open places and cultivated fields. It approaches houses and even varandahs if not scared. Its flight is straight and swift.

Reptiles

(i) Snakes

2B.29 The common Indian Krait (Bungarus caeruleus) it inhabits more or less open country at low altitudes, seldom ascending above 1500 meters.

2B.30 The Indian Cobra (Naja naja):- The cobra may be found in all types of country. It is very fond of water and the hot dry weather before the monsoons breaks in, is seldom found away from it.

2B.31 The Rat Sanke (Ptyas mocosus) is widely distributed and usually frequents the open country in the vicinity of human habitations. It is the common snake of the tract.

Lizards

2B.32 The Common Indian Monitor Lizard (Varanus-monitor):- It is found both in forests as well as in the outskirts of villages.

2B.33 The Common House Gecko (Hemidactylus brooki):- It is found at all elevations and in almost all rest houses and range buildings etc.

****

CHAPTER-III

UTILIZATION OF THE PRODUCE

3.1 AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION: The tract is quite densly populated; the average popolation density being 330 persons per Km3 as against the corresponding figures of 93 for the pradesh (1991 census). The per capita total forest area comes to about 0.04 ha against the figures of 0.5 ha. for the state. To a casual obeserver, the tract may apear to be very sparsely populated as the habitation is generally scattered in the form of small hamlets and the houses are usually hidden in clumps of trees and bamboos. The population is mostly rural and dependent on agriculture. Subsidiary employment as daily paid labourers on various developmental works executed by the Public Works Department, Forest Department and other Government Departments is also available. The area also contributes a sizeable number of recruits every year for the armed forces.

The rural population is dependent to a great extent on the forests for many of their usual requirments. The main requirments from Government forests are; timber for house construction and agricultural implements, fuelwood, grass and fodder, leaves for manur, stones for building, herbs for medicinal use etc. the pressure of these requirments on the forest is very high and ever increasing. The

forest settlement makes sample provision to meet these requirment, either free of cost or at nominal rates.

In the past, houses were built with son dried bricks and usually roofed with thatch, tiles or thin slates. With the rise in the standered of living and proximity to plains, use of kiln burnt bricks and stones for the construction of houses has also come to stay as an important mode of house construction. It is common to fined galvanized iron sheets as roof covering. Linteled roof houses are also common to be seen now days.

Agriculture has also been significant development in the recent past with the use of improved seed varieties and chemical fertilizers. The principal agricultural crops are rice, wheat, maize, barley and vegetables. Rice and wheat are the main staple food. A marked improvement in the animal husbandary practices has taken place and crossbred cows are common sight. However, much is yet to be achieved on this front. Emphasis still is mainly on milk quantity than quality and stall feeding is not practiced except when unavoidable, and on this account most of the cattle dung is lost in the forests during grazing. Dung is still being used as fuel and when used as manure, the system of compost pits is not followed correctly. The dung is heaped in an open place for months before it is used in the field as manure. In the vicinity of the forests, people collect leaves to augment their manure supplies. Even chil needles after being used as cattle bedding find use as manure. Manuring is also affected by panning the ‘gaddis’ flocks in the field for few nights.

The demand of timber is increasing because the age-old joint family system has been splitting up and every partner in a family wants a house of his own. The large proportion of the population of the area is working outside the state and earnings of such persons find way mostly for the construction of houses. There is a craze for building big houses. Though the forest settlement provision provide for the grant of timber at Z – rate only for the construction of and repair of houses required for the reasonable satisfaction of agricutural needs, distinction between agricultural and other needs is hard to make; more influential a person is, more easily he can prevail upon the administration to grant him trees at Z – rate. The annual requirmrnt of TD in this Division is about 10,000 m3.

There is a shortage of fuelwood also especially in Sujanpur area and in towns of Nadaun and Hamirpur. Coppice areas are few, confined only to Nadaun range and already overworked and overburdened. H.P. State Forest Corporation is maintaining public sale depots, where fuelwoodand charcoal is brought from other divisions (especially Nurpur and Dehra divisions) and sold. The quantity of these commodities sold from Hamirpur sale depot during last 3 years is tabulated below:-

Year	Name of Depot	Quantity Sold	
		F/wood of Chil	F/wood of B/L
2010-11	Hamirpur	148.00	268.35
2011-12		100.35	239.74
2012-13		36.65	107.82

(Source: DM Office Hamirpur).

No charcoal has been brought and sold from Hamirpur Depot.

These figures include the supplies made to various departments also. Various measures to reduce the dependence on the conventional fuel have been taken in the recent past. These include fuel efficient smokeless dhauladhar chullahs and installation of bio-gas plants in the rural areas and supply of L.P.G. (Cooking gas) in the towns. The former are a failure, where as the latter has made significant contribution in solving the problems of townships/urban areas.

Large quantities of grass are used, both for fodder and thatching. It is obtained generally from the closed areas in D.P.F. and U.P.Fs, of from kharetars (hay field); which are either derelict abandoned fields put under grass or parts of the waste land, private or protected, which are closed to grazing during the rainy season. After cutting the grass, these areas are kept open for grazing during rest of the year. The number of cattle kept is large and often beyond the carrying capacity of the land. In addtion to grass, the trees like dhaman, rajain, ber, siris, bahera, dhau, suhanjana and subabul are lopped for fodder during winters. These trees are also growth by villagers on their field boundries. Bamboo is also an important fodder species.

The statistics of human population for Hamirpur district is as under:

Years of census	POPULATION		
	M	F	T
1971	125554	139457	265011
1981	147841	169910	317751
1991	175329	193799	369128
2001	195593	216107	412700
2011	216742	237551	454293

3.2 MARKETS AND MARKETABLE PRODUCTS: The main marketable products from the forest of this division are: Timber, Resin, Katha, Pulpwood, Firewood and Charcoal.

3.2.1 TIMBER: The timber exported from the division is mainly of chil. It finds its way to the markets of Pathankot, Yamuna Nagar, Jalandhar and other parts of Punjab through Himkastha Sale Depot Managed by Forest Corporation at Parwanoo, Baddi and Bhadroya. It is used for constructional purpose and manufacture of cheap furniture apart from being used as railway sleepers because of its being ring porous and easy to creosote.

3.2.2 RESIN: It is the chief forest produce of this area and the main source of revenue. The resin is consumed primarily by Resin and Turpentine factories at Bilaspur and Nahan, which are managed by Forest Corporation. The surplus is supplied to private factories located at Kandrori, Damtal Hamirpur and Una.

3.2.3 KHAIRWOOD AND KATHA: It is extracted from heartwood of khair and main markets of katha are located in Delhi and Amritsar.

Khair trees allowed for felling from private areas and quantity of katha exported is tabulated below:

Name of Division.	Year	No. of Bhatties	Khair heartwood consumed (Qtls)	Katha extracted
Hamirpur	1997-1998	13	5404	772.48
	1998-1999	18	6854	979.64
	1999-2000	16	8589	1227.31
	2000-2001	14	8547	1221.23
	2001-2002	13	7994	1142.23
	2002-2003	8	6902	986.32
	2003-2004	10	4081	583.92
	2004-2005	10	3997	751.71
	2005-2006	6	3479	497.35
	2006-2007	7	7173	540.20
Hamirpur	2007-2008	3	4562	605
	2008-2009	2	5057	370
	2009-2010	2	5571	465.75
	2010-2011	3	7397.05	612.50
	2011-2012	3	7480	728.25
	2012-2013	4	9040	(Wet. Up to 31.3.2013)3941

(Source: DFO Office Record)

3.2.4 PULPWOOD: Chil pulpwood from the small wood upto a minimum diameter of 10 cm has also been started to be converted recently and finds its markets in paper mills at Yamuna Nagar and Saharanpur, and as packing case material.

3.2.5 FUELWOOD AND CHARCOAL: Coppice coupes composed of misc. scrubs species are the main source of fuelwood and charcoal. Such forests are located in Nadaun range. However, no coppice coupe has been exploited in this division during past more than 10 years and the requirment of fuelwood and charcoal is met with by imports from other divisions. Chil charcoal is also obtained from unfit trees and the lops and tops which finds its market in activated carbon factories at Hoshiarpur and Amritsar, and with Gold smiths.

3.3 LINES OF EXPORT: Forest produce is carried from the forest to the road side depot by mules, camels and manual labour. There after it is carried by vehicles to the main market. Roads are the main line of export from this division. The area is extensively covered by network of P.W.D. and forest roads and many other are under construction. A list of prominent roads are given in Appendix IV. Railways do not find much use so far as the export of the forest produce of this division is concerned. Nearest railway stations are located at Una (85kms.) and Hoshiarpur (105kms.). The method of transportation/export by water-ways is not in vogue in the division.

3.4 METHODS OF EXPLOTATION AND THEIR COST: The exploitation works of timber, khair, coppice and resin lots are undetaken by Forest Corporation so far as Government forests are concerned. These lots are handed over to the Forest Corporation after making. Corporation gets these worked by engaging labour directly or through labour supply mates.

3.4.1 TIMBER: Chil from private forests also is exploited through Forest Corporation. These days non standard sizes of timber are also being converted and even lops and tops are converted in to pulpwood and charcoal. The utilization percentage has thus increased considerably. However, the conversion is still done manually using old techniques and there is much scope of improvement, both in quality and percentage of outturn as well as cost of extraction. The average cost of extraction of sawn timber per m3 for chil works out to Rs. 260/m3 converted volume as per schedule rate of Forest Corporation for the year 1994-95.

3.4.2 RESIN: After carrying out the enumeration by the department, the forests are handed over to the Forest Corporation for tapping. The tapping in private forests is, however, done directly by the contractors on the tapping permit issued by the Forest Department. With the coming inforce of H.P. Resin Products (Regulation of Trade) Act, 1982, the resin from private forest can be sold only to Forest Corporation at the rates decided by Resin Advisory Committee constituted under the act, and approved by the Government from time to time.

The tapping in Government forests is now done by the "Rill method", which technique has been described in detail in the relevant chapter. However, in the private forests still conventional cup and lip method of resin tapping is in vogue. Local labour is well versed with both these techniques. A section of 1000 blazes is alloted to one mazddor who can earn about Rs. 4000/- during the total tapping period of approximately 7 months. Resin tapping thus provides seasonal gainful employment to a large number of labour. The wages for the extraction of resin are paid in a graded manner thus introducing a system of incentives for better work. The rates paid by Forest Corporation for resin tapping for the year 2012-13 is Rs. 634 per qtls.

3.4.3 KATHA: Khair lots of Government forests are exploited by Forest Corportation. However, khair trees in private areas are worked directly by contractor on the felling permit issued by Forest Department. Katha is manufactured from heartwood of khair by installing battis near water source. The heartwood is chipped into small pieces, which are repeatedly boiled in water in metallic vessels. The extract thus obtained is evaporated, thickened and cut into cakes and biscuits. Labour for manufacture of Katha is mostly imported from U.P.

A minimum of 400 meter girth of khair (which raughly equals 50-60 m3 converted solid volume of Khair) is required for running one bhatti. Each bhatti is worked for approximately 70 days. Total cost ofproduction, excluding royality, comes to about Rs. 4000-5000 per quintal of katha, which presently fetches around 22000 to 27000 Rs./Qtl. in Delhi/Amritsar markets.

There is only one katha factory by the name Ms. Mahesh Udyog at Gagret in Una. Factory manufactured katha is superior in quality. Besides, cutch, which is wasted in bhatti system, is also utilized in factory as a by product. From 29.4.2008 State Govt. vide Notification No. FFE-B-(7)-1/2000 Dated 29.4.2008 has made Himachal Pradesh Forest (Sale of Timber) Ammendment Rules 2008 and laid down following condition for regulating working of Khatha Batties & Katha Bhatties using IBR boilers.

The number of traditional katha bhatties allowed to operate in H.P. shall be 40 as were operating during 2006 – 07.

The number of katha units using boilers will be restricted to 39, which was the number of units allowed to install baby boilers up to 31.3.2007.

The traditional katha bhatties will be allowed to operate at their current level of consumption of khairwood.

If any traditional katha bhatti unit is found to be storing or in possession of quantity of khairwood in excess of permissible limits, its license and permit will be cancelled without any prejudice.

The baby boiler units shall upgrade their existing boilers to IBR boilers and be brought under the preview of Indian Boiler Act, 1923 and rules made there under from time to time. All the boilers will have to be registered with the Chief Inspector of Boilers of the State.

The use of term 'baby boilers' will be replaced by the term 'IBR boilers'.

The modified saystem of katha extraction through IBR Boilers will continue to remain seasonal. Katha will be extracted during the winter months from 1st November to 31st March only, as is being done through the traditional Bhatti system.

On the basis of the production of Khairwood in the State, maximum of Khair heartwood allowed to be used by boilers units will be 3750 qtls. = 5435 qtls khairwood with bark (2534 M.G. or say 2500 M.G.) of khair in the season. If at any time the quantity of of khair heartwood or or equivalent khairwood with bark is found to be more than the permissible limit applicable at the time of inspection, its registration will be cancelled.

3 autoclaves each of maximum capacity of 3000 liters volume will be allowed to be installed by katha bhatties using boilers.

Pan evaporator will be allowed to be installed for concentration of liquid katha extract.

The boiler units will be allowed to eract a cooling chamber having maximum storage capacity of 40 M.T. of katha extract at a time.

The katha units using boilers shall be allowed installation of 2 cooling chambers fitted with Air Conditioning system not exceeding 5 tons each.

3.4.4 FUEL AND CHARCOAL: Marked coppice coupes are handed over to the Forest Corporation for extraction for fuelwood and charcoal. Since there is ban on green felling hence no coppice coupes have been marked and handed over to HPSFDC during the currency of expired working plan.

3.5 PAST AND CURRENT PRICES: The price of timber and other forest produce is steadly rising. These prices for timber (for non right holders), resin (at which it is supplied to private factories), and fuelwood and charcoal (at which these are supplied to public and Government Department from the sale depots managed by Forest Corporation) are tabulated ahead:-

Year	PRICES								
	Timber 305×26×13 & above				Charcoal (per Qtl)		Fuelwood (per Qtl)		Resin (per Qtl)
	Deo.	Kail.	Chil	Fir	Public	Govt	Public	Govt	Pvt. Factories
2009-10	44031	38044	15372	17271	-	-	410	710	5250
2010-11	47624	41848	16909	18998	-	-	410	710	7000
2011-12	52386	46032	18599	20897	-	-	410	710	7000
2012-13	57624	50635	20458	22986	-	-	430	730	4800

(Source: DM Office Hamirpur).

Standing trees are also sold to local right as well as non right holders by the department. These rates for the species available in this division for the years 2009-10 to 2011-12 are tabulated below:-

Species	2009 – 10	2010-11	2011-12	2012-13
Chil	15372	16909	18600	18600
Shisham	21663	23829	26212	26212
Eucalyptus	6076	6684	7352	7352
Mango	7877	8665	9531	9531
Poplar	8907	9798	10777	10777
Jaman	2024	2226	2449	2449
Simbal	17992	19791	21770	21770
Tun	6503	7153	7869	7869
Siris	3443	3787	4166	4166
Khair	26557	29213	28813	28813

3.5.1 ROYALITY RATES: Following table provides royality rates charged during various years by the Forest Department from the Forest Corporation.

Year	Chil (per m3)	Khair (per M.G.)	Coppice (per ha.)
2009-10	626	1078	481
2010-11	572	952	326
2011-12	704	811	371
2012-13	739	794	300

(Source: DM Office Hamirpur).

3.6 PAST OUTTURN: Subsequent table gives the outturn of forest produces from timber (chil) lots:

Year	Total Standing Volume	Total Produce Obtained			
	(m3)	Timber (m3)	P/Wood (m3)	F/Wood (m3)	Charcoal (Qtl.)
2009-10	17227.446	201.31	-	-	309.50
2010-11	18247.845	888.35	53	6	627.05
2011-12	5889.06	21.37	7	486	141.40
2012-13	11545.998	838	35	104	108.70

(Source: DM Office Hamirpur)

Only one khair lot was marked during these years; where 64 M.G. was marked and 11.3 m3 billets alongwith 6m3 khair fuelwood was obtained.

****

CHAPTER – IV

ACTIVITIES OF FOREST DEVELOPMENT CORPORATION LIMITED

Himachal Pradesh Forest Corporation Limited an undertaking of the HP Govt. which came in to existence on the 25th of March. This Corporation deals with the marketing of mainly Timber, fuelwood, pulpwood, bamboos, khair, rosin, turpentine oil, subsidiary products(viz., phenyl, varnish, black japan). In addition, a Fibre seasoning for Government as well as private timber.

The corporation has been mainly created with the following objectives:

- To carry out the extraction of timber and resin on scientific lines by adopting suitable moderan techniques.
- To eliminate the Contractor's agency in respect of works of timber extraction and resin tapping.
- To obviate the chances of illicit felling of trees illicit tapping of resin and other malpractices.
- To work the forests on commercial lines by recycling of funds for works and also by raising funds from financial institutions as per requirements.

The Corporation has got expertise in the following:

4.1 TIMBER OPERATIONS: The Corporation has a long experience of timber harvesting and extraction operations and is in a position to provide expertise for the purpose.

4.2 RESIN TAPPING: Since the entire resin tapping work is being done by the Corporation, it has developed Modern techniques or resin tapping and expertise in this respect is available for training as well as executing of works.

Working of the Himachal Pradesh State Forest Development Corporation is supervised by department, and if any violation is noticed then action as per standard agreement of deed is taken and damage bill/ penalty is charged. Year by salvage removal & resin blazes handedover to Himachal Pradesh Sate Forest Development Corporation during the plan under revision is as under:-

Salvage Removal

Year	No. of trees	Volume
1998-1999	3274	4071.540
1999-2000	7518	12254.65
2000-2001	10369	14609.94
2001-2002	7613	10637.230
2002-2003	9215	14161.630
2003-2004	9935	13404.91
2004-2005	11240	14808.00
2005-2006	11614	15728.29
2006-2007	8717	10654.85
2007-2008	7219	10221.89
2008-2009	8469	10409.484
2009-2010	11669	16983.45
2010-2011	13397	18236.14
2011-2012	5086	5889.06
2012-2013	8853	11550.00
Total	**134188**	**183621.064**

Against prescribed removal of 2, 05,500 from felling series I & II, 1, 83,621.064 m3 was removed as salvage up to 2012 – 13.

Resin Blazes Handedover

Sr. No	Year	No. of resin blazes
1.	1998	116589
2.	1999	110560
3.	2000	112037
4.	2001	101226
5.	2002	86433
6.	2003	97396
7.	2004	82738
8.	2005	79518
9.	2006	74709
10	2007	72045
11	2008	72121
12	2009	71332
13	2010	46129
14	2011	45649
15.	2012	44835
	Total	**1213317**

4.3 GENERAL: Resin tapping in the forests of Hamirpur division was started in 1912. Theses forests were, infact, first to be tapped and used to be, in past, a major source of revenue of this division. Resin tapping up to 1975 used to be done departmentally. This operation is now been done by H.P. State Forest Corporation Ltd.

4.4 TECHNIQUE: Prior to 1984, the tapping was done by conventional 'French cup and lip method'. This method involved deep and rather uncontrolled depth of the blaze which coupled with frequent fires and high velocity winds was responsible for heavy salvage removals. Besides, quantitative and qualitative output of timber also used to be affected adversely.

The conventional method was gradually replaced by improved 'Rill method' of resin tapping and the tapping since 1988 is being done only by the Rill method. This method has been enunciated in field guide to modern methods of resin tapping by V.P. Verma, I.F.S. published by Forest Research Institute and Collages, Dehradun. A detailed guideline manual about this method has also been published by Directorate (North) of the H.P. State Forest Corporation Ltd. Various standards as per latest instruction are as under:-

4.4.1 TAPPABLE DIAMETER: Vide Pr. C.C.F. Memo No. A-1259-15/67(s) dated 19 April.2007, the tappable diameter for Rill method is fixed as 35 cm. This however is on the lower side resulting in large scale drying up of trees. It is recommended that tappable diameter be increased to 40 cm.

4.4.2 CROP SETTING: Crop setting must be started by 15th Feb. and completed by 15th March. It is important that the crop setting is completed in time so that tapping season is not lost. The area to be tapped should be cleared of inflammable material over a radius of 1m.

4.4.3 SHAVING OF BARK: Loose bark over a surface area of about 45 cm x 30 cm is removed with the help of bark shaver leaving a space of about 15 cm from ground level. The bark left should not exceed 2 mm in thickness to facilitate freshening.

4.4.4 MARKING THE POSITION OF BLAZE AND GROOVE: Blaze frame is put in vertical position on the debarked area and outer boundaries of the blaze marked with black japan. Position of blaze and the central groove are marked with the help of wooden board and marking gauge.

4.4.5 CUTTING THE CENTRAL GROOVE: Central groove is cut by drawing the groove cutter from above downwards. Since in the first year the blaze is very near the ground, the groove cutter is moved upwards. Central groove should be centrally placed.

4.4.6 FIXING THE LIP: The lip is fixed with the help with two horse shoe nails so that it makes an angle of 45° with the tree. A 5 cm long wire nail is driven in to the tree about 2 cm below the mid point 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. It is suggested that instead of wire nails, bamboo/wooden nails should be used for hanging the pot with tree. In the event of a fire breaking out in the forest these wooden nails will get burnt and the pot will be dislodged from the tree. The iron nail holds the pot fast to the tree and the burning resin in the pot acts like a blow lamp.

4.4.7 FRESHNING: First rill should be drawn by moving the freshening knife from the lowest point of the central groove upwards along the blaze boundary in a way that rill makes an angle of 40° with the central groove. The process is repeated on the other side of the central groove. For the second and subsequent freshenings which are repeated app. at weekly intervals, the guide of the freshening knife

should move touching the upper side of the previous rill. The rills should be parallel to each other with an uncut bark (inter rill back) of 5 mm in between two successive rills. Width of the rill is 6 – 7 mm and depth 2 mm (excluding 2 mm. depth of unshaved bark). The length of rills should neither exceed nor fall short of the blaze limit. One freshening is given almost every week and the blaze thus attains a height (length) of 36 – 38 cm in one season. The tapping season is from 15th March to 15th Nov. i.e. 8 months. The freshenings are given 4 times in month and thus the total no. of rills is to be limited to 32 in a season. The width of the blaze is 20 cms i.e. 10 cms on either side of the central groove

4.4.8 APPLICATION OF STIMULANT: The stimulant is nothing but a 20% solution of the mixture of sulphuric and nitric acids mixed in equal proportion w /w. it should be sprayed on the freshly cut rill by squeezing the plastic bottle and moving its nozzle in a steady motion along the rill. Precaution should be taken to remove the pot till the extra acid has run down the lip. The tendency to apply stimulant more frequently and in higher concentration to obtain higher yield should be curbed since it affects the tree adversely.

4.4.9 COLLECTION OF RESIN AND CLEARING OF GROOVE: The pot should be removed from the tree and the resin should be poured in to collection can (Balti). The resin still adhering to the pot should be removed with the help of scrapper. Central groove should also be cleaned after each collection with groove cleaner to avoid accumulation of resin in it. For improving labour output, collection of resin from the pots should be done with alternate freshening in March, April and August October. If necessary, the pots of bigger size may be used. However, from May to July, collection may be done with each freshening.

4.4.10 TAPPING SEASON: Tapping season extends from 15th March to 15 November. Freshenings are not made from 16th Nov. to 30th Nov. and during the period resin is scrapped (Raghod).

4.4.11 USE OF GUIDE: The use of guide with the rill knife by the tapper is compulsory.

4.4.12 INSTALLATION DURING SUBSEQUENT YEARS: For installation during second year of tapping the position of the blaze is marked above the top of first year blaze and other operations of first year are repeated.

After tapping for two years the blaze reaches a height at which it is not possible to pull the freshening knife upwards (from the central groove towards the outer edge of the blaze).

Like this the blaze is extended upwards for four years. During fifth year it may be necessary to use a ladder. During 6th year or in some cases during 5th year a new blaze is made at the bottom leaving 7.5 cm wide space from the outer edge of the first year blaze.

Tapping season extends from 15th March to 15th November. Freshenings are not made from 16th November to 30th November and during this period resin is scrapped (Raghod).

4.5PAST YIELD: Details of the blazes tapped by rill method and the yield obtained during past 15 years are tabulated below:

Year	No. of Blazes	Total Yield (Qtls.)	Yield / section (Qtls.)
1999	NA	NA	NA
2000	NA	NA	NA
2001	NA	NA	NA
2002	NA	NA	NA
2003	97396	NA	NA
Year	**No. of Blazes**	**Total Yield (Qtls.)**	**Yield / section (Qtls.)**
2004	82738	NA	NA
2005	79518	NA	NA
2006	74709	NA	NA
2007	72045	NA	NA
2008	72121	NA	NA
2009	71332	NA	NA
2010	46129	1666.19	35.36
2011	45649	1752.36	38.38
2012	44835	1575.96	35.15
2013	44557	NA	NA

(Source: D.M. Hamirpur)

4.6 AREAS AVAILABLE FOR RESIN TAPPING: Resin tapping will be carried out in all the chil forests of the division subject to availability of adequate number of blazes. The Divisional Forest Officer may stop resin tapping in any forest where it is felt that the resin extraction work is likely to interfere with the growth of the trees or may be a potential source of fire hazard. Tapping shall be done only by rill method. The number of blazes is likely to increase significantly in the future with the carrying out of prescribed thinnings in P.B.IV areas.

4.7 FIRE PROTECTION: All needles and other refuse within 1m. of the trees tapped for resin should be removed and other instructions laid down in the HP Forest Manual Vol. IV and the Other latest instructions must be observed carefully. It will be better if bushes within 2 m. of these trees are cut. Area being tapped for resin are very susceptible to fire and need intensive fire protection. Some sort of fire fighting equipment should be provided in all resin depots whether forest or road side to meet an emergency. All stuff put on resin work should be taught the use of this equipment.

4.8 LATEST INSTRUCTIONS: A great concern has been expressed by the Govt. alarmed at the drying up of trees in some forests of Barsar range put to resin tapping by rill method. Latest guidelines on tapping are summarized below:-

i) No. of Rills : only 32 number rills are permissible during the entire tapping season. A penalty of Rs.3/- per blaze is leviable if the number of rills are from 33 to 40. in case this number is from 41-50, Rs. 50/- per rill will be charged as penalty. If the number exceeds 50 penalty will be levied at Rs. 100/- per rill.

ii) Width, depth and interdistance between rills : permissible limits on these accounts are 20cm, 2mm and above 5 mm, respectively. A penalty of Rs. 10/- has to be charged as penalty for each such defect, separately.

iii) Concentration of stimulant: 20% solution of sulphuric acid and nitric acid mixed in equal proportion w/w is the permissible concentration of stimulant. Penalty for use of stimulant in concentration of higher than prescribed has now been fixed at Rs.500/- per offence.

iv) Illicit Tapping Penalty for illicit blaze has now been fixed at Rs. 100/- per blaze.

v) Use of guide Penalty for not using the guide with the rill knife has now been prescribed at Rs. 10/- per offence.

4.9 SUSPENDING RESIN TAPPING OPERATIONS: In case drying up of trees due to resin tapping is observed in some forests it should be immediately closed for tapping for a minimum period of 3 years. Retapping in these forests should be taken up only after the reason for drying up of trees are analysed and effective steps taken to prevent reccurence.

4.10 DATA COLLECTION AND RECORDING:it is observed that HPSFC Ltd. does not maintain data of resin extraction compartment wise. It is, therefore, prescribed that the data of resin extraction be got maintained compartment wise and be entered in the respective compartment history file.

****

CHAPTER – V
FIVE YEAR PLANS

5.1 GENERAL: The forests of the division have been managed for getting sustainable yield. The silvicultural fellings were aimed at making the forest uniform and the regeneration achieved through natural means. Till the early seventies, the emphasis was on planting commercially important species such as chil, khair, shisham etc. Growing demand of forest produce in the state especially that of timber resulted in focus on large scale plantations of commercially important species. Although the plantation programme started from I Five Year Plan but it gained momentum from III Plan onwards. The Plan wise management of forests is depicted as under:

5.2 IstFIVE YEAR PLAN (1951-1956): During Ist five years plan, this division was managed under Jalmeja Singh Working Plan (1952-53 to 1961-62). The forests of the tract were exploited commercially to meet the timber and the fuelwood requirement. Chil working circle, bamboo working circle and coppice working circle were constituted. The chil working circle was managed under Punjab shelterwood system with mainly object of naturally regeneration. Patch sowing was done over 249

ha.The combined figure of revenue and expenditure during Ist Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.2.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1951-52	N.A.	N.A.	N.A.
1952-53	N.A.	N.A.	N.A.
1953-54	N.A.	N.A.	N.A.
1954-55	N.A.	N.A.	N.A.
1955-56	N.A.	N.A.	N.A.

5.3 IIndFIVE YEAR PLAN (1956-1961): During this period the forest of this division were managed under Jalmeja Singh Working Plan (1952-53 to 1961-62) as above. The combined figure of revenue and expenditure during IInd Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.3.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1956-57	N.A.	N.A.	N.A.
1957-58	N.A.	N.A.	N.A.
1958-59	N.A.	N.A.	N.A.
1959-60	N.A.	N.A.	N.A.
1960-61	N.A.	N.A.	N.A.

5.4 IIIrdFIVE YEAR PLAN (1961-1966): During this period the forest of this division were managed under Jalmeja Singh Working Plan (1952-53 to 1961-62) and H.C. Sharma Working Plan (1962-63 to 1981-82). During this period (H.C.Sharma Working Plan) chil working circle, plantation working circle were constituted and special works of improvement, artificial regeneration fire protection were prescribed. In chil working circle, the scheme of rotational closure, regeneration period of 30 years and rotation of 120 year were fixed. It was suggested that the culturable area of 1092 ha. in Nadaun range will be planted in 30 years with khair and eucalyptus. Since eucalyptus planting which was carried out in the first few years failes measurably it was later on replaced by khair. Artificial regeneration was also carried out in chil working circle.The combined figure of revenue and expenditure during IIIrd Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.4.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1961-62	N.A.	N.A.	N.A.
1962-63	N.A.	N.A.	N.A.
1963-64	N.A.	N.A.	N.A.
1964-65	N.A.	N.A.	N.A.
1965-66	N.A.	N.A.	N.A.

5.5 IVth FIVEYEAR PLAN (1969-1974): During this period the forest of this division were managed under H.C. Sharma Working Plan (1962-63 to 1981-82). Plantations of eucalyptus and khair were raised beside chil plants were also planted under chil working circle for artificial regeneration as has been done in IIIrd five year plan. The combined figure of revenue and expenditure during IVth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.5.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1969-70	2499000	2135000	(+)364000
1970-71	2912000	2663000	(+)249000
1971-72	4971000	3333000	(+)1638000
1972-73	2865000	3047000	(-)182000
1973-74	3313000	3017000	(+)296000

(Source: Balbir Singh Working Plan)

5.6 Vth FIVE YEAR PLAN (1974-1979): During this period the forest of this division were managed under H.C. Sharma Working Plan (1962-63 to 1981-82). Plantation operation and artificial regeneration in chil working circle has been done as per IIIrd and IVth five year plan.The combined figure of revenue and expenditure during Vth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.6.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1974-75	2353000	4035000	(-)1682000
1975-76	2965000	2550000	(+)415000
1976-77	1670000	1824000	(-)154000
1977-78	1274000	2192000	(-)918000
1978-79	1754000	3008000	(-)1254000

(Source: Balbir Singh Working Plan)

5.7 VIth FIVE YEAR PLAN (1980 -1985): As above, till 1982 the forests of this tract were managed under H.C. Sharma working plan and from 1981-82 to 1995-96, the forests were managed under Balbir Singh working plan. Chil shelterwood working circle, plantation working circle and coppice working circle were constituted. In the first time in this division, undemarcated protected forests of more than 2 ha. in extent were dealt within this wirking plan for first time. The special objects of management in chil working circle was to improve the stopping of poor stands through artificial regeneration, to meet the bonafide requirment of right holder and optimize the yield of reason.

The forests were managed under the Punjab shelterwood working circle with natural regeneration to be supplemetarry by planting. Rotation of 120 years wirh regeneration period of 30 years were aqopted in felling series – I (D.P.F.). In felling series-I allotment to all the four periodic blocks viz PBI, PBII, PBIII, PBIV was made, but in case of felling series-II the allotment was made to three periodic blocks viz PBI, PBU, PBIV. In felling series-I to ensure better yield and to meet growing demand of right holders all trees below 50 cm dbh occurring singly or in groups were to be retained and same uniformty as in case of felling series-I was not aimed at. Exploitable dia was fixed at 60 cm. In plantation working circle no silvicultural system was adopted and whatever tree growth of important species existed was prescribed to be retained for seed, shed and to meet the requirement of right holder for timber fuel and fodder. Planting of khair, chil was to be discouraged and these were to be planted only when the site was unsuitable for other species specifically demanded by right holders. Emphasis was to be on species like shisham, siris, bamboo, tun, kachnar, tut and safeda. In coppice working circle, coppice with standard silvicultural system was prescribed.The combined figure of revenue and expenditure during VIth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.6.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1980-81	3432000	3843000	(-)411000
1981-82	N.A.	N.A.	N.A.
1982-83	N.A.	N.A.	N.A.
1983-84	N.A.	N.A.	N.A.
1984-85	N.A.	N.A.	N.A.

(Source: Balbir Singh Working Plan)

5.8 VIIth FIVE YEAR PLAN (1985-1990): During the period the forests were managed under Balbir singh working plan, the social forestry works were in full swing, main emphasis was on raising fuel,fodder, small timber and grasses to meet the increasing domestic needs of rural communities.The combined figure of revenue and expenditure during VIIth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.7.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1985-86	N.A.	N.A.	N.A.
1986-87	N.A.	N.A.	N.A.
1987-88	N.A.	N.A.	N.A.
1988-89	N.A.	N.A.	N.A.
1989-90	N.A.	N.A.	N.A.

5.9 VIIIth FIVE YEAR PLAN (1992-1997): The JFM approach started in the division and the forestry activities were implemented under departmental schemes and under ODA project. As ban on green felling continued, the objective remained afforesting denuded/degraded forests. The constitution of forest development committees and their participation in planning and implementation was sought.The combined figure of revenue and expenditure during VIIIth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.9.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1992-93	N.A.	N.A.	N.A.
1993-94	N.A.	N.A.	N.A.
1994-95	N.A.	N.A.	N.A.
1995-96	N.A.	N.A.	N.A.
1996-97	N.A.	N.A.	N.A.

5.10 IXth FIVE YEAR PLAN (1997-2002): Up to 1998 forests were managed under Balbir singh working plan and from 1998 onward the area was managed under Dr. Rakesh Working Plan. (1998-99 to 2012-13). The activities of ODA/DFID continued in the pilot phase and in theC& D phase. The works of afforestration, soil conservation, entry point activity started by the VFDCs and microplan process learnt and executed. Sanjhi Van Yojna started on the principles of JFPM. Here again the focus remained on restocking/regeneration of degraded forests.The combined figure of revenue and expenditure during IXth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.10.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
1997-98	N.A.	N.A.	N.A.
1998-99	N.A.	N.A.	N.A.
1999-2000	N.A.	N.A.	N.A.
2000-01	N.A.	N.A.	N.A.
2001-02	N.A.	N.A.	N.A.

5.11 Xth FIVE YEAR PLAN (2002-2007): Both the JFM programmes DFID & SVY created mass awareness about forestry but the focus was again on raising plantations besides soil works and entry point activities. The contribution in works to the tune of 5 to 15 % was desired but could not be

persued properly.The combined figure of revenue and expenditure during Xth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.11.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
2002-03	N.A.	N.A.	N.A.
2003-04	N.A.	N.A.	N.A.
2004-05	3243660	28150740	(-)224907080
2005-06	3993037	35736207	(-)31743170
2006-07	1577223	37707189	(-)36129966

(Source: DFO Office Hamirpur)

5.12XIth FIVE YEAR PLAN (2007-2012): During the period the forests were managed under Dr. Rakesh Kumar working plan (1998-99 to 2012-13).Main objects of the period were to maintain and to endeavor to improved environment. To provide for the bonafide requirements to the local people for timber, fuel and fodder and other forest produce. To enhance the area under forest cover by raising plantation of suitable species. The chil sheltertwood working circle, the plantation working circle and the coppice working circle were constituted. In chil working circle, plantation raised in undemarcated protected forest were included modified shelterwood system known as Punjab shelterwood system was adopted. Two felling series viz (i) legel closure felling series (felling series-I) (ii) voluntary closure felling series (felling series-II) were constituted. In plantation working circle all new unestaiblish plantation in the undemarcated protected forest and other areas which were either blank/ poorly stocked or with miscellaneous scrub growth were allotted to this working circle. In coppice working circle predominentally khair scrub bearing areas were allotted to this working circle.The combined figure of revenue and expenditure during XIth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.12.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
2007-08	1891603	32669610	(-)30778007
2008-09	21966229	48139418	(-)26173189
2009-10	5985451	54637420	(-)48651969
2010-11	10734750	31378875	(-)20644125
2011-12	2305513	62929133	(-)60623620

(Source: DFO Office Hamirpur)

5.13XIIth FIVE YEAR PLAN (2012-2013): During the period the forests were managed under Dr. Rakesh Kumar working plan (1998-99 to 2012-13). The combined figure of revenue and expenditure during XIth Five Year Plan of Hamirpur Forest Division are tabulated as under table 5.12.1.

Year	Revenue (Rs. In Lakh.)	Expenditure (Rs. In Lakh.)	Surplus / Deficit
2012-13	30378649	76312124	(-)45933475

(Source: DFO Office Hamirpur)

****

CHAPTER – VI

PAST SYSTEMS OF MANAGEMENT

6.1 GENERAL HISTORY OF THE FORESTS: Prior to 1846, the rajas of petty principalities, into which the tract was divided, considered allthe forests and tree growth as their personal property, and were using these chiefly as their game reserves.

With the advent of British rule (1846), the Forests were placed under the control of the Deputy Commissioner who managed these under the rules embodied in the Barnes Regular Land Revenue Settlement (1849-52) and entered in the village administration papers. These were merely a reiteration of ancient practices replaced by local rules applied under the authority of "Rules for the Conservancy of Forests in the Hill tracts of the Punjab" promulgated by Government. The regular forest settlement which resulted in the formation of protected forests in Hamirpur commenced in 1883 but was not legelized till. 1897.

In 1909, the Government of India drew attention to unsatisfactory nature of many of the forest settlements for protected forests, ever – increasing demand by right – holders and to the excessive

sheep and goat grazing, and asked for the adoption of suitable measure to save the forest from permanent injury. An exhaustive and protracted injury ensued and resulted in the imposition of a cattle tax, the enhancement in the Gaddis grazing dues, and in the creation, in 1920, of two forest autorities in the district. Areas which were likely to responed to proper silvicultural treatment were retained by the Forest Department and subjected to a scheme of Rotational Closures (prepared by Michell and Walters and sanctioned by the Government in 1921) and the remaining forest areas were once more placed under the charge of the Deputy Commissioner (who employed separate staff to protect and control them) with a view to managing them solely for the benefit of the villagers, with their consent and assistance. This, arrangement, however, lasted only until 1924 when the Punjab Legislative Council refused to provide funds for the Deputy Commissioner's special establishment and the Forest Department resumed control of all the forests. The position has since remained unchanged.

As regard ex-jagir forests of Nadaun, in 1880 stenhouse made a preliminary demarcation of 22 blocks in Nadaun, but Govt. directed that the question should be held in abeyance, pending orders on the joint report of Stenhouse and Anderson called for in letter nos. 197 Ft. dated 3.5.1880 and 367 dated 29.8.1881 to the address of Financial Commissioner. This report was submitted in 1882 and the Govt., vide letter No. 567 dated 20.12.1884 orderd:-

i) Demarcation already carried out in Dada-Siba was enough.

ii) Closure in scrub working circle will be for 10 years subject to reconsideration on the expiry of that period.

In 1912, Sheepshanks was deputed as Forest Settlement Officerto revises the draft and rules prepared for Jagir forests by Anderson. No fresh demarcation was, however, orderd. The settlement report was submitted in 1913 and Notification No. 2839-A to 2839-E dated 31-8-1915 were issued.

At the time of revenue settlement of 1910-15 tree files, showing the khasra number the tree growth on which belonged to the Govt., were prepared for each tika. These were later on consolidated by tehsils in 1918. In 1921, some 3500 boundary pillars were erected at a cost of Rs. 3491.62 to indicate the boundaries of Ban Sarkar areas.

6.2 PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS: The area dealt with in this working plan comprises of two different types of areas as for a management of forests is concerned. These up to 1981-82 were managed under separate working plans and are discussed under separate heads.

i) Areas of erstwhile Hamirpur tehsil.

ii) Areas of ex-jagir Nadaun.

iii) However, after 1981-82 a common working plan was prepared for these areas for the period 1981-82 to 1995-96.

6.2.1 AREAS OF ERSTWHILE HAMIRPUR TEHSIL: The period 1846 to 1995- 96 can be divided in to three distinct periods from mananement point of view:

i. The period of organization (1846 to 1870); the forest remained under the management of Deputy Commissioner.

ii. The period of transition (1870 to 1903).

iii the period of scientific management (1903-04 to 2012-13) ; the forest were managed under regular working plans.

The system of management during each period is described as under:

6.2.1.1 THE PERIOD OF ORGANIZATION: The period from 1846 to 1870 during which the forests of the Kangra district were managed by the Deputy Commissioner, is characterised by the promulgation of simple forest conservancy rules. Barnes, conservancy rules asserted the exclusive right of Government to sell timber forbade the cutting of green wood for fuel and made an order of the village headman necessary before timber could be felled for building; but the laxity of the system failed to save the forests from misuse. Bailey, who succeeded Barnes, drew up a code of rules in 1853 which introduced a stricter system of forest consevancy and which provided, *inter alis*, for the division of all forest land in to three parts, for the closure of each part (one third, *tihai or trihai*, the name still is used for a closed area wheather actually one – third or not,) for three or more years in rotation for stricter control in the open two-third and for the prohibition of grass burning in winter in extension of cultivation without permission, and for the appointment of forest assistants (ban wazirs) in each pargana. In 1855, the general rules for forest conservancy in Punjab hill tracts were introduced under which Commissioners of divisions were required to submit detailed rules of forest conservancy applicable to the circumstances of their divisions. Colonel Lake, the then Commissioner, proposed certain amendments and alterations in Bailey's rules which were sactioned by the Lieutenant-Governor in 1859. The most notable alterations were that the zamindars were ordered to apply to the Tehsildar of the pargana for all timber they might require for building or agricultural purposes and to pay a light fee

for it, instead of getting it free on application to the village headman. On the other hand, a share of four annas in the rupee (i.e.25%) of the value of timber sold annually by Government was awarded to the village official and village community, with the object of interesting them generally in the success of forest conservancy. These two measures laid the foundations of what are now called the grant of trees at the Zamindari rate and the system of the distribution of Zamindari share. The amended rules were put in effect, and in 1859 and 1860 the trihais (one-third or there abouts of the forest in each mauza) were marked off and closed to rights of users in Hamirpur and part of Dehra tehsils ; but no arrangement was made to carry out the original intention of closing in rotation, with the result that in the vast majority of cases the original trihias remained unchanged till 1917 (as a result of Anderson's forest settlement the trhais in Hamirpur were notified in 1897 to be continued to be closed for a further period of 20 years).

The effect of 57 years closures (1860 to 1917) was undoubtedly benificial not only to the areaclosed, but to a considerable tract outside the closures where perhaps the villagers not undertaking the final action taken on Lyall's demarcation proposals (1865-69) were afraid to graze their cattle. Extensive natural regeneration of chil was obtained.

However imperfect the closure proposals may have been in conception and execution, the demarcation of trihais is the outstanding feature of the early history of forest conservancy in the Kangra district.

6.2.1.2 THE PERIOD OF TRANSITION (1870 TO 1903): The period 1870-1903 in Kangra district, of which Hamirpur was the part, is characterised by the legal settlement of forest estate and the constitution of various kinds of forests under the Indian Forest Act. The old system of management continued more or less unchanged. The forests now comprising parts of Hamirpur forest division were not worked regularly for export. Only unsound, croocked and supressed trees were marked to meet the local requirment.

6.2.1.3 THE PERIOD OF SCIENTIFIC MANAGEMENT (1903-04 TO1995-96): During the period most of the forests were managed under regular working plans discussed in brief as under:

6.2.1.3.1 HART'S WORKING PLAN (1903-04 TO 1920): After the completion of forest settlement works in 1897, the first working plan was prepared by Hart in 1903-04. The main object was to bring entire workable area under scientific management and to provide for the realization of sustained annual yield primarily for the satisfation on the legitimate requirements of the right holders, and the surplus, if

any to be sold at market rates. A total area of 46708 ha (including the areas in present Una, Nurpur, Hamirpur, Dharamshala and Dehra forestsdivisions) was considered workable and dealt with under following worling plans.

a) Pine Wirking Circle; divided in to three felling series viz. Hamirpur Dehra and Hoshiarpur.
b) Bamboo working circle.
c) Scrub working circle.

a) PINE WORKING CIRCLE: All the areas of the present working plan except Nadaun ex-jagir were covered under Hamirpur felling series of the Pine Working Circle.

Since closure was a problem, the system of concentrated regeneration felling could not be adopted. The plan prescribed a system of improvement felling and thinnings which ranged in intensity from the felling of nature of shelterwood seeding felling to cleaning in very young crop.

The felling were prescribed at a cycle of 10 years and an exploitable size of 195 cm. approximate girth corresponding to an age of 90 years was fixed.

The yield in Chil areas turned out to be of poor commercial value, especially in Hamirpur where it was very difficult to get the fellings carried out due to difficulty in water transport facilities. Thus by about the middle of the period, fellings were largely in arrears. It was only possible to get these worked by allowing the contractor to atke out only the large sized trees. This led to an unfortunate and arbitrary distinction between improvement fellings and thinnings, the former tending to degenerate in to revenue fellings and later remaining a strictly silvicultural operation. The results were unfortunate particularly in Hamirpur where there was a marked difference between the average size of the crops growing on exposed situations and those in sheltered nallas. The former was shortboled but of a higher girth class and were felled abundantly while the crop in the nullahs was better but was left untouched due to lack of transport system. This unavoidable departure from strict silvicultural provisions was rectified to a considerable extent towards the end of the period of the plan by making special thinning provisions. The produce when the where not marketable was given to right-holders. These fellings were generally done year by year to meet the demand of the moment,with the inevitable result that some patches were left unthinned while, over the greater part of the area, thinning were extremely uneven.

b) BAMBOO WORKING CIRCLE: None of the areas presently included in Hamirpur Forest Division was worked under this working circle.

c) SCRUB WORKING CIRCLE: In 1904, the out-turn from the scrub areas was not marketable. It was, therefore, suggested that, should any demand arise, the scrub reserves may be felled under the coppice with the standerds system with a rotation of 20 years and reservation of 60-65 standerds per ha. None of the areas covered by the present Working Plan was worked during the period.

6.2.1.3.2: CHANGES ANTECEDENT TO REVISION OF HART'S WORKING PLAN:THE SCHEME OF ROTATIONALCLOSURE BY MITCHELL AND WALTERS: The period of Hart's Working Plan did not actually expire till 1922-23. But lack of progress of chil regeneration tended of vitiate its prescriptions, and the steady detereoration of the forest areas, not included in the old trihais, over the greater part of Kangra proper, forced the Government to adopt suitable measures for saving the forests outside trihais from irretrievable damage. Ideas underlying the rules of 1859 were reverted to and, in 1913, the Government issued orders for the Preparation of a scheme of Rotational Closures where in one-third of the forests were to be closed at a time.

Details of the scheme of closures devised can be found in the special report submitted to Government by Mitchell and Walters in 1919 (Report on the delimitation of areas to be submitted to a scheme of Rotational Closures in Kangra proper). The forests included in the Rotational Closur Scheme were designated as Delimited Protected Forests. The scheme is summarised in para 1.8.1.6.

The Delimited Protected Forests (subjected to this scheme) were divided in to a number of closure series. Each closure series in chil forests was divided in to four parts to be closed in rotation for 30 years; while in the case of Scrub forests, each closure series was divided in to 3 parts, each part being made available for closure on condition that no part could be closed for longer than 10 years at a time. The first closures were marked on the ground and the sequence of other closures was indicated on map especially prepared for the purpose and bound in a register called the English Register.

Briefly, for chil forests, the scheme envisaged the closure of one-fourth of the area at a time, with a maximum of 30 years closure.

Article 15 of the Kangra Forest Record of Rights clearly lays down that all rights admitted are subjected to the limitation that they might not be exercised to an extent that may endanger the existence of the Forests over which the rights are admitted. Closure meant to ensure the stability and existence of Delimitted Protected Forests could be manipulated whithin the frame work of the closure scheme enunciated above.

A record of rights of way and water was prepared during delimitation proceedings and no interference with such rights is permissible. The record was guaranteed completeness for the first closures, but, though no right was believed to have been overlooked, completeness for the entries for

the other closures was not claimed. The Divisional Forest Officer had power to grant facilities of ways etc. in working the closures in cases of apparent hardship.

In 1921, the local government accepted, by an executive order, the suitablity for closure of the all the areas comprised whithin the scheme, but ordered that in any case, where the closure of more than one-third of a scrub forest or one-fourth of the other forests was contemplated the Commissioner should satisfy himself that the areas left open were adequate for the use of the people.

This Rotational Closure Scheme provided a satisfactory solution of the difficulties which the Forest Department had hitherto experienced in the selection and notification of closures so faras the Delimited Protected Forests were concerned in practice though it increased the risk of ultimate destruction of the areas not included in the delimitation where the Governments's right to closure has, by executive order, been greatly limited, especially in case where right holders object to closures (as they inveriably did). In terms of forest management the scheme resulted, in the case of Delimited (Pine) Forests, in a system of periodic blocks with the period of regeneration and rotation fixed at 30 and 120 years respectively, while in the case of Delimited (Scrub) Forests it presumed closure for a period of 10 years to be sufficient for the permanent maintenance of the forests; a presumption which was perhaps hardly justified. Moreover the scheme read with the executive orders of Government regarding closures reffered to above, condemned undelimited areas to increasing risk of deterioration and ultimate disforestation.

6.2.1.3.3 WALTERS REVISED WORKING PLAN (1920-21 TO 1929-30): The scheme of rotational closures constituted the frame work of this working plan brought in to force from 1st July, 1920. Only following two Working circle pertain to areas comprising present Hamirpur Forest Division.

a) Kangra Pine Working Circle comprising the delimited protected chil forests of Hamirpur tehsil and divided in to two felling series; export and right-holders.

b) Unworkable Working Circle comprising a part of one scrub forest of Hamirpur tehsil.

a) KANGRA PINE WORKING CIRCLE: The object of management in the Kangra Pine Working Circle were the replacement of the then existing irregular crop by even aged crops normally distributed over 4 age classes ; the maintenance of trees of all sizes in each block of forest forming a complete closure series for the satisfaction of rights ; the realization of maximum sustained yield, both in final and intermediate fellings ; and the realization of maximum revenue from the surplus yieldafter meeting the demands of the right-holders.

The difficulty of enforcing a closure immediately after the fellings which had prevented Hart from prescribing a system of concentrated regeneration fellings, had been over come by the scheme of Rotational Closures and Walters proceeded to apply to the chil forests the Uniform System with artificial regeneration in P.B.I. and subsidiary fellings, aiming at the removal of overmature trees standing over pole crops, with the fellings of other trees according to strict silvicultural rules in other periodic blocks. On account of very heavy demand of right-holders the *modus operandi* for the later (other PB areas) was to divide the areas in to blocks B and A, B was to be thinnied and sold, while A was of right holders metfrom marked trees for five years. At the end of the five years, marked and standing trees if any were to be sold and the block completely thinned while B was marked for the requirments of the right-hoders for the ensuing five years. In other words, other than P.B.I. areas were prescribed to be worked on a five years felling cycle.

The result of management in P.B.I. and other than P.B.I. areas are discussed separately as under:-

i) P.B.I.: Fellings in P.B.I. of the export felling series began in 1924 and up to the end of 1926-27 were generally of the heavy nature prescribed by the working plan and as a rule advance growth was not retained as part of the future crop and extreme regularity and evenagedness of the crop was aimed at. By the end of 1926-27, it was realized as a result of severe conflagrations of 1921, 1924 and 1926 that with a limited period of regeneration and general insufficiency of seed, evenaged crop not were possible of attainment and the prescription for the retention of healthy and well formed pole woods should be given a liberal interpretation. Regeneration fellings executed after 1926-27 were thus lighter in nature and considerable proportion of pole wood was retained as a part of the future crop and the raising of unevenaged crops instead of the prescribed evenaged crops was taken to be the object of management.

In the right – holders felling series, no fellings were made for a considerable time, as the working plan had not prescribed a definite mode for executing such fellings. The demand in the series was annual and the usual method of making seeding felling over the whole area at once would have resulted in a large supply material to right – holders in one year and almost none for the following decade. So, 1928-29 annual shelterwood strip fellings were started, the dimention of the strip being determined by the annual demand, and the whole compartment was thus provided to be gone over in say 5 to 6 or more years.

During the period 1920-21 to 1930-31of the total P.B.I. area of 1401 ha (1214 ha of Export felling series and 187 ha of right – holders felling series), 528 ha (482 ha Export felling series) was felled under regeneration felling. Of the total P.B.I. area; 421 ha had been completely regenerated while 248 ha were under regeneration. Contrary to Walter’s expectations nearly two–third of the future crop had

been obtained by natural means. By the end of 1927-28 it had become evident that natural regeneration could be established generally under a heavy shelterwood and in exposed and warmer situations by the retention of a large number of seed bearers. The regeneration could be seen under all conditions (excepting the very open) of light and shade thus greater reliance on natural reproduction began to be placed by the end of 1928-29. Artificial reproduction was, however, necessary in the very heavily felled areas and blanks created by fires as the seed bearers could not be expected to completely restock areas particularly invaded by *Carissa spinarum.* Artificial regeneration thus extended over considerable area and detailed technique for sowing operations was developed for the special conditions prevailing in Hamirpur. The progress of regeneration considering the poverty of the soil and the great damage through drought has been distinctly satisfactory, but it can not be denied that a still greater part of P.B.I. could have been brought under regeneration by effectin closures and by generally removing supressed and useless trees but without making any heavy seeding felling. *Heavy fellings are entirely unsuited to the Hamirpur crops.*

ii) Other than P.B.I. areas: In 1920, it was decided to postpone the fellings for two years to enable the tapping of trees for resin but the 1921 incendiary fires threw the thinning and improvement felling programme out of gear.

Attention was diverted to the removal of trees killed by fire and the division in to blocks “A and B” was not carried out and if carried out suitable maps showing the division were not prepared even till 1924 and some what after wards also when the sales were also made. In some places, the division was effected what the right – holders consumed the supply of five years in one year and began to cry for more. To all intents and purposes the prescriptions with regard to the division in to two blocks remained a dead letter though fellings for sale were made removing a considerable number of matured trees, and in places pole woods were thinned while the requirments of the right – holders were met by the time honoured custom of meeting the demand of the moment. In 1927 the rules were changed. The division in to blocks was kept intact but it was ordered that instead of marking trees for right – holders for 5 years in advance the marking was to be done annually. Fellings for export after 1927 extended only over half of the compartment thus confirming to some extent to the principal of division in to two blocks. The sub division in to two blocks could only be put in practice if it had resulted in the division of each tika area (instead of a compartment which is composed of more than one tika) but this was never attempted. The combined effect of all these factors has been that right holders have been getting trees from their tika area according to the provisions of the settlemnt irrespective of the fact of the area

falling in to blocks A and Band sales had proceeded in areas where sufficient trees could be marked to attract a purchaser.

The confused operations have certainly reacted on the well – being of the forest. The area from which trees have been exported and in which the incidence of wood rights was also heavy or in forests in which the demand of the right – holders was considerable have been over worked, the stocking generally having been reduced to very open. Areas in which the demand of the right–holders was limited and from which the Forest Department had been unwilling to give trees to non right – holders even on a small payment have not been thinned on account of lack of demand for the export of small poles. Against an anticipated yield of 45159 m3 and 5917 m3 from export and right – holders felling series respectively, the actual removals were 35255 m3 and 547 m3. Apparently the requisite yield could not be obtained as the yield aimed at was too high. Trade depression and consequently very restricted demand were the other factors for higher deficit.

b) UNWORKABLE WORKING CIRCLE: Only part of one forest in Hamirpur tehsil was allocated to this circle. The first closure in it was effected in 1921 but the area was again opened in 1927 only to be re – closed in 1929. Some chil regeneration was obtained; but as the period of closure was small (limited to 10 years – up to 1931) and discontinuous, it was not very encouraging.

6.2.1.3.4. SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN:

I) ARTIFICIAL CULTIVATION OF CHIL: After the constitution of forest, chil sowing was started in old fields near about 1873 – 74. Sowing was done in ploughed furrows. It was done only in fire burnt areas. The area taken up was very small verying from 0.4 to 6 ha. Chil sowings done in Badiana I & II during 1873 – 74 to 1878 – 79 are doing well. Desin Cla, Dhar Jajjar Jakh C2, Mandliani C2 and Samtana C2 sown during 1887 after the devastating fire if 1886 had been damaged again by fire and lack of tending of a varying degree. Sowings were done in fire blanks in Humal, Dhar Jajjar Jakh, & Samtana (near Paniali) and Mandhiani during 1889 – 1902. Total area represented by these sowings is very small but a beginning in artificial regeneration had been made.

II) FIRE PROTECTION: Intensive fire protection measures were introduced in 1928 – 28. Definite blocks were placed under selected assistants during fire season, extensive fire lines burnt in the winter, while look out *machans* were erected to watch the regeneration areas. A scheme of departmental burning was prepared and enforced, though the previous experience did not warrant the introduction of

such a measure. When departmental burning was first introduced in other chil forests in 1912-13, the Kangra chil was considered to be unsuitable for being departmentally burnt on account of the low crowns of the trees and excessive undergrowth. A scheme of departmental burning was introduced in 1924 under which 1527 ha were burnt, but the scorching effect was so severe that it was abandoned in 1925. Another scheme was prepared in 1927 which prescribed triennial burning. Under this scheme 1771 ha, 1826 ha, 1371 ha, and 423 ha, were departmentally burnt during 1927 – 1928, 1928 – 1929, 1929 – 1930 and 1930-1931, respectively. This resulted in lesser fire hazards as compared to the earlier periods.

III) ROADS AND BUILDINGS: During the period 40 km. of bridle paths and other roads were constructed in the entire area covered by the plan. Forest Rest House at Chakmoh and Ranger quarters at Hamirpur were reconstructed during 1926 – 27 and 1928 – 29 respectively. Civil Rest House at Aghar was transferred to the control of the Forest Department in 1924 – 25.

6.2.1.3.5. MOHAN'S REVISED WORKING PLAN (1933 – 34 TO 1950 – 51): The general objects of management were as follows:

- To preserve forest vegetation of all types to the fullest extent possible with a view to prevention of erosion and desiccation and to satisfy as much as possible, the local demand for timber, fuel, fodder and grass.
- To apply the Rotational Closure Scheme, sanctioned by Government, to all the Delimited Protected Forests of the Division.
- To ensure the regeneration of all areas closed in accordance with the Rotational Closure Scheme wherever the old crop had been exploited or had reached its physical maturity.
- To provide for the higher possible sustained yield of chil timber primarily with the object of satisfying local demands for timber and fuel and secondly, with a view of selling any surplus suplies of timber in the open in the market.
- To provide for the sustained annual output of bamboo for sale.
- To provide for the exploitation of the very limited areas of scrub forests for the produce of which there existed a demand then or for which a demand was certain to arise during the working plan period.
- To arrange for collection of resi from as large an area as possible of the chil bearing tracts, and

- To protect all forests from fires.

Only following two Working circles comprised the areas covered by the present working plan.

a) Hamirpur Chil Working Circle comprising the better stocked Chil forests, and

b) Protection working circle comprising the very poorly stocked forests of Hamirpur tehsil.

a) <u>HAMIRPUR CHIL WORKING CIRCLE</u>: The silvicultural system applied was Shelterwood Compartment system with fixed periodic blocks. The regeneration period fixed at 30 years was to expire on 31st March, 1951. The P.B.I. areas were still under the first series of closures in the Mitchel and Walters Rotational Closure Scheme. Each closure series is arranged tika wise and covers a part of the whole of the forest.

Regeneration was prescribed to be obetained by natural means and in case of failures supplementation with artificial mean was recommended. In 1930 the average age of the crop was 50 – 80 years and a normal distribution of age classes was absent. Mature woods formed a negligible proportion of the entire growing stock. Stock mapping was not carried out because no appreciable change in the crop since Walter's stock mapping in 1920 was deemed to have taken place. Enumiration of chil trees down to 20 cm diameter was carried out because no appreciable change in the crop since Walter's stock mapping in 1920 was deemed to have taken place. Enumiration of chil trees down to 20 cm diameter was carried out and areas were classed in to moderate and understocked. It was prescribed that deficit in mature trees be built up by retaining 5 to 10 healthy and clean bold I and II class trees per ha over young regeneration. Thinnings were prescribed in well and moderately stocked areas only. Thinning yield from the understocked and moderately stocked areas was reserved for the right – holders. The making of trees to be felled during the year were to be carried out at one – time and one – tenth of the marked trees were to be given to right – holders each year. Very heavy thinnings approaching increment fellings were prescribed for forests in P.B.I. Since P.B.I. areas were to be completely regenerated by 1951 immediate closure of P.B.I. areas, without waiting for the seeding felling to be made was prescribed. Compact groups of healthy and vigorous poles were to be retained as advance growth. Annual yield of 2180 m3 from P.B.I., and 2973 m3 from P.B. others was prescribed without considering increament in the yield calculation. Walter's two fellings series viz. for right – holders and for sale were amalgamated in to one.

i) P.B.I. Areas: An area of 1280 ha was allotted to P.B.I Groups of apparently young crop retained as advance growth at the time of seeding fellings were not distinguished from the main crop and were felled in subsequent secondary fellings. The seeding fellings were lighter than the one prescribed. On an average 40 trees per ha were retained as seed bearers in about 35 forests, this being the maximum number prescribed. The seeding and secondary fellings had not being diiferentiated as two distinct

phases of regeneration fellings, in fact the tendency had been for gradual removel of overwood. The greater number of seed bearers retained did not adversely affect the progress of regeneration. *This confirms Mohan's view that heavy seeding fellings are not desirable for Hamirpur Chil because of the habitat being hot and dry.* The retention of so many seed bearers in P.B.I. areas has indirectly helped in the building up of mature growing stock.

All the P.B.I. areas had not been completely regenerated. An area of 1701 ha (56% of the total area in P.B.I.) had been fully regenerated and in the rest of the areas the regeneration was not up to the mark. More concentrated efforts were desirable for completing the regeneration of P.B.I. areas in view of the fixity of regeneration period and Rotational Closure Scheme. Incomplete regeneration was attributale to (i) artificial regenerations operations not given due importence. (ii) Closures were not strictly enforced in some areas. (iii) Grass cutting in areas with unestablished regeneratin. (iv) Premature departmental burning of areas under regeneration. (v) Accidental fires in P.B.I. areas. Against a prescribed yield of 39241 m3 from main felling and 53511 m3 from thinnings, the removals were 38559 m3 and 36990 m3 respectively. Thinnings had been in areas. It appears the yield was over – estimated. Also P.B.II. areas were not thinned as heavily as prescribed.

b. PROTECTION WORKING CIRCLE: A total of 720 ha; including 271 ha of chil, 440 ha of scrub and 9 ha of cultivation was allotted to this working circle.

Areas allotted to this working circle were protected against denudation and restocked artificially to most right – holders demands. Chil trees were enumirated but no stock mapping was done. Regular fellings were not prescribed. Rotation of 120 years and thinning cycle of 10 years was fixed, yield was prescribed by area. A program for regenerating artificially 81 ha was laid down.

Denudation could not be prevented because effective closures could not be enforced over more than 121 ha at the time under the Rotational Closure Scheme. The closed areas were treated like P.B.I. areas of Hamirpur Chil Working Circle. The program of artificial restocking and thinning was not carried out properly.

Revision of the third Plan was considered necessary for the following reason:

i) The period of the plan expired on 31st, March, 1951.

ii) The period of first closure for the chil forests also expired on 31st, March, 1951.

iii) The prescribed yield from P.B. other of the Hamirpur Chil Working Circle was not available to the prescribed extent.

iv) Rotation for coppice had to be increased from 20 years to 30 years.

This called for the general stock – taking and their after placing another set of forests under regeneration.

C. SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN:

I) ARTIFICIAL REGENERATION: Chil sowings were done over 77 ha in various forests but with partial success. Regeneration as a result of these operations in P-19 Kharal-I C2a, P.24 Gangot C2a and P-48 Bijuri C2a was destroyed as a result of fire. Chil sowings in areas alloted to protection working circle were carried out as prescribed.

II) FIRE PROTECTION: Departmental burning had been done every year except during 1925 – 26 but the area control burnt varied from 145 ha in 1949 – 50 to 2134 ha in 1948 – 49. Firewatchers were employed regularly during the fire season. Fire lines were not properly maintained.

It is to be noted that over a period of these 14 years, total area burnt was 19090.2 ha. This gives an average of 1363.58 ha. per annum. The identical figures for last 20 years were 3946.62 ha. as total and 197.33 as average.

Non carrying out of the departmental burning and other silvicultural operations like pruning, cleaning and thining in regeneration/regenerated areas have resulted in wiping out a large number of beautifully regenerated (yet not estaiblished) areas. The fires are normally ground fires.

III) ROAD & PATHS: Bridle and inspection paths over 75 Kms were constructed during the period.

IV) BUILDINGS: Seven buildings were constructed during the period at a cost of Rs. 7825/-.

V) BOUNDARIES & BOUNDARY PILLARS: Repairs and replacement of boundary pillars was not given due attention.

6.2.1.3.6 JALMEJA SINGH'S REVISED WORKING PLAN (1950 – 51 TO 1980 – 81): The general objects of the management were as follows:

i. To preserve and improve forest vegetation of all types to the fullest extent possible with a view to satisfy, as much as possible, the local demand for timber, fuel, fodder and grass.

ii. To apply the Rotational Closure Scheme sanctioned by Government to all the Delimited Protected Forests.
iii. To ensure the regeneration of all areas closed in accordance with the Rotational Closure Scheme wherever the old crop had been exploited or reached its physical maturity.
iv. To arrange for the collection of resin from as large an areas as possible of the chil bearing tracts.
v. To provide for the highest possible sustained yield of chil timber primarily with the object of satisfying local demands for timber and fuel and secondarily with a view to selling any surplus supplies of timber in the open market.
vi. To provide for a sustained annual output of bamboo for sale.
vii. To provide for the exploitation of the very limited areas of scrub forests for the produce of which there was a demand or for which a demand was certain to arise during the working plan period.
viii. To increase the proportion of economically important species in the scrub forests by artificial means.
ix. To bring the growing stock as near to the normal state as possible and,
x. To protect all forests from fire.

A total of four working circles ; Hamirpur Chil, Bharwain Chil, Bamboo and Coppice Working Circle were constituted but only Hamirpur Chil Working Circle comprising Chil forests of Hamirpur concerns the area now forming Hamirpur Forest Division.

a) HAMIRPUR CHIL WORKING CIRCLE: An area of 6314.83 ha bearing chil was alloted to this working circle. It included 5592.47 ha of Hamirpur Chil Working Circle and 720.56 ha of protection working circle of Mohan's working plan. Later was in fact abolished. The growing stock was enumerated in 10 cm. diameter classes down to 20 cm. dbh and stock maps were prepared on 1:15840 scale. Forests were generally understocked on ridges and moderately to well stocked on lower slopes. In some areas viz. Dhar Jajjar Jakh, Chabutra Dhar, Dhar Kangar, the proportion of chil reduced and scrubs of misc. B.L. species increased on exposed expects and lower altitude. The forests were worked under Punjab shelterwood system. To comply with requirment of rotational closure scheme, conversion period and rotation were fixed at 120 years and the exploitable diameter at 53 cm.

All P.B.I areas were to be closed at once and were cosidered to have been brought under regeneration with out waiting for the actual seeding felling. Seeding felling were to be completed within first 15 years of the plan i.e. up to 1965 and sequence of felling was though suggested but

Divisional Forest Officer was given discretionary powers to make alterations in it. Natural regeneration was to be relied upon. Patch sowing was also prescribed over 249 ha. Trees only 30 cms and over in diameter were to count towards yield. 5 trees of IA class per ha which were to beleft for putting maximum volume increment and as fire insurance trees, were also not to count towards yield. Increment was also not taken in to consideration to account for excessive fellings in case of some unforseen emergencies like fire etc. yield was prescribed at 2780 m3 per annum.

No commercial fellings in P.B.II. were prescribed. Only malformed, dead dying trees not likely to survive till the end of the working plan period were to be removed. Thinnings were prescribed in the forests allotted to P.B.III and were to be carried out as per provisions of PunjabForest leaflet no. I and IA. Intermediate yield from these areas was worked out at 3454 m3 of trees of III class and over but keeping in the view the lower density it was estimated that not more than 2123 m3 may be available annually from these forests. Yield in these areas was however prescribed by area and there was no volume control. Programme of thinnings was suggested. Right – holders requirment were also met from these P.Bs. it was further suggested to mark right–holders requirments in advance for 5 years so that they do not fell silviculturally unavailable trees for the purpose of cremation etc.

It was estimated that about 80% of I class and 50% of II class trees would be available for felling and balance were to be retained to fill up the blanks. The average annual yield was prescribed as 843 m3, thus making a total of 3623 m3, annually from P.B.I. and P.B.IV. For convenience in working and to complete felling over whole of the compartment or a section, an accumulated deviation of 15% from the prescribed annual yield was permitted in any year. Sequence of fellings was also laid down but the D.F.O. had the discretion to change it. Overwood was to be removed in three of more installments depending upon the condition of young regeneration. Early thinnings of “D” grade was prescribed.

The rotation of 120 years and regeneration period of 30 years worked well and was also in consonance with the Rotational Closure Scheme operative in the divison. There was definite improvement in the growing stock.

With a few exceptions forests alloted to P.B.I. have regenerated well. The areas are generally understocked though proportion of mother trees is considerable. Regeneration P.1 Karot, 2b, 3b ; P.6 Dhar Jajjar Jakh, 6b, 7b, 11b, 12b ; P.8 Samtana 1b,2c ; P.13 Reli 3b, 5a ; P.16 Dhar Sidg 1b, 2b, 4b, 5b, ; P.19 Kharal-I1b, 2a, 3b, 4b, P.20 Kharal-II 2 ; P.21 Bijhri 2, ; P.31 Khajjian 2b, ; P.47 Dhurkhar 1d, 2c, ; P.48 Bajuri 2b,3b ; and P.55 Dhar Chabutra 1a, 2b did not come up satisfactorily inspite of artificial regeneration operations and bush cutting etc. this was probably due frequent fires accompanied by drought, excessive grazing and dense bush growth.

The practice of closing P.B.I. areas prior to seeding felling proved injurious to natural regeneration. Closure resulted in heavy bush / weed growth which not only supperessed the existing young seedlings but also prevented fresh seed from reaching the ground. P.B.I. areas should remain open to grazing till the seedling fellings are carried out.

Seedling fellings had been carried out in all the P.B.I. areas from 1952 – 53 to 1973 – 74. The marking so carried out in P.B.I have been rather conservative in so far as a large number of chil trees than required had been retained as seed bearers. Consequently opening of canopy had not been judiciously manipulated and this proved detrimental to the coming up of chil regeneration to the desired extent in some areas and also suppression of the regeneration. In most of the P.B.I. areas, where the regeneration has estaiblished, secondary and final felling could not be done due to very heavy salvage markings. Salvage removals in some cases exceeded the prescribed annual yield.

No felling in P.B.II. areas was prescribed, but these forests were open to local timber distribution and this practice depleted their mature stock, thus finally affecting future yield. P.B.II. areas should have been most efficiently managed in order to obtain maximum future yield. It would have been better if apart from salvage removals a restriction on marking of trees 40 cms, d.b.h. and over had been imposed in local timber distribution. No T.D. should have been given to right-holders from P.B.II. as per standing order 3486-89 dated 20-6-1973.

In some of the P.B.IV. areas number of mother trees decreased considerally over a period of time mainly to meet the local timber demand. Cleaning and early thinning in P.B.IV areas as suggested in working plan were generally neglected and these operations were attended properly in few areas only. Retention of more fire insurance trees in certain P.B.IV areas proved detrimental to growth of young crop. Final annual yield of 3623 m3 from P.B.I. and P.B.IV was prescribed which was very much on the conservative side. A deviation of 15% of the annual yield was permitted in any year. However, at the end of the working plan period there was excess removals to the tune of 2574 m3 which is a little more than the prescribed yield for 7 years.

In view of the open nature of crop as well as heavy salvage markings thinnings did not get the due attention.

6.2.2 AREAS OF EX-JAGIR NADAUN:

6.2.2.1 MANAGEMENT UNDER RAJAS: These forests had been in the management of the Rajas who prior to the annexation of Kangra by the British managed these as game reserves. There were no fellings for export, the rights of bartan were restricted and the forests are said to have been dense and in good condition. However, with the definite recognition of the rights of the villagers, the old restrictions could no longer be enforced. With increase in population and improvement in standards of living, the demands of right-holders steadily increased.

The Jagirdar Rajas also started exploiting the forests to earn revenue resulting in the deterioration of forests except for the bamboo forests which continued to be closed during 3 months of the rains.

Hart's working plan came in to operation in 1904-05 in Dada - Siba forests. Since there were no demarcated forests in Nadaun area these were not included in that scheme. The heavy burden of rights, frequent fires in chil areas and the sales made to the traders from 1920 – 1930 rendered them very open and resulted in deterioration of the growing stock. The scrub forest except for the remote parts of Naungi and Jihn deteriorated in to only *Carissa* and *Adhatoda* bushes with scattered remnants of the miscellaneous scrub.

After the preparation of the scheme of Rotational Closure Scheme, the Kangra Forests were brought under Walter's Revised Working Plan from 1920-21 in which Jagir Forests were not included. In 1928, the closure scheme of Rotational Closure for Jagir forests was drawn by Aggarwal and Kundan Singh, on the basis of the one prepared by Mitchell and Walter for Kangra Forests.

6.2.2.2: AGGARWAL'S WORKING PLAN (1932 – 33 TO 1951 – 52): This working plan dealt with the Jagir Forests of Dada – Siba, Nadaun, Goler and Kutleher and covered an area of 10954 ha. The objects of management were protection, improvement and adequate regeneration of all forest area included in the Rotational Closure Scheme, satisfaction of right – holders demands and realization of maximum revenue as for as possible with due regard to the other objects. The area was split in 3 working circle, which are discussed below:

a) PINE WORKING CIRCLE: This contained all the chil forests of Dada – Siba, Kutlehar, Nadaun Jagirs, as there were no chil forests on Goler. The silvicultural system prescribed was light Improvement fellings cum thinnings combined with regeneration of selected areas. Rules for thinnings

and regeneration fellings were prescribed and during the plan period 208 ha were required to stocked artificially.

Unfortunately almost no prescription of working plan was carried out. No regular regeneration fellings were carried out and the trees were marked for right – holders often with considerations other than silvicultural. Practically no cultural operations were carried out. As a result of this very little regeneration of chil came up.

b) SCRUB WORKING CIRCLE : The object was mainly protection and meeting right – holders demand. Under letter No. 28863 Ft. dated 15th, October, 1930 from revenue Secretary, Government of Punjab to the C.C.F., Punjab, the old undemarcated tihais of less than 10 ha extent were to remain wholly closed indefinitely. Period to closure was fixed at 10 years, but at the expiry of the period, the closure was considered too short to have done any permanent good and was further extended by 10 years. This resulted in the improvement in density and more and better species like Khair and Shisham came up. Protection of interior areas away from road was very poor.

c) BAMBOO WORKING CIRCLE: None of the areas forming part of the working circle fall in present Hamirpur Division.

6.2.2.3 GURBACHAN SINGH'S WORKING PLAN (1952 – 53 TO 1961 – 62) : In this working plan four ex – Jagir namely Dada – Siba, Nadaun, Kutlehar and Goler were dealt with. The area covered amounted to 10954 ha of Delimited Forests out of which 690 ha and 3082 ha was of Dada – Siba and Nadaun respectively.

The objects of management were to protect and improve all the forests included in Rotational Closure Scheme, to prevent denudation through erosion, to regenerate closed areas and to meet the demand of the right – holders besides realizing maximum revenue.

The entire working plan area was split in to three working circles, which are discussed below:

a) CHIL WORKING CIRCLE: It covered an area of 2070 ha in both the tracts of Dada – Siba and Nadaun. The silvicultural system adopted in Aggarwal's plan was discontinued and the Chil forests were managed under Punjab Shelterwood system. This change was brought in, keeping in view the demand for resin extraction, which had increased manifold by that time. The total area was divided in to four fixed periodic blocks imposed by the Rotational Closure Scheme and regeneration was to be obtained, both by natural as well as artificial means which ever was feasible. All the areas forming first closure series of the Rotational ClosureScheme were included in P.B.I. and the remaining in P.B. unalloted. P.B.I. covered an area of 230 ha and 233 ha and P.B. unalloted 690 ha and 916 ha in Dada –

Siba and Nadaun Jagirs, respectively. At the time of introduction of shelterwood system, 20 years of closure had already passed and it was considered a difficult job to regenerate all the area included in P.B.I. during a short period of 10 years.

All the forests of Dada – Siba included in P.B.I. lacked in young stock except for a few poles, which occurred in depressions or on cooler and shady aspects. However, in Nadaun a few areas had been regenerated very nicely. In P.B. others improvements fellings and thinnings were carried out. A triennial control burning programme was laid out and the extent of the areas to be burnt departmentally in 3 years was 13 ha and 490 ha in Dada – Siba and Nadaun, respectively. This does not appear to have been carried out. The prescription of artificial sowing of chil and khair during first 3 years of the working plan in low lying areas, where natural regeneration was likely to fail, was not carried out. The forests were mismanaged, ill protected and the prescriptions do not appear to have been carried out whole – heartedly.

b) SCRUB WORKING CIRCLE: This working circle included all the Delimited scrub forests of the ex-Jagirs and degraded chil and bamboo forests which were unfit for working and were not included in any other working circle. It covered an area of 6356 ha out of which 330 ha and 1933 ha was of Dada – Sibe and Nadaun respectively. The method of treatment comprised of mainly strict protection, reducing and stopping denudation and erosion and restocking the area with more valuable tree species. For major part of the duration of the working plan the forests were under the control of Jagirdars, who were satisfied, if they got enough money. But in turn did not care for protection and scientific management. Some seeds of broad leaved species are said to have been broadcast to supplement natural regeneration. These never germinated due to lack of protection and proper soil working. The staff was very poorly trained, and the prescriptions of the working plan could not be carried out. Some of the areas in Nadaun prescribed to be closed were not closed. Some efforts were made after assumption of control of forests by the forest department to restock the areas artificially. Soil conservation works were also carried out to prevent erosion.

c)BAMBOO WORKING CIRCLE: None of the areas forming part of this working circle falls in Hamirpur Division.

6.2.2.4 H.C. SHARMA'S WORKING PLAN (1962 – 63 TO 1981 – 82): The general objects of the management were:

i. To protect and improve all forest areas included in the Rotational Closure Scheme and to prevent erosion and denudation in the interest of the general welfare of the local inhabitants.

ii. To obtain regeneration in all areas closed in accordance with the provisions of the Rotational Closure Scheme, where ever the crop had either attained physical maturity or was under – stocked.
iii. To improve the economical value of the forests by replacing inferior growth with plantations of last growing species.
iv. To provide to the fullest extent compatible with objects (1) to (3) for the bonafide domestic and agricultural requirements of the local inhabitants for the timber, firewood and grazing.
v. To produce maximum sustained yield of resin so as to realize maximum net profit without hampering the growth of chil forests.
vi. Consistent with the above objects to realize maximum revenue by the sale of forest produce.

In order to achieve these objects three Working circles were created, which are discussed below:

a) CHIL WORKING CIRCLE: The total area under this working circle was 1149 ha out of which 215 ha were allocated to P.B.I. The forests were worked under the Punjab shelterwood system. To comply with the scheme of Rotational Closure a regeneration period of 30 years and rotation of 120 years were fixed.

Seeding fellings were to be completed in first 10 years. No commercial fellings were prescribed in P.B.II. Only dead, dying and diseased trees were to be marked to meet the requirement of right – holders. Since the crop in P.B.III. was generally open due to adverse biotic influence, very little yield was expected. Only dense pockets were prescribed and were actually gone over in "D" grade thinnings. In P.B.IV. mother trees were prescribed were to be removed besides carrying out thinnings in out crop as per provision laid down in Punjab Forest leaflet I and Ia.

All removals from P.B.I. and P.B.IV. were to count towards final yield and those from P.B.II. and P.B.III. formed the immediate yield. It was prescribed by area. An area of 21 ha was to be worked annually in P.B.I. for 10 years and there after – final yield was to be obtained by the removal of overwood from 23 ha annually. Sequence of felling was suggested. Total final yield was estimated to be 212 m3 standing volume of 30 cm and over trees. Intermediate yield was also to be controlled by area and 48 ha were to be worked annually.

It terms of volume it was calculated to be 83 m3. Thinnings cycle was fixed at 10 years and sequence of felling suggested. In view of the frequent occurrence of fires it was laid down that fire damaged trees should be removed immediately and it was prescribed that the deviation over a period of 5 years should not exceed 20% of one year yield.

Seeding felling in P.B.I. areas under this working plan were started in 1965 – 66 and completed by 1975 – 76 as prescribed. The regeneration in most of the areas had come up and secondary fellings

were also carried out as per requirement of the crop. P.B.II and P.B.III areas which were opened up due to fire and heavy timber distribution were allotted to P.B.I. to ensure their regeneration.

b) PLANTATION WORKING CIRCLE: All the Delimited Protected Forests (1933 ha in Nadaun area) of scrub working circle of Gurbachan Singh's Working Plan was allotted to this working circle. These forests were either too deteriorated or carried only inferior species. The object of management was to replace the exiting growing stock with economically important species to improve the stocking and to maximize the revenue.

The treatment comprised of clear felling with artificial regeneration by quick growing and economically valuable species. Clear felling was desired to be avoided on very steeps slopes and above the landslips. 10 – 15 healthy vigorous trees of chil, shisham, khair, simbal and dhao capable of yielding seed and putting on increment were to be retained. Sequence of felling and planting was suggested. It was further desired that the culturable areas of 1092 ha in Nadaun will be planted in 30 years i.e. 36 ha annually.

All the areas prescribed to be worked were gone over except P.XXXVI. Jihn 5c, 6c, 7c, measuring 63.5 ha. Planting of these areas with eucalyptus and khair was prescribed. Since eucalyptus planting which was carried out in the first few years failed miserably it was later on replaced by khair. An area of 1093 ha was planted at a cost of Rs. 110065/-.

C) SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN:

I) ARTIFICIAL REGENERATION:-

HAMIRPUR AREA : Planting operations were carried over 1654 ha. at a cost of Rs. 346855/-. This includes planting in P.B.I. areas to supplement the natural regeneration. This planting in Trilokpur forest is very good example of a useless scrub / bamboo forest converted in to a beautiful chil plantation. Plantation of eucalyptus carried out in P-36 Dhar Kangar has not come up to the expectation.

NADAUN AREA: Artificial regeneration operations were carried out over an area of 1191 ha. This includes supplementing natural regeneration in the areas allotted to P.B.I of Chil Working Circle and 1093 ha. of Plantation Working Circle planted with khair.

II) FIRE PROTECTION: - Departmental burning had been done in the past but the frequency was not the same as prescribed. Fire watchers had been regularly employed in the fire season. Fire lines were cleared.

III) ROADS :- The roads over 75.7 Km. were constructed during the plan period.

IV) BUILDINGS :- 100 buildings were constructed during the plan period.

V) BOUNDARIES AND BOUNDARY PILLARS: - Checking of boundaries and repair of boundary pillars has not been attended to properly. In Nadaun area the boundary pillars do not bears numbers even and the work has not been attended to though there was a specific prescriptions to this effect.

VI) CONTROL: - Control forms were maintained properly but compartment history files were poorly maintained. Occurrences of fires have not been shown in some cases while in others areas shown are not up to date. Control maps indicating areas thinned, artificially stocked, naturally regenerated or departmentally burnt have not been maintained. Very few inspection notes have been incorporated in C.H. files, which indicate either few inspection or poor maintenance of records.

Both Jalmeja Singh's and H.C. Sharma's working plan expired in 1980 – 81. Areas of present Hamirpur forest division were dealt with in both these working plans. At the time of revision of these working plans, therefore, amalgamation of areas dealt with in both these working plans was done and a common working plan for Hamirpur forest division as a whole was prepared by Balbir Singh for the period 1981 – 82 to 1995 – 96, which is presently under revision. Appraisal of this working plan is as under :

6.2.2.5 BALBIR SINGH'S WORKING PLAN (1981 – 82 TO 1995 – 96): Undemarcated protected forests, more than 2 ha in extent and P-56 Trilokpur were dealt with in this working plan for the first time.

General objects of management of this plan were as follows:

i. To protect and safeguard the hill slopes against denudation, erosion and ravages and to ensure even and equitable flow of water in to streams thereby ensuring environmental conservation and sustained water supply.
ii. To provide for the bonafide domestic and agricultural requirements of the local people for timber, fuel, fodder and other forest produce within the capacity of each forest besides provision of grazing lands.

iii. To conserve, sustain, protect and improve the quality and the density of the existing forests and to induce them gradually to conditions as near to normal and natural as possible by obtaining a more normal gradation of age classes with normal increment and normal density of stocking.

iv. To supplant less valuable species by raising plantations of most valuable trees species in all localities suited to their growth.

v. To provide for the creation, expansion and maintenance of rural fuelwood / energy plantations to cater the local demand of the people.

vi. Consistent with above objectives to obtain the maximum possible sustained annual yield of timber and other forest produce.

a. Chil Shelterwood Working Circle.

b. Plantation Working Circle and

c. Coppice Working Circle.

a) CHIL SHELTERWOOD WORKING CIRCLE: It was most important working circle and encompassed 75% (11738.79 ha) of the total forest area dealt within the working plan. The forests on the whole were understocked, irregular and heavily burdened with rights. The undemarcated protected forests, brought under regular management for the first time, had been treated mercilessly, in the past. So the working circle was divided in to two felling series ; Legal Closure Felling Series (Felling Series – I) comprising of already covered delimited protected forests of earlier plans and Voluntary Closure Felling Series (Felling Series – II) comprising of newly included undermarcated protected forests. The Trilokpur forest (160.85 ha) was of course also included in Felling Series – I. The area under felling series – I was 7715.42 ha and felling series – II was 4023.37 ha. The special objects of management were to improve the stocking of poor stands through artificial regeneration; to meet the bonafide requirement of right – holders and optimize the yield of resin. Complete enumeration of chil and shisham trees was carried out in 10 cm diameter classes down to 10 cms and khair in 5 cm diameter classes. The average growing stock of chil per ha was 132.23 m3 in felling series – I and 90.72 m3 in felling series – II against normal growing stock of 162 m3 per ha.

The forests were to be managed under the “Punjab Shelterwood System” with natural regeneration to be supplemented by planting in refractory and problematic areas. Compact groups of well – grown poles up to 30 cm d.b.h. and the least 0.2 ha in extent were to be retained as advance growth. Rotation of 120 years with regeneration period of 30 years wasadopted. In felling series-I, allotment to all the four distinct periodic blocks was made, but in case of felling series-II, the allotment was made to three periodic blocks viz. P.B.I., P.B.U (II + III) and P.B.IV. Only two regeneration

fellings viz. seeding felling and final felling were to be carried out in P.B.I. Final felling was to be carried out only when the regeneration was 3-4 m high and the area control burnt at least twice. In felling series – II, to ensure better yield and to meet growing demand of right holders all trees below 50 cm. dbh occurring singly or in groups were to be retained and same uniformity as in case of F.S.-I was not aimed at. Exploitable dia was fixed at 60 cm. keeping in view extraction of trade size timber and optimum resin yield. In P.B.II. no commercial fellings of any kind were to be carried out, except for the removal of dead, dry and fallen trees. Green standing trees were not to be marked even in timber distribution and other requirements of the right-holders. In P.B.III. and P.B.U. thinnings ; and in P.B.IV., removal of overwood along with thinnings in young crop was prescribed.

The yield was prescribed by volume and was calculated separately for P.B.I. and P.B.IV of each felling series and P.B.III of felling series-I and P.B.U. of series-II. Sequence of fellings were prescribed.

The plan emphasized the need of final fellings in P.B.-I areas and thinnings in P.B.III.

Entire chil areas were prescribed to be control burnt once in three years. It was specially mentioned that the areas where regeneration has attained a height of 2.5 more shall be control burnt annually till the regeneration attains a height of 5 m.

In the legal closure felling series, P.B.I. areas of working plan, which could not be regenerated adequately were identified and it was prescribed that such areas will be planted artificially with in next five years. In addition, small blanks varying from 1 to 8 ha were identified in many other forests (106.5 ha) and prescribed for planting. Similarly in voluntary closure felling series also, planting was prescribed in culturable blanks totaling 198 ha. All these areas have been planted with chil with good success.

It was suggested that efforts should be made to restrict the exercise of rights to undemarcated protected forests and that in order to improve the stocking and to ensure the future yield, no green free should be granted from the areas allotted to P.B.II.

Results of Working: Deviation statement of control forms have been prepared by clubbing P.B.I., and P.B.IV., and P.B.II., and P.B.III. This information for P.B.U. areas has been separately. The position of yield as on 31st March, 1996 is provided below:

F.S.	Periodic Block	Yield Prescribed	Yield removed	Excess /Deficit (m3)	Area (ha)
I	P.B.I. & P.B.IV.	190500	91344	(-) 99156	1924.69+1923.55 =3848.24
I	P.B.II & P.B.III.	25500	132064	(+) 106564	1935.23+1931.95 =3867.18
II	P.B.I. & P.B.IV.	22500	21707	(-) 793	1042.68+1017.96 =2060.64
II	P.B.U.	7500	43025	(+) 35525	1962.73

The yield removed during 1996-97 is as under and the yield removed during 1997-98 is given in Appendix XVIII.

Felling Series I	Felling Series II
PBI+PBIV - 7412	PBI+PBIV -1537
PBII+PBIII - 10778	PBU - 3284

In felling series – I, an area of 1752.32 ha was prescribed for regeneration felling. Out of this only one area viz. P-37 Bakroh, C-3b (12.14 ha) was felled during 1991-92 and all other areas remained unfilled. Likewise in felling series – II, no seeding felling took place in any of the forests, though a total of 1054.73 ha was prescribed. No thinnings were carried out in any of P.B.III or P.B.U. areas against prescription of 1949-79 and 1918-28 ha, respectively. Removal of overwood was also not done in any of P.B.IV areas in either felling series - I or II, against prescription of 1917.85 and 1017.73 ha, respectively. These areas in felling are attributable to moratorium on green fellings imposed by Government.

Less removals in P.B.I and P.B.IV in felling series – I are due to the reason that seeding and final fellings were not carried out. It should, however, be noted that even without these fellings, removals are app. 48.6% of the total prescribed yield for these P.B.'s (12700 m3/annum). It is mainly on account of salvage removals in both these P.B.'s and concessional grants in P.B.IV. There is, however, excess removal of app. 425% of the total prescribed yield in P.B.II. and P.B.III (1700 m3/annum) in felling series – I. it again is attributable primarily to salvage removals and to meet the demand of right – holders. Similar is the case in P.B.U. areas of felling Series – II, where removals were more than 6 times of prescribed yield (500 m3/ annum). This further shows that the average annuals removals (Salvage + T.D.) from the forests of this working circle were to the tune of the app. 6200 m3 from P.B.I. and IV and 8900 m3 from P.B.II and III in case of felling series – I and 1450 m3 from P.B.I. and IV and 2900 m3 from P.B.U. in case of felling series – II. *The total being 19450 m3. Out of it about 3500 is of T.D. so salvage per annum is estimated to the tune of 16000 m3.*

As discussed in para 2.1.3 supra, regeneration chil in this division is not difficult to obtain. Except in Nadaun range, it comes profusely with closure. Though seeding fellings have not been carried out but heavy salvage removals have resulted in considerable opening up of the canopy. Most of P.B.I. areas today do not require typical seeding felling but the one resembling corrective seeding fellings. Adequate regeneration has come up in these areas both naturally and though plantations.

Subsidiary silvicultural operations have however, been generally neglected and few well regenerated areas have been wiped out because of ignoring the most important prescription of control burning to help the young crop establish. Opening up of canopy due to salvage removals and consequently the regeneration has been gradual thereby imparting slight irregularity to the crop.

P.B.II and P.B.III areas have, in addition to heavy salvage removals borne the major pressure of concessional grants against the prescription that no marking should be done even for timber distribution in P.B.II areas. Most of the areas allotted to P.B.II. carry scattered middle aged to mature trees with enough natural regeneration at sapling to pole stage and areas with typical P.B.II crop are simply not available. Salvage removals and T.D. markings in P.B.II have in – advertantly served the purpose of seeding felling and a good number of P.B.II areas have passed on to P.B.I. crop in the need of corrective seeding fellings. Such premature opening in Nadaun forests have led to invasion of chil areas by scrub species specially khair, the chil being of unstable type in these forests. The object of management with regard inducing the crop of normal by obtaining a normal gradation of age class and normal density of stocking has thus been defeated as for P.B.II areas are concerned.

Due to non removal of mother trees from P.B.IV areas, the young crop is suffering from suppression. It, coupled with non carrying out of cleanings and thinnings have resulted in congestion of crop affecting it adversely both qualitatively and quantitatively. Resultingly, many P.B.IV areas which with prescribed silvicultural operations could have passed on to P.B.III still support typical P.B.IV crop. Plantations carried out in undemarcated protected forests 20-25 years ago are an example of such areas. It had an adverse impact on the management object of maximum sustained yield.

One most important prescription of control burning has been practically ignored which has resulted not only in heavy salvage removals and consequent adverse impact on the stocking and uniformity of crop as discussed above but also had a harmful effect on regeneration. It is to be noted that over a period of these 14 years, total area burnt was 19090.2 ha. This gives an average of 1363 .58 ha. per annum. The identical figures for last 20 years were 3946.62 ha. as total and 197.33 as average. This aweful increase in fire incidences is attributable to gross neglect of prescribed operation.

Young regeneration in a number of adequately regenerated areas has been affected adversely due to fires since as prescribed, annual control burning till young crops attains a height of 5m have been ignored. It coupled with non carrying out of other silvicultural operations like pruning, thinnings and cleanings play havoc with young crop in case of fires.

Chil plantings have also been carried out in few P.B.II and P.B.III areas aiding irregularity in the crop. While planting, no consideration for the potential of area to regenerate naturally is normally

being made and areas which can regenerate naturally simply with an effective closure, are planted with 1000-1100 plants/ha.

It would be unwise to comment upon the suitability of Punjab Shelterwood system with the present result of this working circle in view, since none of the major prescriptions of the silvicultural system viz; seeding felling, final felling, thinnings etc. were carried out during the plan period. Removals from P.B.II and P.B.III. areas have also remained uncontrolled due to inefficient management practices. In view of the potential of areas to regenerate naturally, it would be fair to conclude that the chil forests of this division can be regenerated satisfactorily, if due attention is paid. The main inhibiting factor is fire, which must be kept under check especially in areas under regeneration. The rotation of 120 years and the regeneration period of 30 years are quite suited to these chil forests and no change, there in therefore contemplated.

b) PLANTATION WORKING CIRCLE: Blanks and the areas with useless brushwood species requiring afforestation and the young plantations carried out in undemarcated protected forests during previous working plan periods were allotted to this working circle. The objects of management were to raise compact plantations to meet the requirement of local people for timber, fuel fodder and fruit; to nurse the existing plantations and natural young growth under a systematic regime of cleaning and thinnings and to augment the forest resources by afforestation of bank/ degraded forests with commercially important species and there by a amplify the financial returns.

A total of 1789.32 ha area was allotted to this working circle. Only one felling series was formed since only undemarcated protected forests were allotted to this working circle. No silvicutural system was felt to be prescribed and whatever tree growth of important species existed, was prescribed to be retained for seed, shade and to meet the requirement of right holders for timber, fuel and fodder. For planting, species suitable for meeting local requirement were to be preferred. Planting of khair and chil was to be discouraged and these were to be planted only when the site was unsuitable for other species specifically demanded by right – holders. Emphasis was to be on species like shisham, siris, bamboo, tun, kachnar, tut and safeda. Out of 1789.32 ha area allocated to this working circle, only 442 ha was assessed to be available for planting which was listed. No definite sequence of planting was, however, laid because the closures were to be voluntary.

Planting was prescribed at a spacing of 3×3 m. two weedings and bush cuttings in the first year and one weeding during rains in the following 2 to 3 years were found essential. Beating up was to be done for subsequent 2 to 3 years, if the survival %age was less than 80%.

There has been a great emphasis of plantations during the plan period. Planted areas include all of the 442 ha areas identified as plan table by Balbir Singh. Emphasis had, however, been on chil and

khair against the prescriptions of working plan. Bamboos have been totally ignored. This attitude of field staff is well understood in view of the department having a perfected a very good package of practice for these species but is lacking of techniques of planting of fuel and fodder species. Average survival percentage of these plantations is 60 – 70 percent.

The results of working in this working circle are of mixed type as far as success of plantations is concerned. Because of certain limitations, the plantations have not responded, as they should have. A number of plantations are reasonably successful especially those where the Proportion of chil and khair is high. However, failures are also common and exceed 50%. The main reasons for failure are suppression by heavy bush growth, infestation by *lantana*, drought, non cooperation by local people and heavy biotic pressure. Human factors like poor nursery stock, wrong choice of species, inadequate pit size, poor protection etc. are other factors responsible for these failures. Fires also have played their role in affecting adversely the plantations. Failures are striking so far as broad leaved fodder species like Harar, Behera, Siris, Kachnar and Tut are concerned; which are attributable to poor nursery stock, inadequate pit size and palatability of the species coupled with poor protection. No cleanings / thinnings as were envisaged in U – 183 Telkar were carried out.

c) COPPICE WORKING CIRCLE : This working circle encompassed predominately khair and scrub bearing areas. The objects of management were to develop and augment the forest resources by afforestation uneconomical scrub forests with commercially important species like khair; to meet the local demand for fuel, fodder and small timber by planting fast growing trees and to improve the stocking and ensure maximum sustained yield from these forests.

A total of 2114.01 ha area was allotted to this working circle, of which 1842.86 ha was from delimited protected forests (legal closure felling series) and 271.15 ha from undemarcated protected forests (Voluntary closure felling series). Most of the area allotted to this working circle was in Nadaun range (1815.97 ha). Enumerations of khair were carried out in 5 cm dia classes down to 10 cm except in the areas either worked or planted during the currency of H.C.Sharma's working plan. Silvicultural system prescribed was coppice with standards. About 30 – 40 sound vigorously growing trees with well – developed crown were to be retained per ha as standards. Rotation of 30 years for coppices and 60 years for standards was prescribed. The area was to be felled and planted in the following year. Choise of species was prescribed to be khair. Sequence of felling and planting was laid down for 513.51 and 196.32 ha of legal and voluntary closure felling series areas, respectively.

As against 513.51 ha of delimited protected forests prescribed for felling during the plan period, only 4 areas viz; P-XXXVI Jihn, 6b, 6c, 7c and 8c were felled in 1981–82 and 1982–83. From certain

other areas, only mature and overmature khairs were removed. Prescriptions of working plan have thus not been followed.

Biodiversity of the crop has been a major casuality in the forests worked under this system, specially with respect to fodder species like dho, which has diminished greatly. Most of the broad leaved species throw vigorous coppice shoots but those of fodder value are lopped in the first year itself. Thinning and singling out of coppice shoots was prescribed but seems not having been carried out. Undersize khair trees were not felled though these were not retained as standards. It, coupled with the subsequent khair plantations carried out in the area after felling has rendered these more or less khair forests, which though meets the one object of management but is very much against the others.

Grazing has been another factor responsible for the failures. As worked out by Balbir Singh, there is an acute shortage of grazing areas; 10212 ha. as against an optimal requirement of 457161 ha The situation has further worsened due to large scale plantations carried out during the plan period. The tendency of the staff to raise relatively non plantable species like chil, khair and shisham in preference of fodder species is also attributable to their concern and safeguard against chances of failure due to grazing of latter. Excessive grazing has also led to qualitative reduction of the forests allotted to this Working circle. Cattle prefer tender shoots of coppice origin resulting in gradual wiping out of the fodder species from the forest. Dho has been the main causality.

d) RESIN INDUSTRY: Resin tapping has been by conventional cup and lip method up to 1983. Thereafter, a gradual switch over to till method has been done and this shift was completed by 1988. Several new forests have been brought under tapping because of reduction in tappable diameter under rill method.

While there is no denying the improvement in the quality of resin extracted by rill method, its effects on the general health of the tree have raised many controversies. Advocates of conventional method allege that it leads to drying of the tree and the process of healing is practically absent. Field observations have not provided conclusive indications to this effect except in few forests of Barsar range, where driage of unexplainably higher number of trees tapped by rill method was observed. It would however be too imaginative to attribute it solely to rill method. The loss of tree due to windfall is however greatly reduced as compared to conventional method.

The tapping by rill method has, however, not been done as per guidelines on the subject specially with respect to concentration of acid used as stimulant, use of rider on freshening knife and size of the blaze. These factors specially the use of more than recommended concentration of acid as stimulant

and more than recommended depth of blaze (in an attempt to obtain higher yield) may have contributed to driage of trees and absence of healing.
This tendency need be strictly checked less these faulty practices result in condemnation of a scientifically superior method of resin tapping.

e) GRAZING: Suggestions regarding revision of forest settlement, improvement of milch quality, increase in grazing fee and enforcement of stall feding etc. have not been implemented. However, field inspections revealed a definite shift in the attitude of local people towards cross bred cattle.

Suggestions regarding introduction of legumes in, removal of wood shrubs from and application of fertilizers to grazing lands have generally been ignored. Enforcement of closures from 1st July to 30th September has been lax. Khair and shisham have been preferred over Bahunia, Grewia, Terminalia and Bamboos in plantations against the prescription of the working plan. A plantation of fodder and timber species on bunds in agriculture fields and khair in Kharetars has taken place but the effort of the department in such case is restricted to providing saplings at subsidized rates.

f) ESTABLISHMENT AND LABOUR: Suggestion regarding reward to rakhas out of the penalties realized in place of Z – share and payment of Z – share to rakhas of ex – Nadaun Jagir have not even been considered.

g) MISCELLANCEOUS REGULATIONS:

i) ROADS: Roads over 8.9 Kms were constructed during the period of the working plan under revision. Repair of roads and paths have been done on regular basis depending upon availability of budget.

ii) BUILDINGS: 40 buildings were constructed during the working plan period as per details available in appendix – V. However, only 7 out of these are the ones prescribed in the working plan. Position regarding proposed Fgd. Huts has been discouraging and only 2 of the prescribed 14 Fgd. Huts were constructed. However, 6 out of 7 proposed B.O. quarters have been constructed. Repair of buildings in the interiors (especially Fgd. Huts) has generally been ignored.

iii) MAINTENANCE OF BOUNDARIES: Checking of boundary and repair of boundary pillars has not been attended to properly. Neither P.B. areas nor UPFs have been demarcated, as prescribed. No clearing of boundary lines or renewal of white paints belt around the trunks of trees along the

boundary lines has been carried out. Quinqennial programme for the checking and repair of boundaries has not been adhered to and consequently boundary register have not been maintained.

h)CONTROL AND RECORDS: C.H. Files have not been maintained properly. Entries regarding occurrence of fires and areas affected are incomplete. Though plantation journals have been maintained, research journals have not been prepared. Control forms have, however, been posted properly. Forest guard manuals are being maintained at beat level.

i) WILDLIFE AND ITS MANAGEMENT: Suggestion regarding setting up of wildlife sanctuary has not been met with.

6.2.2.6 DR. RAKESH KUMAR WORKING PLAN (1998 – 99 TO 2012 – 13):-General objects of management of this plan were as follows:

i) To maintain and to endeaover to improve the environment.

ii) To preserve the hill slopes against denudation, erosion and raverage and to ensure even and equitable flow of water in to streams.

iii) To provide for the bonafide requirments of the local people for timber, fuel, fodder and other forest produce.

iv) To conserve, protect and improve the quality and stocking of the existing forests with a view to bring them gradually to conditions nearer to a normal forest.

v) To enhance the area under forest cover by raising plantations of suitable species of fuel, fodder and timber suited to the local needs and to improve the quality of existing forests by supplementing less valuable species more valuable tree species.

vi) Consistent with the above, to obtain maximum possible sustained yield of various forest products of cater to the local and national requirements.

To attain these objectives, following working circles were constituted:

a. Chil Shelterwood Working Circle.
b. Plantation Working Circle and
c. Coppice Working Circle.

a) CHIL SHELTERWOOD WORKING CIRCLE: It was most important working circle and encompassed 67% (10524.67 ha) of the total forest area dealt within the working plan. The forests on the whole were understocked, irregular and heavily burdened with rights. The working circle was divided in to two felling series; Legal Closure Felling Series (Felling Series – I) comprising of already covered delimited protected forests of earlier plans and Voluntary Closure Felling Series (Felling Series – II). The area under felling series – I was 7581.38 ha and felling series – II was 2943.29 ha.

The Chil Forest were to be managed under the Indian Irregular Shelterwood System or The Punjab Shelterwood system with floating periodic blocks. The method of periodic blocks or single periodic blocks was adopted in view the area subject to the repeated forest fires and interspersed blanks.

YIELD: - Yield was calculated for volume annually as per detail below:

Felling Sries – I:-

P.B.I.:-

Seeding Felling = 1600 m3.

Final Felling = 2200 m3.

P.B.III = 1700 m3.

P.B.IV = 6400 m3.

Total =11900m3.

Felling Series – II:-

P.B.I.:- = 600 m3.

P.B.U. = 200 m3.

P.B.IV. =1000 m3.

Total =1800m3.

The abstract of prescribed yield and the removal therof along with the deviation statement from 1998-99 to 2013-14 (The control forms for the division have been prepared and got approved up to 2009-10) :

PB	Total prescription	Total removal	Deviation
I	52800	49837.65	-2962.35

III	20400	57027.74	+36627.74
PB U	2400	23472.54	+21072.54
G.Total	**75600**	**130337.93**	**+54737.93**

The position of yield as on 31st, March, 2013 is provided below:

Felling Series	Periodic Block	Previous Balance	Yield Prescribed up to 31.03.2013	Yield removed during the year	Deviation of the year	Cumulative Deviation
I	P.B.I.	(-) 6223.011	57000	2659.68	(-) 1140.32	(-)7363.331
	P.B.IV.	(-) 34406.133	96000	2119.18	(-) 4280.82	(-)38686.953
I	P.B.II	55940.15	0	2885.18	2885.18	58825.33
	P.B.III.	38177.55	25500	7833.49	6133.49	44311.04
II	P.B.I.	(-)313.71	9000	165.10	(-) 434.90	(-) 748.61
	P.B.IV.	(-) 2780.41	15000	190.70	(-) 809.23	(-) 3589.64
II	P.B.U.	23159.66	3000	762.59	562.59	23722.25

Felling Series – I

P.B.I.: 3800 m3 vol. per annum was prescribed for removal, but due to complete ban on green felling the prescription could not be achieved.

P.B.IV.: 6400 m3 vol. was prescribed for removal annually but due to complete ban on green felling the prescriptions could not be achieved and there was total deficit of (-)38686.953.

P.B.II and P.B.III: Areas have, in addition to heavy salvage removals borne the major pressure of concessional grants against the prescription that no marking should be done even for timber distribution in P.B.II areas. Most of the areas allotted to P.B.II. carry scattered middle aged to mature trees with enough natural regeneration at sapling to pole stage and areas with typical P.B.II crop are simply not available. Salvage removals and T.D. markings in P.B.II have in – advertantly served the purpose of seeding felling and a good number of P.B.II areas have passed on to P.B.I. crop in the need of corrective seeding fellings. Such premature opening in Nadaun forests have led to invasion of chil areas by scrub species specially khair, the chil being of unstable type in these forests. The object of management with regard inducing the crop of normal by obtaining a normal gradation of age class and normal density of stocking has thus been defeated as for P.B.II areas are concerned.

Felling Series – II

P.B.I.: 600 m3 vol. per annum was prescribed for felling. but due to complete ban on green felling the prescription could not achieved and there was total deficit of (-) 748.61.

P.B.IV.: 1000 m3 vol. per annum was prescribed for removal, but due to complete ban on green felling (-) 3589.64m3 less removal has been done.

P.B.U.: In this PB 200 m3 vol. was prescribed for removal. Due to salvage removal 23722.25m3 vol. has been removed in excess.

RESULT OF WORKING: - Theareas which were prescribed for felling were not worked due to ban on green felling. During the period of plan only salvage from markings were done in salvage marking 1,83,621.064 m3. Volume of chil was removed.

SOWING AND PLANTING:-No sowing planting progrmme was prescribed and was left to the direction of DFO particularly no seeding felling was done and areas were cleared of scrub only. Removed of dry/ falling trees was an annual feature.

CONTROL BURNING:-The programme was followed partially and fire lines maintained as per avaibality of funds.

CRITICAL APPRAISAL:-

1) Defective resin tapping and and frequent fires in chil areas are the main reasons of drying up of chil trees in the working circle. Fire protection measures such as control burning, maintenance of the fire lines, creation of internal fire lines, were not followed for want of funds with the result that lot of chil trees dried up in fire. Similarly defective resin tapping both by cup and lip, rill method also led to dry up of trees. Efforts had been to have maximum yield without caring for quality tapping. Reducing of minimum tappable dia from 35 to 30cm further damaged poles.
2) Subsidiary silvicultural operations such as weeding bush cutting, pruning etc remained unattended during the plan period. This also led to spread of fire.

The comparison of growing stock of chil at the beginning and end of Dr. Rakesh Kumar's plan is given here in after:-

b) PLANTATION WORKING CIRCLE :

i) All the plantations which were raised in the UPFs during the currency of the working plan under revision of earlier, which have been considered yet not established and so are unfit for allotment to other (Chil or Coppice) Working Circles.

ii) All such areas in the undemarcated protected forests which were blanks, under stocked or stocked with brushwood species and can be better stocked.

iii) Some areas of the delimited protected forests which were earlier under chil working circle but have been invaded by scrub to such an extent that now makes chil regeneration almost impossible and some other steep slopping areas in urgent need of protection against erosion.

A total areas of 3094.43 ha. As per detail below was allotted this working circle.

DPF Forests = 189.82

UPF Forests = 2934.61

No silvicultural system was prescribed. Where as annual target of 8.5 ha. and 21 ha. for plantation series no.1 and 2 Total 127.66 and 313.50 in felling series – I & II were prescribed which have been achieved during the plan under revision.

Planting was prescribed at a spacing of 3x3 mtr. The result of this working circle are of mixed type as for as suucess of plantation is concerned. Because of certain limitations under plantation have not responded as they should have. The number of plantation reasonable of successful especially those where the perposal of chil and khair is high. However failure are up to 40% extent. The main reason of failure are suppression by heavy bushgrowth, infestation of Lantana, continuous drought and heavy biotic pressure. Mostly failures are of broad leaved species which are due to poor nursery stock and absence of advance work, in addicuate pit size and in some cases poor protection.

c) COPPICE WORKING CIRCLE: This working circle comprises of khair and scrub miscellaneous broad leaved forest which were managed. The objects of management was to improve existing growing stock of the forest, to increase the economic value of the forest by planting more valuable species, to meet with the bonafide demand of local people for fodder fuel and timber. A total of 1962.53 ha. area was allotted to this working circle, of which 1813.73 ha. was from Delimited Protected Forest (Felling Series-I) and 148.80 ha. from Undemarcated Protected Forest (Felling Series-II). Most of the area allotted in this working circle was in Nadaun Range 1735.10 ha. annual target of 40 ha. and 3 ha. was prescribed for felling series I&II which have not been achieved due to ban imposed on green felling by Apex Court.

In other chapters like miscellaneous, regulation wildlife no prescription were prescribed

DETAIL OF SALVAGE REMOVAL FROM THE PLAN UNDER REVISION:-

SALVAGE REMOVAL

Year	No. of trees	Volume
1998-1999	3274	4071.540
1999-2000	7518	12254.65
2000-2001	10369	14609.94
2001-2002	7613	10637.230
2002-2003	9215	14161.630
2003-2004	9935	13404.91
2004-2005	11240	14808.00
2005-2006	11614	15728.29
2006-2007	8717	10654.85
2007-2008	7219	10221.89
2008-2009	8469	10409.484
2009-2010	11669	16983.45
2010-2011	13397	18236.14
2011-2012	5086	5889.06
2012-2013	8853	11550.00
Total	**134188**	**183621.064**

DETAIL OF RESIN BLAZES HANDED OVER TO H.P.S.F.D.C. FROM THE PLAN UNDER REVISION:-

RESIN BLAZES HANDEDOVER

Sr. No	Year	No. of resin blazes
1.	1998	116589
2.	1999	110560
3.	2000	112037
4.	2001	101226
5.	2002	86433
6.	2003	97396
7.	2004	82738
8.	2005	79518
9.	2006	74709
10	2007	72045
11	2008	72121
12	2009	71332
13	2010	46129
14	2011	45649
15.	2012	44835
	Total	**1213317**

DETAIL OF AREA PLANTED DURING PLAN UDER REVISION

Sr. No.	Year	Area (h.a.)

1	1998-1999	725.70
2	1999-2000	662.00
3	2000-2001	596.23
4	2001-2002	578.03
5	2002-2003	298.47
6	2003-2004	181.35
7	2004-2005	428.50
8	2005-2006	566.21
9	2006-2007	489.16
10	2007-2008	242.55
11	2008-2009	425.00
12	2009-2010	453.60
13	2010-2011	642.00
14	2011-2012	330.18
15	2012-2013	373.74

****

CHAPTER – VII

STATISTICS OF GROWTH AND YIELD

7.1 GENERAL: Chil is the most important species of this division and occupies more than 75% of total forest area. The average quality of Hamirpur chil conforms to F.R.I. III. The old and mature crop of age over 100 years conform to quality III and occasionally falls below that, young crop touching I/III quality. Quality is best in P.38 Platu, so far as this division is concerned. Khair forms next important species occupying about 15% of the total forest area.

7.2 GROWTH AND YIELD DATA:

7.2.1 CHIL: Age diameter relationship arrived at by Balbir Singh after stem analysis of 18 chil trees and local volume tables derived from this data is tabulated below and shall be made use of.

Diameter – Age Relationship

Age (Years)	15	19	25	32	40	48	57	67	78	90	103	117	132
Diameter over bark (cm)	10	15	20	25	30	35	40	45	50	55	60	65	70

Local Volume Tables

Diameter Class (cm)	Class	Volume (m3)
10 – 20	V	0.08
20 – 30	IV	0.31
30 – 40	III	0.85
40 – 50	IIA	1.58
50 – 60	IIB	2.55
60 – 70	IA	3.74
Above 70	IB	4.96

7.2.2 KHAIR: Following table as adopted by R. Malhotra from Pande's Haldwani Working Plan has been relied upon for age, diameter and no. of trees per ha. relationship.

Age, diameter and number of trees per ha.

Crop age (years)	Average dia. (cm.)	Average ht. (mt.)	No. of trees (Per ha.)	Standing vol. Stem timber (Cum. Per ha.)
5	(3.5)	(3.3)	--	--
10	(7.6)	(6.0)	--	--
15	(11.1)	(8.5)	(583)	--
20	(13.9)	(10.9)	(514)	5.59
25	16.5	(13.1)	(445)	11.61
30	18.8	14.9	385	20.64
35	20.8	16.7	331	26.93
40	22.66	18.3	287	32.53
45	24.1	19.5	252	37.78
50	25.4	20.7	227	41.98
55	26.6	21.6	203	--
60	27.7	22.5	188	--

(The figures within brackets are extrapolated)

The age of khair trees cannot be determined from stumps. For the collection of growth statistics, linear plots have to the laid in the existing plantations and periodically measured. A specific recommendation in this regard is being made in miscellaneous regulations for future.

Following table shows the average period in years taken by different diameter classes to enter in to the next higher diameter class. This has been derived from the above table.

Age on entering diameter class

Diameter class (cm)	Total age of entering the class (Years)	Years taken
25	47	14
20 – 25	33	11
15 – 20	22	8
10 – 15	14	-

(Source: Working Plan under revision)

It is estimated that annual rate of mortality in passing from one diameter class to the next higher diameter class is 2%.

The figures of Nurpur working plan by Nanak Chand have been adopted to show the relationship of diameter, height standing volume, heartwood contents and yield of katha in khair. These are tabulated below:

Diameter (cm)	Height (m)	Standing Vol. (m3)	Heartwood Vol. (m3)	Wt. of Heartwood For Katha (Kg.)	Wt. of Air Dry Katha (Kg)
10 – 15	8.3	.0257	.0122	11.2	--
15 – 20	10.1	.0686	.0310	31.1	2.5
20 – 25	11.18	.1181	.0576	50.6	5.0
25 – 30	12.9	.1697	.1096	78.7	8.0
30 – 35	13.4	.2528	.1757	128.3	14.1
35 – 40	13.4	.3310	.2496	167.7	18.0
40 – 45	13.4	.4337	.3016	197.4	23.0
45 – 50	13.4	.5468	.3898	280.1	29.0

(Source: Working Plan under revision)

7.2.3 Fuelwood: The data has been taken from Ch. Nanak Chand Working Plan of Nurpur Forest Division at 01.04.1976 to 31.03.1991. The third most important produce of the area is fuelwood. The number of trees of different species and diameter classes available per ha. of areas under scrub on the basis of 10 plots of 1 ha. each laid over the whole area is estimated as under:-

Botanical Name	Local Name	V	IV	III	IIA	IIB
Anogeissus latifolia	Dhao	6	4	-	-	-
Lannea coro-mandelica	Kehmbal	1	9	4	2	-
Syzygium cumini Var. Caryophyllifolia	Katharan	2	3	1	-	-
Albizzia odoratissima	Karmaru	2	1	-	-	-
Flacourtia indica	Kangu	12	6	2	-	-

Mallotus phillipinensis	Kamal	13	12	2	-	-
	Total	**36**	**35**	**9**	**2**	**-**

The stacked volume of fuelwood is per ha. is estimated as 25m3 with a weight of 175 quintals (wet).

(Source: Nanak Chand Working Plan of Nurpur Forest Division)

Volume table of miscellaneous B/L species:-

Name of Species	**Name of Working Plan**	**Classification of trees**								
		V	**IV**	**III**	**IIA**	**IIB**	**IA**	**IB**	**IC**	**ID**
		10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Shisham	Nahan	0.064	0.176	0.467	0.977	1.523	2.265	2.265	2.265	2.265
Other B/L Mango,Eucalyptus Popular etc.	Average vol. factor has been adopted as circulated vide by PCCF. Vide memo No. FT21/700-82(S) vol. VII. Dated 31.07.2010	0.161	0.217	0.563	1.110	1.654	20.323	2.957	2.957	2.957

7.3 DENSITY: The canopy density of all the compartment / sub compartments have been assessed occularly and recorded in the respective compartment history files.

7.4 ENUMERATIONS: Enumeration has been carried out as per instructions contained in National Working Plan Code Para 31. The sampling intensity of 5% with compartment as a unit has been used in coppice & plantation working circle where as in chil working circle 8% to the extend of area has been used.

7.5 STOCK MAPS: Stock maps on 4"= 1 mile (1:15840) scale have been prepared for each compartment / sub compartment, the tracing of which have been placed in the respective compartment history files.

7.6 QUALITY CLASS: The site quality class in respect of chil has been assessed occularly in each compartment sub compartment and has been recorded in the respective compartment history file.

The royalty rates of 2012-13 are as under:

S. No.	**Species**	**Royalty rates (Rs.)**
i)	Chil	739/- per cum
ii)	Khair	794/- per M.G.
iii)	Coppice in coppice	300/- per ha.

	with Khair areas	

The working circle wise value of trees is as under.

7.7 REGENERATION STATUS/ SURVEY:-In chil working circle the chil regeneration is absent in almost all PBI areas due to frequent fires during summer season hence no regeneration survey has been carried out similarly in coppice working circle no felling has been carried out and regeneration cannot be ascertained in the absence of felling.

****

CHAPTER – VIII

ESTABLISHMENT AND LABOUR SUPPLY

8.1 EXECUTIVE CHARGES: The executive charges as they stood on 1st April, 2013 are as follows:

Name of Range	Name of Block	Number of Beats
Hamirpur	Hamirpur	5
	Sujanpur	6
	Towni Devi	5
Aghar	Aghar	5
	Bhareri	5
	Jharalari	5
Barsar	Barsar	7
	Bumbloo	3
	Hareta	5
Bijhri	Bijhri	4
	Chakmoh	4
	Leharli	3
Nadaun	Nadaun	5
	Kangoo	4
	Dhaneta	4
5	**15**	**70**

(Source: DFO Office Hamirpur).

The position on 31-03-99 was as under:

Name of Range	Number Blocks	Number of Beats
Hamirpur	3	16
Aghar	3	15
Bijhri	3	11
Nadaun	3	13
Barsar	3	13
Total	**15**	**68**

(Source: Dr. Rakesh Kumar W.P.)

8.2 STAFF: The following statement shows the present sanctioned and existing strength of permanent plan and non plan staff vis-à-vis the position of 2012.

Sr. No.	Category	Posts	Sanctioned Strength	Existing Strength	Variation
1	Class – I	DFO	1	1	0
		ACF	1	1	0
		Total Class – I	**2**	**2**	**0**
2	Class – II	RFOs	6	5	-1
		Total Class – II	**6**	**5**	**-1**
3	Class – III	Supdt.	1	1	0
		Sr. Asstt.	3	4	+1
		Clerks/Jr. Asstt.	6	5	-1
		Deputy Rangers	19	12	-7
		Forest Guards	88	78	-10
		Naib Tehsildar	1	0	-1
		Kanungo	1	0	-1
		Patwari	1	1	0
		Driver	1	1	0
		Total Class – III	**121**	**102**	**-19**
4	Class IV	Peons	7	4	-3
		Khalasi	2	1	-1
		Chowkidar	8	8	0
		Sweeper	1	0	-1
		Dak Runner	0	2	+2
		Mali	3	4	+1
		Forest Workers	37	31	-6
		Total Class IV	58	50	-8

		Grand Total	**187**	**157**	**30**

(Source: DFO Office Hamirpur).

Field staff is adequate. There is no need of creating new beats, keeping in view average forest area of 230 ha per beat and very efficient network of roads in this division. Reports of resin smuggling are frequent especially from the areas of Barsar range and it requires more intensive patrolling by the field staff. Newly created flying squad division at Bilaspur can check this menace by carrying out frequent patrolling in sensisitive areas in association with territorial staff. There has however been a significant increase in paper work at range level during last years. It would therefore be advisable to provide each range officer with some office support in the form of a range clerk to increase the efficiency of range working.

Paper work has increased manifold at divisional level also during last years. Though the present staff seems to be adequate to cope up with this increased work, it would be extermely hepful to post one stenographer in divisional office. A lot of work has to be disposed off on dictation to ensure quality and efficiency. It is more so after the Divisional Forest Officer has been provided quasi judicial powers as collector under the H.P. Public Premises and Land (Eviction and Rent Recovery) Act, 1971 and as Authorized Officer under amendment to section 52 of I.F.A. Likewise, there is need for posting a court clerk (reader) conversant with court procedures in view of these judicial duties of Divisional Forest Officer. Technical support on legal issus like vetting of replies of court cases, apearing in the court presided over by the Divisional Forest Officer to defnd the cases of the state is also felt atleast at the circle level.

Another branch which needs strengthening at divisional level is the support on revenue matters in the form of atleast one naib tehsildar, one kanungo and two patwaries.

8.3 LABOUR SUPPLY: There is adequate availability of the labour in the area except during harvesting and sowing seasons, when people are busy with their own fields.

Well-trained labour for resin extraction is available in the area in plenty, who also go to other parts of the Pradesh as also to J&K for works. Labour for Katha manufacturing is however imported from Eastern Uttar Pradesh. Gaddis graze in this division during winters and form a part of unskilled labour force for different operations for three months from December to February.

The minimum wages fixed under the Minimum Wages Act, for unskilled labours for forest for forest operations have been revised recently (2012) from Rs. 120/- to Rs. 150 per day. The skilled workers like masons; carpentars etc. are generally available at a rate varying from Rs. 162/- to 271/- per day. The minimum wages in 1999 was Rs. 65/- per day.

****

CHAPTER – IX

CAPITAL VALUE OF THE FOREST

9.1 GENERAL: It is very difficult to ascertain the exact value of forest especially when intaingible benifits derived from these renewable resources are taken in to account. However, present capital value has been estimated on the basis of value of land, growing stock of various species and other non timber forest produce.

9.2 ESTIMATION OF CAPITAL VALUE: The degree of estimation can be said to be reasonably accurate as partial enumerations were carried out. The capital value of forests is worked out as under:-

A. VALUE OF FOREST LAND

Sr. No.	Working Circle	Area	Rate	Value of Land
1	Chil Working Circle	11,359.26	8,45,000*	9,59,85,74,700
2	Coppice Working Circle	2,080.83	8,45,000*	1,75,83,01,350
3	Plantation Working Circle	3,094.43	8,45,000*	2,61,47,93,350
Total		**16,534.52**		**13,97,16,69,400**

(*NPV rates are fixed by the Hon'ble Supreme Court of India for Eco class V for dense forests i.e. density up to .4 has been applied)

B. GROWING STOCK: The present capital value of trees has been estimated by applying current market rates. The estimation of capital value of growing stock is tabulated as under:

Sr. No.	Species	Volume	Rate	Amount
1	Chil	14,42,122.28	18,600*	26,82,34,74,408
2	Khair	1,44,574.33	32,134*	4,64,57,51,520
3	Shisham	2,177.04	26,712*	5,81,53,092
4	BL	28,475.95	7,869*	22,40,77,250
	Total	**16,17,349.6**		**31,75,14,56,270**

VAT = 31,75,14,56,270* 13.75% = 4,36,58,25,237 Total Value = 36,11,72,81,507

Total Value of Forest Land (A) = 13,97,16,69,400

Total Value of Trees (B) = 36,11,72,81,507

Total Capital Value of forests (A+B) = 13,97,16,69,400 + 36,11,72,81,507 = 50,08,89,50,907

****

PART-II

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

CHAPTER – I
BASIS OF PROPOSALS

1.1 GENERAL OBJECTS OF MANAGEMENT: In a hilly state like Himachal Pradesh, forests are very intimately connected with human life. They not only meet day to day requirements of timber, fuelwood, fodder etc. of the local population and their live stock, but also play a key role in the maintenance of pure and salubrious environment, protection of the hill slopes and regulation of supply of water in the rivers and streams. The fertility of agricultural land is very much dependent on the flow of the water in streams and a rivulet which in turn depends upon the forest cover on hill slops. The forests are heavily burdened with rights of local people under provision of various settlements. The general objects of management of these forests therefore, shall be as under: –

i) To maintain and to endeavor to improve the environment.

ii) To preserve the hill slopes against denudation, erosion and ravages and to ensure even and equitable flow of water in to streams.

iii) To meet with the bonafide requirements of the local people for timber, fuel, fodder and other forest produceaccording to silviculture availability.

iv) To conserve, protect and improve the quality and the stocking of the existing forests with a view to bring them gradually to conditions nearer to a normal forest.

v) To enhance the area under forest cover by raising plantations of suitable species of fuel, fodder and timber suited to the local needs and to improve the quality of existing forests by supplementing less valuable specieswithmore valuable tree species.

vi) Consistent with the above, to obtain maximum possible sustained yield of various forest products to cater to the local and national requirements

vii) To preservethe forestto improve the quality of NTFPs in the division and to harvest it on sustainable basis

viii) To remove alien species to make more and more area available for regeneration.

ix) To carry out improvised wildlife management for the improvement of wild life habitat to minimize man animal conflicts.

1.2 CONSTITUTION OF WORKING CIRCLE: In conformity with the objects of management outlined above, following working circles will be constituted:-

I. The Chil Working Circle.
II. The Coppice Working Circle.
III. The Plantation Working Circle.
IV. Forest Protection (Overlapping) Working Circle.
V. Joint Forest Management (Overlapping) Working Circle.
VI. Wildlife Management (Overlapping) Working Circle.
VII. Non Timber Forest Produce (Overlapping) Working Circle.

1.3 THE CHIL WORKING CIRCLE: The working circle is composed of all such forests where chil is found either in pure or in fair proportion and are considered suitable for application of the system of concentrated regeneration fellings. Chil plantations raised in undemarcated protected forests, generally of the age of 20 years and above, and considered established have also been included. Modified shelterwood system known as “Punjab Shelterwood System” has been adopted. Two felling series viz. (i) Legal Closure Felling Series (Felling Series-I) and (ii) Voluntary Closure Felling Series (Felling

Series-II) have been constituted in view of their status with regard to closure. The former covers the DPFs and the later includes the UPFs.

1.4 THE PLANTATIONWORKING CIRCLE: The area (159.82 under DPF and 2934.61 Ha under UPF) under plantation WC, taken under Dr Rakesh Kumar Working Plan will be continued to be taken in the current working plan. Besides this, other areas overlapping in Chil and coppice working circle, which are either blank/ poorly stocked or carrying misc. scrub growthand weedshave also been included in this working circle for plantations activities.Two plantation series viz.: (i) Legal Closure Series for DPFs (Plantation Series – I) and (ii) Voluntary closure series for UPFs (Plantation Series – II) keepingin view their status with regard to closure, have been constituted.

1.5 THE COPPICE WORKING CIRCLE: Predominately khair and scrub bearing areas have been allotted to this working circle. Two felling series viz: (i) Legal Closure Felling Series (Felling Series – I) for DPFs and (ii) Voluntary Closure Felling Series (Felling Series – II) for UPFs have been constituted.

1.6 WORKING CIRCLE: THEIR AREA AND DISTRIBUTION: Following tables depict the distribution of area of each working circle in various ranges under different classes of forests and differences as compared to previous working plan.

Distribution of area of each Working Circle:-

Range wise distribution (ha)							
Working Circle	**Class of Forest**	**Aghar**	**Barsar**	**Bijhri**	**Hamirpur**	**Nadaun**	**Total**
Chil	**DPF**	2096.82	1692.94	2170.72	959.56	1016.13	**7936.17**
	UPF	572.43	1430.83	575.60	543.89	300.34	**3423.09**
Plantation	**DPF**	8.90	0	48.97	32.38	69.57	**159.82**
	UPF	535.95	507.22	408.67	766.05	716.72	**2934.61**
Coppice	**DPF**	0	227.43	0	0	1586.30	**1813.73**
	UPF	0	118.30	0	0	148.80	**267.1**
Total		**3214.1**	**3976.72**	**3203.96**	**2301.88**	**3837.86**	**16534.52**

Variation in areas in different Working circles as compared to plan under revision:-

Variation in allotment in current working plan							
Working Circle	**Class of Forest**	**Area in Dr. Rakesh Kumar Plan (ha)**	**Area transfer from Kutlehar Forest Division**			**Totalling error (ha)**	**Area in current plan (ha)**
			Chil	**Coppice**	**Plantation**		
Chil	**DPF**	7581.38	354.39	0	0	.40	7936.17
	UPF	2943.29	479.80	0	0	0	3423.09
Plantation	**DPF**	159.82	0	0	0	0	159.82
	UPF	2934.61	0	0	0	0	2934.61
Coppice	**DPF**	1813.73	0	0	0	0	1813.73
	UPF	148.80	0	118.30	0	0	267.10
Total		15581.63	834.19	118.30	0	.40	16534.52

*including totaling error.

1.7 BLOCKS AND COMPARTMENTS: These generally remain the same as in the working plan under revision. However, few DPF &UPFs are added from Kutlehar Jagir, Una Forest Division. The changes made are indicated below:-

Sr. No	Name of Forest	New Compartment	
		No.	**Area (ha).**
1	DPF IV Sasal	C1a	10.52
		C1b	10.12
		C1c	10.52
2	DPF V Satrukha	C1a	31.96
		C1b(N.B.)	16.58
		C1b(S.B.)	11.73
		C1c	25.10
		C1d	26.63
3	UPF Pathliar	C1	30.50
		C2	26.00
		C3	57.50
4	UPF Satrukha		2.60
5	UPF Bhutlar	C1	12.00
		C2	28.00
		C3	26.00
6	UPF Jabbal Kherian	C1	9.30
		C2	12.20
		C3	64.50
7	UPF Barsar	C1	26.50
		C2	13.20
		C3	20.40
		C4	28.20
		C5	12.10
		C6	7.30
8	DPF I Thethu	C1a	16.58
		C1b	19.41
		C1c	13.79
		C1d	16.18
9	DPF II Chhatrah	C1a	31.96
		C1b	29.12
		C1c	31.60
		C1d	31.96

10	DPF III Ban Maslana	C1a	6.87
		C1b	6.07
		C1c	7.69
11	UPF Nain	C1	22.10
		C2	12.00
		C3	15.00
		C4	7.00
12	UPF Maslana Khurd	Entire	60.10
13	UPF Maslana Kalan	C1	28.00
		C2	4.00
14	UPF Jhanjyani	C1	19.00
		C2	13.00
15	UPF Chambeh	C1	30.00
		C2	4.10
		C3	7.50
	Total		**952.49**

1.8 PERIOD OF THE PLAN: The period of this plan is for 15 years w.e.f. 1st April 2013 to 31st March 2028. This period is considered sufficient.

****

CHAPTER – II

THE CHIL WORKING CIRCLE

2.1 GENERAL CONSTITUTION AND CHARACTER OF VEGETATION: This working circle contains all the pure or nearly pure chil forest of the division. Total area of this Working circle is 11359.26 ha. as against 10524.67 ha. in plan under revision. The abstract of changes in areas as compared to the plan under revision is given in para 1.6. The following table summarises the distribution of the circle in various ranges:-

Sr No.	Range	Class of forest		
	Area (ha)	DPF	UPF	Total
1.	Aghar	2096.82	572.43	2669.25
2.	Barsar	1692.94	1430.83	3123.77
3.	Bijhri	2170.72	575.60	2746.32
4.	Hamirpur	959.56	543.89	1503.45
5.	Nadaun	1016.13	300.34	1316.47
Total	**Total**	**7936.17**	**3423.09**	**11359.26**

The general character of the vegetation has already been described in para 2A.1. The forests on the whole are under stocked, vastly variable in density and the normal distribution of age classes is lacking except in few P.B.IV and P.B.III areas of the DPFs and most of the P.B.IV areas of the UPFs. Many of these have generally young crops raised artificially and middle aged and mature trees are much in deficit.

2.2 BLOCKS AND COMPARTMENTS: The boundaries of the forest blocks remain the same as in the previous plan. The compartments and sub compartments also remain the same.

2.3 FELLING SERIES: Keeping in view the legal status of the forests with regard to closure and their control for management, two felling series have been constituted as under:-

i) Legal Closure Felling Series (here in after referred to as Felling Series – I) comprising of the DPFs.

ii) Voluntary Closure Felling Series (here in after referred to as Felling Series –II) comprising of the UPFs, closure in which is purely voluntary.

2.4 SPECIAL OBJECTS OF MANAGEMENT: The special objects of management shall be as under:-

i) To continue conversion of generally irregular, under stocked chil forests to more or less regular, fully stocked pure crops.

ii) To improve the stocking of chil through natural and artificial regeneration.

iii) To provide for the bonafide requirements of the right holders regarding timber, firewood, grazing, grass cutting etc.

iv) Consistent with the above, to obtain maximum possible sustained yield of timber, pulpwood and resin.

2.5 AREA AND ALLOTMENT: - The following table gives the area (in ha) of each felling series allotted to different periodic blocks

Felling Series – I					
Range	**P.B.I.**	**P.B.II.**	**P.B.III.**	**P.B.IV.**	**Total**
Aghar	426.15	539.05	557.64	573.98	2096.82
Barsar	448.86	347.55	442.68	453.85	1692.94
Bijhri	639.79	493.32	474.71	562.90	2170.72
Hamirpur	250.93	196.68	267.07	244.88	959.56
Nadaun	360.18	188.16	239.56	228.23	1016.13
Total	**2125.91**	**1764.76**	**1981.66**	**2063.84**	**7936.17**

Felling Series – II				
Range	**P.B.I.**	**P.B.U.**	**P.B.IV.**	**Total**
Aghar	140.44	289.47	142.52	572.43
Barsar	185.03	893.72	352.08	1430.83
Bijhri	190.23	287.84	97.53	575.60
Hamirpur	105.55	270.43	167.91	543.89
Nadaun	59.14	177.74	63.46	300.34
Total	**680.39**	**1919.2**	**823.5**	**3423.09**

2.6 ANALYSIS AND VALUATION OF THE CROP: The crop is analysed for different characters of vegetation as under:-

2.6.1 STOCK MAPS: All areas of the working circle have been stock mapped and the stock maps showing necessary details have been prepared on survey sheets of 4" = 1 mile (1:15,840) scale. Copies of the same have been placed in the respective compartment history files. Chil is the predominant species all

over. About 80% of the area is occupied by chil, the rest is under miscellaneous broad – leaved species and blanks.

2.6.2 SITE QUALITY AND AGE CLASSES: The site quality of each compartment / sub compartment has been assessed and recorded in the compartment history files. The quality corresponds to class III and occasionally to class II / III. Average site quality of the division can be safely taken as II / III. The stands are on the whole irregular having preponderance of younger age classes. However, the crop in most of P.B.IV areas is more or less uniform.

2.6.3. DENSITY: Crop density of each forest / compartment has been estimated ocularly and recorded in the compartment history files.

2.7 ENUMERATIONS AND THEIR RESULTS: Enumeration has been carried out as per instructions contained in National Working Plan Code Para 31. The sampling of the intensity of 5% with compartment as a unit is used. The sample has been selected randomly by stratified Random Sampling method. In chil working circle 10% enumeration has been done and in other working circle where no felling has been prescribed 5% enumeration has been done. The details are shown in Appendix – II and the abstract of chil trees is as follows:-

Felling Series – I												
PB	**Area (ha)**	**No. of Trees in Dia. Classes**									**Total**	
		V	**IV**	**III**	**IIA**	**IIB**	**IA**	**IB**	**IC**	**ID**	**No.**	**Volume**
I	2125.91	330491	121930	79566	38198	17480	9329	3555	906	136	601590	294483.48
II	1764.76	121947	89555	46089	15424	7707	4069	885	151	11	285837	141127.16
III	1981.66	87425	65559	61082	36837	15111	3969	967	153	38	271141	196558.18
IV	2063.84	91280	171988	130430	42241	11099	2838	1040	446	59	451421	284805.31
Total	**7936.17**	**631143**	**449032**	**317167**	**132700**	**51397**	**20205**	**6447**	**1656**	**244**	**1609989**	**916974.13**
Felling Series – II												
I	680.39	69274	50702	29101	10294	2944	1355	981	245	53	164950	81183.73
U	1919.20	66753	134254	51294	11857	3197	931	263	101	0	268650	122733.38
IV	823.50	23577	37401	32131	9701	1699	225	113	20	0	104866	61952.52
Total	**3723.09**	**159604**	**222357**	**112526**	**31852**	**7840**	**2511**	**1357**	**366**	**53**	**538466**	**265869.63**

The following table indicates comparative position of the existing growing stock (G.S.), the normal growing stock (as per yield table figures corresponding to the crop age) and the growing stock at the beginning of the plan under revision (the figures for the corresponding periodic block).

Felling Series – I				
Periodic Block	**No. of trees per ha. at present**	**Present G.S. (m3/ha.)**	**Normal G.S. (m3/ha.)**	**G.S. at the beginning of the plan under revision. (m3/ha.)**
I	283	138.52	234	106.6
II	162	79.96	198	132.30
III	137	99.18	169	129.10
IV	219	137.99	86	116.90
Felling Series – II				
I	242	119.31	234	98.1
U	140	63.95	183	93.9
IV	127	75.23	86	97.6

The normal G.S. figures have been borrowedfrom theplan under revision.

Above position indicates a satisfactory increase of growing stock in P.B.I areas of both felling series I and IIand considerable growth in PB.IV in felling series I.The increase is on account of presence of seed bearers and dominons of young regeneration. The position of growing stock in all other P.B.s of both the felling series is discouraging which is attributable mainly due to open crop of these areas created on account of frequent fires and salvage markings of higher classes. The higher growth of present growing stock comparative to normal growing stock in P.B.IV. areas is attributed due to more increamnt presentage in young pole crops.

2.8 MEAN ANNUAL INCREAMENT: Volume increment percent figures for each diameter class have been adopted from the plan under revision:-

Diameter Class (cm)	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**
Vol. Increment percentage	6.51	3.87	3.22	1.80	1.23	0.56

Annual volume increment for each felling series based on these figures is given as under:-

Felling Series – I										
Class	**V**	**IV**	**III**	**IIA**	**IIB**	**IA**	**IB**	**IC**	**ID**	**Total**
No. of Trees	631142	449032	317167	132701	51397	20204	6447	1655	244	**1609989**
Vol. (m3)	50491	139200	269592	209668	131062	75765	31977	8209	1210	**917174**
Increment (m3)	3287	5387	8681	3774	1612	424	0	0	0	**23165**
Felling Series – II										
No. of Trees	159604	222357	112526	31852	7840	2511	1357	367	53	**538467**
Vol. (m3)	12768	68931	95647	50326	19992	9416	6731	1820	263	**265894**
Increment (m3)	831	2668	3080	906	246	53	0	0	0	**7784**

2.9 SILVICULTURAL SYSTEM: The silvicultural system will be the modified shelterwood system known as The Indian Irregular system. The system permits retention of compact groups of well grown not less then 0.2 ha. and having density 0.7 of pole crop as part of the future crop and, thus, certain amount of irregularly in the crop is allowed. The marking conforms to the selection principles where topographical features of the Ground inhibit concentrated fellings.Most of the forests of this division being of stable and intermediate sub type regenerate naturally satisfactorily. Natural regeneration supplemented by artificial planting in blanks where regeneration does not come up naturally in the area.

2.10 CHOICE OF SPECIES: Chil shall be the principal species and preferred to the miscellaneous broad – leaved species. All cultural works shall aim atencouraging chil in the forests of this working circle.

2.11 ROTATION AND CONVERSION PERIOD: The rotation of 120 years, in keeping with the requirement of the scheme of Rotational Closures, has been adopted. At this age the crop diameter of chil, in this locality, is about 60 cm, a size suitable for conversion in to sleepers and for resin extraction.

2.12 REGENERATION PERIOD: The scheme of Rotational Closure is based on a closure period of 30 years. Keeping in view the periodicity of good seed years, the danger from forest fires and the growth – rate of chil in the locality, this period is sufficient to obtain adequate established regeneration and, therefore, regeneration period of 30 years is being adopted.

2.13 REDUCING FACTORS AND REDUCED AREAS: There is not much variation in the site – quality of the forests. Though, density is quite variable yet as the yield is being regulated by volume and controlled by the area also so, it is considered unnecessary to reduce the areas for site quality and density.

2.14 DIVISION IN TO PERIODS AND ALLOTMENT TO PERIODIC BLOCKS: With a rotation of 120 years and regeneration period of 30 years, there will be four periodic blocks. Definite allotment to each periodic block has been made in the case of the Felling Series – I, whereas in case of Felling Series – II, only PBI and PBIV areas have been allotted; the others being grouped together as P.B. unallotted. Due to preponderance of young age classes (III and below) it is not possible to identify areas specific to each P.B. yet, the following broad principles have been kept in view while making the allotments.

P.B.I: Forest with comparatively mature to over mature trees, areas regenerated adequately with young crop yet not established; where blanks / interruption of crop canopy has been created due to various removals; of lower density; with blanks having incipient regeneration and apparently degraded ones have been allotted to this periodic block.

P.B.II: Areas with typical P.B.II. crop i.e. the crops approaching maturity have been allotted to this P.B.

P.B.III: The areas having preponderance of IV, III and IIA class trees have been allotted to this periodic block.

P.B.IV: Successfully regenerated areas with preponderance of class Vand IV trees and considered established with few overwood trees have been allotted to this periodic block. In case of UPFs this periodic block primarily includes successful plantation areas mainly of seventies. With a few exceptions the areas allotted to different P.B.s are the same as in the plan under revision.

2.14.1 PROVISION IN CASE OF NATURAL CALAMITIES: In case an area is destroyed (50% or more) due to natural calamities like fire/wind, it will be relegated to PBI (seeding felling areas) and will be taken up for regeneration operations and unfilled equal area from PBI (seeding felling) will be relegated to concerned PB. In these cases necessary entries will be made in concerned compartment history files.

2.14.2 DISTRIBUTION: Range by distribution of different periodic blocks is given below:-

Felling Series – I

Range	Area (ha)				
	PBI	**PBII**	**PBIII**	**PBIV**	**TOTAL**
Aghar	426.15	539.05	557.64	573.98	**2096.82**
Barsar	448.86	347.55	442.68	453.85	**1692.94**
Bijhri	639.79	493.32	474.71	562.90	**2170.72**
Hamirpur	250.93	196.68	267.07	244.88	**959.56**
Nadaun	360.18	188.16	239.56	228.23	**1016.13**
Total	**2125.91**	**1764.76**	**1981.66**	**2063.84**	**7936.17**

Felling Series – II

Range	Area (ha)			
	PBI	**PBU**	**PBIV**	**TOTAL**
Aghar	140.44	289.47	142.52	**572.43**
Barsar	185.03	893.72	352.08	**1430.83**
Bijhri	190.23	287.84	97.53	**575.6**
Hamirpur	105.55	270.43	167.91	**543.89**
Nadaun	59.14	177.74	63.46	**300.34**
Total	**680.39**	**1919.20**	**823.5**	**3423.09**

2.15 CALCULATION AND PRESCRIPTION OF YIELD: The yield has been calculated by volume separately for all the P.B.s in both the felling series, except P.B.II of legal closure felling series. It is because crop in this P.B. is already open and no commercial fellings have been prescribed here. In order to safeguard the future yield increment has not been taken in to consideration as insurance against fire and to improve the growing stock, which is far less than normal.

2.15.1 FELLING SERIES – I

2.15.1.1 YIELD FROM P.B.I: Yield from P.B.I areas has been calculated separately for seeding and final felling areas.

2.15.1.1.1 SEEDING FELLING AREAS: The abstract of enumeration of chil trees from such areas (1416.49 ha) is as below:

	V	IV	III	IIA	IIB	IA	IB	IC	ID	TOTAL
No.	220203	81242	53013	25451	11647	6216	2369	604	91	**400836**
Vol (m3)	17616	25185	45061	40212	29699	23247	11750	2995	451	**196216**

About 20% of the trees of class III and below shall be available for felling. The number of class II trees is almost 26 per ha, most of which will have to be retained as seed bearers. However 60% of class 1 trees will be available for felling.

The average annual yield (y) has thus been calculated as

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

Where

C1, C2 and C3 – are the constants to represent the fraction of volume of trees of class I, II and III & below, respectively which will be available for felling. These values are 0.6, 0.1 and 0.2, respectively.

V1, V2 &V3 – are the corresponding volumes of trees of these classes.

P – Period during which fellings are to be completed – 15 years.

$$Y = \frac{0.6 \times 38443 + 0.1 \times 69911 + 0.2 \times 87862}{15}$$

$$= \frac{23065.80+6991.10+17572.40}{15} = \frac{47629.30}{15}$$

= 3175.28 m3 or say 3100 m3.

The yield prescribed is 2500 m3

2.15.1.1.2 FINAL FELLING AREAS: The abstract of enumeration from such areas (779.91 ha) is as below:

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	110285	40688	26553	12747	5833	3113	1186	302	47	**200754**
Vol. (m3)	8822	12613	22570	20140	14874	11642	5882	1497	233	**98273**

I class trees are out of place in such areas and are required to be removed except those standing isolated in open places or on the peripheries of the forests. It is estimated that 80% such trees shall be available for removal. As regard IInd class trees, about 40% will have to be retained and 60% shall be removed as they exist blended with the advanced growth and because of their strategic location. Just 10% of class III and below trees shall be available for felling by way thinning.

The average annual yield (Y) has thus been calculated as:

$$Y = \frac{C1V1 + C2V2 + C2V3}{P}$$

Where:

C1, C2 & C3 – are the constants of represent fraction of volume of trees of class I, II and III & below, respectively which will be available for felling. These values are 0.8, 0.6 and 0.1, respectively.

V1, V2 and V3 – are the corresponding volumes of trees of these classes.

P = Period during which fellings are to be completed – 15 years (the plan period for the sake of convenience of working).

$$Y = \frac{0.8 \times 19254 + 0.6 \times 35014 + 0.1 \times 44005}{15}$$

= 2720.81 m3 or say 1800 m3.

Total annual yield of 4300 m3 (2500 m3 + 1800 m3) is therefore being prescribed for P.B.I. area of Felling Series – I.

2.15.1.2 YIELD FROM P.B.II: No yield is prescribed from P.B.II as no silvicultural fellings are prescribed. The removals, if any like salvage (dry and fallen) shall count towards yield of P.B.I.s

2.15.1.3 YIELD FROM P.B.III: Abstract of enumeration of chil trees in this P.B. is as below:

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	87425	65559	61082	36837	15111	3969	967	153	38	**271141**
Vol. (m3)	6994	20323	51920	58203	38534	14843	4795	757	189	**196558**

The yield in this P.B. shall comprise mainly from thinning of trees belonging to class IV, III & IIA. It is estimated that about 15% volume of these trees shall be available in thinning during the working plan period.

Annual yield (Y) thus works out as under:

$$Y = \frac{15\% \text{ of } 130446 \text{ m3}}{15}$$

= 1304.46 m3 or say 1300 m3.

Annual yield from this P.B. is therefore being prescribed at 1000 m3.

2.15.1.4 YIELD FROM P.B.IV: Abstract of growing stock from this P.B. is given below.

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	91280	171988	130430	42241	11099	2838	1040	446	59	**451421**
Vol. (m3)	7302	53316	110866	66741	28302	10614	5159	2210	295	**284805**

Yield in this P.B. will be derived from trees of IIA and above and some thinning in younger crop (class IV & III). Increment and V class trees have been ignored as a safety measure against fire and wind strome etc. From management point of view all the I & II class trees are out of place in this P.B. and can at best be removed during the first period. It is, however, not possible to do so on silvicultural consideration. Trees that stand along the outer boundaries and nallas, on broken ground and blanks, cannot be felled wholesale. Similarly removal of many such trees as studded amongst patches of polewood retained as future crop will also not be possible. It is estimated that 80 percent of the volume of trees above 40 cms. d.b.h. will be available for felling. So far as yield from thinning is concerned it is estimated that about 20 percent of the volume of class III & IV will be available for felling keeping in view the object of increasing the density of the forests.

The yield has thus been calculated as:-

$$Y = \frac{C1V1 + C2V2}{P}$$

Where:-

C1 & C2 – are the constants to represent the fraction of volume of trees of class IIA and above, and III & IV respectively that will be available for felling. These values are 0.8 and 0.2, respectively.

V1 & V2 – are the corresponding volume of trees of these classes.

P – Period during which felling and to be completed 15 years.

$$Y = \frac{0.8 \times 113321 + 0.2 \times 164182}{15}$$

=8232.86 or say 8200 m3

Most of these P.B.IV areas are common to Dr. Rakesh Working Plan. No fellings have taken place during Dr. Rakesh Working Plan period (1998 – 99 onwards), these areas are therefore proposed to be felled in next 15 years in the interest of the crop.

Annual yield from this P.B. is therefore being prescribed is 7000 m3.

2.15.2 FELLING SERIES – II

2.15.2.1 YIELD FROM P.B.I: The abstract of enumeration of chil trees from such areas is as below:

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	69274	50702	29101	10294	2944	1355	981	245	53	**164949**
Vol. (m3)	5542	15718	24736	16265	7508	5067	4868	1217	265	**81186**

About 70% of the trees of class I, just 10% of class II and 30% of class III and below are likely to be available for felling.

The yield has thus been calculated as

$$Y = \frac{C1V1 + C2V2 + C3V3}{P}$$

Where:

C1, C2 & C3 – are the constants to be representing the fraction of volume of trees of class I, II and III & below, respectively which will be available for felling. These values are 0.7, 0.1 and 0.3 respectively.

V1, V2 & V3 – are the corresponding volumes of trees of these classes.

P – Period during which fellings are to be completed – 15 years.

$$Y = \frac{0.7 \times 11417 + 0.1 \times 23773 + 0.3 \times 45996}{15}$$

= 1611.20 m3 or say 1600m3.

An annual yield of 1600m3 is therefore being prescribed.

2.15.2.2 YIELD FROM P.B.U: Abstract of enumeration in this P.B. is given below:

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	66753	134254	51294	11857	3197	931	263	101	0	**268650**
Vol. (m3)	5340	41619	43600	18735	8152	3481	1305	502	0	**122734**

The yield in this P.B. shall comprise mostly of trees IIA and above which are mostly suppressed and dried. It is estimated that 10% of volume of the trees in these classes will be available for felling during the Working Plan Period. Annual yield thus works out as under:-

$$Y = \frac{10\% \text{ of } 32175}{15}$$

= 214.50 m3 or say 200 m3.

An annual yield of 200 m3 is therefore being prescribed.

2.15.2.3 YIELD FROM P.B.IV: Abstract of growing stock in this P.B. is given below:-

	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
No.	23577	37401	32131	9701	1699	225	113	20	0	**104867**
Vol. (m3)	1886	11594	27312	15327	4332	842	558	102	0	**61953**

As discussed in case of yield from P.B.IV from Felling Series – I, 20 percent of growing stock of class III & IV shall be available for thinning. However, only app. 40% of the volume of trees above IIA and above will be available for felling. The volume of such trees per ha. is just 26.The yield from this P.B. will be:

$$Y = \frac{C1V1 + C2V2}{P}$$

Where

C1 & C2 – are the constants of represent the fraction of volumes of trees of class IIA & above and III & IV, respectively that will be available for felling.

V1 & V2 – are the corresponding volume of trees of these classes.

P – Period during which fellings are to be completed. As no silvicultural fellings were done earlier so it is prescribed to free the regeneration from overwood in this plan period i.e. 15 years.

$$Y = \frac{0.4 \times 21161 + 0.2 \times 38906}{15} = 1083.04 \text{ m3 or say } 1000 \text{ m3.}$$

2.15.3 PRESCRIBED YIELD: The yield will be of two kinds viz, (a) from fellings and (b) from closure targets.

(a) From fellings: - The total annual yield from the chil working circle thus comes to Felling Series – I.

Felling Series – I

P.B.I	
Seeding Felling	= 2500 m3
Final Felling	= 1800 m3
P.B.III	= 1000 m3
P.B.IV	= 7000 m3
Total	**=12300 m3**

Mean annual increment of this Felling Series –I is 23165 m3 (ref. para 2.8). Total annual yield comes out to 11500 m3 which works to 49.64% of the mean annual increment. Thus 50.36% of mean annual increment will go towards building up of the growing stock.

Felling Series – II

P.B.I	= 1600 m3
P.B.U	= 200 m3
P.B.IV	=1000 m3
Total	**=2800m3**

Mean annual increment of this Felling Series –II is 7784 m3 (ref. para 2.8). Total annual yield comes out to 2800 m3 which works to 35.97% of the mean annual increment. Thus 64.03% of mean annual increment will go towards building up of the growing stock.

2.15.3.1 COMPARISON OF YIELD WITH THE PREVIOUS PLAN: The yield prescribed in the previous plan was 13700 m3.

Previous Working Plan		**Current Working Plan**	
Felling Series – I		**Felling Series – I**	
P.B.I	= 3800 m3	P.B.I.	= 4300 m3
P.B.III	= 1700 m3	P.B.III	= 1000 m3
P.B.IV	= 6400 m3	P.B.IV	= 7000 m3
Total	**=11900 m3**		**=12300 m3**
Felling Series – II		**Felling Series – II**	
P.B.I	= 600 m3	P.B.I	= 1600 m3
P.B.U	= 200 m3	P.B.U	= 200 m3
P.B.IV	= 1000 m3	P.B.IV	=1000 m3
Total	**=1800 m3**		**=2800 m3**

(b) From closure targets:- It is again prescribed that P.B.I areas scheduled for seeding fellings in a particular years (ref. para 2.21.1.1) will be closed for regeneration in subsequent year irrespective ofwhether they could not be felled due to ban on green fellings. The annual targets for closure will be in ha. as per the seeding felling programme.

COMPARISON OF THE GROWING STOCK: The total growing stock present in this Working Circle is 1182843.76 m3 (F.S.I.=916974.13+F.S.II.=265869.63).The comparison of the growing stock of chil in DPFs and UPFs at the beginning and end of Dr. Rakesh Kumar's working plan is tabulated below.

It needs to be observed that the proportion of volume of younger age classes (V and IV) in DPFs has decreased significantly during the working plan period.However proportion of volume of age classes III and IIA has increased. Same trend has been observed in UPFs also.

Demarcated Protected Forests (F.S.I.)

Year		V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
1995	No.	1073602	474195	190816	103189	60472	34695	10681	3021	834	1951505
	% total	55.02	24.29	9.79	5.29	3.09	1.79	0.54	0.15	0.14	100
	Vol.	85888	147000	162194	163038	154203	129759	52978	14984	4137	914181
	% total	9.39	16.08	17.74	17.83	16.88	14.19	5.8	1.64	0.45	100
	No./ha	141.6	62.55	25.16	13.62	7.98	4.58	1.41	0.39	0.11	257.4
	Vol/ha	11.33	19.39	21.39	21.5	20.34	17.12	6.99	1.98	0.54	120.58
2012	No.	631142	449032	317167	132701	51397	20204	6447	1655	244	1609989
	% total	39.20	27.89	19.70	8.24	3.19	1.25	0.40	0.10	0.02	100
	Vol.	50491	139200	269592	209668	131062	75765	31977	8209	1210	917174
	% total	5.51	15.18	29.39	22.86	14.29	8.26	3.49	0.90	0.13	100
	No./ha	79.53	56.58	39.96	16.72	6.48	2.55	0.81	0.21	0.03	202.87
	Vol/ha	6.36	17.54	33.97	26.42	16.51	9.55	4.03	1.03	0.15	115.57

Undemarcated Protected Forests (F.S.II.)

Year		V	IV	III	IIA	IIB	IA	IB	IC	ID	Total
1995	No.	426787	207864	77952	30456	13401	5335	2000	667	254	764716
	% total	55.81	27.18	10.19	3.99	1.75	0.7	0.26	0.09	0.03	100
	Vol.	34143	64438	66259	48120	34172	19953	9920	3407	1260	281672
	% total	12.12	22.88	23.52	17.08	12.13	7.08	3.53	1.21	0.45	100
	No./ha.	145.01	70.62	26.48	10.35	4.55	1.81	0.68	0.23	0.09	259.82
	Vol/ha.	11.6	21.89	22.51	16.35	11.61	6.78	3.37	1.16	0.43	95.7
2012	No.	159604	222357	112526	31852	7840	2511	1357	367	53	538467
	% total	29.64	41.29	20.90	5.92	1.46	0.47	0.25	0.07	0.01	100.01
	Vol.	12768	68931	95647	50326	19992	9416	6731	1820	263	265894
	% total	4.80	25.92	35.97	18.93	7.52	3.54	2.53	0.68	0.10	99.99
	No./ha.	46.63	64.96	32.87	9.31	2.29	0.73	0.40	0.11	0.02	157.32
	Vol/ha.	3.73	20.14	27.94	14.70	5.84	2.75	1.97	0.53	0.08	77.68

2.15.3.2 CONTROL OF YIELD AND DEVIATION: The control of yield will be by volume & felling series wise. All the tees of chil alone to what so ever dia class down up to V class (10 cm. dbh) removed for what so ever purpose will count towards the yield of the felling series in which the forest concerned falls. There is already a provision in para 2.14.1 for relegating the areas to P.B.I. in case of heavy natural calamities. Due to this provision the areas and consequently the removals will be counted towards P.B.I. There by the deviation in other P.B.s (most likely P.B.III) will remain under limits. It is also laid down that the removals from P.B.II where from no yield is prescribed will count towards P.B.I.

It is also laid down that when ever an area is transferred to PBI from other PBs, the entry will invariably be made in the respective compartment history file.

The enumerations of the current plan were done mainly during the year 2012 – 13 where as the current plan is made operative from 1st April, 2013. The deviation will be carried forward as usual.

Deviation of + (-) 25% of the annual prescribed yield are permissible yearly but cumulative deviation of blocks of 5 years should not exceed 10%.

2.16 METHOD OF EXECUTING FELLINGS IN P.B.I: There are generally two kinds of fellings in this periodic block (i) seeding felling and (ii) final felling. The detailed marking rules are contained in the H.P. Forest manual Vol. IV. Following guidelines are, however given for the guidance of marking officers.

2.16.1 SEEDING FELLING: Crops are sufficiently opened to permit the establishment of a great deal of regeneration without felling even a single tree. Many areas have sufficient naturalregeneration. Simple closure against grazing and grass cutting will help in regenerating the areas and establishing the regeneration.

However, for the guidance of the marking officer following guidelines are given:

(i) About 20 to 25 trees per ha: shall be retained as seed bearers. The seed bearers should preferably be from the trees of middle aged to near mature (IIA and IIB) and should have well – developed crowns, long, clean, cylindrical boles and should be free from twist and diseases.

(ii) The seed – bearers should be as far as possible uniformly distributed.

(iii) On steep and broken ground, along the banks of nalas and other vulnerable situations markings shall be conservative conforming to the selection principles.

(iv) Compact groups of healthy and vigorously growing pole crop up to 30 cm. d.b.h. not less than 0.2 ha. in extent and having atleast 0.7 density shall be retained as part of the future crop. All trees of larger

dimensions occurring in the patches of such advance growth shall be removed provided no permanent gap is caused in the canopy. However, congestion in such patches is to be removed by thinning.

(v) Scattered Young Poles (up to IV class) and sapling which can merge in to future crop will not be removed as their occurrence will help in soil moisture conservation and also keep the weeds under control.

(vi) All isolated III class trees which are bound to develop in to wolf trees will be marked in felling series-I but will be retained in felling series – II to meet the requirement of right holders.

(vii) In certain cases, regeneration of sapling to pole stage may already be present. Markings in the over – wood standing over such groups of regeneration shall be heavier so as to afford better growth conditions to these groups. It is to be of the nature of secondary fellings.

(viii) Except when considered necessary for the development of or interfering with the chil regeneration and the advance growth, the broad leaved trees shall not be removed as it is advisable to retain them as a healthy mixture for improvement of the soil to make it alkaline in nature and also to meet the local requirements for fuel and fodder.

(ix) Only selection cum improvement markings will be carried out in a width of 15 m on either side of the main road.

2.16.2 FINAL FELLINGS:i) Final fellings will be carried out only when the regeneration has attained a height of atleast 2.5 meters and has been control burnt thrice.

(ii) About 5 seed bearers per ha. tall, healthy and vigorously growing, will be retained until the end of the regeneration period as a fire – insurance measure, increment treesand to meet the local demands.

(iii) Advance growth retained at the time of seeding felling shall in no case be felled. Thinnings may, however, be carried out if required.

(iv) Seed bearers shall be lopped before felling to minimize damage to the young crop.

A marking note along with detailed marking map of the area delineating the type of markings carried out in various part of the compartment and the advance growth retained shall be prepared by the marking officer and posted in the compartment history files for the future guidance. A record of seed bearers retained at the time of seeding felling should also be prepared and placed in the compartment history files as a check over markings and future removals.

2.17 METHOD OF EXECUTING FELLINGS IN P.B.II: No fellings shall be carried out in this periodic block in order to safeguard the future yield. Removal of only the dead and fallen trees the permitted to improve the hygiene of the crop. No green tree should be granted in timber distribution to right holders from the areas allotted to this P.B.

2.18 METHOD OF EXECUTIN FELLINGS IN P.B.III: These forests will be gone over in thinning and improvement fellings. The markings will be done only to meet the local timber and other bartan requirements. The guidelines to be followed will be as under:-

(i) Removals shall be confined mainly to the dry and fallen trees shall be marked first.

(ii) Dense compact group of poles will be thinned by removal of suppressed trees alongwith unusually bigger trees, if any occurring in such group.

(iii) The intensity of thinning is in no case, to exceed the 'D' grade of thinning.

(iv) All markings are primarily to be done for improvement of the crop. The tendency to remove selected, well grown better stem must be avoided.

2.19 METHOD OF EXECUTING FELLINGS IN P.B.IV: In this periodic block in many compartments still contain the mother trees which are no longer required. The felling shall aim at removal of such trees. Cleanings and early thinning in the young crop is also necessary to obviate congestion. The cut material of such poles is normally utilizes as fuel. The following guidelines are given:-

(i) All I class and most of II class trees shall be marked for felling unless required on silvicultural considerations.

(ii) Isolated II and III class trees standing over the young crop that are likely to develop as prospective wolf trees shall be marked.

(iii) Along the nalla banks and on very steep terrains, removal of the over – wood should be conservative.

(iv) All dry and fallen trees shall be removed to improve the crop.

(v) Thinnings and cleanings shall be carried out in the congested young crop conforming to the D – grade of thinning. Detailed guidelines about thinning and cleanings are available in Chapter – I of the Vol. IV of H.P. Forest manual.

2.20 METHODS OF EXECUTING FELLINGS IN P.B.U. (F.S.II.): No regular thinning / fellings are required to be done at present as the crop is very open. The fellings, only to meet the various types of demands of the right – holders, being unavoidable are to be made. These will be done strictly on silvicultural principles, keeping in view the density and the terrain of the forests.

2.21 SEQUENCE OF FELLINGS: the following sequence of fellings for each felling series if laid down. It can, however be altered by the Divisional Forest Officer with the prior permission of the Add. P.C.C.F. (Working Plan & Settlement).

2.21.1 FELLING SERIES – I

2.21.1.1 FELLING IN P.B.I: (Areas is given in ha.)

Seedling Fellings				Final Fellings		
Year	**Forest**	**Comptt**	**Area**	**Forest**	**Comptt**	**Area**
1	**2**	**3**	**4**	**5**	**6**	**7**
2013-14	P.1. Karot	C.2c	5.67	P.15. Kalwal	C.3	15.38
	P.6. Dhar Jajjar Jakh	C.7b	16.19	P.38. AM Platu	C.1c	14.16
	P.13 Bara	C.3	2.43	P.40. Dharara	C.3	5.26
	P.19. Kharal – I	C.1c	21.85	P.17. Samaila	C.2d	8.5
	P.21. Bijhri	C.4	6.88	P.5. Humal	C.1c	9.71
	P.XX Malag	C.4d	7.28	P.9. Dhangota	Whole	30.76
	P.XXVI. Hathol	C.2c	6.88	P.37. Bakroh	C.3b	12.14
			67.18			**95.91**
2014-15	P.20. Kharal – II	C.3	20.23	P.38. AM Platu	C.3c	33.18
	P.XXVIII. Bhaunti	C.1b	26.3	P.XV. Kashmir	C.1a	3.64
	P.47. Dhurkhar	C.2a	9.31	P.XVI. Dhaily	C.1c	4.45
	P.54. Dhar Guga	C.4	8.5	P.28. Desin	C.2b	14.57
	P.23. Chalsai	C.3c	4.86	P.XX. Malag	C.1c	4.05
			69.2			**59.89**
2015-16	P.I. Karot	C.1d	27.92	P.16. Dhar Sidh	C.3b	21.04
	P.24. Ghangot	C.2d	21.04	P.41. Jharmani	C.5	20.23
	P.52. Sawarin	C.4	11.74	P.43. Naural	C.2c	11.33
			60.7			**52.6**
2016-17	P.XXVIII. Bhaunti	C.1a	12.55	P.14. Reli	C.3c	29.54
	P.36. Dhar Kangar	C.3b	10.93	P.43. Naural	C.1c	11.74
	P.55. Dhar Chabutra	C.1b	15.38	P.48. Bajuri	C.1d	5.67
	P. XVIII. Jassai	C.1c	17	P.14. Reli	C.4c	13.35
	P.XXII. Kunah	C.3a	5.67	P.6. Dhar Jajjar Jakh	C.10c	25.9
			61.53			**86.20**
2017-18	P.4. Cheli Matroh	C.3	6.88	P.6 Dhar Jajjar Jakh	C.5d	6.48
	P.13. Bara	C.4	8.09	P.6. Dhar Jajjar Jakh	C.6b	10.52
	P.19. Kharal – I	C.2c	15.78	P.48 Bajuri	C.1c	28.75
	P.22.Gutiana Batiana	C.2d	5.26	P.46. Mandiana	C.3b	8.5
	P.XXIII. Loharkhar.	C.1c	23.88	P.35. Jathunda	C.4	13.76
			59.89			**68.01**
2018-19	P.14 Reli	C.2d	18.21	P.6. Dhar Jajjar Jakh	C.12b	22.66
	P.28 Desin	C.1c	8.09	P.6. Dhar Jajjar Jakh	C.8g	22.66
	P.48. Bajuri	C.3a	7.28	P.30. Ghata Panga	Whole	5.26
	P.35 A. Kanoh	C.2	10.12	P.38 AM. Platu	C.2b	14.16

	P.VII. Mandian	C.1c	21.45	P.12. Khilawat	C.3	14.57
			65.15			**79.31**
2019-20	P.XXII. Kunah	C.2c	3.64	P.6. Dhar Jajjar Jakh	C.1d	21.04
	P.11. Sathwin	C.1	12.95	P.27. Dugwar	Whole	17
	P.19. Kharal – I	C.4c	10.93	P.31. Khajjian	C.2c	10.52
	P.26. Salan	C.3d	14.57	P.15. Kalwal	C.2	11.33
	P.55. Dhar Chabutra	C.4d	21.45	P.18. Bihru	C.2	13.76
			63.54			**73.65**
2020-21	P.47. Dhurkhar	C.1b	10.12	P.14. Reli	C.5c	21.85
	P.37. Bakroh	C.1d	10.52	P.39. Galor Khas	Whole	12.95
	P.45. Karer	C.1c	10.52	P.XV. Kashmir	C.3d	11.74
	P.6.Dhar Jajjar Jakh	C.11b	12.95	P.23. Chalsai	C.1b	2.43
	P.26. Salan	C.1b	19.02	P.24. Ghangot	C.1c	28.33
			63.13			**77.3**
2021-22	P.5. Humal	C.3a	8.5	P.16. Dhar Sidh	C.1c	19.42
	P.23. Chalsai	C.2d	7.28	P.14. Reli	C.5b	18.21
	P.XXII. Kunah	C.1c	3.64	P.16. Dhar Sidh	C.1d	12.55
	P.XXII. Kunah	C.2d	4.05	P.23. Chalsai	C.1c	4.05
	P.XXIII. Loharkhar	C.2c	8.5	DPF.II. Chhatrah	C.1c	31.6
	P.55.Dhar Chabutra.	C.2c	34.8	P.53. Samluhi	C.3	19.42
			66.77			**105.25**
2022-23	P.21. Bijhri	C.1	8.9	P.14. Reli	C.3d	29.14
	P.31. Khajjian	C.1c	8.9	P.18. Bihru	C.4b	4.45
	P.47. Dhurkhar	C.2c	11.33	P.23. Chalsai	C.2c	5.67
	P.XV. Kashmir	C.3c	14.57	P.55.Dhar Chabutra	C.3c	11.33
	P.XXX. Karour	C.1b	12.95	P.XXXIII. Bodh	C.1c	17
			56.65			**80.94**
2023-24	P.XXV. Beha	C.1d	6.88	P.16. Dhar Sidh	C.4c	35.61
	P.XII. Karsai	C.1b	4.05	P.XXV. Beha	C.2c	6.07
	P.32. Cheli Ghumari	C.3	13.35	P.XXIX. Galoh	C.1b	4.45
	P.37. Bakroh	C.2c	10.52	P.XXX.Karaur	C.1c	13.35
	P.47. Dhurkhar	C.1c	12.95	DPF.I. Thethu	C.1c	13.79
	P.XXXIII. Bodh.	C.1d	19.83	P.46. Mandiana	C.2b	14.57
			67.58			**87.84**
2024-25	P.44. Galoh.	C.2	7.69	P.17. Samaila	C.2c	12.95
	P.XXVII. Basaral	C.2c	13.76	P.XVIII. Jassai	C.2d	17
	P.34. Thana.	C.3	6.48	P.XX. Malag	C.3c	12.95
	P.42. Paniali	C.3	17.81	P.8. Samtana	C.2d	38.85
	P.XIV. Plassi	C.1c	2.43	P.26. Salan	C.2c	12.95
	P.XVIII. Jassai	C.2c	14.97	P.45. Karer	C.2b	5.67
			63.14			**100.37**

2025-26	P.45. Karer	C.2c	9.31	P.6. Dhar Jajjar Jakh	C.4c	8.09
	P.8. Samtana	C.3b	19.02	P.16. Dhar Sidh	C.2c	32.78
	P.37. Bakroh	C.2d	13.76	P.XXV. Beha.	C.1c	6.48
	P.XV. Kashmir	C.4c	4.85	DPF.V. Satrukha	C.1c	25.1
	P.XVII. Behrar	C.1c	4.85	P.XXVIII. Bhaunti	C.3d	4.05
	P.19. Kharal – I	C.3c	14.57	P.51. Dugnehra	C.3	10.93
			66.36			**87.43**
2026-27	P.XVIII. Jassai	C.4a	4.05	P.12. Khilawat	C.4	15.78
	P.20. Kharal – II	C.4	32.78	P.XXIII. Lohar Khar	C.2a	10.52
	P.XX. Malag	C.2d	15.78	P.16. Dhar Sidh	C.5c	17
	P.XXVII. Basaral	C.1c	10.12	P.22. Gutiana Batiana	C.1b	8.5
	P.36. Dhar Kangar	C.4c	12.95			
			75.68			**51.80**
2027-28	P.35. Jathunda	C.3	10.12	P.6. Dhar Jajjar Jakh	C.2c	13.36
	P.37. Bakroh	C.3c	8.09	P.48. Bajuri	C.1e	20.64
	P.49. Jhaniara	C.1c	14.57	P.XX. Malag	C.3d	8.9
	P.XX. Malag	C.2c	11.33	P.10. Pehrwin	C.2	8.09
	P.45. Karer	C.1b	12.95	P.11. Sathwin	C.3	18.21
			57.06			**69.2**
	G. Total		**963.56**	**G. Total**		**1162.35**

2.21.1.2 FINAL FELLINGS CUM THINNINGS IN P.B.IV:

Year	Forest	Comptt.	Area (ha.)
1	**2**	**3**	**4**
2013-14	P.6. Dhar Jajjar Jakh	C.10b	14.16
	P.16. Dhar Sidh	C.5d	10.93
	P.23. Chalsai	C.4b	22.66
	P.34. Thana	C.4	3.88
	P.46. Mandhiani	C.3a	9.71
	P.53. Samluhi	C.2	12.95
			74.29
2014-15	P.6 Dhar Jajjar Jakh	C.5b	8.09
	P.6 Dhar Jajjar Jakh	C.8e	23.47
	P.11. Sathwin	C.2	21.85
	P.37. Bakroh	C.1b	9.71
	P.41. Jharmani	C.4	17.00
	P.50. Dang Di Kawali	C.2c	4.86
	P.54. Dhar Guga	C.2	9.31

			94.29
2015-16	P.3. Badhiana – II	C.3	2.83
	P.6. Dhar Jajjar Jakh	C.8d	7.28
	P.16. Dhar Sidh	C.3a	22.66
	P.19. Kharal – I	C.4b	9.71
	P.28. Desin	C.2a	10.52
	P.35. Jathunda	C.2	12.55
	P.41 Jharmani	C.2	12.54
	P.51. Dugnehra	C.2	8.09
			86.18
2016-17	P.5. Humal	C.2b	14.57
	P.6. Dhar Jajjar Jakh	C.2b	12.55
	P.19. Kharal – I	C.2b	17.40
	P.38. AM. Platu	C.3b	34.80
	P.43. Naural	C.2a	15.78
	P.49. Jhaniara	C.1b	12.59
	P.XX. Malag	C.4b	5.67
			113.36
2017-18	P.5. Humal	C.1b	11.33
	P.23. Chalsai	C.2b	9.31
	P.25. Khansara	C.2	19.02
	P.38. AM. Platu	C.2a	13.76
	P.43. Naural	C.1b	8.90
	P.46. Mandhiani	C.2a	21.02
	P.50. Dang Di Kawali	C.2b	13.76
	P.XX. Malag	C.2b	21.85
	P.XXI. Bandhera	C.1a	4.45
	P.XXVIII. Bhounti	C.8b	3.24
			126.64
2018-19	P.6. Dhar Jajjar Jakh	C.1	7.28
	P.10. Pherwin		9.31
	P.25. Khansara	C.3	17.00
	P.26. Salaln	C.3b	9.31

	P.31. Khajjian	C.1	10.12
	P.40. Dharara	C.5	13.76
	P.42. Paniali	C.2	12.95
	P.52. Sawarin	C.2	9.31
	P.XXI. Bandhera	C.1c	2.43
	P.XXII. Kunah	C.2b	4.05
	P.XXIX. Galol	C.1c	5.67
			101.19
2019-20	P.5. Humal	C.2c	6.07
	P.6. Dhar Jajjar Jakh	C.3b	13.35
	P.14. Reli	C.1b	17.81
	P.24. Ghangot	C.2b	14.16
	P.33. Cheli Harma	C. Whole	8.90
	P.43. Naural	C.1a	11.74
	P.55. Dhar Chabutra	C.4c	30.35
	P.XVIII. Jassai	C.2b	10.52
	P.XX. Malag	C.1b	4.85
	P.XXII. Kunah	C.1b	4.85
	P.XXIII. Loharkhar	C.1b	11.74
			134.34
2020-21	P.6. Dhar Jajjar Jakh	C.1b	30.35
	P.8. Samtana	C.2b	43.71
	P.14. Reli	C.1c	8.09
	P.17. Samaila	C.1b	10.93
	P.19. Kharal – I	C.2d	17.00
	P.29. Dabriana	C.3	10.12
	P.40. Dharara	C.4	12.55
	P.55. Dhar Chabutra	C.2b	21.85
	P.XVII. Beherer	C.1b	4.05
			158.65
2021-22	P.6. Dhar Jajjar Jakh	C.9a	19.42
	P.8. Samtana	C.2c	29.54
	P.16. Dhar Sidh	C.1b	17.40
	P.22. Gutiana Butiana	C.2b	7.28
	P.35 A. Kanoh	C.1	3.64
	P.43 Naural	C.2b	13.35
	P.55. Dhar Chabutra	C.2d	23.07
	P.XXVI. Hathol	C.2b	7.28
	P.XXVIII. Bhounti	C.3b	4.85

	XXVIII. Bhounti	C.3c	4.05
			129.88
2022-23	P.6. Dhar Jajjar Jakh	C.5c.	6.07
	P.14. Reli.	C.2c	23.47
	P.16. Dhar Sidh	C.2b	26.30
	P. 46. Mandhiani	C.1b	8.09
	P.48. Bajuri	C.2c	20.64
	P.55. Dhar Chabutra	C.3d	22.66
	P.XV. Kashmir	C.2c	3.24
	P.XVIII. Jassai	C.4b	4.86
	P.VII. Mandhiani	C.1b	15.78
	P.XXIII. Loharkhar	C.2b	8.09
			139.20
2023-24	P.1. Karot	C.1b	12.95
	P.5. Humal	C.2d	25.09
	P.6. Dhar Jajjar Jakh	C.4b	17.81
	P.13. Bara	C.2	9.71
	P.18. Bihru	C.3	13.76
	P.20. Kharal – II	C.2	13.35
	P.36. Dhar Kangar	C.1c	10.52
	P.47. Dhurkhar	C.1d	12.95
	P.XIII. Phahal	C.1b	11.33
	P.XIII. Phahal	C.1c	14.57
	P.XIV. Plassi	C.1b	3.24
	P.XVI. Dheli	C.1b	3.64
	P.XXVII. Basaral	C.1b	9.31
	P.XXXIII. Bodh	C.1b	15.78
			174.01
2024-25	P.2. Badhiana – II	C.3	4.86
	P.4. Cheli Metroh	C.2	6.88
	P.6. Dhar Jajjar Jakh	C.3a	7.28
	P.14. Reli	C.3b	46.94
	P.16. Dhar Sidh	C.4b	29.54
	P.24. Ghangot	C.1b	30.35
	P.32. Cheli Gumari	C.2	13.76
	P.38. AM. Platu	C.1b	12.55
	P.XV. Kashmir	C.2b	3.24
	P.XXI. Bandhera	C.1b	2.83
	P.XXVII. Basaral	C.2b	18.62

	P.XXIX. Galol	C.1a	5.26
			182.11
2025-26	P.1. Karot	C.2b	8.09
	P.3. Badhiana – II	C.2	2.83
	P. 6. Dhar Sidh	C.5b	14.16
	P.31. Khajjian	C.2b	10.52
	P.37. Bakroh	C.3a	4.05
	P.56. Tarlokpur	Whole	160.85
	P.XXI. Bandhera	C.1d	5.26
			205.76
2026-27	P.1. Karot	C.3b	6.48
	P.8. Samtana	C.3a	17.81
	P.12. Khilawat	C.2	15.38
	P.14. Reli	C.2b	24.28
	P.17. Samaila	C.2b	11.74
	P.21. Bijhri	C.2	8.50
	P.28. Desin	C.1b	6.88
	P.37. Bakroh	C.2b	10.93
	P.XV. Kashmir	C.3b	15.38
	P.XVIII. Jassai	C.3b	4.05
	P.XVIII. Jassai	C.1b	12.95
	P.XXV. Beha	C.2b	5.26
	P.XXV. Beha	C.1b	6.88
			146.12
2027-28	P.2. Badiana – I	C.2	9.71
	P.14. Reli	C.5a	17.00
	P. 19. Kharal – I	C.3b	11.33
	P.22. Gutiana – Butiana	C.1a	8.50
	P.23. Chalsai	C.3b	6.07
	P.26. Salan	C.2b	16.59
	P.36. Dhar Kangar	C.4b	10.52
	P.48. Bajuri	C.1a	12.54
	P.55. Dhar Chabutra	C.4b	8.50
	P.XV. Kashmir	C.4b	6.07
	P. XXIV. Batran	C.1a	3.64
	P.XXIV. Batran	C.1b	10.11
			120.58
		Grand Total	**1986.60**

2.21.2 FELLING SERIES – II: Keeping in view their legal status, difficulties are envisaged in securing closure in the forests belonging to this felling series. The felling sequence in these forests is therefore suggestive in nature and it may be altered by the Divisional Forest Officer.

2.21.2.1 FELLING IN P.B.I.:

Year	Forest	Area (ha)
2013-14	U.40. Ghalloun	8.432
	U.120. Kotla	10.789
	U. 165. Har	6.445
	U.294. Karour, C.2	4.317
	U.431. Darbeli	8.416
		38.399
2014-15	U.42. Bairi	23.027
	U.168. Akrana Raiputana	8.737
	U.269. Batran, C.4	3.763
	U.429. Chabot Brahmana C.1	7.879
		43.406
2015-16	U.Chamboh, C.6	26.247
	U.141. Lohani	10.900
	U.246. Beherara	7.257
		44.404
2016-17	U.244. Paniali, C.2	32.607
	U. 413. Dhanetar	11.206
		43.813
2017-18	U.35. Ropari	13.757
	U.248. Charara	5.874
	U.268. Hathol, C.2	9.687
	U.393. Banal	11.259
		40.577
2018-19	U.36. Uled Sidhu	11.705
	U. 71. Ghansuhi	4.640
	U.118. Jaral	17.854
	U.268. Hathol, C.4.	7.253
		41.452
2019-20	U.16. Kathera	6.223
	U.127. Chalsai, C.1	5.598

	U.134. Dalchera, C.2	10.630
	U.146. Baiiyah Khurd	15.003
		37.454
2020-21	U.17. Samtana Kalan, C.1	19.710
	U.129. Samaila, C.2	5.285
	U.385. Ropa	16.387
		41.382
2021-22	U.156. Desin. C.1	17.007
	U.255. Pansai, C.3	13.534
	U.424. Chunhal	5.511
		36.052
2022-23	U.116. Kalwal, C.2	2.171
	U.119. Chakmoh, C.3	6.579
	U.136. Chukhnyar	2.977
	U.243. Jiana, C.1	22.734
	U.425. Jatheri, C.1	10.369
		44.830
2023-24	U.51. Dhuklera	7.948
	U.57. Dhanedd	12.203
	U.62. Makkar, C.3	2.206
	U.69. Karer, C.1	8.572
	U.90. Bijhri, C.5	5.660
	U.139. Usnar Kalan, C.1	2.615
		39.204
2024-25	U.20. Thana	10.426
	U.50. Laleen, C.3	2.874
	U.53. U. Dhughara	3.976
	U.62. Makkar, C.2	2.518
	U.64. Bahl	2.219
	U.100. Khilawat, C.1	3.705
	U.115. Loharli	7.276
	U.119. Chakmoh, C.4	4.698
		37.692
2025-26	U.127. Chalsai, C.2	2.695
	U.134. Dalchehra, C.3	2.071
	U.268. Hathol, C.7	7.450
	U.377. Chabutra Khas, C.1	23.425
	U.430. Chunhal	11.093
		46.734

2026-27	U.106. Gharyani Jattan	31.964
	U.121. Chakrala, C.2	8.061
		40.025
2027-28	U.112, Reli	36.348
	U19. Chakmoh, C.5	2.603
		38.951
	Grand Total	**614.390**

2.21.2.2 FINAL FELLING CUM THINNINGS IN P.B.IV:

Year	Forest	Area (ha)
1	**2**	**3**
2013-14	U.22. Ukhli, C.1	9.313
	U. 90. Bijhri, C.1	7.036
	U.142. Loharkhar, C.1	9.894
	U.157. Plehra	9.144
	U.255. Pansai, C.4	4.294
	U.382. Chalokhar, C.1	10.579
		50.260
2014-15	U. 3. Amroh, C.2	9.422
	U.91. Kot, C.2	6.544
	U.149. Thana	9.042
	U.155. Ganoh Brahmna, C.5	7.621
	U.268. Hathol, C.1	8.593
	U.411. Dalwana Brahmna	12.685
		53.907
2015-16	U.3. Amroh, C.1	29.047
	U.84. Changar	6.159
	U.210. Gandholi	15.356
	U.214. Kohlwin, C.1	4.433
	U.353. Sialan Di Bahl	2.806
	U.383. Nakhrehd	13.033
		70.835
2016-17	U.83. Barla, C.1	2.864
	U.84. Dughiar, C.1	4.210
	U.205. Sunwin	32.390
	U.417. Jullani	12.576
		52.040
2017-18	U.87. Sohari, C.1	11.210

	U.151. Garli	4.915
	U.258. Kohlwin	3.801
	U.391. Kuhal	25.969
		45.895
2018-19	U.9. Bajroh, C.2	9.113
	U.102. Sathwin, C.3	3.853
	U.114. Bhater, C.2	3.538
	U.160. Tarandola	3.492
	U.175. Nauhal	15.609
	U.259. Sanahi Kalan	15.271
		50.876
2019-20	U.101. Bara	6.078
	U.147. Harma	10.209
	U.357. Bhaloon	3.323
	U.381. Tibbi	15.533
	U.407. Muthan Lokhariyan	8.449
		43.592
2020-21	U.2. Deyog	3.135
	U.50. Laleen, C.2	6.658
	U.184. Samlehra	14.250
	U.242. Sarehri	2.027
	U.405. Chowki	6.341
	U.434. Matani, C.1	20.234
		52.645
2021-22	U.108. Chalouli	35.950
	U.171. Kyota Brahmana	3.123
	U.406. Bhud	5.591
	U.422. Krust	5.886
		50.550
2022-23	U.6. Sain Da Ghat	6.951
	U.172. Kyota Rajputan	3.972
	U.225. Brahlri	13.056
	U.404. Bhatti	7.635
	U.434. Matani, C.2	3.671
	U.437. Kusar	6.554
		41.839
2023-24	U.178. Karsai	42.133
	U.183. Telkar	13.757
		55.890

2024-25	U.11. Baroh	7.535
	U.22. Ukhli, C.3	3.864
	U.97. Paplol Brahmna, C.1	2.930
	U.152. Kheri	2.987
	U.159. Kharota	7.754
	U.211. Mair.	6.003
	U.270. Chaloon, C.3	2.569
	U.427. Sihal Buhli	6.602
		40.244
2025-26	U.14. Palpal	3.037
	U.22. Ukhli, C.2	9.917
	U.68Panjarar, C.1	2.515
	U.158. Badloi	5.798
	U.161. Kothi	5.615
	U.206. Kudhar	6.731
	U.250. Dhagoh	9.534
		43.147
2026-27	U.24. Mansui Jhikii	7.783
	U.60. Dhanota	7.998
	U.72. Galoh, C.2	5.619
	U.85. Dughiar, C.2	4.038
	U.139. Usnar Kalan, C.2	2.478
	U.169. Gumarli	6.479
	U.202. Hareta, C.1	8.549
	U.270. Ghaloon, C.1	2.286
		45.250
2027-28	U.32. Lodhar	3.586
	U.43. Kasiri, C.3	7.825
	U.62. Makkar, C.1	2.475
	U.98. Paplol Hazaru	3.100
	U.155. Ganoh Brahmana, C.1	2.405
	U.156. Desin, C.2	4.619
	U.174. Lasmai	7.967
	U.272. Basaral, C.1	10.979
	U.408. Muthan Bhaiwallan	6.575
		49.531
	Grand total	**746.500**

2.22 SUBSIDIARY SILVICULTURAL OPERATIONS IN P.B.1: Details of the various subsidiary silvicultural operations to be carried out in P.B.I areas are given below.

2.22.1 DISPOSAL OF FELLING DEBRIS: Soon after the fellings are over, all felling refuse should be collected in heaps at safe places, away from the advance growth and the seed bearers and thoroughly burnt so as to provide a clean and receptive bed for the germination of seed.

Very often, the local people take away the debris for fuel who should be encouraged to do so. Collection and the burning of the debris should commence from top of the forest and progress downhill. Chips should be thoroughly raked to ensure complete burning. In areas where regeneration already exists and where final fellings are to be made no attempt to burning the felling debris should be made. In such places the refuse should simply be dumped in depressions and nalas so that the young growth is kept free of slash and lops and tops of felled trees. Detailed instructions on the subject are contained in the chapter 7 of the H.P. Forest Manual Vol. IV, which shall always be adhered to.

2.22.2 SUBSIDIARY FELLINGS: All marked trees left unfelled should be cut back before burning of the debris and allowed to be removed by the local people; the left overs should be burnt along with the felling refuse. The climbers, along with other unwanted growth, should be cut away.

2.22.3 WEEDING AND BUSH CUTTING: Weeds are normally not a serious problem in these forests except those of Nadaun range. Weedings are, however, very much necessary for the proper development and establishment of seedings and this operation should be given due importance. *Lantana, Ageratum*arethe main weeds observed and all such weeds and other bush growth in the regeneration areas should be cut repeatedly till the young plants become free from suppression. Ordinarily two weedings in the first year and thereafter one weedings each during rains for subsequent two – three years are considered necessary. All bushes ofcarissa and dodonaea need not be removed because side shade is often beneficial to the young seedlings but these must be free of over head shade.

2.22.4 CLEANINGS: Natural regeneration of chil is generally profuse and dense and cleanings must therefore commence early and repeated after short intervals to provide ample space to Seedling to make them grow rapidly.

Cleanings should start at the age of three when the saplings reach a height of app. one m. and spaced about one m. apart. The vigour and quality of saplings should get more consideration than spacing. Second cleanings should be carried out when the crop is about 2m. high at which time it will be spaced about 3m. apart. Cut material, unless required by the villagers will be collected at open spaces or in nallas and burnt in order to reduce the fire hazard. Early cleanings will reduce the cost of other tending operations like pruning and bush cutting. Proper spacing at the time of cleanings will obviate the necessity of carrying out early unsaleable thinning.

2.22.5 SOWING AND PLANTING: Chil regeneration is plentiful in the locality if adequate protection against fire and grazing is ensured. However, in some lower areas especially in Nadaun range where the conditions are not so favourable, artificial regeneration will have to be resorted to. After the seeding – fellings, subsidiary fellings and the debris burning, the area will be immediately taken up for planting. Chil seedlings raised in polythene bags will be planted in July – August. The nursery and plantation techniques of chil are now well established and understood by the field staff. The planting should not be left entirely to the labor and must be carried out under the supervision of trained personal. Proper care in handling of the seedlings during transportation and timely planting during early monsoon are of vital significance. Collection of seed should be given due consideration so that the bestquality seed, only from the selected stems is utilized. Properly aligned inspection paths in all the regeneration areas where these do not exist should invariably be constructed.

2.22.6 CULTURAL OPERATIONS IN P.B.IV: Tending operations, such as cleanings and thinning, shall be carried out in the dense crops. The available material, if not saleable, should be used departmentally / given to right holders. Non – sale ability of such material should not be taken as an excuse to neglect these operations, as these are necessary to reduce the fire hazard.

2.22.7 CONTROL BURNING: The areas under regeneration will be control burnt only when saplings reach the height of 1.5m. The instructions are contained in chapter “Protection against damage by fire” in H.P. Forest Manual Vol. IV.

2.23 CLOSURES: All P.B.I. seeding felling area shall be closed to grazing by proper fencing immediately after the felling is over and in cases where area could not be felled due to ban on green

fellings, the year subsequent (s) to the year prescribed for felling and shall remain closed for about 30 years. Though, the regeneration period is 30 years, it will not be always necessary to ensure closures for the full regeneration period as chil saplings are beyond the damage within a period of 10 – 15 years. In the case of the UPFs, steps to complete the necessary codal formalities for closures must be taken well in advance so that the closures are duly notified before commencement of regeneration operations. Besides PB-I areas other blanks / poorly stocked areas in all the PB's of this Working Circles are to be closed for regeneration / plantation activities to increase the overall growing stock.

2.24 GRASS CUTTING AND GRAZING: Grass cutting will be prohibited in all the P.B.1 areas after commencement of regeneration operations till the young crop is beyond the stage of damage, i.e. about 50 cm and up. Grass cutting shall be allowed to be carried out under the strict supervision of the forest guard so that seedlings are not cut along with grass. Grazing shall be strictly prohibited in the regeneration areas till the regeneration reaches a height of more than one meter. After that light cattle grazing (not goat) should be permitted to reduce. Inflammable grasses. Unrestricted grazing should not be allowed till regeneration is fully established.

2.25 FIRE PROTECTION AND CONTROL BURNING: Chil forests are more vulnerable to the risk of forest fires than any other type of forests. Considerably large areas of chil forests get burnt every year. In case of severe fires, even the well regenerated pole crops receive serious set – back. Therefore, it is most essential that forests allotted to this Working circle are adequately protected against fire. The control burning is the most important operation and should never be neglected. However, if need arises the control burning can be carried out earlier also with prior permission of Conservator of Forest. Detailed instructions on control burning are contained in the H.P. Forest Manual Vol. IV and are summarized below:-

(i) The control – burning should be done always during winters, in January – February.

(ii) Burning should progress from up hill to down hill in calm weather and special care should be taken to keep the line of fire as straight as possible and under control.

(iii) To fire should start along the ridge, a cleared path or specially – cleared lines.

(iv) Chil needles and other inflammable material should be fully raked to ensure thorough burning.

(v) In forests under resin – tapping, it must be ensured that ail chips, fallen resin, needles etc. are cleared about 1.5m. away from the base of the trees by the resin coolies.

(vi) Cleanings and early thinning in young regeneration areas must be completed before the control burning.

(vii) Burning shall be done always under strict supervision and control of the executive staff and shall never be left to engaged labour.

(viii) The existing fires lines should be properly maintained and kept clear. The roads bridle paths and inspection paths must be kept clear of all inflammable material so as to act as fire lines.

(ix) Sufficient number of trained fire watchers should be employed during the fire season to help the field staff and provided with necessary equipments. No felling operations, even to the right holders, should be allowed during the fire season.

It is, however, to be noted that areas under regeneration should not be control burnt until the regeneration reaches a height of about 1.5m. In such areas, however, the grass cutting / needle collection by right holders be encouraged.

The control burning will also form a part of control forms and deviation reflected there in very clearly giving reasons.

2.25.1 PROGRAMME FOR CONTROL BURNING: It is prescribed that in case any of the area could not be control burnt in the prescribed year, it should be control burnt in the following year(s). In case of area getting burnt itself, the control burning should be decided by the D.F.O. on merits of the case. It is also prescribed that D.F.O. should add other areas also, not prescribed here, to the control burning programme depending upon their requirements.

2.25.2 FIRE MAPS: All cases of fires should be promptly reported giving the extent of damage. A tracing of all the burnt areas, 0.4 ha. And above in extent, should be prepared on 16”=1mile and sent along with the report; copy also being placed in the respective compartment history files.

2.25.3 MONITORING: It is also prescribed that the fire prevention measures will be monitored by A.P.C.C.F. (Protection) / A.P.C.C.F. (W.P. & Settlement).

2.26 RESIN TAPPING: As per latest instructions of 2007, the minimum tappable dia is 35 cm. The tapping is to be done by Rill method only. The enumerations are to be carried out every 5 years/as per prevailing instructions. In case drying up of trees due to resin tapping if observed in some forest it should

be immediately closed for tapping. Retapping in such forests should be taken up after a minimum period of three years only after the reasons for drying up of trees and analysed and effective steps to preventrecurrence taken. Complete record in this respect will be maintained at divisional level. However, following points require special attention:

(i) Rider should not be allowed to be removed/adjusted so that freshening knife is not able to make rills deeper than 2 mm.

(ii) Width of rills should remain within prescribed limit of 6 – 7 mm so that inter rill back does not become fragile and consequently break.

(iii) The total size of the blaze should remain within prescribed limits of 36 – 38 x20 cm. and no. of rills in a season should not exceed 32.

(iv) New channel should be started only after the previous one has been tapped for 4 -5 years and intervening space between two adjoining channels should not be less than 7.5 cm.

(v) Strict supervision should be exercised over the concentration of acids stimulants since higher concentration can irreparably damage the tissue thereby adversely affecting the process of healing.

2.27 RIGHT HOLDER'S DEMAND FOR T.D.: T.D. should be marked preferably from Final Felling (P.B.I.) and P.B.IV (removal of overwood) areas. Silviculturally available trees from such areas should be marked for T.D. irrespective of their year of felling. No T.D. grant should be made from P.B.II areas. Requirements for T.D. for next 15 years is anticipated at 4000 m3 per year.

2.28 SALVAGE REMOVALS: The qualitative and qualitative norms for salvage marking fixed vide PCCF memo no. Ft. 116 – 84/71 (S)Part. Add. Mob. Dated 10.5.1997 are appended. These be followed in letter and spirit. The fire burnt chil trees should not be taken as dry or dead until there is no sign of revival till end of September of the year of fire.

2.29 REGENERATION ASSESMENT SURVEYS: The regeneration assessment surveys of the felled P.B.I areas will be done every alternate year for at least 10 years. The reports be placed before the review committee of the Govt. of India of the time of periodic reviews.

****

CHAPTER – III

THE COPPICE WORKING CIRCLE

3.1 GENERAL CONSTITUTION AND CHARACTER OF VEGETATION: This working circle comprises of predominately khair and scrub/miscellaneous broad leaved forests which were managed under the same working circle in the plan under revision:

These generally carry bushes and an overwood consisting of a varying proportion of broad leaved trees. Chil trees are occasionally found mixed with the scrub and occur either singly or in small groups. The stocking varies considerably and in typical scrub areas, is generally dense and the brushwood completely covers the ground. The trees of overwood are branchy and mature and have extensive crown. In drier localities the tree growth is very much limited and whatever exists, is stunted. A reasonably good number of areas being allotted to this working circle carry almost pure young khair crops raised artificially during last about 25 years. Few areas are very much degraded and almost blank. Total area of this working circle is 2080.83ha.

3.2 BLOCKS AND COMPARTMENT: The boundaries of the forest blocks remain the same as in the previous working plan. The compartments and sub – compartments also remain the same.

3.3 FELLING SERIES: Like the Chil Working Circle, this working circle too will have two felling series viz;

i) Legal Closure Felling Series (Felling Series – I) comprising of the DPFs and

ii) Voluntary Closure Felling Series (Felling Series – II) comprising of UPFs.

3.4 SPECIAL OBJECTS OF MANAGEMENT: The special objects of management will be as under:

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

ii) To increase the economic value of the forest by planting more valuable species.

iii) To meet the bonafide demand of the local people for fodder, fuel and timber,

iv) Consistent with above to obtain progressively increasing yield of khair wood, fuel wood, fodder, timber and other non – timber forest produce.

3.5 AREA AND ALLOTMENT: The distribution of area in different ranges is tabulated below:-

Sr. No.	Range	Class of Forest		
		D.P.F.	**U.P.F.**	**Total**
1.	Aghar	-	-	-
2.	Barsar	227.43	118.30	345.73
3.	Bijhri	-	-	-
4.	Hamirpur	-	-	-
5.	Nadaun	1586.30	148.80	1735.10
	Total	**1813.73**	**267.10**	**2080.83**

3.6 ANALYSIS AND VALUATION OF THE CROP:

3.6.1 STOCK MAPS: Stock maps for all the compartments have been prepared on (1:15,000) scale and placed in respective compartment history files.

3.6.2 SITE QUALITY: Site quality has not been determined for these forests.

3.6.3 DENSITY: Density of the compartment has been estimated ocularly and recorded in the respective compartment history files.

3.6.4 ENUMERATIONS: Partial enumerations to the extent of 5% in forests carrying good number of khair trees and 5% in forests carrying very few khair trees has been carried out. Enumeration of khair has been carried out in 5 cm diameter classes and that of chil and other broad leaved species in 10 cm diameter classes, down to 10 cm. The growing stock of coppice working circle is tabulated below:-

Species	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total	Volume
Chil	1682	9036	9403	5466	393	137	17	0	0	26134	21162.31
	134.60	2801.14	7992.714	8636.25	1001.81	511.07	84.72	0	0		21162.31
Khair	194862	240102	28466	2571	145	0	0	0	0	466146	53943.48
	15588.97	74431.52	24195.93	4061.74	370.23	0.00	0.00	0	0		118648.39
BL	27748	24990	6064	2408	581	196	17	0	9	62013	12142.314
	1775.90	4598.12	2534.68	2131.48	879.85	450.62	54.54	0.00	27.27		12452.45

3.7 SILVICULTURAL SYSTEM: The forests allotted to this circle will be managed under coppice with standards system. The standards serve the purpose of safeguarding against erosion and frost. Besides these to meet the requirement of right holders for fodder and timber. The regeneration will be by coppice supplemented with artificial planting. The natural regeneration of seed origin if any will also be relied upon.

3.8 ROTATION: Rotation of 30 years for coppice and 90 years for standards is prescribed.

3.9YIELD CALCULATION AND CONTROL: Yield shall be regulated by area.

Total area of working circle for felling series – I and II is 1813.73 and 267.10 ha. respectively. Keeping in view, the rotation period of 30 years, an annual target of 40 ha and 6 ha is therefore being prescribed for felling series – I and II, respectively.

Average out turn of fuelwood is expected to be 100 qtls. Per ha. this, however, is an estimation only and will not be controlled.

The control of yield will be by area and annual deviation of up to 25% and with a maximum of 10% for each 5 year block will be permissible.

3.10 METHOD OF EXECUTING FELLINGS: Fellings will be carried out in accordance with the following rules:-

i) The area will be properly delimited before carrying out markings.

ii) Entire area shall be felled retaining about 30 – 50 trees per ha. as standards.

iii) The standards should be middle aged, healthy and vigorously growing with well developed crown and suitably staggered (1 – 2 crown width apart depending upon aspect and slope). These should preferably be of timber and fodder species.

iv) Trees of any size and species within 6 m of nalas, roads and slips shall be retained.

v) All trees to be retained will be numbered, white band put over them with paint, list prepared and recorded.

vi) Khair trees above 15 cm d.b.h. only shall be marked for felling unless required to be retained as standards/on vulnerable locations. These shall be listed and recorded.

vii) No khair trees will be felled unless marked for felling.

viii) All the marked trees should be felled by giving sliding cut 9" above the ground, so that it can coppiced well and trees should not be cut flush to the ground, which do not coppice well.

ix) Chil and Dho will not be felled irrespective of size. These will count towards standards, if more than 20 cm in d.b.h.

x) No bamboo clumps shall be felled.

xi) The felling should be completed by 28th Feb. and conversion by 31st. March. The converted material should be carried out of forest area by 30th June. The converted material should not be stacked over stumps.

3.11 SEQUENCE OF FELLINGS: Out of a total area of 2080.83ha. allotted to this working circle, 661 ha. Area is prescribed for felling programe. Because there was no felling during the period of expired working plan, so felling programme remains unchanged. The felling programme is suggested as under. This can, however, be changed with the prior permission of Add.P.C.C.F. (W.P. & Settlement).

3.11.1 Felling Series – I:

Year	Name of Forest	Comptt.	Area (ha.)
1	**2**	**3**	**4**
2013 – 14	P.IV. Sitla Bag	C.1a	6.07
	P.XXXVI. Jihn	C.3a	33.59
			39.66
2014 – 15	P.VI. Bhadrun	C.1a	4.05
	P.XI. Raisara Panjarara	C.2a	6.07
	P.XXXII. Naungi	C.1a	14.57
	P.XXXIV. Tahrar	C.2a	5.26
	P.XXXVII. Kuthera	C.1c	5.66
			35.61
2015 – 16	P.IV. Sitla Bag	C.2a	6.07
	P.VIII. Bandhera	C.1a	2.83
	P.X. Sadoh	C.1a	8.09
	P.XI. Raisara Panjarara	C.5a	8.09
	P.XXXV. Rira Johri	C.6a	8.09
			33.17
2016 – 17	P.1X. Mansai	C.1a	11.74
	P.XI. Raisara Panjarara	C.6a	6.07
	P.XXXII. Naungi	C.3a	17.81
	P.XXXV. Rira Johri	C.4a	6.07

			41.69
2017 – 18	P.V. Bathrun Bassi	C.2a	5.26
	P.XI. Raisara Panjahra	C.7a	4.05
	P.XXXV. Rira Johri	C.1a	5.26
	P.XXXVI. Jihn	C.5a	24.28
			38.85
2018 – 19	P.IV. Sitla Bag	C.3a	4.45
	P.XXXII. Naungi	C.4a	13.35
	P.XXXV. Rira Johri	C.2a	22.66
			40.46
2019 – 20	P.V. Bathrun Bassi	C.1b	9.31
	P.XXXII. Naungi	C.5a	22.66
	P.XXXVII. Kuthera	C.1a	4.86
			36.83
2020 – 21	P.III. Bharartha	C.1c	6.07
	P.X. Sadoh	C.1b	6.07
	P.XI. Raisara Panjarara	C.8a	8.90
	P.XXXVI. Jihn	C.1a	18.62
			39.66
2021 – 22	P.V. Bathrun Bassi	C.1a	8.09
	P.1X. Mansai	C.2a	4.86
	P.XI. Raisara Panjahra	C.9a	10.52
	P.XXXII. Naungi	C.6a	14.57
			38.04
2022 – 23	P.XXXII. Naungi	C.2c	19.42
	P.XXXV. Rira Johri	C.5a	14.57
	P.XXXVIII. Kuthar	C.1a	6.47
			40.46
2023 – 24	P.II. Badoli Bhagaur	C.1a	5.26
	P.IV. Sitla Bag	C.1b	6.07
	P.XXXII. Naungi	C.2a	22.66
	P.XXXV. Rira Johri	C.7a	4.86
			38.85
2024 – 25	P.1. Kitpal	C.1a	8.50
	P.XXXIV. Tarhar	C.1b	26.71
	P.XXXV. Rira Johri	C.3a	2.83
			38.04
2025 – 26	P.IX. Mansai	C.2b	6.07
	P.XI. Raisara Panjahra	C.8b	8.09

	P.XXXVI. Jihn	C.5c	27.11
			42.08
2026 – 27	P.XI. Raisara Panjahra	C.9b	9.71
	P.XXXV. Rira Johri	C.4b	8.90
	P.XXXVI. Jihn.	C.6b	21.85
			40.46
2027 – 28	P.XI. Raisara Panjahra	C.5c	12.14
	P.XXXVI. Jihn	C.8c	22.66
	P.XXXVII. Kuthera	C.1b	4.86
			39.66
Grand Total			**583.52**

3.11.2 FELLING SERIES – II: Keeping in view their legal status, difficulties are envisaged in securing closures in the forests with the consent of the right holders belonging to this felling series. The felling sequence in these forests is therefore being left to the discretion of the Divisional Forest Officer subject to stability of the yield.

Forest	Comptt.	Area (ha)
U.341. Amlehroo	-	6.888
U.329. jangal	2	2.461
U.276. Mandhyani	2	9.294
U.310. Dabbar	-	2.960
U.300. Nagharda	1	2.607
U.316. Dhanpur	-	10.158
U.326. Bhadetar	-	7.612
U.361. Jandli Gujran	-	17.902
U.314. Palyal	-	3.290
U.321. Choa Chakrala	-	3.607
U.362. Bhalaur	-	10.725

3.12 SUBSIDIARY SILVICULTURAL OPERATIONS: The following subsidiary silvicultural operations shall be carried out.

3.12.1 CLEARING OF THE FELLED AREA: All the tree and shrub growth other than the standards and the young growth required to be retained, shall be felled. After the main felling, the villagers should be encouraged to remove the cut brushwood and other unwanted bushes. All unsaleable material should be dumped in depressions and nallas. The rank growth of *Lantana, Carissa, Dodonea* etc. must be cleared off the area and cut material be stacked in heaps spreading suitably in the area and burnt.

3.12.2 ARTIFICIAL REGENERATION: The area should be planted in the year of following the one in which it is worked. Planting will be done at a distance of 3mx3m. The earth work must be completed during March – April. The choice of species will be as under:-

i) In the depressions and pockets with good soil depth and gentle slope – Kachnar, Harar, Bahera, Amla, Darek, Albizzia, Popular, Tun, Eagle, Ritha etc.

ii) On moderate slopping pockets – Khair, Drek, Ritha, Ohi etc.

iii) On refractory pockets – Kainth showing (patch sowing) and Peache should be grafted on natural plants to increase food value of the forest.

iv) On slips – Ailanthus, Wendlandia, Exerta and Kudzuwine.

3.12.3 WEEDING, BUSH CUTTING, CLEANING AND THINNINGS: Weeding and bush cutting shall be carried out twice in the first year and once in subsequent years for at least 3 – 4 years of save the seedlings from being smothered by the profuse growth of coppice shoots, grass and shrubs. Climbers will be stubbed out completely. Thinning of coppice shoots to two per stool should be carried out during third year of coppice felling. In the 8^{th} to 10^{th} year, singling of coppice shoots will be carried out. Clearing including thinning shall be done as per requirement of the crop after getting the programme approved as laid down in para 4.12.6.

3.12.4 GRASS CUTTING: The right holders will be allowed grass cutting from closed areas in the month of October, November when grass seed ripens only under proper supervision till the plants grow above grass height, so that the plants are not cut along with grass.

3.12.5 CLOSURES: Plantation has to be carried out only after the closure has been notified. No area will be marked unless papers for closures have been prepared. A period of 10 years is considered sufficient for establishment of the plantations after which these can be thrown open for grazing. Besides these areas other blanks / poorly stocked areas of this Working Circles are to be closed for regeneration / plantation activities to increase the overall growing stock.

3.13 INTERMEDIATE FELLINGS: A rotation of 30 years for coppice and 90 years for standards has been prescribed. The removal of standards and has been prescribed. The removal of standards and mature khair trees as well as thinnings may be necessary in the intermediate period. The guiding principle for

thinnings will be overlapping of more than one third crown. First thinning will be required when the trees planted at 3x3 m. in spacing are of 10 years of age. Crop dia at this age of khair will be about 10 cm. At this age mechanical thinnings to space them to 3x6 m will be required and thinnings will also be mechanical in nature to space the trees to about 6x6 m. This will be required at the age of about 20 years. Average crop dia for khair at this stage will be about 18 – 20 cm. Third thinning will be at about 30 – 35 years of age and will be decided depending upon the more than one third overlapping of the crown.

A separate felling scheme for thinnings may be got approved by the Divisional Forest Officer. The proposals in this regard will be made by D.F.O. in the years 2014-15, 2015-17-18, 2020-21, 2023-24, 2027-28 and got approved from the competent authority though proper channel.

3.14 REGENERATION ASSESMENT SURVEY: The regeneration assessment surveys will be carried out every year after felling till a period of 5 years and various reports be placed before the review committee of the Govt. of India.

****

CHAPTER – IV

THE PLANTATIONWORKING CIRCLE

4.1 GENERAL CONSTITUTION AND CHARACTER OF VEGETATION: The working circle includes:

i) All the plantations raised in the forest areas during the currency of the working plan under revision, , which are blank, poorly stocked and which have been considered yet not established and so or unfit for allotment to other (Chil or Coppice) Working Circles.

ii) The areas both in demarcated protected forests and undemarcated protected forests, which are under Chil working circle or Coppice working circle and are blank, poorly stocked , weed infested or having miscellaneous scrub growth shall also be taken keeping in view the needs of the local population and of the silviculturally suitability. As per the assessment made during 2013, regarding the status of invasive alien species in the division, about 5280 ha of area is infested with lantana, ageratumand parthenium species. These weed infested areas in all Working Circles shall be taken up for removal and regeneration / plantation activities.

4.2 BLOCKS AND COMPARTMENTS: The boundaries of the forest blocks remain the same as in the previous working plan. The compartment and sub – compartments also remain the same.

4.3 PLANTATION SERIES: There will be two plantation series as per legal status of the forests with regard to closures as described below:-

i) Legal Closure Plantation Series (Plantation Series – I) comprising of the DPFs.

ii) Voluntary Closure Plantation series (Plantation Series – II) including the UPFs, closure in which is purely voluntary.

4.4 SPECIAL OBJECTS OF MANAGEMENT: The special objects of management for these forests shall be as under:-

i) To nurse the young plantation and natural young growth under a systematic regime of cleanings and thinnings.

ii) To stock the existing blanks and the areas under scrub growth and weed infestations with species of higher utility and economic value.

iii) To meet the requirements of local population for fuel, fodder, fruits, small timber etc.

4.5 AREA AND ALLOTMENT: Besides overlapping areas, the distribution of the area (ha), which was the part of the plan under revision, in different ranges is tabulated below:-

Sr. No.	Range	Class of Forest		
		D.P.F.	U.P.F.	Total
1.	Aghar	8.90	535.95	544.85
2.	Barsar	----	507.22	507.22
3.	Bijhri	48.97	408.67	457.64
4.	Hamirpur	32.38	766.05	798.43
5.	Nadaun	69.57	716.72	786.29
	Total	159.82	2934.61	3094.43

4.6 ANALYSIS AND VALUATION OF THE CROP:

4.6.1 STOCK MAPS: Stock maps for all the compartment have been prepared on (1:15000) scale and placed in the respective compartment history files.

4.6.2 SITE QUALITY: Site quality has not been ascertained for these forests.

4.6.3 DENSITY: Density of the compartment which carry some crop has been estimated occularly and recorded in the respective compartment history files.

4.6.4 ENUMERATIONS: The following forest of plantation working circle have been enumerated and the results of the same has been extrapolated. Felling Series I: P.18. Jassai. C4c & C.4d, Felling Series II: UPF.1. Hanoh, UPF.5. Beri Brahamana, UPF.387. Kalsi, UPF.394. Khuban, UPF.77. Khansra, UPF. 140 Unsar Kalan, UPF.198. Machleri, UPF.143. Baggi.

4.6.5 GROWING STOCK OF PLANTATION WORKING CIRCLE:

Felling Series I

Species	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total	Vol.
Chil	3263	3408	1081	811	707	312	499	125	0	**10204**	**9577.15**
Khair	4406	2723	249	42	0	0	0	0	0	**7419**	**1474.13**
Shisham	62	125	0	0	0	0	0	0	0	**187**	**25.94**
BL	13259	3242	166	21	0	21	0	0	0	**16709**	**1580.72**

Felling Series II

Species	V	IV	III	IIA	IIB	IA	IB	IC	ID	Total	Vol.
Chil	120797	112802	90192	25858	13491	3748	3123	500	0	**370511**	**228539.06**
Khair	20612	9494	125	0	0	0	0	0	0	**30231**	**4698.22**
Shisham	8744	4622	500	125	0	0	0	0	0	**13991**	**1728.51**
BL	6121	3623	1374	625	125	250	0	125	125	**12367**	**3745.59**

Total Growing Stock present in this Working Circle is as under

Species	Growing stock (m3)
Chil	238116.21
Khair	6172.35
Shisham	1754.45
BL	5326.31
Total	**251369.32**

4.7 SILVICULTURAL SYSTEM: Need of prescribing any silvicultural system is not felt as no fellings are required.

4.8 CHOICE OF SPECIES: Requirements and demand of the local people must get preferenceover the economic value of the species to be raised subject, of course to the site suitability.

Species yielding fuel, fodder, small timber, fruit and plants of Medicinal value such as dhaman, kachnar, ohi, mulberry, leucaena (subabul), drek, dheu, kikar, harar, behera, amla, ritha and bamboos will be planted in the areas close to the habitations. In other areas species like poplar, shisham, siris, semal and khair may be raised according to the suitability of the site. Planting of chil and safeda should be discouraged.

4.9 ANNUAL TARGET: Approximate areas, which was also of the plan under revision, to be planted during the plan and corresponding annual targets are as under:

Planting Series	Area to be Planted (ha)	Annual target (ha)
I	105	5-10
II	375	25

Therefore annual target of 7.00ha. and 25.00ha, for plantation series No. I and II, respectively are proposed under ANR and enrichment components.

4.10 TREATMENT OF EXISTING PLANTATIONS: All existing young plantation must be strictly protected and tended properly. Maintenance operation such as fence repair, weeding, bush cutting and beating up of failures should be carried out for a minimum period of 5 years. Chil plantation must be control burnt during the month of December pruned and thinned as per the requirement of the crop.

4.11 NEW PLANTATION, METHODS OF ESTABLISHMENT ETC: Only few areas allotted to this working circle are blanks in the true sense. Most of them carry scattered to open crop of chil and miscellaneous scrub species and/ or sapling to young crop of natural origin or some failed plantations. Besides this, heavy infestation of weeds mainly lantana, parthenium and ageratum has hampered the regeneration both natural and artificial, to a larger extent and thus resulted in large chunk of unutilized land. Emphasis has therefore to be at removal of weeds and the enrichment of under – stocked / poorly stocked areas though gap planting rather than a mechanical method of planting 1100 plants/ha at a spacing of 3x3 m resulting in under planting which has actually been observed having been done in the past. Number of plants to be raised per ha shall very from area to area and this decision should not be left entirely to the labour and Forest Guard. This assessment must be made before closure of the area by at least at Range Officer level and nursery stocked raised accordingly. It should be ensured that only the sturdy nursery stock of proper size, height and other specifications is planted in the field. Another important factor is timely planting and careful transportation. Advantage must be taken of the potential of area to regenerate through coppice shoots, root suckers etc. while making such assessment. The requirement of grazing and grass cutting of right holders must be given due consideration while selecting the site. The plantstions in Chil WC and Coppice WC will be as per the prescription made under paras 2.22.5 and 3.12.2 respectively

4.12 NOTIFICATION OF CLOSURE: Every area to be taken up for plantation should be notified for closure one year in advance. The period of closure may be of 10 years, depending upon the growth of the crop.

4.13 FENCING: All plantation areas will be effectively fenced with a 3 – strand barbed wire. The material available in bush cutting could also be arranged along this fence, which will act as psychological barrier. The fixation of the barbed wire should be on the opposite side both for the same stand on adjoining poles and for the adjoining standard on the same pole.

4.14 SITE CLEARANCE: The site will be cleared to bushes and other unwanted growth only to the extent absolutely necessary. However, on hot aspects, staggered bushes of *Dodonea. Flacourtla, Pyrus* etc. should be left to afford side shade. The shrubs should be allowed to be removed by the villagers.

4.15 ADVANCE WORKS: Pits of the standard size (30 cm x 30 cm x 30 cm for chil and 45 cm x 45 cm x 45 cm for broad – leaved) should be dug about 3 – 4 months in advance and the soil heaped on the lower side of the pit. This helps in weathering and improvement of the soil.

4.16 MAINTENANCE OPERATIONS: The after – care and maintenance of the plantations is of utmost importance, as most of the species to be raised are very palatable and may become the first target of the cattle. Failures should be beaten up for 2 years. Weeding, bush climber cutting etc. may be required for 3 – 4 years. The fence must be kept always well intact.

4.17 CLEANING AND THINNINGS: There is no necessity of cleanings and thinnings in most of the existing young plantations at present. These may be carried out in future, wherever considered necessary. Special programme in this respect be made by D.F.O. (T) in the years2001 – 02, 04 – 05, 07 – 08, 10 – 11 and 13 – 14. The programme be made after listings all compartments/ sub – compartments allotted to this working circle and should cover all the areas requiring cleaning / thinning operations.

4.18 OTHER REGULATION: The other regulations for plantation areas will be as under:

4.18.1 CLOSURES: All areas taken up for planting will remain close to grazing for a period of 10 years, a period normally sufficient for establishment of the plantations. Grass – cutting may be allowed after about 5 – 6 years depending upon growth of the plants / saplings.

4.18.2 SUITABILITY/TREATMENT MAPS: These maps will be prepared for each area before taking up for artificial regeneration. These will indicate broadly the type of rock, soil and its depth, along with the species with which different parts of the area are to be stocked.

4.18.3 FIRE PROTECTION: All old and new plantations must be protected against fires. To this end, fire watchers during the fire – season may be engaged wherever considered necessary. 5m – 6m. Wide strips around fire tender plantations and at 100 m intervals within plantation areas be kept clear of inflammable material. These will act as fire lines. All the plantation areas be made accessible by constructing inspection/ bridle paths to facilitate fire fighting works. A special budget be provide these purpose.

4.19 PLANTATION PROGRAMME:

4.19.1 PLANTATION SERIES – I

Year	Forest	Comptment	Area (ha)
2013 – 14	P.48 Bajuri	C.3b	5
	P.15. Kalwal	C.4	5
2014 – 15	P.19 Kharal 1	C.1a	5
	P.14. Relli	C.2d	5
2015 – 16	P.19 Kharal 1	C.1a	5
	P.15. Kalwal	C.1	5
2016 – 17	P.8 Samtana	C.1b	5
	P.14. Relli	C.2c	5
2017 – 18	P.48 Bajuri	C.3c	5
	P.14. Relli	C.4d	5
2018 – 19	P.48 Bajuri	C.3c	5
	P.19. Kharal	C.2a	5
2019 – 20	P.XXVI Hathol	C.1b & C.1c	5
2020 – 21	P.19 Julah Bahal	Whole	5
2021 – 22	P.19 Kharal 1	C.1b	5
2022 – 23	P.48 Bajuri	C.3d	5
2023 – 24	P.19 Kharal 1	C.1d	5
2024 – 25	P.19 Kharal 1	C.1d	5
2025 – 26	P.19 Kharal 1	C.1d	5
2026 – 27	P.19 Kharal 1	C.1b	5
2027 – 28	P.19 Kharal 1	C.1a	5

4.19.2 PLANTATION SERIES – II: Besides overlapping suitable areas, out of a total area of 2935.24 ha. allotted to this working circle, only 375 ha. area detailed below can be categorized as blank requiring planting of 1100 plants /ha and the remaining area which have already been planted during last 20 years may require at the most gap planting in gaps created due to salvage marking , lantana eradication programs, fire, drought to enrich the existing stocking. On an average approximately 250 ha shall have to

be planted annually.Besides this, areas which are weed infested also required to be planted after its scientifically uprooting. There is however, no restriction on planting more area per annum. No definite sequence of planting is however being laid down because the closures are voluntary and it is being left to the discretion of Divisional Forest Officer to plant these depending upon availability of voluntary closures with the concent of people.

Year	Forest	Comptment	Area (ha)
2013 – 14	Hanoh	C.1 & C3	15
	Nalwar	Whole	10
2014 – 15	Kariana	Whole	15
	Nalwar	Whole	10
2015 – 16	Khazian	C1	15
	Nalwar	Whole	10
2016 – 17	Pansai	C.2	15
	Sariana	Whole	10
2017 – 18	Bandhar Chabutra	Whole	15
	Sariana	Whole	10
2018 – 19	Guhar	Whole	15
	Jangli	Whole	10
2019 – 20	Sanani	Whole	15
	Ghumarth	Whole	10
2020 – 21	Baloh	Whole	15
	Smeila	C.1	10
2021 – 22	Chakmoh	C.1	15
	Bahl Nalochan	Whole	10
2022 – 23	Khatwin	Whole	15
	Batiana	Whole	10
2023 – 24	Dadyahu	Whole	15
	Batinana	Whole	10
2024 – 25	Bijhari	C.3	15

	Tanger	Whole	10
2025 – 26	Ganoh Rajputan	Whole	15
	Bahl Thakroo		10
2026 – 27	Bharratha	Whole	15
	Jajri	Whole	10
2027 – 28	Baddhar	C.1	15
	Smeila	C.2	10

4.20 PLANTATIONS AND NURSERIES: Abstract of **a**rea planted w.e.f 1970 – 71 to 2012 – 13 is given in table below. However block and beat wise detail of plantation has been appended in Appendix – XXII (Page - 440).

Abstract of Plantations

S.No.	Year	Area in Ha.
	1970 – 1971	337.50
	1971 – 1972	306.00
	1972 – 1973	446.30
	1973 – 1974	330.80
	1974 – 1975	245.30
	1975 – 1976	206.00
	1976 – 1977	499.70
	1976 – 1977 (By Soil Conservation)	121.00
	1977 – 1978	113.50
	1977 – 1978(By Soil Conservation)	186.00
	1978 – 1979	222.50
	1978 – 1979 (By Soil Conservation)	62.50
	1979 – 1980	403.00
	1979 – 1980(By Soil Conservation)	28.00
	1980 – 1981	318.40
	1980 – 1981 (By Soil Conservation)	58.00
	1981 – 1982	375.96
	1982 – 1983	407.46
	1983 - 1984	498.78
	1984 – 1985	319.00
	1985 – 1986	640.67

	1986 – 1987	595.00
	1987 – 1988	434.00
	1988 – 1989	918.75
	1989 – 1990	943.80
	1990 – 1991	328.00
	1991 – 1992	412.62
	1992 – 1993	306.00
	1993 – 1994	738.80
	1994 – 1995	564.00
	1995 – 1996	686.50
	1996 – 1997	525.50
	1997 – 1998	683.00
	1998 – 1999	725.70
	1999 – 2000	662.00
	2000 – 2001	596.23
	2001 – 2002	578.03
	2002 – 2003	298.47
	2003 – 2004	181.35
	2004 – 2005	428.50
	2005 – 2006	566.21
	2006 – 2007	489.16
	2007 – 2008	242.55
	2008 – 2009	425.00
	2009 – 2010	453.60
	2010 – 2011	642.00
	2011 – 2012	330.18
	2012 – 2013	373.74

PICTORIAL ILLUSTRATION OF PLANTATION ACTIVITIES

Plantation Works at P.16. Dhar Sidh in Bijhari Range

[P.16. Dhar Sidh C.1d. (3.00 Ha.) during 2009 – 10] [P.16. Dhar Sidh C.1d. (2.00 Ha.) during 2010 – 11]

Detail of Nurseries

S. No	Name of Range	Name of Block	Name of Beat	Name of Nursery	Area in Ha.	Infrastructural requirements
1	Hamirpur	Hamirpur	Bajuri	Daruhi	1	Polyhouse, Root trainer, Mali Hut.
2	Hamirpur	Sujanpur	Karot	Karot		Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
3	Hamirpur	Hamirpur	Chabutra	Chabutra	1	Root trainer, Mali Hut.
4	Barsar	Bumbloo	Bumboo	Bumbloo	0.25	Water Storage Tank,, Polyhouse, Root trainer,Mali Hut.
5	Barsar	Barsar	Khazian	Khazian	0.4	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
6	Nadaun	Dhaneta	Sarain	Bathroon Bassi	0.3	Polyhouse, Mali Hut. Root Trainer.
7	Nadaun	Nadaun	Rangas	Sohri	0.5	Polyhouse, Mali Hut. Root Trainer.
8	Bijhari	Loharli	Relli	Karnehra	0.5	Water Storage Tank, Polyhouse, Root trainer, Mali Hut.
9	Bijhari	Loharli	Loharli	Kalwal-1	0.2	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
10	Bajhari	Bijhari	Peharwin	Mathol	0.2	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
11	Aghar	Aghar	Ukhli	Jhinkary	1	Polyhouse, Root trainer, Mali Hut.
12	Aghar	Bhareri	Bhareri	Badehar		Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.

4.21 MONITORING AND EVALUTION: Monitoring and evaluation of plantation activitieshave not received due attention in the past. It is therefore prescribed that regular review of plantation areas with respect to success percentage and suitability of species planted should be done till establishment. Various reports be also put before the review committee of the Govt. of India at the time of mid term reviews.

4.22 INVASIVE ALIEN SPECIES: STRATEGY FOR CONTROL AND REHABILITATION OF AFFECTED AREAS: Most of open space has been infested with weeds thereby hampering both the natural and artificial regeneration process and for carrying out regeneration in such areas, a serious drive is required firstly by *decongusting*such areas scientifically so that the areas can be made free from such weeds and then subsequently planted it with suitable species. The strategy to be adopted in this regard will be as under:-.

INTRODUCTION: -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 forest ecosystems of India as also in Hamirpur Division. Other alien invasive plant species with significant impact on the forests of Hamirpur Division include *Parthenium hysterophorus*, *Eupatorium* (=*Chromolaena*) *adenophorum*, and *Ageratum conyzoides.* Whereas the incidence of *Parthenium* popularly known as *'Congress Grass'* is largely restricted to degraded and newly opened drier sites along roads and forest fringes, the other three invasive alien species tend to occupy all possible vacant places even under tree canopy. Even as *Eupatorium* and *Ageratum* show a clear preference for moister locales and show gregarious occurrence, at many places these share the niche and grow in an intimate mix with *Lantana*.

A reconnaissance was made to map the distribution of exotic weeds in various compartments in this Division. Whereas, it was possible to record the incidence of *Lantana* fairly accurately, the area infested with the other 3 main invasive alien species could not be recorded comprehensively due to these species being still in dormant condition.

DISTRIBUTION OF INVASIVE ALIEN SPECIES (LANTANA) IN HAMIRPUR

S. No	Name of Range	Area infested
1.	Aghar	155.40
2.	Barsar	250.557
3.	Bijhri	636.672
4.	Nadaun	1174.486
5.	Hamirpur	3062.972
	Total	**5280.087**

Strategy for rehabilitation of forests infested with these four most noxious exotic weeds is dealt in detail as under:

CORE PRINCIPLES OF THE STRATEGY

- **CONTAIN FURTHER SPREAD:** A close watch over the spread of exotic weeds will be kept through biennial monitoring mechanism and necessary corrections in the program will be made to remove the recent infestations on priority basis.
- **COMPLETE REHABILITATION OF INFESTED AREAS**: It will involve shift from 'one time removal of weeds' to 'complete rehabilitation' of the treated areas by competing/ shading out exotic weeds. All noxious exotic weeds on any given area will be tackled simultaneously.
- **RELIANCE ON ONLY MECHANICAL/MANUAL METHODS**: In view of their environmental/ ecological concerns, the rehabilitation measures will NOT employ any Chemicals/ Biological methods of exotic weed control.
- **NATURAL RESILIENCE OF NATIVE FLORA TO BE THE BASIS OF REHABILITATION ACTION:** The indigenous plant species on treated sites will be encouraged as per natural trend of vegetation of treated sites and facilitated to establish towards better environmental and ecological services, including fodder, fuel, water recharge, etc.
- **BIOLOGICAL CONTROL:-** The bamboo planting to rehabilitate facted areas be carried out to control invasive species.
- **NO EXOTIC SPECIES TO BE USED TO REHABILITATE TREATED SITES**No potentially invasive exotic species – (viz. Leucaena leucocephala, Prosopis juliflora, Jatropha curcus, Tecoma stans, Tectona grandis, etc.) – will be used for plantation in the areas under rehabilitation, because of their deleterious effect on the native flora.
- **REHABILITATION TO START FROM LOW INTENSITY INFESTATION AREAS AND TO PROGRESS TOWARDS AREAS WITH HEAVY INFESTATION:**Rehabilitation activities will start from the fringes of infestation zone with lower intensity infestation and will progress towards the heavily infestation areas. This approach will (i) allow tackling larger areas with the given financial resources and result in creating quick visible impact, and (ii) help in containing further spread of exotic weeds.
- **SELECTIVE PRIORITY REHABILITATION OF HEAVILY INFESTED CRITICAL HABITATS:** Rehabilitation of heavily infested areas as starting point will be taken up only in limited

number of carefully selected critical habitats like grazing grounds near habitations. Such sites will then act as nucleus from where rehabilitation activity will radiate to adjoining areas of high infestation.

With the above mentioned core principles of the strategy, the approach/ plan to implement the strategy will be as under:

MANAGEMENT OF *LANTANA*With the major focus of the management strategy on 'containing further spread', a two pronged approach, as described below, will be followed in tackling *Lantana* menace on forest lands.

APPROACH-I (FOR AREAS WITH LOW INFESTATION INTENSITY) More than 60% of the forest areas recorded to be under *Lantana* have been infested with this exotic weed within the past 10 years and have less than 25% intensity of infestation. Under this approach, these areas will be tackled on priority basis for the reasons that (i) with the given financial resources, it would be possible to rehabilitate larger areas for creating significant impact, and (ii) further spread of this exotic weed would be contained.

The rehabilitation activities will be started from the fringes of infestation zone with low intensity infestation and will progress towards the high infestation areas. Major activities under this approach will be repeated manual cutting of *Lantana* bushes and encouraging establishment of local species, including grasses or augmenting populations of native species through plantation.

APPROACH-II (FOR AREAS WITH HEAVY INFESTATION)under this approach, critical areas under heavy infestation, especially the grazing grounds near habitations, will be identified and treated.

The rehabilitation activities will start from the selected critical area that will act as nucleus, and will radiate from this nucleus to cover adjoining areas of high infestation. Major activities under this approach will be repeated manual cutting of *Lantana* bushes, encouraging establishment of local species, including grasses and planting the areas with tall plants of fast growing species to quickly shade out *Lantana*.

The methodology to implement the above two approaches will be as follows:

- Method of cutting *Lantana* will be Cut Root Stock (CRS) method i.e. cutting the bushes below the soil to prevent coppicing. (**See box below for details)**.

- **Forest beat** will be the unit for rehabilitating *Lantana* infested sites. Financial resources available under various schemes will, therefore, be converged towards this end.
- Local people, through existing community groups, will be encouraged to participate in rehabilitation of *Lantana* infested areas. Stake of local people will be built into this initiative under the available JFM instruments.
- The following will be, based on local practices, standardized for effective implementation of *Lantana* management initiative:
    - Cutting tools/ techniques
    - Calendar of rehabilitation activities
    - Cost models
- A three year active maintenance of the treated areas and triennial follow up thereafter will form integral part of the rehabilitation program till the areas gets fully rehabilitated. During this period, constant vigil will be maintained on any opportunistic springing back of sprouts/ seedlings of the invasive alien species and the same will be immediately removed. At the same time, progress of establishment of the native species will be actively monitored and encouraged.
- An average of 150 hectares of *Lantana* infested areas will be taken up for rehabilitation per year.

METHOD FOR REMOVAL OF LANTANA

Removal of adult clumps using 'Cut Root Stock' (CRS) method: This method involves cutting the main tap root of *Lantana* plant beneath the 'coppicing zone' (transition zone between stem base and rootstock) (Figure 1). This method of removal involves engagement of 2–3 individuals to work in a group for the removal of *Lantana* if the clumps are too large to be handled by one individual after the rootstock is cut. The steps involved in the cut rootstock method are:

(i) The person, who engages in removal of *Lantana*, is positioned in a way that he stands near centre of the *Lantana* clump with his back facing the clump and holding the handle of digger (kudal)

(ii) Using the specially designed digger, the person cuts the main rootstock of *Lantana* 3–5 cm below the soil surface by hitting the rootstock 3 or 4 times; while hitting the rootstock the blade of the digger gets lodged into the main tap root, and at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to severe the connection of the clump with the main tap root. In case the clumps of *Lantana* form impenetrable thickets, it is advantageous to cut the rootstocks of 3–4 contiguous clumps to make the removal operation convenient. It may be noted that the branches of *Lantana* clumps should not be slashed/cut to gain access to the centre of the clump for its removal by cut rootstock method. The branches of *Lantana* thicket formed by more than one clump should be lifted and tipped over from one end by using a wooden or bamboo pole of about 1.5–2.5 m long and diameter 5–6 cm which is inserted just below the branches from one side and rolled over easily by two workers holding the pole at either end and pressing it so as to reach the centre of the clump Such manual handling of impenetrable thicket is possible because of the umbrella type of canopy which makes it difficult to reach the centre of clump easily. Such physical maneuvers minimize or prevent regeneration from rooted cut branches when they fall on the ground.

(iii) Lift the clump/s and place the clump/s upside down. If the clump is not placed upside down, the prostrate rooted branches and the aerial old branches having aerial roots at nodes may develop into adult plants when they come in contact with the soil. Therefore, the upside–down orientation of cut clumps is critical in the prevention of regeneration of *Lantana* from cut clumps. It may be noted that *Lantana* does not produce root suckers.

(iv) After drying the clumps, the clumps may be used as fuel or burnt at the same site or all the dried clumps may be collected at one place and then burnt. The best time for removal of *Lantana* is just before rainy season, i.e. when the plants are not in flowering and fruiting.

In Hamirpur Forest Division lantana has been eradicated from 275.00 hac of forest area. Range wise detail is as under:-

Year	Hamirpur	Aghar	Bijhri	Barsar	Nadaun	Total
2009-10	20.00	0	18.00	15.00	17.00	70
2010-11	15.00	0	20.00	5.00	0	40
2011-12	20.00	35.00	0	0	0	55
2012-13	40.00	10.00	10.00	40.00	10.00	110
	95.00	**45.00**	**48.00**	**60.00**	**27.00**	**275.00**

LANTANA ERADICATION WORKS IN HAMIRPUR FOREST DIVISION

BEFORE ERADICATION

P.18. BIHROO. C.2. (10 HA.)

(2012 – 13)

AFTER ERADICATION

P.18. BIHROO. C.2. (10 HA.)

LANTANA ERADICATION WORKS IN HAMIRPUR FOREST DIVISION

(b) MANAGEMENT OF OTHER INVASIVE ALIEN SPECIES (*PARTHENIUM, AGERATUM, EUPATORIUM*)The spread of these three species is largely restricted to the open lands including forest fringes, degraded pastures and areas having soils that are recently exposed due to landslips, erosion, soil cutting or muck dumping. The reconnaissance has shown that the there is a large overlap of areas under different invasive alien species with these three noxious weeds also occurring, though each of these occupying different niches, in most of the forests that are infested with *Lantana*.

The basic approach to rehabilitate areas infested with these three invasive species will be as under:

- **APPROACH-I (AREAS WHERE INFESTATION OVERLAPS WITH *LANTANA*):** Such situation occurs under Chil, miscellaneous broad-leaved and scrub forests. In such areas removal of these three exotic weeds will be taken up simultaneously with removal of *Lantana* and the treated areas rehabilitated with fast growing native species/ grasses.

- **APPROACH-II (AREAS WHERE THERE IS NO OR LITTLE *LANTANA* INFESTATION):** Such situation usually comes across in pastures, degraded forests and recently exposed sites. In such areas, manual uprooting of these exotic weeds just on the onset of monsoon, when the soil is moist, will be employed.

4.23 LAND BANK: In this working circle no blank areas more then 10 ha. is available for planting hence following areas which have very low density have been proposed for enrichment and site specific plantation as land bank.

Sr. No.	Range	Beat	Forest	Area in HA.
1	Barsar	Satrukha	UPF Pathliar	10
2	Hamirpur	Kuthera	P.55. Dhar Chabutra C.3b	10
		Chabutra	P.55. Dhar Chabutra C.2a	20
		Jhaniari	P.53. Samluhi C.4	10
		Bajuri	P.48. Bajuri C.1c	10
3	Aghar	Badehar	P.56. Tirlokpur	10
4	Bijhari	Bada Gran	P.14. Reli C.1c & C.4a	10
		Relli	P.14 Relli C.3d	10
		Bihroo	P.17. Samaila C.2a & C.2b	10
5	Nadaun	Sarain	P.XIV. Sitla Bag	20

Besides the above, plantaions, mainly enrichment plantations in areas which have been lying blank, eroded and infested with weeds will be taken up in phased manner over the working period of the plan. The areas which get burnt or dried up due to draught or pest attack will be taken up for plantation during the period.

During mid sixties huge plantions of Eucalyptus were raised in the Division mainly in P-11 pansara pasarda, dhar kangad, UPF Chabutra, P-32 Ghumri, P-3 Bharratha, P-4 Sheetla bag and P-31 Amlehar. As the trees have attained their exploitable stage, as such, they will be replaced by other broad leaved species suitable to the area.

****

CHAPTER – V

FOREST PROTECTION (OVERLAYIPING) WORKING CIRCLE

(A) 5.1. FIRE:

GENERAL: -Fire is a major factor that causes considerable damage to the forests of this division. The fires both accidental and incendiary are very common in this tract due to the reason that majority of forests are easily approachable by roads/Paths and National/State Highways, other roads, passing along/through most of the forests. Also most of the forests lie in dry/hot areas. As most of the forests are either chil or scrub forests, any incident of severe fire has a considerable adverse effect not only on the vegetation but it also deteriorates the habitat.

Fire has an adverse effect on soil, water and ecological balance of the affected area. Soil becomes vulnerable to soil erosion and its structure gets affected, thereby retarding plant growth. The soil building micro-organisms are destroyed and the area is ultimately rendered susceptible to erosion and decreasing productivity. The young regeneration is wiped out, growth of surviving vegetation is adversely affected, the yield of forest produce is immensely reduced and the vegetation damaged by fire becomes vulnerable to insect and fungal attack. The high salvage removals are attributed to this. In the fire burnt forests change in crop pattern takes place, resulting in mixed crop in the forests. Many ban oak areas have now been invaded by fire resistant species like chil as a result of repeated fires. A mention of fire as a factor that causes injury to the forest crop has already been made in Chapter II "Flora and Fauna" of Part I of this plan. The Chil forests in this division are highly susceptible and are subject to frequent fires in the months of April to June. Because of all these reasons prevention and control of forest fire assumes great importance in Hamirpur Forest Division and there is an urgent need to take effective steps to counter the menace of forest fires, with the aim of:

a) Protecting forests from damaging fires by taking up all preventive measures like administrative, technical, social, legal etc.

b) Preparing adequately and taking appropriate action for controlling, suppressing and extinguishing forest fires, in order to minimize the loss caused by them.

c) Educating local people about fire damage and eliciting their cooperation in preventing, controlling and extinguishing fires.

5.2. CAUSES OF FOREST FIRES: -The main causes attributable for the out break of fires are various and can be summerised as under:-

5.2.1. NATURAL: - This is caused due to lightening, friction between quartzite stones and dry bamboo culms. Such fires are rare.

5.2.2. ACCIDENTAL: - Such fires are more common and are caused due to

i) Charcoal burning and control burning the forests.

ii) Gross carelessness of the passers by, smokers, graziers, hikers, campers, hunters, wood collectors, honey collectors, labourers working in the forests etc.

Burning of refuse in the cultivated fields by the people without suitable precautions or supervision.

5.2.3. INCENDIARISM: -

i) People set fire to forest under the false belief, that the resultant grass growth will be better and more abundant.

ii) Fires are started for scaring away wild animals for poaching.

Fires are caused to destroy the evidence of crimes committed or damage caused to forest property.

5.3. DETAIL OF FOREST FIRE INCIDENCES: -The details of fire incidents in this division during previous plan period is tabulated below:-

Year	Hamirpur		Aghar		Bijhar		Barsar		Nadaun		Total	
	Fire Cases	Area in hac.	Fire Cases	Area in hac.	Fire Cases	Area in hac.	Fire Cases	Area in hac.	Fire Cases	Area in hac.	Fire Cases	Area in hac.
1998	13	12.35	2	15	5	13	6	57	2	72.26	28	169.61
1999	34	278	14	168	7	96	26	517	27	255	108	1315
2000	1	1.5	0	0	0	0	0	0	3	10.5	4	12
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	19	226.33	17	160.93	3	130	3	32.5	8	86	50	635.76
2003	19	191	8	186.8	9	106.35	2	25	17	99	55	608.15
2004	7	30.5	1	4	1	43	10	118.5	1	5.25	20	201.25
2005	9	56	4	73	10	98	12	147.7	16	81	51	455.7
2006	0	0	3	51	0	0	0	0	1	2	4	53
2007	6	87	6	120	2	4	2	31.5	0	0	16	242.5
2008	1	3.5	0	0	5	12	4	22	0	0	10	37.5
2009	2	12	7	107	7	55.15	6	97	9	62.7	31	333.85
2010	3	29	4	64	3	18.5	2	15	6	28.5	18	155
2011	1	9	0	0	0	0	0	0	0	0	1	9
2012	12	181.5	13	244	24	144	7	47	14	92.289	70	714.789
Total	**127**	**1117.7**	**79**	**1193.7**	**76**	**720**	**80**	**1110.2**	**104**	**794.5**	**466**	**4943.11**

It is to be noted that over a period of these 14 years, total area burnt was 19090.2 ha. This gives an average of 1363.58 ha. per annum. The identical figures for last 20 years were 3946.62 ha. as total and 197.33 as average.

Photographs of Fire incidence in Bijhari Range during the period of 2012 – 13

5.4. FACTORS CONTRIBUTING TO FIRE DAMAGE: -Fire is the product of fire environment, which has mainly following components:

i) High temperature

ii) Low humidity

iii) Inflammable material

i) High temperature: - With the increase in temperature during summer season, the possibility of fire increases. In this area 37^0c is considered the critical temperature, above which the cases of fires keep on increasing with increasing temperature. The detection of fire danger day can be assessed with the help of thermometer.

ii)Low humidity: - This factor also contributes towards spread of fire. The areas which are more humid are less prone to fire, than the areas, which have low humidity in summers. This is the reason that the casual rain-fall reduces the fire risk for a few days.

(iii) Inflammable material: - In most of the forests, grasses, chil needles, resin, fallen trees, bushes etc., make ample inflammable material. The possibility of forest fire depends upon the quantity of inflammable material on forest floor. To reduce the inflammable material in forests, control burning is done.

5.5. FIRE SEASON: -The greatest danger of fire occurrence is during summer months from April to early July, up to the commencement of monsoon rains. During autumn, normally, the danger of forest fire is less but occasionally the fires do occur in this period also.

5.6. SPECIAL FIRE RISK ZONES: - The areas burnt during previous years indicate that all most all blocks of the forests are prone to fires:-

Showing Fire Prone areas

Sr.No.	Block of Forest	Range
1.	Hamirpur, Sujanpur	Hamirpur
2.	Nadaun, Dhaneta, Kangoo	Nadaun
3.	Barsar, Bumbloo, Hareta	Barsar
4.	Aghar, Jhiralari	Aghar
5.	Bijhari, Chakmoh, Loharli	Bijhari

Special attention is required for the above forest zones during the fire season.

5.7. MANAGEMENT OF FIRE PROTECTION: -The following steps will prove effective in fire management.

(a) Fire prevention measures

(b) Timely detection of forest fires and information to concerned staff.

© Process of fire control and fire fighting.

(d) Penal provisions and a system of rewards

5.7.1. FIRE PREVENTION MEASURES: -"Prevention is better than cure", and this holds good in case of forest fires too. Prevention of fire is more beneficial and cost effective than fighting the fire. For this effective steps should be taken well in time, such as summerised below:-

5.7.1.1. EARNING GOOD WILL OF LOCAL PEOPLE: -The forests cannot be protected against fire without winning the good will and co-operation of the local people. This can be done by making regular contact with local villagers and meeting the reasonable bonafide demands of right holders, well in time. Also, the closures made should be affected for the minimum required period.

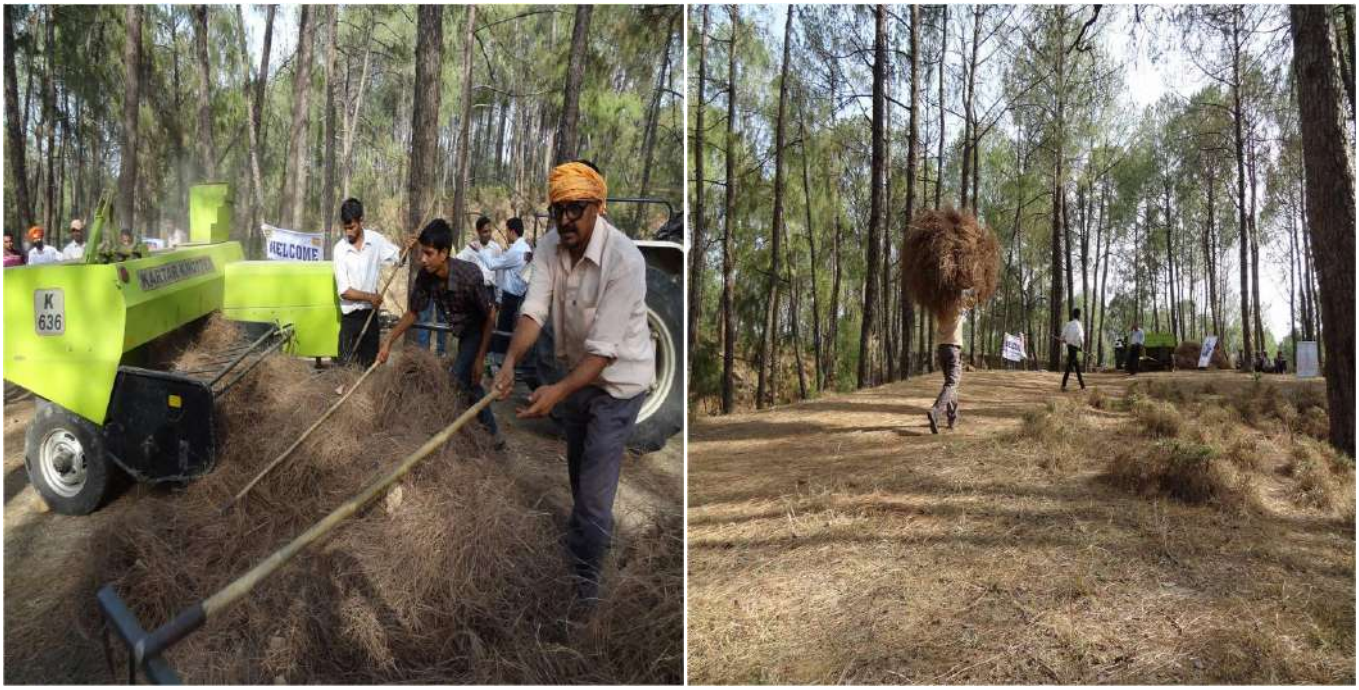
5.7.1.2. EDUCATION AND PUBLICITY: -Wide publicity especially in villages nearby forests should be given against the harms caused by forest fires. For this, timely action should be taken for distribution of pamphlets and other educative material during the fire season, well in advance, so as to acquaint the villagers/local people through Panchayats. The staff should hold regular meetings with local villagers in their areas to create awareness. Also, hoardings, notice boards and banners should be displayed at prominent points to make aware the tourists and local public regarding the damage caused by fires

5.7.1.3. RESTRICTION ON TARRING OF ROADS: - During fire season, tarring of roads in forest areas should be banned, as P.W.D staff/labour burns fire underneath drums of bitumen leading to wild fires.

5.7.1.4. CONCEPT OF JOINT FOREST MANAGEMENT: - Joint Forest Management may help in preventing and controlling fires. For this active participation of local villagers should be sought by involving people in forestry activities.

5.7.1.5. REMOVAL OF PINE NEEDLES: - Local villagers should be allowed and encouraged to collect and remove the fire needles, before hand, for domestic purposes and use as packing material for fruits and vegetables, fire brickets and other alternate uses. A small unit for preparation /manufacturing of fire brickets from dried / fallen pine needle has been established adjoining to Palampur Forest Division at Nagrota town. The strategy to collect, bundle/baling, and transport pine needle from forest areas be chalked out in participation with VFDC,s / JFMC,s / local people of the area and collaborating with manufacturers. This will reduce the fire hazard to a great extent.

PINE NEEDLES COLLECTION WORKS IN NADAUN RANGE



5.7.1.6. CLEANING AND THINNING IN REGENERATION AREAS: - All regeneration areas, should be isolated by cleaning a strip of 3 metre width all around from the inflammable material like leaves, bushes etc. Early cleanings and thinning in young regeneration should be done, to give a spacing of 1 metre.

The pruning of trees, which have attained a height of 1.5 metres, should be done upto $^{1}/_{3}^{rd}$ of their height and debris should be collected at suitable Nallah/place and control burnt.

5.7.1.7. FIRE PROTECTION STAFF: - Divisional Forest Officer will engage sufficient number of firewatchers in consultation with the Conservator of forests, during the fire season. Fire watchers (preferably the local villagers)**,** will patrol the areas extensively for detection andprotection against fires and will ensure all preventive measures with the local forest field staff. During fire season fire fighting squad be formed out of the daily waged who have been regularized. This squad should always be ready at every Range/Block H.Q. and as soon as any intimation of fire occurrence is received, they be rushed on "Fire Pick up Van" to that spot.

5.7.1.8. FIRE PROTECTION EQUIPMENTS: - The field staff (near the fire prone forests) should be provided with sufficient fire fighting equipments, such as brooms, shovels, slashers, axes, hatches, forks, buckets, gunny bags etc, so as to meet any emergency and for facilitating the speedy extinguishing of fire. Field staff should be imparted training for effectively controlling forest fires.

5.7.1.9. FIRE LINES: - The existing fire lines be properly maintained and kept clear of all bushes, needles etc. to avoid any chance of fire. This division has a very good network of National/State Highways, link roads, bridle/inspection paths, Railway passing along or through the majority of forests. Hence, no new fire lines are proposed. It is laid down that all such roads/paths should be kept clear of all inflammable material especially during the fire season, so as to act as fire lines. The detail of existing fire lines is given in appendix-VIII and the fire lines below.

5.7.1.10. CONSTRUCTION OF WATCH TOWERS: -A net work of watch towers, at suitable commanding locations, should be developed. These should be permanently manned by fire watchers/Forest Workers during the fire season. The fire watcher will immediately come to know and report to the beat guard, any out break of fire that may occur. The beat guard will take further necessary action for fire fighting. Fire watch towers, may be constructed wherever considered necessary.

5.7.1.11. CONTROL BURNING: -The Chil forms a thick bark at an early age, by virtue of which it can resist the effects of slow fire and this property is of great advantage and development of control burning. The burning should be thoroughly planned and organized and should be carried out under the supervision of competent officials.

All the forests must be isolated by clearing a strip of 1 metre width, of all inflammable material, leaves, bushes etc. to act as fire barrier during the fire season. Grazing by cattle, should be permitted, in order to reduce inflammable material in the forests.

It is most essential, that forests, allotted to, Chil Working Circle are adequately protected against fire. The control burning is the most important operation and should never be neglected. The triennial programme for control burning is the most important operation and should never be neglected. The triennial programme for control burning is chalked out and is given in following table.

TRIENNIAL PROGRAMME FOR CONTROL BURNING

2013 – 2014	**2014 – 2015**	**2015 – 2016**
2016 – 2017	**2017 – 2018**	**2018 – 2019**
2019 – 2020	**2020 – 2021**	**2021 – 2022**
2022 – 2023	**2023 – 2024**	**2024 – 2025**
2025 – 2026	**2026 – 2027**	**2027 – 2028**

AGHAR RANGE

Forest	Area	Forest	Area	Forest	Area
P.7 Punder	25.09	P.6 D.J. Jakh C1a to 7d	358.95	P.6 D.J. Jakh C8a to 12d	409.52
P.8 Samtana	371.91	P.2 BadianaI	30.76	P.56 Trilokpur	160.85
P.9 Dhangota	30.76	P.3BadianaII	12.95	P.46 Mandiana	163.04
P.45 Karer	80.13	P.5 Humal	160.26	P.47 Dhurkhar	89.84
P.26 Salan	169.17	P.44 Galoh	33.59		
	677.06		**596.51**		**823.25**

BARSAR RANGE

P.XII Karsai	18.22	P.27 Dugwar	17.00	P.38 Palatoo	227.44
P.XIII Phahal	38.45	P.28 Desan	79.72	P.39 Gilor Khas	12.95
P.XIV Plasi	10.93	P.35 Jathunda	48.98	P.40. Dharara	49.37
P.31 Khajjian	79.31	P.35 A Kanoh	13.76	P.43 Naural	104.40
P.32 Cheli Gumri	52.20	P.36d. Kangar	140.43	P.42 Paniali	66.36
P.33 Cheli Harma	8.90	P.XV Kashmir	99.96	P.29 Dabriana	38.45
P.34 Thana	22.50	P.XVI Dhaily	15.38	P.37 Bakroh	121.81
P.41 Jharmani	72.03				
	302.54		**415.23**		**620.78**

BIJHARI RANGE

P.14 Reli	442.31	P.10 Pherwin	36.42	P.16 Dhar Sidh	572.21
P.11 Sathwin	65.96	P.15 Kalwal	54.63	P.30 Ghata Panga	5.26
P.12 Khilawat	55.45	P.19 Kalwal – I	180.08	P.22 Gatiana Batiana	49.78
P.17 Samaila	78.93	P.20 Kalwal –II	100.35	P.23 Chalsai	147.72
P.13 Bara	28.73	P.21 Bijhri	33.99	P.25 Khansera	78.92
P.18 Bihru	62.73	P.24 Ghangot	177.25		
	734.11		**582.72**		**853.89**

HAMIRPUR RANGE

P.1 Karot	121.80	P.55 Dhar Chabutra	354.10	P.4 Cheli Matroh	31.97
P.52 Swarin	38.04	P.50DangKawali	43.70	P.49 Jhaniara	55.89
P.48 Bajuri	189.01	P.51 Dugnehra	31.56	P.54 Dhar Guga	36.43
P.53 Samluh	57.06				
	405.91		**429.36**		**124.29**

NADAUN RANGE

P.XVII Behrer	17.00	P.XVIII Jassai	146.10	P.XX Malag	152.94
P.XXIII Loharkhar	88.62	P.XXVII Basaral	124.66	P.XXIV Batran	13.75
P.XXV Beha	47.75	P.XXII Kunah	53.01	P.XXVI Hathol	26.71
P.XXI Bandhera	14.97	P.XXVIII Bhaunti	91.45	P.XXIX Galoh	15.38
P.XXXIII Bodh	76.49	P.VIII Mandhian	80.94	P.XXX Karaur	66.36
	244.83		**496.16**		**275.14**

The forest areas have been prescribed in full, however it is laid done that all the forest areas planted should not be controlled burnt, until the plants attain a height of 1.5 Meter. The detailed instructions on control burning are contained in the H.P. Forest Manual Vol. IV and are summerised as below: -

(1) The control burning should always be done during winters in January-February.

(2) Burning should progress from uphill to down hill in calm weather and special care should be taken, to keep the line of fire as straight as possible and under control.

(3) The fire should start along the ridge, a cleared path or especially cleared lines.

(4) Chil needles and other inflammable material should be fully raked to ensure through burning.

(5) In forests under resin tapping, it must be ensured that all chips, fallen resin, needles, etc. are cleared about 1.5 m away from the base of the trees by the resin labourers.

(6) Cleanings and early thinning in young regeneration areas must be completed before the control burning.

(7) Burning shall be done always under strict supervision and control of the executive staff and shall never be left to the engaged labour.

(8) The existing fire lines should be properly maintained and kept clear. The roads, bridle and inspection paths etc. must be kept clear of all inflammable material, so as to act as fire lines.

(9) Sufficient number of trained fire watchers should be employed during the fire season to help the field staff and provided with necessary equipments. No felling operations, even to the right holders, should be allowed during the fire season.

It is, however, to be noted that areas under regeneration should not be control burnt, until the regeneration reaches a height of about 2.5 m. In such areas, however, the grass cutting/needle collection by right holders is encouraged.

The control burning will also form a part of control forms and deviation reflected therein should be explained very clearly giving valid reasons.

In order to protect the forests, against fire risk, in case of other forests allotted to Protection cum Rehabilitation working circle, which are not included under chil working circle and are not prescribed for

control burning, and to maintain the sanitation of the forests, the following guidelines/steps are laid down:-

(1) The inflammable/fire hazard material, from the forests should be collected and disposed off during the winters.

(2) The job should be got done preferably, through the regular forest workers of concerned ranges.

(3) Collection of humus and other inflammable material should begun by raking from top of the forest and working down hill.

(4) Stack in moderate heaps in open places or suitable Nallahs.

(5) Burn the heaps down hill so that the smoke does not interfere with men working below and reduces the risk of fire.

(6) Burn the heaps in rotation to reduce the heat.

(7) Burning operation should be carried out under the supervision of forest guard concerned.

(8) Steps should be taken to make it mandatory for right holders and Forest Corporation, to collect the felling refuse after felling trees into heaps or its removal from the forest should be specified.

5.7.1.13. FIRE FIGHTING: -When a fire is observed, Forest Guard or the fire watcher should at once inform the Block Officer (Dy.Ranger) and the Range Forest Officer. He should also inform the President of the local Panchayat immediately, as well as, the staff of the Government Offices or institutions situated in the vicinity and seek their help in the fire fighting operations. In case of alarming situations, immediate help of various organizations like Army Cantonment Head Quarters, Fire Brigade, N.C.C., N.S.S., situated near the vicinity of each range can be availed. District Administration may be requested for immediate help, as and when, required. Beating with a broom of green bushes normally controls the fire.

Fire fighting methods have been given in the Punjab leaf let No-8 and practical forest management by Trevor and Smythies. For guidance of field staff, the method is given in brief here. The Senior Officer present will immediately, take command of the operations. He should know the local geography and have some idea of labour force. The labour force should be organized in sections of suitable strength each under the order of one man and given definite task. A couple of men should be kept in waiting to

take messages and instructions to the various section. In case the fire goes beyond control, it is necessary to localise it by counter firing. Counter firing should only be done under order of a senior officer in charge of operations and attempted from a defined line such as road or ridge or fire line. A line is formed along the ridge by clearing the forest floor and cutting bushes and from this fire is started, so as to consume the fuel in advance of the on coming fire. Wind direction and gradient should always be kept in mind, while counter firing. Roads/Paths are useful, provided, enough manpower is present. After the fire has been brought under control, the smouldering stumps should be extinguished by putting the dug earth on them and strict vigilance be kept till all dangers of fire spreading are taken care of. Arrangement for the transport of food, water and adequate fire fighting tools are essential. The rolls of right holders, who helped to fight the fire, should be kept in record, so that the rights of defaulting right holders can be suspended.

5.7.1.14. PREPARATION OF ANNUAL PLAN: -Preparation of an exhaustive annual plan for the fire protection is also, recommended.

5.7.2. ADMINISTRATIVE MEASURES: -

(i) Administrative aspects are also very important in connection with fire protection efforts. Encouragement should be given to good staff, while negligent staff should be punished appropriately so that the officials remain vigilant and cautious in their work. The concerned Conservator of Forests can give suitable reward, in case of exemplary work done by any official or any other person. So that temptation is more towards the fire fighting operations.

(ii) Regarding Government common land and other forests, which are not under the direct control of the forest department the D.F.O. should write to the revenue department authorities or the concerned authorities to take fire protection measures during fire season, as the fire gets spread in to Government owned forests, from these areas.

(iii) The D.F.O. should also make it known to the district revenue authorities that the staff and vehicles of the forest department should not be deployed for any work other than forest protection during fire season.

5.7.3. LEGAL ACTION/PUNITIVE MEASURES: -All cases of incendiarism should be properly investigated and punitive measures should be taken against the culprits. H.P. Govt. has framed rules

regarding fire protection known as Himachal Pradesh Forests (Protection from fires) Rules, 1999 vide H.P.Govt. Notification No.FFE-A© 7-1/96-11 dated 17-11-99.

5.8. ASSESSMENT OF LOSS CAUSE BY FIRE: -Fire causes tangible and intangible damages to the forests and Wild Life. Loss of timber, resin, etc. is tangible, where as loss of soil fertility and soil constituent are intangible. Fire damage leads to increase in rate of soil erosion and causes drying up of water sources. Fire causes adverse effect on regeneration and destroys under growth leading to invasion by weeds. Natural succession goes into retrogression. Wild animals and birds are killed. Being afraid of disciplinary action, the loss caused by forest fire is often not actually recorded by field staff and is also under estimated because of which calculation of exact magnitude of loss is hardly possible. The offenders responsible for causing fire are also rarely caught and punished for which concrete and sincere efforts are required.

5.9. FIRE RECORD: -All cases of fires are to be registered with police for investigation and bringing the culprits to book soon after the outbreak of fire. The fire reports on prescribed proforma are prepared, immediately after controlling the fire, highlighting cause of fire, extent of area burnt and damage done, suggestions for the treatment of area and safe guards for future incidences. The fire reports should contain a map of the area burnt. All the fire reports are sent to higher authorities and follow up action taken accordingly.A complete record of fires will be maintained, both in Range, as well as in Divisional Offices. Maps of the forests showing the area burnt by fire will be filled in the compartment history files along with other relevant details regarding fire.

5.10. KHOSLA COMMITTEE REPORT: -The Govt.of India, vide No.A-34011/6/95-FF, dated 11thJuly 1995, from Sh. Sarveshwar Jha, Jt. Secy., Ministry of Environment and Forests, constituted a team consisting of Sh. R.P. Khosla, IAS (Retd.) former Chief Secy., U.P. and former Secy., Ministry of steel, G.O.I., and Sh. S. Parmeswarappa, IFS (Retd.) former Pr.CCF., Karnataka to enquire into causes of forest fires, the extent of damage to forest wealth and to formulate a strategy to prevent the occurrence of such large scale fires in future and suggest measures for their control. The recommendations of the committee are attached as annexures in volume II.

(B) 5.11. ILLICIT FELLING AND SMUGGLING

GENERAL: - With development of good network of roads, there has been an increase in incidences of illicit felling. 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 Act (H.P.2nd Amendment 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 forest produce, vehicle and tools involved in smuggling of said forest produce.The detail of vehicle seized in Hamirpur Forest Division is as under:-

Vehicle seized during smuggling of Forest produce.

FIR NO. and date.	Vehicle No.	Forest property seized.
2/2002 dated 2.1.2002	HIH 557	50 No. Resin filled Tins
108/2003 dated 15.3.2003	HP-28 -1628	19 resin filled Tins
16/2006 dated 12.1.2006	HP 69-0112	31 Khair Logs
128/2008 dated 28-3-2008	HP-51B0408 Mohindra Pick Up HP 14 B-T-5328 Indica Car.	32 Khair Logs
23/2009 dated 7.2.2009	HP-20-8840	30 Khair Logs
226/2010 dated 20.11.2010	HP24 -3773	7 Deodar scants
24/2011 dated 13.3.2011	HP23B-5143	17 Khair Logs
Nil dated 5.4.2011.	HP67-0698	14 Khair logs

(Source: DFO Office Hamirpur)

The detail of cases admitted and decided in the court of Authorized Officer – cum – Divisional Forest Officer Hamirpur under 52A as on 31.3.2013.

Showing status of vehicles under Section 52A of IFA

Total cases.	Cases decided.	Balance cases under trial.	No of vehicle confiscated/released.		No of vehicles under appeal/auctioned.	
			Owner	State Govt.	Appeal	Auctioned
9	9	0	2	7	1	1

(Source: DFO Office Hamirpur)

(C) 5.12. ENCROACHMENTS:

GENERAL: -In recent year encroachment of forest land has emerged as a big threat to forest land. This is more so in Un-delimited Protected and un-classed forests. However in DPFs 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 and H.P. Public (Eviction of Un-authorized occupants) Act, 1971. All Divisional Forest Officers in H.P. have been delegated powers of Collectors under H.P. Public (Eviction of Un-authorized occupants) Act, 1971 in respect of forest land. All cases of such encroachments detected should be dealt with immediately as per procedure laid down. The detail of encroachment cases admitted and decided before the DFO – cum – Collector, Hamirpur Forest Division under H.P. Public (Eviction of Un-authorized occupants) Act, 1971.

Encroachments: The detail of encroachment cases up to 31.03.2013 is as under:

Total cases	Cases decided by DFO cum collector	Cases evicted on spot	Cases to be evicted	Balance cases as on 31.3.2013
39	23	7	16	16

The balance cases for eviction are required to be taken up on priority by the field staff.

The detail of encroachment cases received under Regularization of encroachment Policy of State Govt. in Hamirpur Forest Division.

Showing status of Encroachment cases under Regularization Policy of HP State Government as on 31.3.2010.

Total cases received.		No. of cases evicted.		No. of ceses challaned in the relevant court.		Balance cases for eviction.	
No.	**Area in ha**	**No.**	**Area in ha**	**No.**	**Area in ha**	**No.**	**Area in ha**
74	12.02.24	74	12.02.24	0	0	0	0

All the encroachers have evicted forest lane voluntarly and forest land has been taken back in possession by field functionaries.

(Source: DFO Office Hamirpur)

As per order of Hon'ble Supreme Court of India, forest land cannot be diverted / allotted for non forestry activity without prior approval of Govt. of India. Hence suitable steps to evict the encroachers from the remaining forest land needs to be taken immediately.

5.12.1. PREVENTIVE/ 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 challan 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 recorded as forest and in possession of Forest Department 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 or relevant court 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, Kanungo who are on deputation with the forest department be delegated the powers of demarcation of forests to process encroachment cases expeditiously.

5.12.2. 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) As a deterrent, FIRs should be registered as soon as an encroachment is detected.

iii) Latitude, longitude and altitude readings of all boundary pillars (old and new) to be recorded in the BP register and database in the division office.

****

CHAPTER – VI

JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE

6.1 GENERAL: - In the process of resource management, the concept of Joint Forest Management is an intervention to evolve organized and collective thinking on the issue of forest management where all the ingredients of a sound management system i.e. scientific, professional options, social and anthropological dimensions and economic principal are synergies for deriving maximum benefits for the society keeping the sustenance of the resources in mind. It must be remembered that the sources to be managed are limited and claim over the resources are varied, no single solution or a particular practice of this management on control can satisfy the needs of all. The philosophy for JFM in essence aims at involving the people in resource generation activities through motivation, active involvement in the process of management and sharing of benefits to adequate institutional arrangements using PRA tools.

6.2THE BASIS FOR EMERGENCE OF JOINT FOREST MANAGEMENT AND ITS EVALUATION, NEED AND OBJECTIVES: In the colonial India the princely rulers proclaimed the power of eminent domain over the territories they ruled and specified hunting rights for themselves in the forests. Traditional, customary rights of local people living in and around forest were respected and this enabled them to utilize the produce of the forests for their livelihoods. During the 19^{th} and the early part of the 20^{th} century these rights were modified, reduced and in few cases eliminated at the state to cover control of forest resources. This was finally consolidated in 1927 with the passing of the Indian Forest Act, which is still in force today.

A related development was the emergence of" Scientific" forest management by the state, which had the primary objectives of watershed protection and timber production. Local people's needs were provided for through concessions (rarely rights) and privileges administrated by the state. Throughout this century, forestry in India has developed within this framework characterized by state control. Since the extent of forest and consequently the growing stock was large as compared to the demand, the system functioned satisfactorily till fifties. The use of forest resources has also been influenced by the rapid increase in population in recent decades. With the explosion of population as well as expansion of industry, wood demand, particularly of fuel wood increased dramatically, resulting in uncontrolled exploitation of forests at an ever increasing pace. By the seventies, it was understood that treating forests

produce as a national resources for industrial development without proper concern for local demand would result in total destruction of forests, which, in turn would endanger environmental security of the country. So, a modified approach to forestry on the international scene, which in India was labeled Social Forestry was adopted in the 1970's. This attempted to address the forest based needs of local people more directly but did this within the existing framework of State control through the forest departments. The forestry sector was dominated by this approach to forestry which can be rather starkly characterized as forestry for the people by the State on the People's land. Although not as successful as anticipated, many valuable lessons were learned and this Social Forestry legacy is being transformed into a more meaningful partnership between local communities and the forest departments as Joint Forest Management.

As pressure on the forest resource mounted in the 1960's and 1970's, foresters in different parts of India realized that conditions had changed to such an extent that the forest protection model they had inherited would not work. Rather than protecting the forests from the degradations of the local people (as the model described things) this minority of forward looking foresters realized that the local communities had to be directly involved in and benefit in the forest protection and management.

The lead in experimenting with this was taken during the 1970's in West Bengal, Haryana and Gujarat where forests protection communities were formed and given the responsibility of protecting degraded forests, departmental land from illegal cuttings, fires, over grazing, and encroachments. In return they were granted access to a range of non timber forests products and in West Bengal to 25% share of the returns from the coppice fuel-wood harvest in regenerated Sal forests. Other forest protection movements also developed at the same time in Uttar Pradesh, and many tribal forest protection communities emerged spontaneously in part of Bihar and Orissa.

The success that these "experiments" generated gradually begins to influence opinion throughout in India and the forestry debate reached substantial proportions in the 1980's. This culminated in the issue of a new National Forest Policy in 1988 which reversed the previous focus on timber production for commercial value and concentrated on ensuring environmental stability, maintenance of ecological balance and specified that the domestic requirement of tribal and the poor living within the vicinity of the forests should have the first charge on the forest produce. In 1990's this was complemented by another Govt. Order directing all states to undertake participatory forest management on degraded forest

land based on the experiences of states such as West Bengal, Gujarat and Haryana. This order also encouraged forest departments to involve NGO's as intermediaries and facilitators.

This was the first time that the rapidly developing Joint Forest Management had been given official sanctions and marked water shed in India's forestry development. Since that time, 15 states have issued Govt. Orders for the implementation of JFPM. These JFPM initiatives have many of the following characteristics in common:-

i) The formation of local community based institution to participate with the forest department in forest management decision making;

ii) Rules and regulations about responsibilities and sharing decision making;

iii) Involvement of NGOs particularly in documentation, training ,research and community level organizing and facilitation;

iv) Reorientation and training of forest department staff and local communities;

v) The joint preparation of micro-plan for forest management which often forms the basis of formal agreements between the forest department and the local institution;

vi) The formation of state level working groups to co-ordinate their Joint Forest management;

Joint Forest Management in India is a concept in its infancy which is continuously evolving on the basis of local experiences. No two states have identical forms of JFPM but the collective experience of these differences is enriching the concepts in all the states. In recognition of importance of the concept and the value of this learning process prominent NGOs; the Society for the Promotion of Waste-land Development has recently established a JFM network to facilitate the exchange of the experience.

6.3 OBJECTIVES OF JOINT FOREST MANAGREMENT

The basic objects of Joint Forest Management are given below:-

1. To evolve consensus on the basic issues to conservation of soil, water and forest resources.
2. To provide effective and immediate treatment for barren, wastelands, or degraded protected forests situated near villages through protection, Afforestation, pasture development, soil conservation by active participation of local people.

3. To maintain the environmental stability through preservation and wherever necessary, restoration of the ecological balance that has been adversely destroyed by depletion of the forests through involvement of local people in resource management.
4. To augment fuel wood, fodder and small timber production for use by local people.
5. To convert a hostile population living in the fringes of forests areas into friends and ultimately into resource managers and resource users.
6. To evolve policy and law this will help in the continuity in the planning and implementation.
7. To make environment conducive for the adoption and implementation of the JFPM in the State and Area.

6.4 JOINT FOREST MANAGEMENT IN HIMACHAL PRADESH:

Vide H.P. Govt. Order No. Forest © 3-4/80V dated 12.5.1993 a participatory Forest Management on barren or degraded land, it was decided by the Govt. to constitute Village Forest Development Committee for JFM in the villages of Himachal Pradesh for Planning, Protection, Afforestation and judicious use for Eco. Development of the areas situated near the villages so as to arrest their further Afforestation degradation and to augment fuel wood, fodder and small timber production of use by local people through their active participation.

Procedure for constitution of Forest Development Committee as per above mentioned order is laid down as under:-

1. **Name of Committee:** Village Forest Development Committee (V.F.D.C)

2. **Definition:** A village Forest Development Committee is a registered, non political body representing all families of a Tikka /Village.

3. **Area Selection:** There shall be only one village Forest Development (VFDC) in each Tikka/ Village.

4. **Constitution:** One adult male and female member of each family will be enrolled as a member of the General House of VFDC of the village. President Mahila Mandal, President Youvak Mandal, Members of Panchyat representing Tikka /Village will be nominated as members of the General House of the VFDC by the DFO concerned.

5. **Executive Body:** The executive body will have 9 to 12 members including nominated ones. It will have President, Vice President; Treasurer etc. who will be elected by the Executive body itself. Two auditors will be elected in the General House. A uniform representation shall be given to each group 1020 families and the executive body will have minimum 5 members from the Tikka / Village out of which 50% will be women. Forest Guard will be ex-officio Members- Secretary of the Executive Body. One member of Gram Panchyat, One member from Antyodya family, One woman either from Mahila Mandal or otherwise will also be nominated member of the Body.

6. **Meetings:** There will be two meetings of the General House and four of the Executive body in the year. DFO will convene the meeting with the president of he Executive Body of VFDC and the Range Officer concerned twice in a year to review the progress of the work. Quorum will be 50% for these meetings.

7. **Registration of committee:** The territorial Divisional Forest Officer will formally register VFDC.

8. **Management plan:** The Range Officer concerned will prepare Joint Forest Management Plan with the help of Executive Body, which will be discussed with General House of VFDC and finally approved by the DFO.

9. **:WORKING GROUPS ON THE JOB FOR PREPARATION OF VILLAGE PLAN THROUGH INTERACTION WITH PEOPLE:**

…Photographed at BANN Village of Hamirpur Forest Division…By J.K.Dogra (HPFS).

10. **Duties of VFDC:** To persuade the villagers to give the available area for plantation. To assist the Forest Department in Planning, Protection, Afforestation, Judicious use of all existing rights and equitable sharing of usufructs and eco-development of the area as per approved Management Plan.

11. **Responsibilities:** It will be the responsibility of the committee

    a. To just and fair distribution of the usufructs derived and
    b. To ensure its management as per prescribed norm,
    c. Settlement of disputes between villages,
    d. Honor all the commitments.

12. **Powers of the Committee:** Committee will make its own bye- laws with the concurrence of concerned DFO. The committee can recommend punishment to the offender including cancellation of membership and forfeit their shares in usufructs to the concerned DFO.

6.5 DUTIES AND RESPONSIBILITIES OF FOREST DEPARTMENT:

- To explain Joint Management Plan to the villagers.

- To recognize the VFDC in latter and spirit and give recognition to its recommendations.

To provide technical know- how, administrative and managerial skills, in order to assist the Executive Body to carry out the responsibilities.

6.6 POWERS OF THE FOREST DEPARTMENT: Membership of any individual from the general house/ Executive Body can be dissolved by the General House in consultation with the DFO; DFO can dissolve the Executive Body in case it fails to fulfill its duties and responsibilities.

6.7 DISPUTE ARBRITRATION, TERMINATION OF AGREEMENT: Appeal of the aggrieved/ Executive Body with lie with the Conservator of Forests who will cocommunicate his decision within a month time and will be final.



((<u>EQUITABLE SHARING OF USUFRUCTS AMONG VILLAGERS</u>)BY <u>VFDCs</u> and J<u>FMCs</u>

USUFRUCT SHARING: The entire quantity of the usufructs will be distributed to the villagers under the supervision of Forest Guard (Member Secretary) 25% of the net sale proceeds of final harvest will be given to the VFDC out of the plantations/ coppice to be raised and kept in a common fund of the committee known as village development fund which can be utilized for village development works with the approval of general house and in consultation with the concerned DFO. The exercise of other rights viz. timber; fuel wood etc. will be exercisable as per provision in the settlement.

6.8 ROLE OF WOMEN IN JFM: Women in general and those of rural areas in particulars play an important role in maintaining the family and thereby improving the village economy. It is often said that if a women is developed, the entire family is developed because it is only women who is most intimately connected with the basic needs. Thus, the woman as a mother in the house-hold assumes the role of efficient manger and undertakes various functions for the welfare of the family. The entire village abutting the forests actually depends on the forests for the tree based needs in the form of small timber, fuel, fodder, green leaf manure etc., unlike the women in your areas; the rural women are solely dependent on the forests for their fuel needs to a very large extent. It is the woman who collects fuel wood and dried sticks for cooking purposes from forests. Many women also bring fuel wood from forests for their sustenance through wage earning, as they do not have any other alternative sources of employment. The rural women take care of cattle grazing in the forests. In many parts of the country women collect potable water from perennial jungle streams passing through the forests.

The women's attitudes towards forests has been changing conservation strategies at the National and State level. In the Himalayan region, rural men are very much interested in raising pine trees so as to get quick money at the time of harvests. On the other hand the women are interested in raising broad leaved trees like, Terminilia Chebula, Olea cuspidata, Acer, Ban Oak species, Alnus nitida, Grewia, Oppositifolia, Pistacia integerrima, Albizzia stipulaata etc. which improves the diversity and result in perennial flow of water in mountain streams in the region and the woman have succeeded in this sphere of activity

In short, women can play a dominant role in the implementation of J.F.M. because of their intimate association with forests. They depend on forests for various livelihood security services; they must get equal representation in the Village Forest Councils and have a choice in the decision making viz. in the selection of species and other silvicultural measures for upgrading the degraded forests vegetative cover and bio-diversity.

THE ROLE OF WOMEN CAN PRODUCE SUCH THICK FOREST

One Can Think of Such Forest by involving WOMEN

6.9 SCOPE OF JOINT FOREST MANAGEMENT IN HAMIRPUR FOREST DIVISION:

Quite good chunks of UPFs and Govt. Land / Common Land / Shamlats and ceiling areas are blank near the habitations. They support generally inferior and bushy type of vegetations. Pasturelands are deteriorating fast due to excessive grazing. Local people are mostly interested in raising broad- leaved species to fulfill their requirements for fuel wood, small timber and fodder and want to manage these as grass lands and grazing grounds. These lands are being encroached upon by influential strata of the society. The concept of JFM would play an important role in protection, conservation and development of forests, thereby improving the economic conditions of local people.

STRATEGY:

i) **Formation of Village Forest Committees/Societies:** Villagers will be organized in groups called Village Forest Development Committees or Societies. A complete process to form such groups will be adopted through P.R.A. exercises or meetings. General house will consist of the one adult male and one adult female member of a household of all the households of the area covered under the group. Executive Committee preferable 5 to 11 members, 50% of which will be women elected in the General house meeting having at least 50% presence of all

members. Committee/Society will be got registered. On these basis a list of 46 & 30 JFMCs/VFDS under Forest Development Agency Hamirpur already exists and functional/non functional in all five ranges of Hamirpur Forest Division. These can be taken in to account while forming Committees / Societies in future for implementation of various activities under different schemes.

ii) **Formulation of Micro Plans:** Micro Plan of the area will be prepared by following complete process of Micro planning by using PRA TOOLS (Separate page added) and discussed in the ward level/small helmet? Level and passed in the General house before it is approved by the DFO.

AREA SHOWING GULLY FORMATION DUE TO GAPS AMONG TREES
FORMING BASE FOR MICRO-PLANNING

iii) Execution of Developmental Works: Works will be got executed by taking executive in to confidence and their complete involvement will be ensured.

FORMATION OF FDA: Ministry of Environmental and Govt. of India Forests and has proposed creation of F.D.A. (Forest Development Agency) launched new scheme called Samanvit Gram Vanikaran Samiridhi Yojna (S.G.V.S.Y), all other schemes such as has been under this new scheme committees will form a federation and a proposal in the form of a project for :-

i) Integrated Afforestation and Eco-Development Project.

ii) The Area Oriented Fuel wood and Fodder Project Scheme.

iii) The scheme for Development on Non Timber Forest Produce including Medicinal plants.

iv) Scheme for Associate of Scheduled Tribe and Rural Poor in regeneration of degraded forests.

v) Eco-Development in and around National Parks and Sanctuaries.

vi) Plantation programme through Ecological Task Forces will get discontinued.

OBJECTIVES:

The main objectives of the scheme would be to:

- Arrest and reverse the trend of forest degradation due to the unsustainable removal of forest products by communities living in and near the forest areas by making the community responsible for monitoring removals from the forest;
- Provide sustainable and assured employment opportunities to the tribal's and other weaker sections of the rural populations in such areas all round the year;
- Create durable community assets for such populations, which would contribute to overall eco-development in the target areas.
- To involve the village community in execution of the scheme and make the exercise fully participatory.
- Create an effective mechanism in order to ensure that the medium of the FDA is used to reach the beneficiaries by other government departments also.

Recently another scheme namely Green India Mission has been launched and preparatory phase is already in position with selection of LANDSCAPES and operational units will be further managed through existing JFMCs by participatory planning, Implementation and evaluation. All other centrally sponsored schemes already in existence are also going to be emerged in GIM later on. The JFMCs once formed should not be left alone; in fact their activation process should be continued by time to time interactions with them by every visiting officers/officials/field functionaries in their respective areas. These JFMCs should be taken in to confidence for each and every forest activities to be carried out in their respective areas by the department. Such actions will encourage them for helping the department in conservation, protection and management of forests. The more functional JFMCs indicate sign of healthy forests, meaning thereby that all over healthy environment and prosperous life.

JFMCs/VFDS EXISTING IN HAMIRPUR FOREST DIVISION

S/No.	Name of Range	Name of JFMCs/VFDS under FDA,Hmirpur.
1.	Barsar	Balh,Pathliar/Singwin,Galore,Tikker,BrahmnBhakreri,Gumarwin.Kuriah,Tipper-Uperalla, Nain,Ganoh-Brahmna,Neri,Loharhra,Khungan,Karsaai,Hareta,Larha,Kashmir,Sareri,Amroh,Dudana-Lohian.
2.	Aghar	Ganoh,Changar,Pahloo,Patera,Kasiri,Jondwin-Brahmna,Amroh,Laleen,Dain,Punder,Samtana-Kalan,Dhamrol,Makkar.
3.	Hamirpur	Baroha,Gagoh,Majhot,Lahar,Masiana,Dugnehri,Baral, Jassour,Paniala,Chabutra,Bandhar,Chamyola, Pastal,Guhal.
4.	Bijhari	Sariana,Kot,Sohari,Barla,Sathwin,Khialwat,Bijhari, Karah,Changar. Fagoti,Balh-nalochan,Ganghot,Kathiana,Pehrwin.
5.	Nadaun	Luharkar,Malag,Budana,Telkar,Jol-Sappar, Hathol-Khas. Basaral,Chathiar,Tanyan,Bhrantha,Mansai, Farnaht.

JFMCs/VFDS under FDA, Hmirpur Forest Division

SALIENT FEATURES:

i) The scheme will aim at providing employment to the local village community through the Afforestation programme thereby creating valuable forest asset for the village community and other durable community assets for overall eco-development of the target communities/villages.

ii) "Federation of Forest Committees (F.F.Sc)" is proposed to be constituted at the Territorial Forest/Wildlife Division level. Each of these Divisions will constitute the planning unit/ project area for the Forest Development Agency (FDA). On an average, about 25-30 villages would be covered under the SGVSY within the jurisdiction of each FDA and all households needing income augmentation will be targeted. In selecting the village, the criteria will be:

   a) Preponderance of SC/ST population.
   b) Willingness of people to participate in forest conservation efforts.
   c) Existence of FPCs/EDCs
   d) Extent of degraded forestland.
   e) Degree of dependence on biomass resource, etc.

iii) SGVSY will be a demand driven scheme with no fixed earmarking of funds for any particular State or FDA. The requirement of funds would emerge through the micro-planning and Participatory Rural Appraisal (PRA) exercise to be undertaken by each FDA for preparation of an integrated project. The project would seek to establish a link between the level of dependence of the village on forests and the absence of sustainable livelihood opportunities, the need for creation of community assets and the requirement of ecological regeneration to the undertaken in and around the forest areas.

iv) The creation of FDA and adoption of JFM Resolution will be a pre-requisite for the introduction of this scheme. Each FDA would be headed by the respective Territorial/Wildlife Conservator of Forests with the respective Territorial/Wildlife DFO as its Member-Secretary-Cum-Chief Executive Officer. The other members will include representatives of the village forest committees (VFDs/Eco-development committees (EDCs). The FDA will be registered as Federation of Village Forest Committees/Eco-Development Committees under the Societies Registration Act. The Village Forest Committee (VFC/Eco-Development Committee (EDC) will be constituted in within the jurisdiction of each village. The local forest block officer/Forester will be ex-officio Member- Secretary of the VFC/EDC.

THE CONSTITUTION OF THE FDA WILL BE AS UNDER:

S.No.	General Body	Executive Body
i)	Chair persons of all Forest Committees.	Chair person-Conservator of Forests.
ii)	Member Secretary of all Village Forest Committees.	Member Secretary cum Chief Executive Officer-Divisional Forest Officer.
iii)	One Designated Women Member from each Forest Committee	Ex-officio Member (without voting rights)- District Development Officer, District level Officer, Soil Conservation, Animal Husbandry, Panchayat, Public Health and Engineering and Education Departments.
iv)	Chair person of District Committee.	Chair person of District Panchayat Forest Panchayat Forest Committee.
v)	Range Forest Officer, ACFs/	Twenty-five nominees from the VFCs/EDCs SDFs To include minimum of 14 women.

Executive Body Member of the FDA shall be ex-officio members of the General Body of FDA, which would be headed by the respective Conservator of Forests.

FDA will provide the funnel mechanism through which assistance under various schemes would flow and be targeted to the areas covered by the FDA. While the FDA would constitute the administrative, supervisory and monitoring mechanism, the respective VFCs and EDCs will undertake the actual implementation of the projects in the field utilizing the locally available laborers only.

6.10 PROJECT PREPARATION, SUBMISSION AND APPROVAL: Each FDA will be required to prepare an integrated project in the format given at Annexure-II. The project will have to be prepared through a micro planning exercise, including Participatory Rural Appraisal (PRA) process. The basic idea would be to identify the present status of the resources, the level of dependence, the existing employment opportunities as well as the quantum of employment required for ensuring sustainable livelihoods, the member of households belonging to the tribal and weaker sections specifically to be targeted under the scheme, the extent of Afforestation and pasture development to be undertaken the types of community

development interventions to be undertaken. Promotion of harvesting, collection processing, storage and marketing of NTFPs from the project area along with related skill and technology development should also be undertaken. The broad range of entry point activities (25% as against the existing 15% for the Afforestation schemes on NAEB) which can be supported under the SGVSY would include(Labor & Material component 60%&40%) :

Water harvesting structures like check dams for irrigation, drinking water requirements and amelioration of soil moisture regime;

Digging of wells for supply of drinking water;

Creation of roads and culverts;

Construction of sheds for school and community use;

Installation of energy saving and energy alternative devices;

Rural electrification through the use of solar power;

Construction of public toilets etc.

The various activities to be undertaken as part of the project should fit into the range of eligible items of work under the 4 component schemes of the SGVSY mentioned in Annexure I. The project proposal should co-relate the planned activities to the respective schemes to facilitate its processing and approval by the Ministry of Environment & Forests.The SGVSY will provide assistance for project preparation not exceeding Rs. 2.00 Lacs to each FDA, if required. The forest department will provide the necessary technical assistance for preparation of the project proposal. The projects will have to be developed and submitted within a maximum period of 6 months of the proceeding financial year from which the project is proposed to be implemented. Each project proposal should cover a 5-year period and activities phased out and casted for each year.

One of the most important components of the project would be the mutual obligations and responsibilities of the major stakeholders, namely the FDA, the VFDCs/EDCs, the Village Communities and the Forest Departments. These will have been clearly spelled out in the project document. It should be ensured that the participation of the village communities is forthcoming in a substantive manner byagreeing, undertake their part of the obligation/responsibility of desisting from unsustainable, unregulated practices of livestock grazing and fuel wood, small timber and other biomass collection practices.

Each FDA will submit the project proposal to the Special Secretary, NAEB, Ministry of Environment and Forests, Government of India through the respective State Forest Department. The project proposals would be examined and processed in the NAEB and approved by a Committee under the chairmanship of the Special Secretary, NAEB, and it will also include Additional Inspector General of Forests (FC), Additional Inspector General of Forests (WL); Joint Secretary & F.A. (MOEF) and Joint Secretary, NAEB, as Members.

The SGVSY may give special emphasis to the recently announced "Bamboo Development Programme" (BDA) and "Nursery Raising Programme" (DRP) under the NTEP component. Both these programmes are highly labour intensive and involve employment of rural women, especially in the case of the Nursery Programme. The BDP involves the regeneration of bamboo resources in degraded bamboo bearing forest areas and the raising of bamboo in private and community lands, including farmlands and homesteads. It also envisages technology development and training inputs for processing of the harvested bamboo into high value/quality articles for the domestic and export markets. Under the NRP rural women, belonging to the weaker sections would be provided material inputs and suitable forestland for raising nurseries of forest and commercial species for meeting the demands of the Afforestation programs. The forest departments would also provide training and technical inputs for producing high quality and fast growing species. While 75% of the seedlings would be bought-back by the department, the grower would be free to sell the remaining 25% at commercial rates.

6.11 FUNDING PATTERN AND FINANCIAL PROCEDURE:SGVSY is a Centrally Sponsored Scheme and the Central will give grants-in-aid to the FDAs. The eligible items of expenditure would broadly cover Afforestation/tree planting and pasture development activity.

The release of funds to the FDAs will be done in 2 installments. The first installment would be released ordinarily by the end of the third month of the financial year after approval of the project proposal. The second installment shall be released after utilization of at least 60% of the first installment, on submission of a progress report covering the financial and physical progress of work. The second installment will be released latest by the end of December to ensure proper utilization within the financial year.

Each FDA will maintain a separate account, which will be jointly operated by its Chief Executive Officer (CEO) and the Chairperson. The FDA will follow the normal procedure and the accounts will be

subjected to an external audit. The audited report, utilization certificate and the progress of work for the previous year should be submitted by the end of the second month of the next financial year.

As mentioned earlier, the FDA will provide the funnel mechanism for flow of funds for implementation in the project area. Therefore, it will be possible for the FDA to receive funds from other sources also, including other centrally sponsored schemes of the Government of India, as mutually agreed between the Central; and State Governments. This arrangement will help in facilitating the flow of funds to the implementation levels, which is currently one of the major constraints in the effective implementation of several centrally sponsored schemes.

6.12 IMPLEMENTATION, MONITORING AND EVALUATION: The SGVSY will be implemented under the overall supervision of the FDAs, and as mentioned earlier, the VFCs/EDCs will be responsible for actual implementation of various activities in the field. The FDA will co-ordinate the project and provides technical and administrative guidance throughout its implementation. The FDA will also be responsible for coordinating the inputs of relevant line departments, as and when needed.

Capacity building of the VPCs/EDCs will be an essential component of the project. For this purpose, the project will identify those persons who need skill development/up-gradation of skills and suitable training programmes organized in collaboration with relevant institutions, departments and NGOs, as necessary. No new infrastructure should be set up for the FDA. The existing infrastructure of the Chairman and Chief Executive Officer should be used for co-coordinating the implementation of the SGVSY. Additional staff, which may be required under the project, should only be in the nature of project contract staff and their costs met out of the overall project budget. A total of ten percent of the project budget may be year marked for administrative expenses. The creation of new additional posts is strictly prohibited under the SGVSY, either at the Centre or in the States.

The progress of implementation of SGVSY will be monitored continuously through reports and physical verification of various works. At the Central Government level, the project will be monitored on the basis of quarterly progress reports and through periodic field inspections by the officials of NAEB or its authorized evaluation agencies. The annual physical verification of assets may also be undertaken from the Central Government level. The periodical evaluation through reputed institutions should be got done and remedial measures be taken for improvement of the Project.

Lastly an important brief note on PRA Tools is mentioned here for the information and guidance of field staff which will be helpful for them in the field while preparing micro plans with the people for all above said schemes. All the above schemes are already being implemented on the basis of JFMCs and GIM, in which all other Centrally Sponsored Schemes shall be included, will also be implemented through JFMCs. That is why necessity has been felt to mention here the PRA Tools essential for preparing participatory management plan.

6.13 Participatory Rural Appraisal: - It is a tool (based on common sense), enabling people through a process in which the people share, enhance and analyze the village problem, prepare village plan after prioritizing the problem and implement/execute the plan, evaluate with the support of project team and re-planning based on their experiences w.r.t their surroundings. Therefore we can derive the definition of development as Development is a process in which people learn how to earn their livelihood. First of all you need to call people at common place already planned date and time in your team, which is to be fixed keeping in view the work load of the villagers in the village. If at all the turnout is not at the desired level then the first tool of PRA comes in picture which is (D.I.Y) means "Do it yourself"-You are to perform such actions with the villagers carefully with the help of which you can win trust and confidence and then convey your message for meeting.

(Please ensure that every information available has to be recorded while doing PRA in the Village).

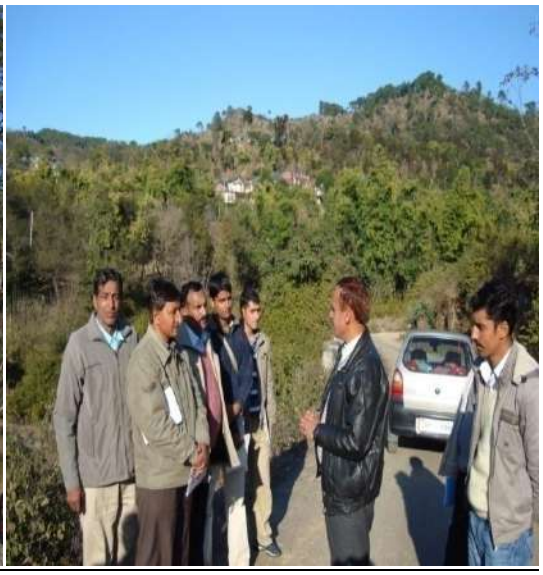
- **Social /Infrastructure Mapping:-** It can be drawn on the ground or on chart by the villagers with your facilitation like religious places, roads, paths, water source etc. along with households and family members data. Even cattle population can also be shown. (Information available to be recorded)
- **Land use mapping: -** Similar map indicating the present land use in the village. Land availability for planting etc. will be available from this map.
- **Seasonality/Time Line/Women work Load Map:-** As the term indicates, these maps can be drawn to know about seasons, history about the village with period and work load on the women month wise in a year. Fodder availability can also be accessed season wise.
- **Wealth Ranking: -** To be done to know the economic status of the villagers orally and to be done confidentially, being a sensitive issue. (Ref Social Map).
- **Matrix-Ranking and Scoring: -** To know the order of preference of the villagers regarding choice of species. We can also know for horticulture/agriculture plants/crops.

- **Lively Hood Analysis MAP: -**To know the ways and means of livelihood sources of the villagers through this mapping. (Income generation activities/user groups/weaker section of society available).
- **Transect-Walk: -** It is a walk to be done in the village along with villagers by your team covering the problematic areas. It will also confirm the information derived from various maps. It is very important and essential from plan point of view and at the same time you can also gather the information like crop pattern, wild life, type of soil, water availability and species existing at different points along with horticulture plants and agriculture crops etc.
- **VENN/CHAPPATI DIAGRAM:-** It can also be done to know the view point of the villagers about various departments working in the village. Even you can also access your working in the village.
- **ENTRY POINT ACTIVITY:-** To begin with, a common village problem can be selected and executed to win trust and confidence of the villagers.

Though all the tools are important but as per need of information relevant tool can be used as the time is very important and valuable for both villagers and team which should not be wasted and should be properly utilized. Then lastly problem analysis is to be carried out with reasons and same be documented. The prioritizing of the problem is also required to be done before actually going for preparation of village micro plan. Then start questioning likes "What is the solution of our problem"? It has been mentioned in a shortened form. VFDC is to be selected as per guidelines as above keeping in view the information available in social map. The VFDS/VFDC/JFMCs so formed should be contacted regularly and ongoing works/plan should be discussed. This is how the objectives of Joint Forest Management can be achieved in real spirit.

VIEW OF MICRO PLANNING PROCESS AT BANN VILLAGE HAMIRPUR FOREST DIVISION

(1).Group Formation Process at Bann



(2). Planning in a Group for Transect Walk

(3).View of Trees and Agriculture Crop. **(4).Domestic Animals in the Village.**

(5).Team Members Talking With Women (6).Bamboo Regeneration View at Bann.

AN EXEMPLARY SPECIMEN PROBLEM ANALYSIS/PRIORITIZING GIVEN

Our ProblemsReasonsOur SolutionWho will execute the work?

Shortage of water 1.Forest fires not allowing fire JFMCs with the support of team full co-operation and sharing responsibility for to the department. Protection, Conservation and Development, Management of forests.

2. Few trees on top Plantation on gaps

3. Soil- Erosion Vegetative works

4. Increase in population. To make people aware

5. Cattle population To decrease cattle population

6. Open grazing Open grazing to be stopped

7. No plantation Plantations in blanks.

Like wise more questions can be asked and discussed at length/ depth as per time avaibility and requirement of plan.

****

CHAPTER – VII

WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

7.1 GENERAL: This is an overlapping Working Circle and overlaps all the Working circles constituted for the tract. Forest management cannot be considered complete without including Wildlife protection in it. It should be clearly recognized that existence of plant life and animal life in which animals, birds and reptiles are included is inter dependent. Every kind of species has its own place in nature's Plan.

The elevation of the tract varies from 570 to 1150m above see level. Therefore, a reasonably good variation in the type of wild life found. However, because of high human population density, inadequate and broken habitat fragmentation, over – grazing, opening up of the tract by numerous roads and ruthless poaching in the past, wildlife populations havedeclined. With the strict enforcement of the complete ban on hunting some populations of species like leopards and birds have revived.

Wild animals and birds not only play an important role in maintaining the ecological balance but their importance from scientific, aesthetic and recreational point of view hardly needs emphasis. Thus forests with wild life become paradise for birds watchers, photographers, biologists, naturalist, ecologists and tourists.

7.2 BLOCKS AND COMPARTMENTS: Each forest will form a compartment and every range will be a block for the purpose of wildlife management.

7.3 SPECIAL OBJECTS OF MANAGEMENT: The special objects of management will be:

- To preserve and protect the natural habitat of wildlife.
- To protect and preserve various wild animals, birds, reptiles and fishes.
- To afford all possible protection and the most congenial conditions of food and environment for an unhindered reproduction of all forms of wild animals, birds, reptiles and fishes.
- To curb poaching of wildlife by organized and un-organized hunters.
- To ensure collection of scientific data for maintenance and development of viable population of fauna for scientific, aesthetic, cultural, ecological and economic purposes.
- To identify problems of wildlife management and to formulate guidelines for its development consistent with the requirements of forestry and environment.
- To address human wildlife conflicts and take appropriate measures to reduce the conflict.

7.4 MANAGEMENT AND ORGANISATION: - The wildlife management activities in the whole Hamirpur Division area are being carried out by DFO territorial who is also the wildlife warden in that regard. Besides this, DFO WL with HQ at Hamirpur, who is primarily responsible for managing wild life activities in the Sanctuary areas only, is also assisting the territorial staff while dealing with human animal conflicts issues and also during wild life census.

7.5 THE EXISTING PROBLEMS: - The fauna of the tract is decreasing due to reduction of the habitat as a result of ongoing development activities. The ever-increasing needs of the growing population is the basic cause of human-animal conflict. The normal living conditions of the wild life are disturbed which is a matter of concern. The following are the hazardous influences threatening the wild life.

1. DEVELOPMENT ACTIVITIES: - The state is in the development phase and the road, path construction is the main activity which in turn is slowly damaging/destroying the natural habitat. The tendency to expand the cultivations into the forests/ natural habitat of wild life is another cause of animal-human conflict.

2. HUNTING: - In spite of complete ban on hunting, the stray incidences of hunting wild animals do take place particularly, when the animals migrate to lower elevations due to unfavorable conditions. The damage to orchards and agriculture crops prompts local people to resort to hunting.

3. FIRES: - Forest fires destroy the habitat and the wild animals are trapped, killed. The fires destroy the eggs, young ones in the hollow rocks, dead stumps and nest built in stumps and on ground.

4. CLIMATIC CONDITIONS: - Sometimes the adverse climatic conditions like heavy rains, heavy snow, and prolonged drought affect the wild animals particularly the young ones.

7.6 HUMAN-WILDLIFE ANIMAL CONFLICTS: Most of the cases of human-wildlife conflict pertain to leopard killing livestock at the animal sheds and child lifting. Habitat degradation, shrinking space and shortage of food often forces the wild animals towards populated areas and it has resulted into the loss of lives of domestic animals as well as property of local people. Massive infestation of forests by alien species, and other factors like road construction etc have led to degradation of habitat and consequent increase in cases of human-wildlife conflict.The cases of killing the domestic animal and cattle are reported every year. For the last 10 years around 200 cattle/sheep/goats were killed. An amount of about Rs. 5.50 lacs was paid as compensation to the affected.

The detail of cases of leopard attacks on human and live stock is under (1998 – 99 to 2012 – 13)

Years	Human beings Killed by Leopard		Human Beings injured by Leopard		Domestic Animals Killed by Leopard	
	No.	Amount (Rs)	No.	Amount(Rs)	No.	Amount (Rs)
1998-1999	0	0	7	13125	265	130565
1999-2000	2	50000	7	13125	304	165775
2000-2001	0	0	15	28125	279	137525
2001-2002	0	0	8	46125	70	44504
2002-2003	0	0	14	57375	261	115826
2003-2004	0	0	6	42375	17	10750
2004-2005	0	0	11	51750	14	6775
2005-2006	0	0	3	5625	29	13375
2006-2007	1	100000	9	73000	113	47135
2007-2008	0	0	18	314000	72	55502
2008-2009	1	100000	15	210000	79	75625
2009-2010	0	0	3	15000	86	77551
2010-2011	1	100000	7	63000	17	22550
2011-2012	1	100000	12	162500	39	34425
2012-2013	0	0	2	38000	70	34704
Total	**6**	**450000**	**137**	**1133125**	**1715**	**972587**

The main reason of the conflict is attributed to the decline of natural prey species of the leopards and also excessive grazing by the ever increasing live stock of the local and migratory graziers in the forests. The other reasons include, disturbance in wildlife in habitats which are now easily accessible by roads and paths.

Of late, the monkey menace has been increasing in the rural areas, destroying the crops sown. In recent years a few cases of monkey biting have also been reported. As in other parts of the state, monkeys are attracted to towns and other habitation for easy availability of food which is catered to them by the pilgrimages and also free access to garbage lying in open. Few incidences of black bear attack on human beings have also been reported in last ten years.

Data pertaining to incidents of wild animals found dead in Hamirpur Forest Division is given in Table.

Information regarding wild animals found dead in forest

S. No	Year	Leopard	Wild Boar	Shamber	Kakar	Monkey	Neel Ox /Gai	Python	Peacock	Wildstag	Wild cat	Civet	Total
1.	2000	9	0	0	0	0	0	0	0	0	0	0	9
2.	2001	2	0	0	0	0	0	0	0	0	0	0	2
3.	2002	6	0	0	0	0	0	0	0	0	0	0	6
4.	2003	8	0	0	0	0	0	0	0	0	0	0	8
5.	2004	4	0	0	0	0	0	0	0	0	0	0	4
6.	2005	1	0	0	0	1	0	0	0	1	0	0	3
7.	2006	3	0	0	0	0	0	0	0	0	0	0	3
8.	2007	9	0	0	1	0	1	0	0	0	0	0	11
9.	2008	6	1	0	0	1	1	1	0	0	0	0	10
10.	2009	4	1	2	0	0	0	0	0	0	0	0	7
11.	2010	10	0	3	0	0	0	0	1	0	1	0	15
12	2011	4	0	3	0	0	1	0	0	2	0	1	11
13.	2012	9	0	1	1	0	2	0	0	0	0	0	13
	Total	**75**	**2**	**9**	**2**	**2**	**5**	**1**	**1**	**3**	**1**	**1**	**102**

7.7 HABITAT MANAGEMENT MEASURES FOR WILDLIFE: The wildlife management on scientific lines is based on biological characteristics of a species. Social, humanitarian, economic and sentimental considerations are also equally important. Wildlife management must take into account all the considerations. The primary requirement of wildlife is food and shelter. Animals and birds are selective in their food habits. Unless they found suitable conditions for themselves, they will not stay in unfavorable habitats. Favorable conditions need to be created. Forests in turn are benefitted by the wildlife. Some important aspects for improvement of wildlife habitat are suggested as under: -

(i) Surprised raised and checks at important points on motor roads for curbing the activities of poachers. Field staff needs to be extra vigilant in the remote and interior areas of the division particularly during winter months. During winter wild animals descend to low elevations in search of food and water when there is snowfall on higher reaches.

(ii) Grazing in the forest area is to be controlled on rotational basis. The existing number of cattle to be frozen after proper counting and punch marking. No new cattle to be allowed to enter the area. This will gradually reduce the number of cattle. The graziers so affected thus may be suitably rehabilitated on other locations.

(iii) Protection of wildlife from forest fire should be effectively ensured by creating fire lines, construction of fire watch towers at strategic points and posting of fire watchers during fire

season. Field posts should be connected with the control office by wireless / mobile system for providing immediate help to the fire fighting parties.

(iv) Periodic inoculation of domestic animals of the immediate surrounding areas should be done to prevent cattle borne diseases spreading to the wild animals.

(v) Adequate food supplies should be ensured. Fruit bearing trees may be planted in the forests augment the existing food supplies.

(vi) Winter hideouts and shelters are constructed for affording protection to the birds and animals descending to lower areas during winter season.

(vii) Salt licks and water holes may be provided at suitable places for healthy growth and reproduction of wildlife.

(viii) Adequate field staff should be provided for enforcing provisions of Wildlife (Protection) act, 1972.

(ix) Wildlife volunteers may be appointed on part time basis to assist the staff in detection and apprehension of poaching activities.

(x) Signboards and notices may be put at prominent places containing information regarding prevailing wildlife protection rules and suitable appeal for their observance.

(xi) List of habitual poachers should be maintained at Range level and their activities kept under observation. In the event of their indulgence in poaching their firearm licenses be got cancelled.

(xii) Crop protection licenses should be issued only where absolute necessary.

(xiii) The length of gun barrel sanctioned under crop protection license should not exceed 45 cm and only a limited quantity of gunpowder / cartridges should be allowed against these licenses.

(xiv) An education drive for the protection and importance of wild life to the mankind is to be carried out through pamphlets and audio-visual media.

(xv) Rewards should be offered to those who report and help in apprehending wildlife poachers.

(xvi) Water is the most important factor for the prolific reproduction and healthy growth of wildlife, particularly during summer months when it is scarce. Necessary water bodies need to be provided/ created in areas where it gets scarce in summer by constructing farm ponds, erecting water retention dams in nallahs etc.

7.8 HUNTING AND SHOOTING: The Wildlife (Protection) Act, 1972 and the rules under section 64 of the Wildlife (Protection) Act, 1972, notified vide by H.P. Government Notification No. 6-9/73-SF

dated 24.2.1975 are in force in the state with an object i.e. of preserving, protecting and reproducing the fast dwindling wildlife.

Vide GOHP Notification No.6-2/73-SF/iv dated 21.6.1984, and Letter No.FFE-B-F(1)-2/2001 Dated 27.1.2010, the Govt. has allowed hunting of the under mentioned crop damaging wildlife, as per procedure laid down:

(i) Wild boar, (ii)Porcupine, (iii) Sambhar, (iv) Cheetal, (v) Hare, (vi) Jackal, (vii) Monkey, (viii) Parrot, (ix) Blue Bull (Neelgai).

The Himachal Pradesh Hon'ble High Court on 06.01.2011 in CWP No. 8149/2010 has stayed granting of permits by officials of the wildlife department to farmers to kill monkeys and other wild animals damaging their crops.

7.9 LEOPARD MENACE: Ban on hunting might be one possible reason which has laid in considerable increase in carnivorous wildlife like Leopard, leopard kill domestic animals killing domestic animals. The Govt. is, therefore, paying compensation to the owners of the domestic animals killed, and for human beings injured or killed by wild animals as per NotificationNotification No. Fts. (F)-6-7/82 loose dated 9.4.1996. Leopard sometimes turns man-eater which might be simply due to an old age loss of cannines or an injured leopard unable to hunt. To check the menace of man-eaters habitual cattle lifter leopards, followings measures are suggested: -

1. At the very initial stage all incidences should be co-related and studied to declare leopard man-eater as per procedure laid down.

2. Traps are to be laid in and around the affected area to trap the leopard.The man-eaters should be translocated to nearby zoo.

3. To make wide publicity in and around the affected localities about the attacking habits of man-eater and circulate do's and ©'s for safety of local peopal.

4. It is suggested that professional hunters should be contacted for the killing of man-eater after proper order from chief wildlife warden.

7.10 MONKEY, WILD BOAR ETC. MENACE: - Monkeys, wild boars and birds cause considerable damage to agricultural crops. Following measures are suggested to control the population of damage causing animals: -

(i) DIRECT METHOD: - This involves lethal methods like shooting; poisoning and biological control through predators shooting shall require proper permission under Wildlife Protection Act 1972.

(ii) PHYSIOLOGICAL CONTROL: - This method involves modification of an animal's physiological ability to reproduce. The tested chemical sterility can be used to cause temporary or permanent sterility in monkey and wild boars.

(iii) CAPTURING AND STERILIZATION: - It is one of the methods to control population in an area where there is abundance of monkeys. This method involves capturing of monkeys in and around the affected locality and transportation to nearest "Monkey Sterilization Centre". This is an expensive method and can be very effective in monkey affected localities.

(iv) SCARING BY USE OF AIRGUN/ FIRE CRACKERS: - By using airguns and fire crackers monkeys can be scard.

The combination of above methods can minimize the problems to some extent in the affected areas. However, some other suggested measures for the reduction in the conflict between man and animals are as under:

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.

v) The issue of crop insurance has a lot of promise to resolve the man-animal conflict in the Hamirpur Forest Division. Possibility of paying a portion of the insurance premium by the Forests Officials for poor villagers should be explored but proper checks and balances are to be devised for such insurance.

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. 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 behavior; 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.

Monkey Menace

Capturing Fields

Sterilization Process

Transportation Cages

Preoperative Handling Procedures

Surgical Procedures

Postoperative Cure

Transported Back

7.11 COMPENSATION ON ACCOUNT OF DAMAGE DONE BY THE WILD ANIMALS: - The H.P. Govt. vide**Notification No. Fts. (F)-6-7/82 loose dated 9.4.1996** have defined the categories of loss done by wild animals and prescribed the rates of compensation thereof as relief. The detail of loss caused to domestic cattle, human beings and compensation paid on account of such losses for the period 1998-99 to 2011-12 is about 25 lacs.

The degree of compensation paid is going to increase over the next few years with the increase in population of cattle, human beings as well as wild animals.

The strategy being followed for estimating the monkey population is as under:

MONKEY POPULATION ESTIMATION: A three-step strategy will be implemented for an efficient monkey population estimation of the state of Himachal. This would include

1. Preliminary Data Collection and Survey,
2. Random Field Survey, and
3. Comprehensive Population Estimation.

STEP 1: PRELIMINARY DATA COLLECTION SURVEY (JANUARY AND FEBRUARY)

This forms the primary step of population estimation exercise. It necessarily would involve all the forest beats of the state. This survey will be conducted during the month of January through mid of February and the data will be collected and compiled in the Form No. 1 given as annexure. This form will be filled-

up in the field based on monkey troop's observations in association with concerned NGOs, and the local people etc. This survey and the data collected will form the background to identify the areas of high population abundance as well as those exhibiting large scale conflicts. All the observations of monkey-infested areas will be marked on the maps at the forest beat, forest range and Forest Division levels.

Mandate for this exercise would be:

1. Preliminary Training to the field staff: All the concerned forest officials, NGOs, community members will be given a hands-on training as how to collect data and conduct population estimation. This would also involve imparting training on techniques for this purpose, habitat definition, migration pattern, population abundance and man-animal interface.
2. The training will be conducted at each Circle/Division HQ level or any other suitable place to ensure participation of all concerned.
3. The preliminary Data Collection Survey is seen as an opportunity to bring together the Forest Officials, and Resource Persons such as NGOs, community to respond to the man-primate conflicts.

STEP2: RANDOM FIELD SURVEY (FEBRUARY AND MARCH)

Based on the preliminary data collected, a random sample for Monkey Population Count will be conducted in the month of February-March. In general this Count would be carried out in the selected high man-monkey conflict areas obtained from the Preliminary Data Collection Surveys. The aim of this exercise would be to impart training to the concerned personnel, NGOs, community for conducting comprehensive survey later on. In general the feedback of this exercise would form a basis for further improvement in methodology and refining of technique of population counts. A data collection sheet given as Form 2 in the annexure will be filled up by all the concerned forest personnel, NGOs, community. The Form 2 will be compiled at the Division level. Simultaneous data plotting on the beat map will be carried out.

STEP3: COMPREHENSIVE POPULATION ESTIMATION (JUNE AND NOVEMBER)

Since population estimation of monkeys of entire state is an intensive and time consuming activity, the estimation of population of monkeys in selected few conflict areas based on Preliminary and Random Field Surveys will be carried out (Form 2 given as annexure). This is a biannual feature to be conducted out during the month of June and November for the reasons that during months of June the parturition of females is nearly over and it will give a better demographic estimation in subsequent surveys. During the

month of November, the feed availability is low and due to better visibility during autumn, better estimation of population can be carried out. During this month the mating of monkeys is on the decline and no new population is likely to be added for another six months or so.

The data from this exercise will be compiled at the Division level in Form 3. The compiled data from this exercise can be used for studying the impact of various conflict resolving methods, like sterilization, garbage management etc., study of migratory pattern of monkeys, social behavior of monkeys, group reorganizational behavior, post-sterilization behavior, resolution of man-animal conflict (including crop damage study, direct bite cases etc.), and demographic trends etc.

A) GUIDELINES

1. In towns like Shimla, Bilaspur, Hamirpur, Dharamshala, Nahan, Solan, or Mandi it may be very difficult to identify a few vantage points. On the clear trails (such as streets or roads), observers will walk in a given timeframe (ten to twenty minutes) to note the numbers of the monkeys, their location, group size, composition, direction of movement, etc. Care must be taken that the spread of the 'transects' is such that a large area of the town is covered, but there are clear blind areas that separate different 'transects', so that chances of double counts are almost excluded.
2. Every observer will identify the areas of potential monkey population pockets (or Core Area) where the count is to be conducted in a period of ten to twenty minutes. The forest officials in association with NGOs, community will indicate the minimum number of observers required to cover entire potential area of monkey population under the jurisdiction of a Forest Beat. Accordingly the Range Officer shall be responsible for deployment of required number of observers for this purpose.
3. A Core Area (potential monkey population pockets or monkey infested area) will be divided in different segments to conduct surveys. In these segments, various vantage points will be identified to closely observe the monkeys without interference. If a particular segment is quite big this may be further sub-segmented under a person/forest guard/observer to observe the monkeys from a vantage observation point, in the morning between 7 and 8 AM when monkeys come out to forage. This should be ensured that monkey in line-of-sight of the observer are counted and there is no repetition of count of the same troupe by the other observers.
4. The monkey count is to be conducted in such a manner that all the monkeys in every observer's domain are counted in a period of ten to twenty minutes. Prior to counting, for a period of half an hour the observer will closely monitor his segment and identify the monkey population there. This includes the

likely foraging behavior and identification of hiding areas where a large number of monkeys may hide. The period of counting should be such that the level of error of number is avoided due to movement of the animals from one observation point to another. In general the count will begin at one time for entire area (watches of all the observers should be synchronized), so that duplication due to movement is checked.

5. The monkey count is to be conducted by involving various NGOs, professionals and other similar institutions involved with monkeys. Perhaps involvement of Eco-clubs, schools/colleges in the vicinity of identified locations will be also a most desirable component.
6. A basic website/blog will be created to have an online access to the information to a wide user/stakeholder groups

B) NOTES

a) Observer's/Forest or Wildlife Guard's familiarity with the terrain and monkeys is the basic assumption/premise of this exercise.

b) The DFOs will help specify the area to be surveyed by the field staff and they will be responsible for the smooth conduct of entire exercise in their divisions. The DFO will also ensure that the maps of beat, block and range are in place and available to the observers (beat guard, NGO or community).

c) There will be a special mention of such areas which are part of monkey surveys/population estimation; where monkeys have been released after their sterilization.

d) Wherever possible GPS data can be incorporated in the database.

e) In order to make the monkey population estimation a long term plan, Open source mapping GIS software can and should be used. There is no cost in acquiring the software plus a large number of people can share the same tools and do some good monitoring which is transparent accessible and verifiable.

FORM 1

Preliminary Data Collection Survey (Jan-Feb at Beat Level)

Ft. Beat/Ward in a town Range Division Circle

Observer's name, organization, address, mobile no. and email (if any)

Date

S.No.	Place or Core Area/ Potential Monkey Population Pockets	Approxi. Monkey Nos.	Seasonal Presence (months)	Habitat (on tree, roof top, open or crowded space, market, etc.)	Nearness to Garbage Dump; Temple/Pilgrim Site if any
Urban /rural area					

FORM II

Random Field Survey (At Beat level in Feb-Mar), and Comprehensive Population Estimation

(June and November)

Monkey Population Count

Urban/rural area

Ft. Beat/Ward in a town Range Division Circle

Observer's name, organization, address, mobile no. and email (if any): Pl fills up in the Table below

Date and Time (this has to be same for all observers/observations):

T A B L E

S.No.and Place	Observer's name, organization address, mobile no. and email (if any)	Troops					
		Troop No.	Adults	Infant	Total	Habitat (on tree, roof top, open or crowded space, market, etc.)	Nearness to Garbage Dump; Road, Temple/ Pilgrim Site
	G total						

FORM III

Comprehensive Population Estimation

(At Division level in March, June and November)

Table: Compilation of Monkey Population Countfor..... Forest/Wildlife Division

Dated

Name of Compiler (the Divisional Forest Officer)

S. No.	Name of Beat/Range or Segment or Ward	Total Troops	Total Adult	Total infant	Total
G.Total					

The monkey population estimation (2012) based on the above strategy/guidelines-

Sr. No.	Name of Range	No. of monkey
1.	Hamirpur	1850
2.	Barsar	1726
3.	Bijhri	1590
4.	Nadaun	1384
5.	Aghar	1129
	Total	**7679**

Drawbacks of the above Survey:

- The survey was confined to hot spot areas only as such, it couldn't give the real picture of the distribution of monkey population in the Division.
- The monkey sterilization drive is not found correlated with the monkey distribution in the beats.
- The monkey population of infants, an important factor for adopting the sterilization strategy, was not covered during the census.
- It was not possible to estimate the population growth trend and fertility rate of the monkeys in various habitats
- The survey was not found helpful to assess the efficacy of sterilization drive.

Detailed Monkey Survey-2013:

To address to the above drawbacks, it has been decided to carry out a detailed survey of the population of monkeys and langurs in the State in all the rural, urban and forest areas. The monkey population survey has the following objectives:-

1) To estimate the population of monkeys/langurs in the State in Various habitats.

2) To estimate the population growth trend and fertility rate of the monkeys in various habitats e.g. urban, semi-urban, road sides, rural villages, temples and forests etc.

3) To assess the migration trend of the monkeys from non-commensally habitats to semi-commensally & commensal habitats i.e. from forest areas towards rural and urban areas.

4) To assess the extent of man-monkeys conflict.

5) To identify the areas and pockets where man-monkey conflict is alarming.

6) To assess the efficacy of monkey sterilizations.

Schedule of monkey/langurs Population estimation Survey:

1.The survey of monkey population shall be carried out in two phases. The first phase of the survey will be done in **June** and second phase will be conducted in **December**. This has been necessitated due to two distinct breeding cycles of Rhesus monkeys.

2. Monkey/langur population has to be done by head counting of male, female, and juvenile/young monkeys/langur in each troupe and number of troupes at each location. The status of monkey/langur population will be estimated in 5 categories viz. forests, urban, rural, temples & road sides separately by following "Direct Head count method".

3. The survey shall be carried out from **7 AM to 5.30 PM in June** throughout the State by all Forest Guards in their beats. The Territorial Forest Guard will carry out the monkey/langur population count throughout their beat jurisdiction. Similarly, the Wildlife Guard will carry out population estimate survey within their Wildlife Beats. The survey will cover all locations urban, rural, forest, temples and road sides falling within the jurisdiction of forest guards.

4. The Forest Guards will start the survey process for a week, when they will observe and note down the locations and movement routes, where monkey troupes are concentrated in their beats. This observation process will continue for a week before the final count.

5. One day before the actual head counting of monkey population, all forest guards will carry out a pre-survey of all monkey/langur troupes' locations and estimate population of each troupe.

6. On the final count day, the survey will begin at 7 AM in the morning and will end at 5.30 PM in the evening. The Forest Guard will visit all the monkey/langur troupes locations identified during the pre-survey period from 7 AM onwards. The details of monkey/langur population found at each troupe location will be filled in table No. 1 (Annexure-1). The Forest Guards may require a team of 3-4 Forest Workers to assist them in visiting various monkey/langur troupe locations.

7. On the following day of the final count, all forest guards will carry out a **Post Survey** verification check. This post verification will again be done from 7.00 AM to 5.30 PM by all forest guards and to verify the correctness of their monkey/langur counting done on previous day.

As per the Monkey population survey result 2013, total 11869 monkeys were found recorded in the Division. It includes 794 infants. The detail as per Appendix XXVIII attached.

7.12 SURVEY AND DATA COLLECTION: - To identify the various parameters to base future management, the survey and data collection on following lines are prescribed to be carried out by the Wildlife Division.

I)**PREDATORS: -** The existing number of each predator species along with their prey population should be assessed. Damage cases of domestic animals and injuries to human should be listed. Prey-predator ratio of these animals should be assessed periodically. All the necessary steps should be taken to keep this ratio to the optimum level.

II)**MIGRATION**: - Most of the animals and birds move to lower elevation in winter. Seasonal migrations and movement of such animals and birds should be studied and record maintained.

III)**BREEDING**: - Breeding seasons of animals and birds should be studied. Hatching period of pheasants should be observed and record maintained.

7.13 SCIENTIFIC STUDY AND RESEARCH: - Studies and research on the wildlife population needs to be studied and applied in the wildlife management. Population has to be studied on the basis of the peculiar habits of animals and the birds and extent of habitat available for that particular animals / birds. Priority should be given to habitat. Latest sampling techniques should be applied in consultation with **Wildlife Institute of India** Dehradun to assess the nature of habitat and population of wild animals / birds. For pheasants particular time of calling and breeding should be studied and data maintained. Similarly for animal population scientific study of their habitat can also be computed. The study on occurrence of diseases in wild animals and birds population should also be made scientifically and sampling methods. This will help in planning the future management of wildlife in more scientific and environment friendly way.

7.14 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 zigzagging 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.

This chapter has been got vetted by Chief Wildlife Warden Shimla vide his Memo ***No. WL/Working Plan/ 8086 Dated, Shimla-1, the/ 01.01.2014.*** *The approval letter is Annexd as Annexure XXXI Page No. 582.*

****

CHAPTER-VIII

NON TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

8.1 SPECIAL OBJECTIVES OF MANAGEMENT:-

- To document important NTFP species found in the division.
- To preserve and improve the quantity and quality of NTFPs in the division and manage them on a sustainable basis.
- To preserve & develop the resource base for food security of wildlife.
- To decide and adopt strategies for the above purpose in the changing context like climate change.

8.2 THE LIST OF IMPORTANT NTFP AVAILABLE IN HAMIRPUR DIVISION:

Sr. No.	Common & Local name	Botanical name	Type	Part used	Uses
1.	Rati	*Abrus precatorius*	Climber	Seed/ Root	Bruised seeds are poisonous seeds are used as purgative emetic, aphrodisiac and used in nervous disorder. Root is known as Indian liquorices
2.	Khair	*Acacia catechu*	Tree	Heart wood	Yield 'Katha' used as astringent, digestive, useful in cough & diarrhea, Externally applied to boils & eruptions on skin.
3.	Puthkanda	*Achyranthes aspera Linn*		Entire plant	Used in cough & its decoction in given in renal dropsy & bronchial infection.
4.	Bansa, Basuti	*Adhatoda vasica*	Herb	Leaves, flowers	Used in treatment of cough, Asthama, Opthalmia.

5.	Bel	*Aegle marmelos*	Tree	Fruit	Fruit is chiefly used in chronic diarrhea & dysentery, sweet drinks soothing for intestines. Half ripe fruit is stringent, digestive & stomachic. Leave are useful in diabetics.
6.	Ramban	*Agave Americana*	Shrub	Leaves and stem	Fiber for rope making
7.	Kikki, Siris	*Albizzia lebbeck*	Tree	Root, Bark, Flower	Used in hemicranias, cooling. Alexiteric, anthelmintic. For asthma & snake bite.
8.	Barbadis akie, Ghikawar	*Aloe barbedensis*	Shrub	Leaves	Source of resinous drug which is used as purgative.
9.	Neem	*Azadirachta indica*		Tree	Source of various drugs such as fungicides etc.
10.	Safed musli	*Asparagus adcendens/ Roxb*			Root
11.	Dante	*Baliaspermum montanum Muell*		Shurb	Roots/Seed
12.	karal	*Bauhinia racemosa.*		Tree	Roots,Bark,Flower
13.	Kaliar, Lal Kachnar	*Bauhinia purpurea Linn*		Tree	Root. Bark, Folwer
14.	Maljhan. Tour	*Bauhinia vahlii*		Tree	Seed
15.	Kachnar	*Bauhinia variegate*		Tree	Bark
16.	Kashmal	*Berberis lyceum*		Shrub	Roots
17.	Ligga	*Boehmeria regulosa*		Shrub	Bark.
18.	Bimol, Ciar, Khaksha	*Boehmeria platyphylla*		Shrub	Bark
19.	Simal	*Bombax ceiba*		Tree	Wood/ Root
20.	Dhak, Palas	*Butea monosperma*		Tree	Wood/ Bark of roots/ flower
21.	Ak	*Calotropis procera*		Shrub	Roots/ leaves
22.	Bhang	*Cannabis sativa*		Shrub	Leaves/ flowers
23.	Amaltas	*Cassia fistula*		Tree	Pods, Root, bark
24.	Tun	*Cassia tora*		Weed	Leaves

25.	Khirk	*Celastrus paniculata Wild*		Climber	Seed/ Leave
26.	Dhak Kari	*Clerodendron infortunatum*		Shurb	Leaves and roots
27.	Jaman khumb	*Cryptolepis buchanani*		Climber	Milk
28.	Akas-bel, Sarag bali	*Cuscuta reflexa*		Climber	Leaves
29.		*Dioscorea bellophyla*			Tubers
30.	Janj,kinch	*Dioscorea deltoidea*			Tubers.
31.	Potatoyam , gaithi, Ratalu	*Dioscorea bulbifera Linn*			Tubers
32.	Amla, Aonla	*Emblica officinalis*		Tree	Fruit
33.	Pariaru,Greru	*Erythrina suberosa*		Tree	Wood
34.	Laldudhi	*Euphorhbis hirta*		Shrub	Entire plant
35.	Pipal	*Ficus religiosa*		Tree	Bark
36.	Kangu	*Flacourtia indica*		Shurb	Seed
37.	Pit- papra	*Fumaria parviflora Lam*			Entire plant
38.	Marorphali	*Helictris isora*		Shurb	Fruit/ Bark/ Root
39.	Kura	*Holarrhena antidysentrica*		Tree	Seed/ bark
40.	Kathi, Hakna,	*Indigofera pulchella*		Shrub	Root
41.	Barnasi	*Limonia crenulata*	Shrub	Leave/Root	Tonic, appetiser& useful in fever.
42.	Aam	*Mangifera indica*	Tree	Fruit/ bark	Acrid, cooling, astringent to the bowels.
43.	Drek	*Melia azaderach*	Tree	Leaves/ Seeds	Anthelmintic, Used in rheumatism
44.	Jangli pudina	*Mentha longifolia Huds*	Shrub	Leaves	Carminative and stimulant
45.	Kambel, Rohni, Kamala	*Mallotus Philippinensis*	Tree	Bark. Fruit	Drug Kamela used for destroying tapeworms used externally in treatment of shin diseases.
46.					
47.	Sahjan	*Moringa pterigosperma*	Tree	Fruit/ Bark/ Leaves	Used in gout and acute rheumatism
48.	Ganghela	*Murraya koenigii*	Shrub	Leaves	Used for flavor to curries
49.	Kaner	*Nerium indicum Mill*	Shrub	Leave	Anthelmintic especially for tapeworm.

50.	Harsingar	*Nyctanthes arbor-tristis*	Tree	Leave/ Flowers	Leaves are used for polishing wood, in medicine as a febrifuge and flower used as orange dye.
51.	Sanan	*Ougenis oojeinensis*	Tree	Bark	Used as febrifuge and also as fish poison.
52.	Chil	*Pinus roxburghii*	Tree	Pine needles/ Oil	As liniment in rheumatic pains as stimulant, expectorant & in chronic bronchitis.
53.	Khajur/ Palm	*Phoenix sylvestris*	Tree	Fruit / Leaves	Fruits are edible. Cooling, tonic, useful in diarrhea and urinary problems.
54.	Kakkar	*Pistacia integerrima*	Tree	Galls	Kakarsinghi used in native medicines
55.	Anardana	*Punica granatum*	Tree	Fruit	Used in diarrhea and dysentery
56.	Rara	*Randia dumetorum*	Tree	Fruit	Fruit are edible & pulp of fruit is also given in dysentery
57.	Basant	*Reinwardti a trigyna*	Shrub	Stempa & Leaves	Applied to wounds infected with maggots, used for treatment of paralysis.
58.	Arandi	*Ricinus communis*	Shrub	Seeds	Made into paste & are applied to sores, bils7 rheumatic swelling.
59.	Kunjo, Kuja	*Rosa moschata*	Shrub		
60.	Guma	*Roylea elegans well*	Shrub	Roots & Leaves	Used as febrifuge
61.	Ritha	*Saptndus mukorossi*	Tree	Fruit	Used in salivation, epilepsy, chlorosis.
62.	Arjun	*Terminalia arjuna*	Tree	Bark	Cooling, Alexiteric, styptic, tonic, antidysenteric, diseases of heart, anemia, excessive, perspiration, asthma.
63.	Bahera	*Terminalia belerica*	Tree	Bark	Mild diuretic , useful in anaemia & leucoderma
64.	Nirgundi, Bana, Sahalu	*Vitex negundo*	Shrub	Leaves	Considered tonic, smoked for headaches and applied to rheumatic swelling of joints

65.	Dawi, Dhai	*Woodfordia fruticosa Kurz*	Shrub	Flowers	Used in dysentery, astringents tonic & in disorders of the mucous membrane.
66.	Tejphal. Tirmira	*Zanthoxylum armatum DC*	Shrub	Bark fruit & seed fruits	Carminative, stomachic & anthelmintic.
67.	Ber	*Zizyphus mauritiana*	Shrub	Leaves/ Fruit	Laxative, given in throat trouble, source of vitamin 'C' & Sugars.

8.3 THREE YEAR EXTRACTION CYCLE FOR COLLECTION OF HERBS (NTFP):

Years for the collection of herbs	**2013-14 2016-17 2019-20 2022-23 2025-26**	**2014-15 2017-18 2020-21 2023-24 2026-27**	**2015-16 2018-19 2021-22 2024-25 2027-28**
Name Of Blocks	Hamirpur,Jharalri, Hareta,Nadaun, Loharli	Barsar, Chakmoh, Sujanpur,Bhareri, Kangoo	Bijhari, Aghar, Bumbloo,Dhaneta Tauni Devi

8.4 QUANTUM OF NTFP AVAILABLE:

There is no record regarding quamtum of NTFP available in Hamirpur Forest Division. It is recommended that the NTFP may be collected/ extracted as per three years extraction cycle. During 2010 farmers have taken intiative in the collection of Pine Needles from the forest area and its sale to the cement industry. From 2010 onward following quantity of Pine Needles have been collected and sold from Hamirpur Forest Division.

2010 = 450 Qtls.

2011 = 2060 Qtls.

2012= 1716 Qtls.

The collection cost @ 165/- per qtls was made to people besides it the Panchayats were benifited from royalty @ 5/- per qtls.

****

CHAPTER – IX

WATERSHED MANAGEMENT

9.1. BACKGROUND

a) Natural Resources conservation, development and their scientific utilization are very crucial for sustained agricultural production. Land and water constitute the important natural resource base for meeting the essential requirement of the society such as food, fodder, fiber, fuel and timber etc. Land degradation poses a severe challenge to life of reservoirs and agricultural productivity. Reservoirs of irrigation projects are threatened bysiltation due to unchecked land degradation and improper land uses in the catchments.

TheCentrally Sponsored Scheme of Soil Conservation in the catchments of River Valley Project (RVP) was launched during the Third Five Year Plan for mounting a concerted effort at prevention of catchment deterioration.

b) Floods are annual features in the Indo-Gangetic Plains & in the Brahmaputra basin. Five States, namely, Uttar Pradesh, Bihar, West Bengal, Assam and Orissa account for nearly 80% of the total flood area and about 75% of the damages caused. Several Expert bodies have highlighted the need for proper catchment management for moderating peak floods and improvement of land resources and moisture regime in the catchments and reduction of silt load in the channel flow affecting river beds. In order to achieve these objectives a Centrally Sponsored Scheme of Integrated Watershed Management in the Catchments of Flood Prone River (FPR) in the Gangetic Plains was launched in Sixth Five Year Plan.

c) Since both schemes are quite similar in objectives and approach i.e. reducing soil loss and minimizing flood hazards through appropriate soil conservation measures, therefore Cabinet Committee on Economic Affairs took a decision to clubbed these scheme together during Ninth Five Year Plan renaming as “Soil Conservation for Enhancing Productivity of Degraded Lands in the Catchments of River Valley Project and Flood Prone River (RVP & FPR)”. Further this scheme was subsumed under Macro Management Agriculture (MMA) from November, 2000 along with other 27 schemes of Department of Agriculture & Cooperation and now this scheme has became a programme/components of MMA. Presently, this programme is being implemented in 53 catchments falling in 27 States of the country as per details given in Annexure-I.

d) The guidelines for planning and execution of soil and water conservation measures under RVP and FPR were initially issued in 1992. Thereafter some modifications for implementation were issued vide

this office letter No.4-2/99-SWC-I, dated 02.03.2000. The modifications/ changes approved have been incorporated in the updated guidelines. Based on the past experience, some modifications were required with a view to make the treatment more focused, cost effective & should promote multi- disciplinary approach involving greater public participation in the planning and execution of the programme. Certain aspects like up gradation of skills, promotion of public awareness and greater thrust on vegetative conservation measures in the interest of sustainability require to be given greater emphasis in the implementation of the programme.

9.2. OBJECTIVES

Objectives of the programme are:-

a) Prevention of land degradation by adoption of a multi-disciplinary integrated approach of soil conservation and watershed management in the catchment areas;

b) Improvement of land capability and moisture regime in the watersheds;

c) Promotion of land use to match land capability;

d) Prevention of soil loss from the catchments to reduce siltation of multipurpose reservoirs and enhance the in-situ moisture conservation and surface rainwater storage in the catchments to reduce flood peaks and volumes of runoff.

9.3. STRATEGY

The strategy inter-alia comprises:-

a) Adoption of a project approach to the treatment of catchment,

b) Integration of sect oral measures for comprehensive watershed development and maintenance,

c) Consolidation of treatment effort through projectasation approach and proper choice of work areas,

d) Emphasis on sustainability of treatment measures,

e) Vegetative thrust for construction of strategically located structures (Light Check Dams – LCDs), along drainage lines to retard velocity of runoff and to impound water in the watershed.

9.4. APPROACH

a) The treatment of watershed must be planned on a project basis for a maximum total period of five years. For this purpose, watershed must be divided into Micro-Watersheds (M.W.) i.e. 500-1000 ha. each

and the work programme must be desegregated on the basis of M.W. The treatment of each M.W. should be phased over 3 to 5 years so as to saturate the whole watershed in a period of five years.

b) The treatment measures for soil and moisture conservation and afforestation must be planned in a synchronized manner so as to complete, from all aspects, the treatment of the whole watershed within the planned period.

c)High priority should be given to vegetative measures like afforestation, growing grasses and shrubs agro-forestry, horticulture and planting fuel, fodder and timber and fruit trees species. Bio-diversity should be the guiding principle in the 'greening' programme (for this purpose special thrust is given to the raising of fuel). Fencing should only be through live hedges on CPT and not wire fencing. Wherever CPT is not feasible it should be supported with stone fencing. Contour bunds, vegetative contour barriers, earthen contour bunds, check bunds along drainage lines from top to downward, plantation along field boundaries as per from the need of the site after discussions with the beneficiaries during farmer training, are to be adopted. Land shaping terracing and leveling should be avoided as they give rise to substantial soil erosion. However, these items could be taken up within 10% of total cost of the watershed provided there are 25% contributions from beneficiaries in cash for taking these works. A written agreement from beneficiaries may be made at formulation stage.

d) Before initiating treatment measures, bench marks must be established so as to facilitate the monitoring and evaluation of the effectiveness of treatment measures from time to time.

e) Clear administrative and institutional mechanisms must be envisaged for the execution, direction and control of the programme and also sustaining of the improved status of the watershed.

f) Initiatives and measures for securing public involvement in the programme must be clearly spelt out. The measures envisaged for treating the project area, should be formulated after discussion with the beneficiaries of the project in a manner, which will involve them in implementation and secure the best land use according to the land capability in order to make the watershed productive on a sustained basis by growing fodder grasses, legumes, shrubs and trees of fuel, fodder and fruit varieties. The programme measures would have to be carefully chosen so as to keep the cost down for achieving greater coverage with given financial resources and beneficiary participation to ensure post project maintenance of the project assets in the area on a continuing basis.

g) Multi-disciplinary approach involving various line departments like Agriculture, Forests, Horticulture, Animal Husbandry, Minor Irrigation etc. should be adopted at the district and project level while evolving programme measures and conducting farmer training. In executing works, daily labour engagement

system should be adopted contracting should be strictly avoided. Identification of institutional and extension linkages and measures for dovetailing research & other activities in these areas should be spelt out.

h) In Tenth Five Years Plan thrust has been given for entry point activity transfer of technology higher size Water Harvesting Structure in Arid and Semi Arid Region, involvement of beneficiaries for planning, implementation and post care maintenance of assets created under the programme and collection of information for self appraisals. Accordingly the unit cost and man days for selected components were increased. The details of percentage allocation of different items allowed under the programme are given in Annexure-II (A). The component-wise man days and cost norms for each componentsfor category-I and for category-II are also given in Annexure-II (B).

9.5. SELECTION OF AREA FOR TREATMENT

The All India Soil and Land Use Survey Organization (AIS&LUS) is engaged in the task of priority delineation and detailed soil survey for guiding the treatment of degraded areas and improving land capabilities. By employing the Silt Yield Index (SYI) method, AIS&LUS has been able to categories Watersheds according to the magnitude and criticality of degradation, into very high, high, medium, low and very low areas. The areas for treatment under RVP and FPR should, therefore, be selected having regard to the following criteria:-

a) Very high and high priority watersheds must first qualify for treatment, in that order,

b) Contiguity of watersheds to be treated is necessary for consolidating the measures of treatment; and

c) Annual programmes must cover whole micro watersheds, as far as possible, and contiguity should guide the choice of the micro watersheds for subsequent periods.

9.6. PREPARATION FOR PROJECT FORMULATION

9.6.1 A detailed survey shall be conducted with the following objectives:-

a) To collect physical data for determining the treatment measures,

b) To identify biological resource endowment and capabilities with a view to determining the specific thrust areas,

c) To identify critical factors contributing to the degradation in the project areas,

d) To establish bench marks for evaluating impact of the project on selected parameters, and

e) To identify linkages, infrastructural and institutional to promote socio-economic development.

9.6.2 The detailed survey must lead to the formulation of a land use capability map.

9.6.3 The survey must collect data on rainfall, its distribution and intensity, ground water potential and run-off behavior, silt carrying etc.

9.6.4 An inventory of physical resources should be made to identify the grass, shrubs and tree species thriving in the area and of use to the local people. This inventory will also identify tree, fodder and grass species, which can be introduced in the area with reasonable success.

9.6.5 An inventory of successful and preferred economic activities and availability of skills shall also be made.

9.6.6 The survey must cover ancillary economic activities of households such as Dairying, Poultry and Pisiculture.

9.6.7 A complete survey of existing crops and cropping system shall be made and identification of cropping systems to suit land capabilities in the project area should be attempted.

9.6.8 A detailed survey for establishing bench marks on the following parameters shall also be made:-

a) Number of wells and average depth at which water is found and the average well yield,

b) The number of tube wells, electric motors and diesel pumps and the average yield of tube wells,

c) The cropping pattern and the crops,

d) The number of persons employed on non-farm activities, and

e) Run-off and sediment yield data.

9.6.9 It is necessary to identify, in consultation with the local population:-

a) Factors contributing to the degradation of the catchment and measures required for their removal,

b) Problems affecting productivity of crops,

c) cost effective treatment for prevention of soil loss and improvement of moisture regime,

d) Behavior of drainage lines and run-off,

e) Migrant behavior of human and livestock population,

f) Local preferences in addition to trees, grasses, shrubs & fodder,

g) Institutional arrangements for securing people's commitment to resource conservation in the project area, and

h) Mechanisms for sustaining the improved state of project area.

9.7. PROJECT FORMULATION (Programme component)

a) The survey, investigation and consultations involved in the preparations for the project formulation would highlight the problems of degradation and indicate the type of measures, which will be required to upgrade the land capability in the project area and conserve land forest resource in the catchments. Sustained conservation, development and management of land resources in the project area would be possible, only if the measures are perceived by the population to be useful and are designed to satisfy some of the needs of the population, living in, and dependent on, the project area, should secure the best land use according to the land capability and make the watershed productive on a sustained basis. These measures would have to be carefully chosen so as to keep the costs down for achieving greater coverage within a given financial resource and to require minimum financial resource and to require minimum financial commitment for the maintenance of the area in a useful state. At the same time, these measures would have to be technically sound and durable in the long run. To achieve these objectives, the technical and managerial know-how of the project staff and the accumulated experience of the village community should reinforce each other and act in union to get the best choice of treatment.

b) The treatment measures under RVP and FPR are essentially designed, in the context of highly degraded areas of the catchments, to:-

_ prevent soil erosion and improve land capability;

_ improve moisture regime, and

_ diversify and improve biological resource endowment.

c)WATER AND SOIL CONSERVATION MEASURES

i) Water and Soil Conservation Measures would be:-

In arable lands:

_ Contour bunding,

_ Vegetative hedges across the slope,

_ Earthen contour bunds,

_ graded bunding particularly in heavy soils and black soils,

_ Bench terracing/land leveling (limited to 10% of the total cost of the watershed and only in areas where minimum 25% contribution is from beneficiaries.)

_ Check bunds and gully plugs along drainage lines (proceeding from top to downwards)

_ Water harvesting structures including farm ponds,

_ Plantation along field boundaries, and

_ Construction of brushwood barrier which would lead to formation of a terrace over a period of 2 to 3 years should be explored.

a. In non-arable lands (including forest and community lands)

_ Contour or staggered trenches,

_ sowing and planting

_ Silvi- Pastoral Development

_ Pasture Development

_ Check bunds,

_ Check dams, gully plugs, and

_ Water harvesting structures.

b. Permanent (Pucca) structures should not be constructed in the first year of the project. Wherever these structures are to be constructed, they will be taken up in the second or third year of the implementation of the programme as per proper sanction for specific structure. This is to ensure that vegetative soil conservation measures, initiated in the first year acquire some definite shape before supplemental engineering structures are put up in the second or third year. Thus, every proposal for an engineering structure would have to be prefaced by a description and site plan of the vegetative soil conservation measures that were implemented in the previous year of the project. Evidently, high priority should be given to vegetative measures over engineering measures.

9.8 MEASURES FOR IMPROVING BIOLOGICAL RESOURCE ENDOWMENT

a) This would include afforestation, promotion of agro-forestry, establishment of composite nurseries (Kisan and departmental), pasture development and fodder development. The composite nurseries shall raise seedlings for providing grass for cattle, effective barrier, shrubs, fodder species (including trees) for meeting the fodder requirement in the area, fuel, wood, timber and species.

b) Complete closure of entire grazing lands available in watershed/micro-watershed should not be planned in the very first year of implementation. Instead it should be staggered by closing $1/8^{th}$ of available grazing area in the first year; $1/8^{th}$ in the second year and similarly in the third year. During this period, the system of 'cut and carry' should be operated to bring home its advantages to the beneficiaries. After about ½ of the available grazing area has been treated like this, the phasing of the treatment of the rest can be faster without causing inconvenience to the beneficiaries of the watershed in feeding their cattle.

c) A silvi-pastoral model for common lands for 15 ha. is given at Annexure III. The same may be adopted.

9.9 AFFORESTATION

a) In taking up afforestation of forest and non-arable lands only live hedges will be used for the purposes of demarcating the boundary of land and the planted area. Contour and staggered trenches in the plantation area and peripheral trenches shall be taken up sufficiently in advance of planting within the enclosed area so as to ensure the establishment of live hedges. For planting saplings and seedlings within the enclosed area, except in flat area, pitting may be avoided: staggered contour trenches should be properly located so as to be in a position to receive the seedlings and saplings in subsequent periods; if trenches are not considered desirable in steep slopes because of geomorphologic conditions, zero tillage may be adopted. Under no circumstances, wire fencing should be made. 6 N0s Micro Watershed namely Be1b,Bf1a,Bh1a,Be2a,Bf2a and Bf2d treated under Centrally Sponsored Scheme RVP from 2010-11 to 2012-2013 as under:

Name of SWS Code	Total area (in ha.)	Area treated	Priority	Nos. Of village covered.
Be1b	615	204	High	10 out of this 2 village left out due to implementation of other Projects.
Bf1a	539	138	High	10 out of this 4 village left out due to implementation of other Project.
Bh1a	1460	582.5	High	42 out of this 17 village left out due to implementation of other Project.
Be2a	640	267	High	12 out of this 4 village left out due to implementation of other Projects.
Bf2a	717	179	Very High	31 out of this 20 village left out due to implementation of other Projects.
Bf2d	1075	252	High	20 out of this 10 village left out due to implementation of other Projects.

Himachal Pradesh Forest Department.

Hamirpur Forst Division Hamirpur, HP.

Activity wise Progress Report under River Valley project (RVP) upto 31.03.2011

Name of MWS	Bh1a			Bf2d			Bf1a Tillo Ist			Be1b			Be2a Tillo 2nd			Bf2a			Total.		
Name of Division/Range.	**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**		
Activities	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**
Waste Land.																					
Demarcation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetative fencing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Composite Nursery	0	0	28000	0	0	17000	0	0	18000	0	0	0	0	0	0	0	0	14000	0	0	77000
Sowing and planting																					
Spillways (Drop/Chute/Baffled Chute etc) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silvi pasture development.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pasture Development	7.5	0	30840	6	0	23759	2	0	8180	2	0	8030	4	0	15459	4.5	0	16163	26	0	102431
Aforestation/Agro Forestry.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour bunding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gap Filling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour Trenching with seed sowing.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drainage Line Treatment																					
Upper Reaches.																					
Earthen/loose boulders.	0	8	39600	0	0	0	0	0	0	0	21	103950	0	11	54450	4	4	19800	4	44	217800
Loose boulders with vegetative support.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middle Reaches																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	0	6	99438	0	6	99000	0	0	0	0	8	132000	0	3	49500	4	2	38333	4	25	418271
Lower Reaches.																					
Earthen bunds/check bunds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with Gabion (storage capacity not less than 1 ha M)	0	5	224450	0	6	273885	0	0	0	0	2	89980	0	4	179965	0	0	0	0	17	768280
water harvesting Structures (WHS) (storage capacity more than 1 ha m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Check bunds (Veg. leg Crip bonds)/ R. walls.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways (Drop chute/Baffled Chute etc.) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percolation tanks/ Silt Detention structures (SDS) Capacity more than 0.5 ha.m.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm Ponds)storage capacity ob 0.20 ha.m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm production System and Micro enterprises.																					
Land Owing Farmers.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land/asset less Farmers/SHG etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantation of Bio Engg. Species.			10930			19590						6983			8065			2901			48469
Total Waste Land	**7.5**	**19**	**433258**	**6**	**12**	**433234**	**2**	**0**	**26180**	**2**	**31**	**340943**	**4**	**18**	**307439**	**12.5**	**6**	**91197**	**34**	**86**	**1632251**

Himachal Pradesh Forest Department.

Hamirpur Forst Division Hamirpur, HP.

Activity wise Progress Report under River Valley project (RVP) upto 31.03.2012.

Name of MWS	Bh1a			Bf2d			Bf1a Tillo Ist			Be1b			Be2a Tillo 2nd			Bf2a			Total.		
Name of Division/Range.	**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**			**Hamirpur/Nadaun**		
Activities	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**
Waste Land.																					
Demarcation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetative fencing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Composite Nursery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sowing and planting Bio Engg.	4	0	28600	3	0	21450	3	0	21450	6	0	42900	3	0	21450	0	0	0	19	0	135850
(Spillways)Drop/Chute/Baffled Chute etc) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silvi pasture development.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pasture Development	17	0	67010	8	0	31520	4	0	15760	6	0	23640	10	0	39400	2	0	7880	47	0	185210
Aforestation/Agro Forestry.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour bunding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gap Filling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour Trenching with seed sowing.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drainage Line Treatment																					
Upper Reaches.																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	8	7	31250	0	0	0	0	0	0	13	18	82920	10	10	47090	4	4	18750	35	39	180010
Middle Reaches																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	1	2	48840	8	3	73260	0	0	0	2	3	65340	1	2	33000	2	1	24420	14	11	244860
Lower Reaches.																					
Earthen bunds/check bunds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with Gabion (storage capacity not less than 1 ha M)	3	3	134970	0	0	0	0	0	0	2	1	44990	4	2	89980	4	1	44990	13	7	314930
water harvesting Structures (WHS) (storage capacity more than 1 ha m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Check bunds (Veg. leg Crip bonds)/ R. walls.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways (Drop chute/Baffled Chute etc.) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	76560	4	1	76560
Percolation tanks/ Silt Detention structures (SDS) Capacity more than 0.5 ha.m.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm Ponds)storage capacity ob 0.20 ha.m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm production System and Micro enterprises.																					
Land Owing Farmers.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land/asset less Farmers/SHG etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Waste Land	**33**	**12**	**310670**	**19**	**3**	**126230**	**7**	**0**	**37210**	**29**	**22**	**259790**	**28**	**14**	**230920**	**16**	**7**	**172600**	**132**	**58**	**1137420**

Watershed and Tika/Nalla wise report for the const. Of structure in Nadaun Range during 2012-13.

Name of M.W.S.	Kind of Land	Particular of work	Qty.	Expenditure
Be1b	Waste land	Const. Of Dry C/Dam in Gouna Nalla (UR)	12 Nos.	70200.00
Amlehar				
	Waste Land	Const. Of Dry C/Dam in Gouna Nallah 3Nos	3 Nos.	17550.00
		(UR)		
		Total UR	15 nos	
		Const. Of C/wire C/Dam in Jangali 1 No	4 Nos.	78000.00
		Forest land & Gouna Nallah 3Nos(MR)		
		Const Of C/wire C/Dam in Gouna Nallah 2Nos (MR)	2 Nos.	39000.00
		Const. Of C/Wire C/dam in Gouna Nallah 1 No (LR)	1 No	53170.00
		G.Total =22 Nos.strs. (All in Karaur beat of Dhaneta Block)	**TOTAL**	**257920.00**
Bf2d	Forest Land	Const. Of Dry C/Dam in Jandli Gujran 3 Nos	4 Nos.	23400.00
Rangas		& Bannh Nallah 1 No (UR)		
		Const. Of C/Wire C/Dam in Paniala Nalla 1	5 Nos.	97500.00
		No, Jandli Gujran 3 No & Bannh Nallah 1No		
		(MR)		
		Const. Of C/Wire C/Dam in Bannh 1 No & 2	5 Nos	265850.00
		Nos Paniala & Jandli Gujran 2 Nos (LR)		
	Waste Land	Const. Of dry C/Dam in Paniala 1 No &	2 Nos.	11700.00
		Bhaloon Nallah 1No (UR)		
		Const. Of C/Wire C/Dam in Jandli Rajputan	1 No	19500.00
		Nallah 1 No (MR)		
		Const. Of C/Wire C/Dam in Bhaloon 1 No &	2 Nos	106340.00
		Kheriana Nallah 1 No (LR)		
		Total	**19**	**524292.00**
		All 19 Str. Are tn Rangus beat of Nadaun Block		
Bh1a	Forest Land	Const. Of Dry C/Dam in P36 Jeehan Nalla	12 Nos.	70200.00
Dhanpur		10Nos & Badiar Nallah 2 Nos (UR)		
Jeehan				
		Const. Of C/Wire C/Dam in P36 Jeehan Nallah	7 Nos.	136500.00
		1 No Gandyana Nallah 2 Nos, Tareti Nallah 4 Nos (MR)		
		Const. Of C/Wire C/Dam in P36 Jeehan	9 Nos.	478530
		Nalla 9 Nos (LR)		
		Const. Of C/Wire R/Wall in Choa Chukarala	1No.	90480.00
		1 No (R/Wall)		
	Waste Land	Const. Of Dry C/Dam in Badiar Nallah 1No&	2 Nos.	11700.00

		Tareti Nallah 1 No (UR)		
		Const. Of C/Wire C/Dam in Gandiyana 1 No	4 Nos.	78000.00
		& Badiar Nalla 2 Nos , Dobar Khurad Nallah 1 No(MR)		
		Const. Of C/Wire C/Dam in Tikkru Barota	6 Nos.	319020.00
		2Nos , Badiar 1No & Gandiana 1No &		
		Dobar Khurad Nallah 2 Nos. (LR)		
		Const. Of C/Wire R/Wall in P-36 Jeehan	1 No	90480.00
		1 No (R/Wall)		
		Total (42 No Are in Jeehan beat of Nadaun Block)		**1274910.00**
Bf1a	Forest Land	Const. Of C/Wire C/Dam in DPF Tillu Nalla	**2 Nos.**	**106340.00**
Tillu 1st		**(LR) (In Tillu Beat of Nadaun Block)**		
Bf2a	Waste Land	Const. of Dry c/Dam in Rail nallah 1 No(UR)	1No.	5850.00
Dhanpur				
Chathiar		Const. Of C/Wire C/Dam in Rail nallah 1 No,	3 Nos.	159510.00
		Ghartun 1 No & Chatrail Nallah 1 No (LR)		
		Const. of C/Wire R/Wall in Rail nallah 1 No.	1 No.	90480.00
		(R/Wall)		
		(5 are in chathiar beat of Nadaun Block)	**Total**	**255840.00**
Be2a	Forest Land	Const. Of Dry C/Dam in Kuthar Nalla (UR)	1 No.	5850.00
Tillu 2nd		Const. Of C/WireC/Dam in Kuthar Nallah 1	1 No.	53170.00
		Nos (LR)		
	Waste land	Const. of c/wire c/Dam in		
		& Gagal nallah 2 Nos. (LR)	2Nos	106340.00
		Const. Of Dry C/Dam in Rakkar Nallah 3 No	3 N0s.	17550.00
		(UR)		
		Const. Of C/Wire C/Dam in Rakkar Nallan (MR)Gagal nallah 1 No	3 No.	58500.00
			1	19500.00
		Const. Of C/Wire C/dam in Rakkar Nalla	3 Nos	159510.00.00
		(LR)		
		(14 are in Tillu beat of Nadaun block)	**TOTAL**	**420420.00**

ABSTRACT			
Sr. No.	**Name of activity**	**Nos./ Qty.**	**Amount**
1	Upper Reaches	40 Nos	234000.00
2	Middle Reaches	27 Nos	526500.00
3	Lower Reaches	34 Nos	1807780.00
4	Retaining Walls	3 Nos	271440.00
	G.Total	**104 Nos**	**2839720.00**

Himachal Pradesh Forest Department.
Hamirpur Forst Division Hamirpur, HP.
Activity wise Progress Report under River Valley project (RVP) upto 30.09.2012.

Name of MWS	Bh1a			Bf2d			Bf1a Tillo Ist			Be1b			Be2a Tillo 2nd			Bf2a			Total.		
Name of Division/Range.	Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun		
Activities	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**
Waste Land.																					
Demarcation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetative fencing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Composite Nursery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sowing and planting Bio Engg.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways) Drop/Chute/Baffled Chute etc) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silvi pasture development.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pasture Development	9	0	41850	9	0	41850	4	0	18600	5	0	23250	9	0	41850	0	0	0	36	0	167400
Aforestation/Agro Forestry.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour bunding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gap Filling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour Trenching with seed sowing.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drainage Line Treatment																					
Upper Reaches.																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middle Reaches																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Reaches.																					
Earthen bunds/check bunds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with Gabion (storage capacity not less than 1 ha M)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
water harvesting Structures (WHS) (storage capacity more than 1 ha m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Check bunds (Veg. leg Crip bonds)/ R. walls.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways (Drop chute/Baffled Chute etc.) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percolation tanks/ Silt Detention structures (SDS) Capacity more than 0.5 ha.m.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Farm Ponds)storage capacity ob 0.20 ha.m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm production System and Micro enterprises.																						
Land Owing Farmers.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land/asset less Farmers/SHG etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Waste Land	**9**	**0**	**41850**	**9**	**0**	**41850**	**4**	**0**	**18600**	**5**	**0**	**23250**	**9**	**0**	**41850**	**0**	**0**	**0**	**36**	**0**	**167400**

Himachal Pradesh Forest Department.

Hamirpur Forst Division Hamirpur, HP.

Activity wise Progress Report under River Valley project (RVP) revalidated funds upto 30.09.2012.

Name of MWS	Bh1a			Bf2d			Bf1a Tillo Ist			Be1b			Be2a Tillo 2nd			Bf2a			Total.		
Name of Division/Range.	Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun			Hamirpur/Nadaun		
Activities	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**	**P**	**S**	**Fin.**
Waste Land.																					
Demarcation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetative fencing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Composite Nursery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sowing and planting Bio Engg.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways) Drop/Chute/Baffled Chute etc) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silvi pasture development.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pasture Development	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aforestation/Agro Forestry.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour bunding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gap Filling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contour Trenching with seed sowing.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drainage Line Treatment																					
Upper Reaches.																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middle Reaches																					
Earthen/loose boulders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with vegetative support.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Reaches.																					
Earthen bunds/check bunds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loose boulders with Gabion (storage capacity not less than 1 ha M)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
water harvesting Structures (WHS) (storage capacity more than 1 ha m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Check bunds (Veg. leg Crip bonds)/ R. walls.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillways (Drop chute/Baffled Chute etc.) only in high rainfall areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percolation tanks/ Silt Detention structures (SDS) Capacity more than 0.5 ha.m.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Farm Ponds)storage capacity ob 0.20 ha.m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Farm production System and Micro enterprises.																						
Land Owing Farmers.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land/asset less Farmers/SHG etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Waste Land	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

The following types of engineering structure has been constructed categorized three parameters i) Upper riches ii) Middle reaches iii) Lower reaches.

The photographs of engineering works carried out in Nadaun Range under RVP/ NPV Scheme during the period of 2012 – 13.


AFTER THE WORK
const.of WHS p20 Malag
c2c nallah 1/2012-13 under NPV scheme


AFTER WORK
const. of Farm pond (packa) in p20 Malag
c2c 1/2012-13 under NPV scheme

****

CHAPTER – X

BAMBOO MANAGEMENT

10.1 GENERAL: -Himachal Pradesh, a Western Himalayan hill state, has sizeable natural populations of the following bamboo species:

Sub-tropical areas: *Dendrocalamus strictus*, *Dendrocalamus hamiltonii*, *Bambusa arundinacea*.

Temperate areas: *Arnudinaria falcata; Arundinaria spathiflora*

Both the temperate and sub-tropical bamboo species form an integral part of the lives of Himachalis. The bamboos in the State are extensively used in the form of 'kiltas' (conical baskets) and other type of baskets for carriage and storage of all types of items – both domestic and agricultural. Bamboos also form significant source of cash income to the farmers as well as to the basket weavers and other artisans. The State has good potential of augmenting its bamboo resources – both on forest and private lands and promoting use of bamboos.

Bamboo is a versatile group of plants which is capable of providing ecological, economic and livelihood security to the people. Keeping in view the vast untapped potential of the bamboo plant, a scheme on National Bamboo Mission has been launched in Himachal in 2007, for addressing the issues relating to the development of bamboo in the State.

The National Bamboo Mission is a Centrally Sponsored Scheme, in which the contribution of the Central Government is 100%.

10.2 The main objectives of the Mission are:

- To promote the growth of the bamboo sector through as an area based regionally differentiated strategy;
- To increase the coverage of area under bamboo in potential areas, with improved varieties to enhance yields;
- To promote marketing of bamboo and bamboo based handicrafts;
- To establish convergence and synergy among stake-holders for the development of bamboo;

- To promote, develop and disseminate technologies through a seamless blend of traditional wisdom and modern scientific knowledge.
- To generate employment opportunities for skilled and unskilled persons, especially unemployed youths.

In Government forest lands, bamboo plantation programme is being undertaken through the Forest Development Agencies (FDA) and the Joint Forest Management Committees (JFMCs). However, in case of Non-Forest Areas, the Bamboo Development Agencies (BDAs) is the nodal agency BDA.

10.3 Planting Scheme: -The planting scheme has to take into consideration the size and growth habit of the species. In the planting scheme envisaged for a few species, it is to be noted that spacing of plants between lines is greater than the spacing of plants in line. This is because it allows greater ease of movement for maintenance and harvesting activities and also allows movement of tractors and small vehicles. As per the guideline of national Bamboo Mission, an indicative model of 10 bamboo species is given below

Planting Scheme for different species of Bamboo

Selected Species	In Line	Between lines	TotalPlants/ ha.	Mortality@ 25%	Total plants per ha.
Bambusa tulda	5	6	333	83	416
Bambusa balcooa	5	6	333	83	416
Dendrocalamus hamiltoni	5	6	333	83	416
Melocanna baccifera	4	6	417	104	521
Dendrocalamus giganteus	6	7	238	60	298
Dendrocalamus asper	6	7	238	60	298
Bambusa nutans	5	6	333	83	416
Bambusa bambos	5	5.5	400	100	500
Dendrocalamus strictus	4	6	417	104	521
Ochlandra travancoria	4	5	420	105	525

- **Forest Areas**

MoEF is promoting bamboo plantations on commercial basis in different States of the Country as per their mandate. Since the MoEF may not have sufficient resources to plant bamboo of their own, the fund required for planting bamboo in Government Forest Land under JFMS will be met from the National Bamboo Mission in a phased manner. The total cost of planting bamboo in one hectare of Government Forest Land works out to Rs. 25,000/-. The funds will be released in two equal instalments of 50:50.

Assistance for the second year will be subject to 90 % survival of the plants. The planation in Forest Area will be carried out through JFMCs

- **Non-Forest Areas**

The bamboo growers in the non-forest land would be extended direct subsidy up to 50% of the cultivation cost per hectare subject to a ceiling of Rs. 8,000/ for small and marginal/ SC/ ST farmers. The funds will be released in two equal instalments of 50:50. Assistance for the second year will be subject to 90 % survival of the plants. Apart from the subsidy component, the funding mechanism in the private sector (non-forest areas) may be sourced from (a) linking with existing government programmes; and (b) through Bank Loans.

The planation in Non Forest Area will be carried out through NGOs, SHGs, Individual Farmersand Farm Associations (ha).

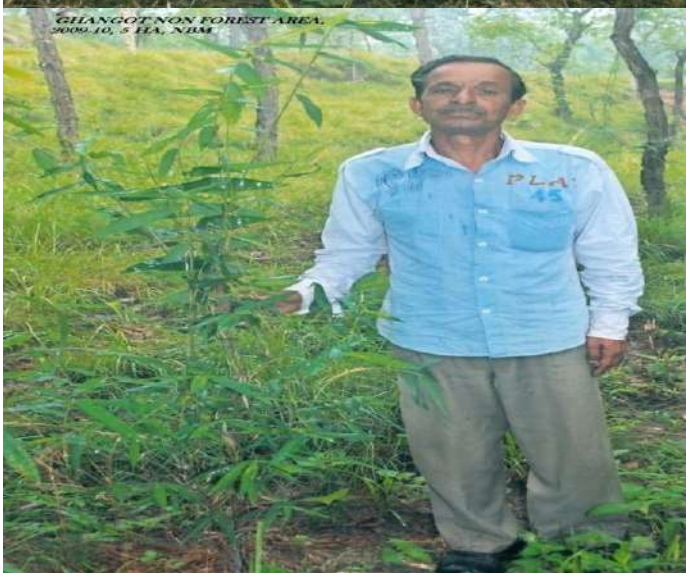
10.4Improvement of Existing Stock:- Crafts-persons and artisans of this country are dependant for their livelihood on handicraft items for which a specific number of bamboo species are being used since time immemorial. In order to improve the quality of such products, there is a need to improve upon the existing stock and variety of bamboo that is being used by these crafts-people and artisans in order to derive maximum benefits and returns. With a view to maximize returns without any substantial investment, an area of 7,500 hectares of the existing stock of bamboo will be improved initially. This task will be undertaken by BDAs and FDAs as in case of bamboo plantation at the state level. The technical instructions for the operations to be executed for the improvement of growing stock is as per annexure-

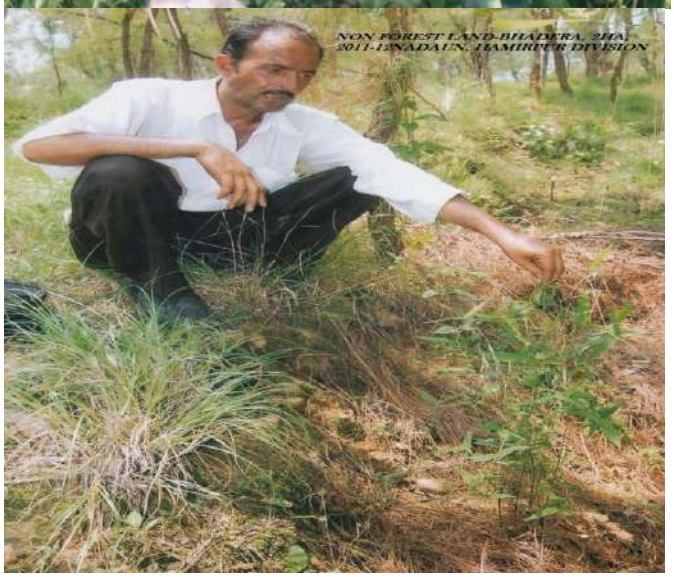
The detail of the works carried out under the national bamboo mission in the Division, since the inception of the project is as per table below:-

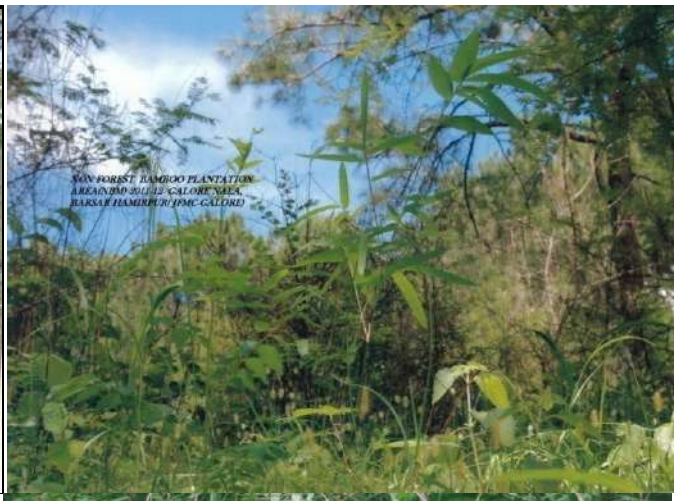
Year	Plantation on Non Forest land	Plantation on Forest land	Improvement of existing stock
2008-09	20	19	2
2009-10	52	31	-
2010-11	40	30	7
2011-12	50	40	5
2012-13	20	27	-

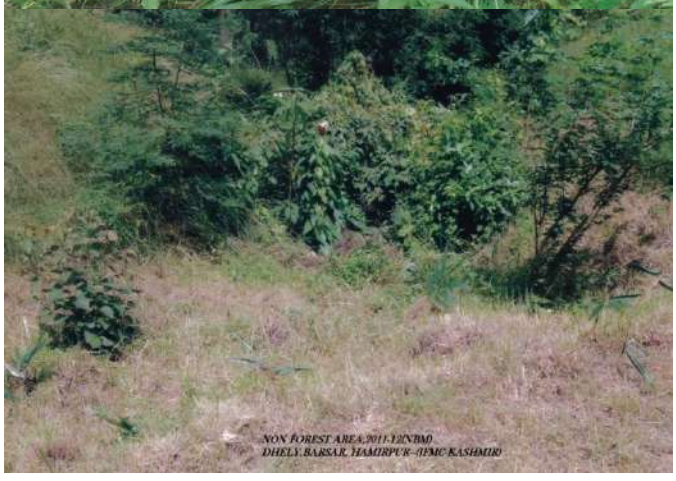
Pictorial illustration of Bamboo Plantation under National Bamboo Missionin Nadaun Range U.P.F. 366. Rangas (3.00 Ha.) during the period of 2008 – 09


Pictorial illustration of Bamboo Plantation under National Bamboo Missionin Nadaun Range during the period of 2012 – 13




NON FOREST BAMBOO PLANTATION
AREA(NDM) 2011-12 GALORE NAKA,
BARSAR HAMIRPUR (DFMC GALORE)


NON FOREST AREA 2011-12(NDM)
DHELY BARSAR, HAMIRPUR-(DFMC KASHMIR)

Detail of bamboos exported from Hamirpur Forest Division during last 6 years

Year	Magar	Piece	Faglu	Piece	Sotha	Piece
2004 -05	123291	379600	120908	399087	97090	339572
2005-06	130063	351495	159790	483383	42892	139764
2006-07	129159	356938	205127	650113	113299	292180
2007-08	28085	1545	29900	1046	28430	426
2008-09	0	0	0	0	0	0
2009-10	442669	24346	614727	21515	476536	7148
Total	**853267**	**1113924**	**1130452**	**1555144**	**758247**	**779090**

Felling of bamboos in private area is being doneas per 3 year felling cycle.

Sr. No.	Year	Name of Range	Name of Block	Remarks
1.	2014 – 15	Hamirpur	Touni Devi	All the tikas fells under the jurisdiction of the block.
		Aghar	Bhota	All the tikas fells under the jurisdiction of the block.
		Barsar	Bumbloo & Barsar	All the tikas fells under the jurisdiction of the block.
		Nadaun	Kangoo	All the tikas fells under the jurisdiction of the block.
2.	2015 – 16	Hamirpur	Hamirpur	All the tikas fells under the jurisdiction of the block.
		Aghar	Bhareri	All the tikas fells under the jurisdiction of the block.
		Bijhari	Bijhari	All the tikas fells under the jurisdiction of the block.
		Nadaun	Nadaun	All the tikas fells under the jurisdiction of the block.
3.	2016 – 17	Hamirpur	Sujanpur	All the tikas fells under the jurisdiction of the block.
		Aghar	Aghar	All the tikas fells under the jurisdiction of the block.
		Bijhari	Chakmoh & Loharli	All the tikas fells under the jurisdiction of the block.
		Nadaun	Dhaneta	All the tikas fells under the jurisdiction of the block.
		Barsar	Hareta	All the tikas fells under the jurisdiction of the block.

****

CHAPTER – XI

DIVERSION OF FOREST LAND UNDER FOREST CONSERVATION ACT, 1980

11.1 FOREST CONSERVATION ACT 1980:With enactment of the FCA, 1980 no forest land can now be diverted for non forestry purpose without the permission of Govt. of India. As consequence of this, the position regarding breaking up of land for cultivation in the un-classed and the un-demarcated protected forests with permission of Deputy Commissioner has been completely altered. Thus, the distinction amongst the demarcated protected, un-demarcated protected and un-classed forests, as far as the breaking up of land is concerned has dis-appeared. So far as total of 43.25 ha. of land has been diverted for non forestry purpose in this Division under this Act. Detailed has been appended as appendix XXIX. However range wise detail of area diverted under FCA up to 31.03.2013 is as under:

S.No.	Range	Area diverted in Ha.
1	Hamirpur	34.9729
2	Bijhari	0.8800
3	Nadaun	0.7922
4	Barsar	0.0681
5	Aghar	6.55
	Total	**43.2632**

****

CHAPTER XII

MISCELLANEOUS REGULATION

12.1 Petty Felling: Minor fellings, the produce of which falls in low limits are counted towards petty fellings and also one from the following listed purposes, allowed on silvicultural considerations by the Divisional Forest Officers. All such removals should be accounted for in control forms and recorded in compartment history files.

(i) Dry, Fallen and fire damaged trees occurring scattered in forests for ordinary departmental uses or for other Government departments.

(ii) Trees required for the bonafide timber requirement of local villagers i.e. free grantees and the right holders.

(iii) Trees required tomeet special free grants where property is destroyed due to the natural calamities, as per provisions of the Government orders.

(iv) Trees falling under alignments of transmission lines, roads and other development projects.

(v) Trees required for research by the silviculture division of the department, universities or Forest Research Institute and Indian Council of Forestry Research and Education and also else where.

(vi) Other departmental uses, such as temporary construction of bridges, Charcoal manufacture etc.

12.2 Deviations:

Large scale felling which has not been prescribed in the working plan will constitute deviations these should be approved from the competent authority. The classes of removal constituting deviation are indicated below:

1. Large scale felling of trees to clear alignment of major roads or electric transmission lines.
2. Extensive removal of wind fallen and dry trees (salvage).
3. Special felling to meet unfor seen industrial or defence requirement.

12.3 Road Path & Bridges:

The list of existing roads and paths has been given in appendix – IV. Most of the inspection paths have been covered by lantana and other bushes/ weeds. They should be maintained and repaired as per

requirement. Almost every forest is accessible by vehicles therefore no new roads are perposed to be constructed. However suitable inspection paths may be constructed in plantation areas as per requirement.

12.4 Buildings:

List of existing buildings is appended as appendix – V. some of the buildings like Fgd. Hut Jeehan & Seed store Karaur, B.O. Quarter Jharalari are in bad shape these should be dismantled and written off. Remaining buildings be repaired and maintained as per requirement. Following new buildings are required to be constructed during plan period.

12.5 Building proposed:

Sr. No.	Type of Buildings	Range	Location
1	B.O. Quarter	Aghar	Aghar
2	B.O. Quarter	Aghar	Jhiralari
3	Fgd. Hut	Aghar	Mandiana
4	Fgd. Hut	Aghar	Ropri
5	Fgd. Hut	Aghar	Nagrota
6	Fgd. Hut	Bijhari	Baragraon
7	B.O. Quarter	Bijhari	Loharli
8	B.O. Quarter	Barsar	Khajjian
9	B.O. Quarter	Barsar	Desan

12.6 Water Supply:

There is enough ground water available and only proper planning and investment are needed to create water supply to buildings and nurseries.

12.7 Telephone/ Wireless Networks:

Telephone set has been provided at range office Hamirpur however with the spread of mobile network connectivity has increased tremendously.

12.8 Drought Mortality:

Post spring and auturn are the drought periods. The worst of the two is post spring. The prolonged post spring drought periods increases the fire incidences also. This period is therefore important for fire

protection measure.Drought mortality can also by minimized by strictly adhering to maximum plantable size of the seedlings. Root shoot cuttings be preffered in plantation of broad leaved species.

12.9 Maintenance of Boundaries:

Boundary registers are available for all the forest. All the boundary pillars should be regularly checked by the ACF and longitude, latitude and elevation be also registered along with the forward and backward bearings. The boundary pillars should be repaired in accordance with the quinquennial programme laid in the Appendix No. X.

12.10 Rights and Concessions:

Gadies have grazing rights in all DPF and UPFs. Detail of grazing permit issued has been given in Chapter – I (Para – 1.11).

12.11 Survey and Maps:

Following survey sheets are available:

Sr. No.	Survey Sheet Numbers	Scale
1	53/A/2	1:15000
2	53/A/5	1:15000
3	53/A/6	1:15000
4	53/A/6/NW	1:15000
5	265/SE/3	4 inch = 1 mile
6	265/SW/2	4 inch = 1 mile
7	265/NE	4 inch = 1 mile
8	286/SW/3	4 inch = 1 mile
9	286/SW/4	4 inch = 1 mile
10	286/NW/1	4 inch = 1 mile
11	286/NW/3	4 inch = 1 mile
12	53/A/7	1:15000
13	53/A/9	1:15000
14	53/A/10	1:15000
15	53/A/10/SW	1:15000
16	53/A/10/NW	1:15000
17	53/A/11	1:15000
18	53/A/13	1:15000
19	265/A/SE	4 inch = 1 mile
20	265/A/SW/3	4 inch = 1 mile
21	265/A/SW/4	4 inch = 1 mile
22	265/A/SE/4	4 inch = 1 mile
23	265/NW	4 inch = 1 mile
24	265/SW/E	4 inch = 1 mile

25	265/E	4 inch = 1 mile
26	286/SW/1	4 inch = 1 mile
27	286/SW/2	4 inch = 1 mile
28	287/NE	4 inch = 1 mile
29	287/W	4 inch = 1 mile
30	287/NW	4 inch = 1 mile
31	288/NW	4 inch = 1 mile

Following maps have been prepared:-

Forest type map on 1:50,000

Management map on 1:50,000

Stock maps on 1:15,000

Regeneration maps on 1:15,000

One copy of stock maps has been put in the concerned compartment history files.

12.12 Research Plots:

Khair has close grained typical heartwood and its growth rings are not distinct. In order to ascertain relationship between age, d.b.h. and height we should have at least six sample plots of khair (three each for seedling and coppice origin) scattered over the Hamirpur Division. Annual measurement of d.b.h. and height should be taken for all khair plants in these plots.

12.13 Lopping:

Lopping for fodder measuring by the right holder and by Gaddi within their grazing runs is allowed with certain restrictions which have been dicussed in detail under chapter – 1 (Para – 1.13)

12.14 Encroachments:

Encroachments are generally made by people in undemarcated protected forests. Strict vigil by the field staff should be exercised in future for detecting encroachments.

12.15Five yearly review of the working plan:

The Conservator of Forests to be designated by the State Govt. will review the progress of implementation of all the prescriptions of this working plan in the years 2017, 2022 and 2027 while reviewing the progress following points may be given due importance.

1) Position of yield and related deviations in respect of each working circle. Reasons for deviations may be identified and corrective measures regarding further implementation may be suggested.
2) The progress of regenerations in chil working circle reasons for deviations/ failures may be identified and necessary corrective measures taken.
3) Progress of quinquennial programme of maintenance and checking of the boundary pillars.
4) Position of fires. Preparedness of the sub ordinate staff for fire fighting and availability or other wise of enough firefighting equipment.
5) The progress of research in the research plot five five yearly reviews will highlight the constraints/ failures in the field as well as non availability of enough funds for carrying out the prescription. A comprehensive review report may be prepared and submitted the Pr.C.C.F. for his information and necessary action. Copies of this report may also be sent to the C.C.F. (W.P.) for their record. The Pr.C.C.F. may request the Government for timely release of funds so that the prescriptions of the working plan may be carried out timely.

****

CHAPTER – XIII

CONTROL AND RECORDS

13.1 COMPARTMENT HISTORY FILES: The compartment history files for each forest have been prepared (two copies; one each for division and range). Compartment description, stock map and prescriptions for their management have been appended with these files. These files will be accurately posted and properly maintained under the personal supervision of the Divisional Forest Officer, who is required to submit a certificate to CF together with the control forms and that all the compartment history files have been brought up to date.

13.2 CONTROL FORMS: The Divisional Forest Officer shall submit control forms A, B, C, compartment outturn, miscellaneous regulations etc. to the Conservator of Forest annually. These control forms have been standardized as given in the code of "Working Plan Procedure" and have been appended with the respective compartment history files for maintenance of these records for each compartment / sub compartment.

13.3 DIVISIONAL NOTEBOOK: This notebook is maintained for the use and guidance of Divisional Forest Officer. All information required by the Divisional Forest Officer for day to day working in each year, trends of prices of various forest products, circulations regarding prices / auctions of timber / trees etc. and other information as required by the conservator of Forests should be included. It is very interesting note book and, if maintained properly, is of immense help to the Divisional Forest Officer.

13.4 PLANTATION JOURNALS: Plantations journals be maintained at range level up to date for all plantation areas other than those mentioned in the compartment history files showing the years of planting, species and cost of various operations. The success percentages for each year and subsequent maintenance be entered invariably till establishment. In case of failure etc., detail along with reasoning be recorded and the suggestions for improvement should never be ignored.

13.5 NURSARY JOURNALS: These should sum up all nursery operations done stepwise viz; site preparation, origin of seed, date of sowing with distance in bed, date of germination, germination percentage, cultural operations / treatments alongwith cost of each operations. Resultant cost of raising

the plants be worked out, and distribution / supply of plants to various planting sites be recorded. The journals are to be maintained at range level.

13.6 RECORD OF MACHINERY: All vehicles and other machinery plants be entered in respective registers with year of purchase/receipt, cost, repair and other details effected from time to time.

13.7 REGISTER OF ROADS, PATHS, BUILDINGS, FIRE LINES ETC.: These should be maintained in each range and compiled in to the consolidated divisional record updated at the close of the year.

13.8 FIRE RECORDS: A record of fires shall be maintained according to the standing orders in force from time to time.

13.9 RAINFALL / TEMPERATURE RECORD: This should be maintained in a consolidated from for different stations where rain gauges are installed. It has been observed that this record is being maintained in a casual manner.

13.10 FOREST GUARD MANUALS: Some of forest guards incharge of beats do not have the beat manual where as the manuals with other forest guards do not contain the requisite information in respect of areas they are supposed to protect. In order to have uniformity it is, therefore, laid down that the beat manuals should be brought up to date and have at least the following information:

i) List of forests in their beats with areas and allotment.
ii) Forest maps, tracing of compartment history files maps sowing compartments, sub compartments, coups, boundary pillars, roads, paths etc.
iii) Copy of the boundary register of forests pertaining to his beat.
iv) Extracts form the Indian Forest Act, notification regarding closures and other orders promulgated.
v) Extracts from the wajib – ul – arz.
vi) Concessions and rights allowed to the local population.
vii) Beat guard duties.
viii) Zamindari rates for forest produce.

ix) List of roads and paths.

x) Range officer's standing instructions.

xi) List of other beats in the range.

xii) Abstract of standards marked in the coppice coupes and mother trees as well as patches of advance growth retained in P.B.I. areas.

xiii) Class wise volume and marked rates of chil, shisham and khair.

xiv) List of plantations raised (to be updated regularly).

xv) Particulars of important / resourceful persons in the beat along with the telephone numbers.

xvi) Particulars of habitual offenders.

13.11 RECORD OF CAPITAL EXPENDITURE: A record of capital expenditure on roads, buildings and other works shall be maintained in the prescribed forms.

13.12 REGISTER OF REGENERATION ASSESMENT SURVEYS: A register depicting the details of various regeneration surveys carries out as per prescriptions of the plan will be maintained as range level. The consolidated annual report of regeneration assessment surveys will be sent by R.O. to the D.F.O. annually.

****

CHAPTER – XIV

FINANCIAL FORECAST AND COST OF THE PLAN

14.1 FUTURE REVENUE: Based on annual prescribed yield and the current prices, the anticipated annual revenue and expenditure is given below:

Anticipated Annual Revenue of Hamirpur Forest Division.

Sl.No.	Produce	Expected annual yield M^3	Rate (Rs.)	Amount in Rs.
1	**2**	**3**	**4**	**5**
1.	Royalty of standing Chil trees	14,300 M^3	693/-cum.	99,09,900
2.	Royalty from coppice coupes.	46 ha.	11,000/-ha.	5,06,000
3.	Royalty of Resin blazes	50,000 Blazes	45/ blaze	22,50,000
4.	Sale of grass & Grazing fees	-	-	10,000
5.	Timber and other forest produce removed from the forests by consumer/purchasers other than HPSFC.	-	-	20,000
	Revenue from damage of Forest Produce as Compensation & Penalty	-	-	6,80,000
7.	Rent of buildings.	-	-	3,00,000
8.	Receipt from registration fee.	-	-	7,35,000
9.	Export permit fee.	-	-	65,000
10.	Receipt from seedlings distribution.	-	-	31,000
11.	Other Misc. revenues	-	-	1,35,000
			Total	**2,12,56,900**

14.2 FUTURE EXPENDITURE:

a)	**Establishment**	
1)	Pay of staff	150000000
2)	T.A.	8250000
3)	Office expenses	9000000
4)	Uniform and liveries	2250000
5)	Rent and Taxes	0
6)	Pay of contingent staff	750000
7)	Motor vehicle	300000
8)	Other charges	0
	Total	**170550000**
b)	**Conservancy and development**	
1)	Marking and enumerations	120000
2)	Demarcation and maintenance of boundaries	100000
3)	Purchase of store tools and plants	50000
i)	New construction of road and buildings	1000000
ii)	Repair of roads and buildings	150000
4)	Protection of forests	600000
5)	Raising of plantations and nurseries	7000000
6)	Regeneration operations	300000
7)	Wildlife protection	200000
8)	Others	300000
	Total	**9820000**
	Grand Total	**180370000**

14.3. COST OF THE PLAN:

The expenditure incurred on the preparation of this plan is as under:

1)	Pay and allowances	0
2)	Travelling allowances	0
3)	Cost of enumerations and other fields works	740000
4)	Wages of Khalasies	0
5)	Purchase of store tools and plants	250000
6)	Motor vehicles expenses	50000
7)	Office expenses	330000
	Total	**1370000**

The expenditure on preparation of working plan has been Rs. 83/- per ha and on enumeration alone it is Rs. 45/- ha.

****

CHAPTER – XV

SUMMARY OF PRESCRIPTIONS AND SUGGESTIONS

15.1 IMPORTANT PRESCRIPTIONS: The important prescriptions and suggestions of the working plan are as under:-

Heading	Prescription / suggestion	Paragraph
THE CHIL WORKING CIRCLE		
Felling series	Two viz. Legal (I) & Voluntary (II)	2.3
Silvicultural system	The Indian Irregular Shelterwood System	2.9
Choice of species	Chil	2.10
Rotation & conversion period	120 years	2.11
Regeneration period	30 years	2.12
Periodic block	Four in F.S.I. and three in F.S.II.	2.14
Yield from F.S.I.		
P.B.I.	4300 m3	2.15.1.1
P.B.III.	1000 m3	2.15.1.3
P.B.IV.	7000 m3	2.15.1.4
Yield from F.S.II.		
P.B.I.	1600 m3	2.15.2.1
P.B.U.	200 m3	2.15.2.2
P.B.IV	1000 m3	2.15.2.3
Method of executing fellings		
P.B.I.	Guidelines given	2.16
P.B.II.	No green trees to be removed	2.17
P.B.III.	Guidelines given	2.18
P.B.IV.	Guidelines given	2.19
P.B.U	Guidelines given	2.20
Sequence of fellings	Laid down	2.21
Subsidiary Silvicultural operation in P.B.I	Prescribed	2.22
Fire protection and control burning	Discussed	2.25
Regeneration assessment surveys	Every alternate year for at least 10 years	2.29
THE COPPICE WORKING CIRCLE		
Felling series	Two viz. Legal (I) & Voluntary (II)	3.3
Silvicultural system	Coppice with standard	3.7

Rotation	Coppice 30 years and standard 90 years	3.8
Control of yield	By area	3.9
Method of executing fellings	Guidelines given	3.10
Sequence of felling	Laid down	3.11
Subsidiary silvicultural operations	Prescribed	3.12
Regeneration assessment survey	Every year till five years	3.14
THE PLANTATION WORKING CIRCLE		
Plantation series	Two viz. Legal (I) & Voluntary (II)	4.3
Choice of species	Local requirement to be preferred	4.8
Treatment of existing plantations	Guidelines given	4.10
Planting programme	Laid	4.19
Monitoring and evaluation	Regular review prescribed	4.21
JOINT FOREST MANANAGEMENT WORKING CIRCLE		
Objectives of joint forest management	Given	6.3
WILDLIFE MANAGEMENT WORKING CIRCLE		
Special objects of management	Creation suggested	7.3
NON TIMBER FOREST PRODUCE WORKING CIRCLE		
Three year rotation cycle for collection of herbs	Suggesation made	8.3
Quantum of NTFP available	-	8.4
CONTROL AND RECORDS		
C.H. files	To be maintained	13.1
Control forms	To be maintained	13.2
Divisional note book	To be maintained	13.3
Plantation journals	To be maintained	13.4
Nursery journals	To be maintained	13.5
Register of roads etc.	To be maintained	13.7
Fire records	To be maintained	13.8
Forest guard manual	To be maintained	13.10
Record of capital expenditure	To be maintained	13.11

****