REVISED
WORKING PLAN
FOR
RAJOURI FOREST DIVISION
(2014-15 TO 2023-24)

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PREPARED BY
WORKING PLAN CIRCLE
JAMMU/SRINAGAR

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Introduction

The Rajouri Forest Division is situated in Rajouri District, at the North-West corner of Jammu Province in Jammu & Kashmir State. The Rajouri forest division came into being since independence of the Nation by amalgamating the portion of Mirpur forest division and old Poonch Jagir. Later it was bifurcated into Rajouri and Poonch forest divisions. In 1984, the Rajouri forest division is bifurcated into Rajouri and Nowshera forest divisions.

The last working plan of this division was authored by Sh. Suresh Kumar Gupta IFS for the period between 2001-02 to 2010-11. During the current revision of the working plan, no major changes were observed in the growing stock position in fir working circle. In chir working circle, the growing stock is under severe threat from population pressure and resin tapping. This forest division was considered to be one of the major resin producing divisions of the State. Huge quantity of resin was exported from this division. During the current revision of the plan, it was observed that all the resin tapping potential was already exploited fully and hence recommended accordingly. Major of the chir forest areas are under-stocked and degraded. The Chikdi is an unique crop in the division. Due to the excessive exploitation, the crop is severely stressed and needs to be conserved.

Even though some parts of the division falls in higher altitudes, majority of the area is sub-tropical climate where availability of water is the major limiting factor of forest crop growth. By improving the water regime, better survival of the forest crop is observed in some pockets.

The encroachment is the major threat to the forest wealth of the division. Due to various reasons discussed in the past working plans, a large proportion of forest area slipped out of the hands of forest department. It is still continuing in alarming proposition. It is suggested that the demarcation and boundary consolidation must be taken up in priority to save the remaining forest land.

The Rajouri forest division is bestowed with many scenic beauties. Also there are important religious places of major religions of the State. Hence the tourists are visiting these places from many parts of the State and outside the State as well. The ecotourism potential of these places must be tapped properly. The ecotourism huts constructed in DKG and Shadra-Sharif are attracting tourists in larger way.

The present revision of the working plan of the division was started by Mr. K. Ramesh Kumar IFS. After his transfer, DR. V. S. Senthil Kumar IFS conducted majority of the field works, but unfortunately he was replaced by the undersigned. The remaining field works and the drafting of the plan was undertaken by the undersigned.

The growing stocks were estimated by using the Point Sampling techniques. The open source LISS III imageries provided by the ISRO are also used in the present revision. Had the 0.1 ha sample plots been laid for estimation of growing stocks, it would have provided better data for comparison with the imageries. However, it may be taken up in the next revision.

Many of the field staff involved in the estimation of the growing stock. Hence the sampling work was conducted simultaneously and completed within the specified time frame. The data compilation and typing works was undertaken by Anil and Sourab of this division. The undersigned is highly thankful to all the staff involved in the preparation of the working plan.

(DR. K. ANANDH, IFS)

CHAPTER I.

The Tract Dealt With

1.1. Name and Situation

1.1.1 The forests of Rajouri Forest Division have been covered under this working Plan. The Rajouri Forest Division has emerged after the bifurcation of old Rajouri Forest Division during the re-organization of Forest Department in 1984. It is situated in the north-west corner of Jammu province of Jammu & Kashmir State.

1.1.2 Initially this Division was created after 1947 by amalgamating the portions of Mirpur Forest Division and old Poonch Jagir which remained on this side of cease fire line. Later-on, it was splited into Poonch and Rajouri Forest Divisions. In 1984, Rajouri Division was again bifurcated into Nowshera Forest Division and present Rajouri Forest Division vide Government Order No FST/2/1540 of 1984 dated 23-05-1984.

1.1.3 The tract of Rajouri Forest Division lies between 74^0 11' 03.03"E and 74^0 40' 21.95"E longitude and 33^0 08' 47.77"N and 33^0 35' 05.16"N latitude. The division is covered under topo sheet Nos. 43/K/2, 43/K/3, 42/K/4 43/K/6, 43/K/7, 43/K/8, 43/K/10, 43/K/11 and 43/K/12.

1.1.4 The Rajouri Forest Division shares common boundary with Nowshera Forest Division in the South and South west; with Kashmir region in the north; with Poonch Forest Division in the North West; with Mahore Forest Division and Reasi Forest Division in the east and in the west it is bounded by line of control. The Pir Panchal range of mountains form portion of the Northern boundary whereas the Dum Gali ridge forms major part of east boundary. The Nohari Tawi forms the Southern boundary of this division and separates it from Nowshera Forest Division.

1.1.5 This Division is spread over Geographical area of 1430.29 Sq.Km (including the State and Revenue and Private land holdings) which is 54.38% of total geographical area of whole district Rajouri (2630 Sq Km). Rajouri is the head quarter of the Division as well as the district. The Jammu - Poonch National Highway passes through the Division; it enters the Division at Kali Dab and leaves in the North at Bimber Gali (BG) after touching the Rajouri town in its way.

1.1.6 Rajouri Forest Division comprises of three territorial ranges viz., Rajouri, Kalakote and Kandi with respective head quarters at Rajouri, Kalakote and Kandi Bakori and a Soil Conservation (Non Territorial) Range. The sister wings of forest department such as Wildlife, SFC, Forest Protection Force, Social Forestry and Soil Conservation departments have their divisional headquarters at Rajouri.

1.2 Configuration of the Ground

1.2.1 The whole of the tract is hilly. The high altitude mountains occur in the north east of The Division. The altitude varies from the minimum of 600 meters in compartments 159 and 160 /Kalakote to 4660 meters at the Dakyar in Budhal area which is the highest peak in the Division.

1.2.2 The high elevation portion of the Division i.e Kandi Budhal area drains into river and which ultimately drains into river Chenab near Reasi.

1.2.3 The remaining portion of the Division drains into main Tawi which finally joins river Chenab. The main tributaries of main Tawi are:

- Rajouri Tawi
- Sukhtao
- Panda Kas
- Dhelloriwali Tawi
- Jamola Wali Tawi
- Nehari Tawi
- Khandal nalah
- Kalar Kas etc.

1.2.4 There are about 20 high altitude lakes along the northern boundary of the Division in the Pir Panchal Range.

1.3. Geology, Rock and Soil

1.3.1 A note on geology and mineral sources of this area was supplied by Jammu Circle of Geological survey of India and included in the previous plan is being reproduced with little addition.

1.3.2 Rocks ranging in the age from pre-cambrian to recent are found in this area. Sand stones shales, Lime stones, slates and basalts are the different rock types recorded in the area.

1.3.3 The weathering of above rock types is responsible for the occurrence of clayey and loamy soil found in the plain areas. The black cotton soils which occur locally is the result of weathering of basalts.

1.3.4 Coal, limestone, bauxite, iron ore and bentonite are the main minerals reported from this area.

Coal

Semi-anthracitic coal occurs within the Eocene rocks of Jigni (Kura), Kalakote, Metka, Mogla coal fields. The coal was used in the Kalakote thermal power house which is not, functional at present.

Limestone

It is an important industrial raw material used in the manufacture of cement and in the chemical metallurgical and other industries. Thick bands of limestone associated with eocenes of Kalakote Metka area and with the carboniferous sequence of Budhal and Thanamandi areas have been recorded. Lime stone bands also occur associated with the great limestone formation exposed in Mougla and Chakkar area.

Bauxite

It is an important ore of aluminum. It is also used as refractory material. In the area under discussion, it occurs as capping above the great lime stone formation of Kalakote Metka, Mougla and Chakar area.

Iron-ore

Inferior iron ore with iron content from less than 20% to 50% occurs in the Gagrote-Khandi Devi area. Lenticular bands of Hematite occur associated with the Carboniferous and ferruginous shale slates and quartzite sequence underlying the Panjal traps. The total reserves of different grades of ores have been estimated at 0.2 million tones.

Fullers Earth

Activated fullers earth is mainly used in vanaspati and petroleum industry. It is also employed for washing of hair and plastering of mud walls. A two meter thick fullers earth band associated with the slates has been reported from Budhal area. It occurs at three different places which are:-

1). Three Km North West of Budhal Town.

2). Two Km North east of Budhal Town.

3). At Kandra hill 4 Km North west of Budhal Town.

1.3.5 Apart from the above minerals, sand stones of the Murree series and Basaltic rocks of Panjal trap formation are a good source of road and building material.

1.4. Climate

1.4.1 As already stated the altitude of the Division varies from 600 meters to 4660 meters. So the areas falling in low altitude experiences sub-tropical climate where the summers are hot and winters are cold. Most of the precipitation occurs in the form of rains during monsoons and partly in winters.

1.4.2 The north and north eastern portions of the tract where the altitude rises above 1800 meters experiences temperate climate and gets heavy winter snowfall. Here the snow stays even upto April. Some of the areas below 1800 meters altitude also get winter snowfall but here the snow does not stay for long.

1.4.3 No reliable data of temperature is available for the areas of this division.

1.5. Rainfall

1.5.1 This area receives both winter and summer rainfall. The intensity of rainfall increases as we proceed from south to the north of this Division.

1.5.2 The summer rainfall in Rajouri is 50% higher than the corresponding winter rainfall. When compared to the Kulu the winter rainfall at Rajouri is almost same though over longer period i.e October to May. But the summer rainfall at Rajouri is almost two times that of Kulu.

1.6. Water Supply

1.6.1 Snowfall, winter rains and monsoon rains supply plenty of water for agriculture, domestic and forestry activities. There are good number of springs and perennial nallas all over the tract which suffice the water requirement of the area. Melting of snow and natural springs make available sufficient water during the peak summer.

1.7. Distribution and Area

1.7.1 **The total area of the demarcated forests of this division works out to 720.69 Sq.Km which is 51.38% of the geographical area.** To estimate the area properly it is recommended to lay the boundary pillars on ground and georeference them. These geocoordinates shall be transferred to the GIS platform for estimation of forest area. The range wise distribution of the area is as given under:

Table 1.1. Rangewise area of Rajouri Forest Division

Range	Total no. of Compartments/ Sub-Compartments	Area in Hectare
Kandi	142	24572
Kalakote	132	21456
Rajouri	152	26041
Total:-	**426**	**72069**

1.7.2 The species- wise distribution of area (in ha) of territorial ranges is given in the following Table 1.2.

Table 1.2. Rangewise area under different forest species in Rajouri Forest Division

Range	Chir	Fir	Kail	B.L	Scrub	Blanks	Alpine	Total
Kandi	2356	6002	0	4180	3134	5832	3068	**24572**
Rajouri	7459	3035	144	2702	4402	7915	384	**26041**
Kalakote	7664	0	0	3177	4800	5815	0	**21456**
Total	**17479**	**9037**	**144**	**10059**	**12336**	**19562**	**3452**	**72069**

1.7.3 The range wise stock maps were prepared at a scale of 1:50,000 and area was calculated using Arc GIS software. The individual compartment wise stock maps were prepared on 15,000 scale.

1.7.4 Chir crop dominants the forest by occupying 24.25% of the area. The Fir, Kail, Broad Leaved crops and Scrubs constitute 12.53%, 0.20%, 13.96%, and 17.12% respectively. 27.14% area is Blank. The alpine pastures spread on 4.80% of the area.. Species, which are important as MFP are mostly endangered and some of them are at the verge of extinction have been discussed in detail in NFTP working circle in part-II.

1.7.5 These forests are honeycombed with numerous chaks of different size, most of which have grown considerably in size during the course of time due to illicit felling and consequent encroachment upon forest land. Poor condition of the demarcation line has made the forests highly susceptible to encroachments which are rampant and hence the job of stock maping and consequent area computation was extremely difficult.

1.7.6 The Berune line forests falling in the Division are shown at Annexure-I. 4392.65 Ha (87852 kanal and 19 marlas) area is under Beruine line forests in this division.

1.8 State of Boundaries

1.8.1 When Shri. J. N. Dullu prepared the Working Plan of this area in 1960-61, the demarcation and settlement work was in progress and hence no length of boundary and the number of boundary pillars could be given in that plan. The boundary pillars erected at that time were "Stone Pillars".

1.8.2 In absence of boundary pillars, large junk of forest land was encroached which makes the job of layout extremely difficult. But for the satellite imageries, the preparation of stock maps was almost impossible in these circumstances. Moreover demarcation of encroachments on stock maps was actually impossible. The compartment wise encroached areas were cataloged by the field staff. An area of 2057.05 Ha was estimated to be under encroachment.

Table 1.3. Table Showing the position of the demarcation files is as per Form -1.

S.No	Name of the Range	Total No. of forests	No. of files passed	No. of files un-passed	No. of files missing	No. of files without map
1	Rajouri	59	59	0	6	12
2	Kandi	49	49	0	5	16
3	Kalakote	42	35	7	7	17
	Total	**150**	**143**	**7**	**18**	**45**

Table 1.4. Table showing the No. of Boundary pillars and the area details of the demarcated forests

S.No	Name of the Range	No. of BP's in the main line	Area of the demarcated forest land			Length of main line		
			Acre	Kanal	Marla	Mile	Chain	Karam
1	Rajouri	6326	45541	3	18	530	43	0
2	Kandi	5018	36230	7	10	425	38	5
3	Kalakote	3769	36524	6	1	373	99	1
	Total	**15113**	**118297**	**1**	**9**	**1329**	**80**	**6**

Table 1.5. Table Showing the details of the chaks

S.No	Name of the Range	No. of BP's in the Chak line	No. of chaks	Area of the chak			Length of chak line		
				Acre	Kanal	Marla	Mile	Chain	Karam
1	Rajouri	1339	171	1514	1	2	74	55	0
2	Kandi	1171	135	1400	5	16	64	98	5
3	Kalakote	1783	220	2632	1	3	103	33	1
	Total	**4293**	**526**	**5547**	**0**	**1**	**242**	**86**	**6**

Two retired Girdawars have been engaged by Rajouri Forest Division for verification of complaints related to encroachments.

1.9. Legal Position

1.9.1 The forests are owned by the government of Jammu and Kashmir and are mainly administered under J&K Forest Act of Samvat 1987 (1930 A.D) as amended up to December 1997. The Forest Department is responsible for the management of these forests on behalf of J&K Government.

1.9.2 In discharging its obligations and responsibilities, the Forest Department is guided by the following acts, rules and notification that came into being from time to time.

a. The J&K Forest Act of Samvat 1987 (1930 AD) as amended upto December 1997.
b. The J&K (Sale of timber) Act 1987 (1933 AD) Act III of 1987.
c. The Kuth Act 1978 (1921 AD) Act-I of 1978.
d. The cattle trespass Act 1977 (1920 AD) ACT VIII of 1977.
e. The J&K (Land improvement Schemes Act, 1972) Act XXIV of 1972.
f. The J&K game Preservation Act 1988 (1942 AD)
g. The J&K Kahcharai Act 2011 (1954 AD)
h. The J&K State forest Corporation Act 1978.
i. The J&K Preservation of specified trees ACT 1969.
j. The J&K Wildlife (Protection) Act 1978.
k. The J&K Public Premises (Eviction of unauthorized Occupants) Act 1959.
l. The Jammu Forest notice and Kashmir Forest notice.
m. The Sawmills (Registration and Control) Rules 1968.
n. The J&K nationalization of forest, working ordinance 1986.
o. The J&K Extraction of Resin Act, 1986.
p. Govt. order No. 24-FST of 1990 dated 15.1.1990- Restriction on commercial fellings.
q. The J&K Forest (Conservation) Act 1990 Govt. Act XXVI of 1990.
r. The J&K Rehabilitation of Degraded Forests village plantation rules 1992 (Rules for benefit sharing) SRO 61 of 1992 dated 29-03-1992.

1.10. Rights and Concessions

1.10.1 No rights are recognized in the demarcated forests but local people enjoy liberal concessions under Jammu Forest Notice. Concessionists are categorized into “A’ and “B” categories for purpose of the extent of major concession granted i.e. timber trees of Chir, Kail and Fir are granted at highly concessional rates to the villagers residing within 3 miles (5Kms) of demarcated forests for their bonafied use. Timber is granted free in case of fire or any other natural calamity. However, the residents of towns are entitled to the supply of timber only from the depots under the conditions and rates prevailing at these depots.

1.10.2 Timber except Deodar, required for house building and house repairing purposes are granted at 1/5th of their standard rate. Dead fallen trees of any size and species, except Deodar over 3’ in girth at base and naturally broken pieces 6’ above in length and of any girth, can be removed free of charge without any permit, at any time of year. In addition, in

forests in which fellings have been made, concessionists may remove without any permit such felling refuse after the work has been completed. Standing dead trees except deodar is given on permit at half the ordinary concession rates to villagers. The details of trees issued to concessionists from 2001-2002 to 2013-14 is shown in the Table below.

Table 1.6. Table showing the details of trees issued to Concessionists under Jammu Forest Notice

Year	Oak/ B.L (No. of trees)	Chir (Trees/ Vol in Cum)	Fir (Trees/ Vol in Cum)	Kail (Trees/ Vol in Cum)	Total (Trees/ Vol in Cum)
2001-02	1	33/137.760	20/210.422	0/0.000	54/348.182
2002-03	0	57/381.290	21/212.206	0/0.000	78/593.496
2003-04	0	56/259.400	8/233.869	0/0.000	64/493.269
2004-05	1	73/416.800	18/736.548	0/0.000	92/1153.348
2005-06	1	81/474.940	21/401.447	0/0.000	103/876.387
2006-07	5	96/714.760	38/934.455	0/0.000	139/1649.215
2007-08	6	110/784.890	36/777.891	0/0.000	152/1562.781
2008-09	6	123/910.480	56/1187.692	0/0.000	185/2098.172
2009-10	10	156/1840.270	47/1156.968	1/3.341	214/3000.579
2010-11	13	172/1834.260	58/2459.088	1/4.417	244/4297.765
2011-12	12	164/1628.050	47/1492.381	0/0.000	223/3120.431
2012-13	8	158/1264.730	42/639.365	1/3.341	209/1907.437
Total	63	**1279/10647.630**	**412/10442.330**	**3/11.100**	**1757/21101.060**

1.10.3 Unrestricted grazing and grass cutting are permitted except in closed areas.

1.10.4 Cattle and other livestock may freely pass through the forests which are not closed to grazing and if any forest is closed for grazing by special order, right of way and access to water will be provided.

1.10.5 Firewood for village domestic use may be removed free of charge from dry and fallen wood not fit for building purposes, without any permit. Cutting with an axe for torch wood from stumps of tree is permitted.

1.10.6 Lopping with a cutting instrument of trees except the trees whose lopping is prohibited, is permitted but no branch thicker than a man's wrist may be cut and no branch may be cut above the three fourth of the height of any trees.

1.10.7 The MFP's, which are allowed by the Government can be collected by the local people for their domestic use.

1.11. Grazing

1.11.1 The forest areas of this division have been facing the onslaught of grazing from permanent and migratory livestock population from time immemorial. The grazing in forest areas is unscientific, uncontrolled and un-regulated. This has adversely affected the regeneration of Chir and depletion of ground flora in other areas.

1.11.2 Due to non-availability of adequate and quality fodder, the quality and health of livestock is very poor. Number of scrub cattle is quite large.

1.11.3 In addition to the local livestock population herds of migratory livestock also pass over these forests on their way to and return from the higher alpine pastures of Pir Panjal.

1.11.4 This grazing activity is regulated by the forest department under the Kahcharai Act and the rules framed there under. Total grazing fee recovered from 2001-2002 to 2012-2013 is shown in Table below.

Table 1.7. Table showing the recovery of grazing fee

S.No	Year	Amount (In Rs.)
01	2000-2001	--
02	2001-2002	--
03	2002-2003	--
04	2003-2004	4192.00
05	2004-2005	11569.00
06	2005-2006	9348.50
07	2006-2007	9038.40
08	2007-2008	11905.00
09	2008-2009	8345.65
10	2009-2010	8882.00
11	2010-2011	10620.00
12	2011-2012	2317.00
13	2012-2013	9177.00
14	2013-2014	9374.00
	Total	**94768.55**

1.11.6 Out of the livestock population, the population of sheep and goat (Both local and migratory) is quite high.

CHAPTER-II
FLORA &FAUNA
(A) FOREST FLORA

2.1. Composition and Condition of the Crop

2.1.1 Chir (*Pinus roxburgii*) is the predominant species of Rajouri Forest division occupying one fourth of the total area of this division. Fir (*Abies pindrow*) is the next principal species and covers 12.53% of the total area of the division. Percentage wise area distribution is as below:-

Chir	Fir	Kail	B/L	Scrub	Blank	Alpine
24.25	12.53	0.20	13.96	17.12	27.14	4.80

2.1.2 Spruce (*Picea smithiana*) is also found mixed with fir in the form of a few scattered trees. Kail (*Pinus wallichiana*) occupies a negligible small number of patches. Yew (*Taxus baccata)* is also encountered but its number is very small. **One of the important features of this Division is complete absence of Deodar (*Cedrus deodara*).** The sub- tropical pine forests found in the lower tract of the division suddenly give way to Fir forests as we go on to higher elevations. That is to say that the species like kail and deodar found in the intermediate altitudinal zones are conspicuous by their absence. This inter-mediate zone is mostly occupied by Ban Oak (*Quercus incana*) and Chikri patches. Absence of deodar is said to be due to edaphic factors.

2.1.3 Condition of these forests is evident from the data presented above. 44.26% area is under scrub and blank. These forests on the whole are poorly stocked, over grazed and frequently subjected to forests fires (especially the chir forests). Chir forests which are found in lower terrains are thoroughly interspersed with chaks, villages and cultivations and unbroken long stretches of these forests are not met with. Similarly, the fir occupying the higher elevations are also infested with chaks and encroachments, by graziers.

2.2. General Description of Forest Zones

2.2.1 The forests of this division can be divided into three distinct zones of vegetation.

a. Sub – tropical zone.
b. Temperate zone
c. Alpine zone.

(A) Sub- Tropical Zone

2.2.2 Parts of Rajouri and Kalakote Ranges represent sub-tropical zone. In Kandi Range, small lower most portion adjoining Kalakote Range near Dhangri and Bhindi Jamola area also fall in sub-tropical zone. Chir is the chief species of this zone and occupies the major portion. Rest of the area in this zone is either blank, scrub or has poorly stocked broad leaved trees. The broad leaved trees are:-

Acacia catechu, Acaciamodesta, Emblica officinals, Dalbergia sissoo, Mallotus phillipinesis, Lamnea coromandlica, Punica granatum, Flacourita romentchii, Ficus roxburghii, Olea

cuspidata, Terminalia belerica, Syzgium cumini, Cassia fistula, Zizyphus spp, Pyrus pashia, phoenix indicus, Euphorbia royleana etc.

The important shrubs are:-

Adhatoda vasica, Dodonea viscosa, Carissa spinarum, Woodfordia fruticosa, Berberis lyceum, Vitex negundo, Myrsine Africana, Nerium indicum (along nallas), Agave spp (in lower dry portions)etc.

In this zone, Dalbergia sissoo and Acacia catechu are found to be coming up well along nalla beds at several places but the size (dia) of these trees in invariably small except for some traces occurring on private lands, because of over- exploitation of these species by local population. Further the Chir forests of this zone occur almost in a pure form only with a sprinkling of broad leaved trees here and there and are found somewhat intermixed with oak (*Q.incana*) and *Lyonia Ovalifolia* etc. in the higher areas of this zone where it touches the temperate zone.

(B) Temperate Zone

2.2.3 Fir is the predominant coniferous species of this zone, and occurs almost pure with sprinkling of *Picea smithana*, *Quercus semicarpifolia* etc. The lower belt of this consists of forests of oak mixed chiefly with *Lyonia ovalifolia* and *Rhododendron areboreum*. The oak forests found in the lower belt of this zone bear the heaviest brunt of encroachments and other biotic pressures and over a major portion these have been degraded into scrub forests with scant tree cover. Because of heavy lopping the oak trees have mostly changed into bushy shape especially near habitations.

2.2.4 The lower belt of ban oak forests gives place to pure fir forests as we move higher. There is complete absence of Kail and Deodar, found in the inter mediate zone. (The exceptions being the negligible number of patches of Kail near, Dera- ki- gali). The complete absence of Deodar and scant presence of Kail over this tract is perhaps due to higher precipitation although no reliable rainfall data is available and partly due to edaphic factors.

2.2.5 Presence of sizable patches of Chikri (*Buxus wallichiana*) Syn. *B. sempervirens* along with lower fringes of fir forests is a specialty of this Division. It is found in Thanamandi, Darhal and Kandi areas of this Division. Presence of this species is said to be due to some edaphic factors.

(C) Alpine Zone

2.2.6 This zone occupies 4.79% of area of this division. This vegetational zone occupies the top portions of Darhal and Budhal blocks where the area abuts into the main Pir Panjal mountain Range and altitude rises above 3000 meters. As the altitude increase above 3000, meters, the fir forests are replaced by alpine brushwood of junipers and occasional Birch and high level *Rhododendrons*. Willows and *Spiraea* species are also found. Finally these tree species give way to grassy expenses. These grassy expenses are rich in Medicinal and herbaceous plants and form summer pastures where a large number of cattle, sheep and goat graze.

2.3. Description of Forest Types

2.3.1 As per Champion and Seth's classification, the forests of this division can be classified into following types:

2.3.2 *Lower or Shivalik Chir pine forests (9/C1a).*

This forest type occurs in the lower portions of Kalakote and Rajouri Ranges. The general floristics of this type as are:-

i. *Pinus roxburghii*

ii. *Acacia catechu, Acacia modesta, Emblica officinals, Dalbergia sissoo, Mallotus phillipinensis, Cassia fistula, syzygium cumini, Butea monosperma, Ficus roxburgii, Pistacia integerrima. Terminalia belerica.*

iii. *Flacourtia ramontchi, Caesaria tomentosa, Carissa spinarum, Dodonaea viscosa, Woodfordia fruticosa, Adhotoda vasica, Berberis lyceum, Rubus ellipticus, colebrookea oppositifolia, Mycrine Africana, Punica granatum, Zanthoxylum elatum, Zizyphus mauritiana, Rhus cotinus, Vitex nugundo, Nerium iindicum.*

iv. *Rumex hastatus, Plantago spp., Echinopsechinatus, Cymbopogon spp., Cenchrus ciliaris.*

v. *Very few climbers, Peuraria tuberose.*

2.3.3 Upper or Himalayan Chir Pine forests (9/C1b)

These forests occur in the upper portions of sub-tropical zone where Chir forests touch the temperate zone. It occurs in all three Ranges of the division. The floristics of this type are :-

i. *Pinus Roxburghii.*

ii. *Quercus incana, Lyonia ovalifolia, Rhododendron arboretum, Syzigium cumini, Ficus roxburghii, Olea cuspidata, Pyrus pashia, Emblica officinalis, Pistacia iintgerrima, and Zanthoxylum elatum.*

iii. *Colebrookea oppositifolia, Berberis lyceum, Rubes ellipticus, Rubus laceocarpus, Woodfordia fruticosa, Myrsine Africana, Prinsepiautilis.*

iv. *Rumex hastatus, Tarasacum officinals, Myosotis myerantha, cynodon dactylon, Cymbopogon spp;*

v. *Rosa moschata.*

2.3.4 Himalayan sub- tropical scrub (9/C1/DS1)

In this forest type occurring in the Chir zone, the over wood is almost completely absent and has either been destroyed or perhaps has not been able to develop owing to excessively dry and shallow soil. This type occurs in the major portion of Kalakote Range, parts of the Rajouri Range and some lower areas of the Kandi Range. The predominant shrubby growth

consists of *Carissa spinarum* and *Dodonaea viscosa* alongwith scattered shrubs of *Adhatoda vasica, Berberis lyceum, Woodfordia fruticosa* etc.

2.3.5 Sub-tropical Eurphoriba scrub (9/C1/DS2)

Eurphorbia royleana forms consosiations in patches. There distribution is related to edaphic factors, notably dry rocky ridges but under biotic pressure, these extend and become denser and purer. This forest type covers small patches in the lower portions of Kalakote Range especially in the area between Kalakote and solki Villages. Other associates of Eurphorbia royleana are:- *Carisa spinarum, dodonaea viscosa, cassia fistula etc.*

2.3.6 Ban Oak (Quercus incana) Forest (12/C1a)

This forest type occurs in the lower most portion of temperate zone in all the three ranges of the division and its general floristics are :-

i & ii *Quercus incana, Rhododendron arboretum, Lyonia ovalifolia, Pyrus pashia,*

Machilus duthei, Pistacia integerrima and Ilex dipyrena.

iii. *Rubus laceocarpus, Prinsepia utilis, Berberis aristata, Viburnum species,*

Desmodium tilliaefolium, Berberis lyccon, Rubus ellipticus, Myrsine Africana, Indigofera species, Rhus cotinus.

iv. *Rumex hastatus, Mysosotis mycrantha, Plectrenthus rugosus, Thin grass.*

vi. *Vitis Himalayan, Hedera helix, Rosa moschata.*

2.3.7 Oak Scrub (12C1a/DS1)

In this forest type the oaks and associated species have been reduced to low stunted unsound trees, usually coppice while ***Rhododendron arboreium*** tends to be left as useless for villagers purpose. With it are bushes of berberis species, Prinsepia species and sometimes ***Spiraea indigofera*** etc. short grass covers the soil where is not completely exposed by the trampling.

2.3.8 Himalayan Temperate secondary Scrub (12/C1/DS2)

This forest type consists of an irregular scrub cover through out the temperate zone on burnt areas especially on southern aspects on excessively grazed and lopped areas near villagers and on other similar sites.

2.3.9 Western Mixed Coniferous forest (12/C1d)

This forest type occur mainly between the altitudes of about 2400 to 3000m. It covers about 12.5% of the total area of this division. The general floristics are:-

i. *Abies pindrow, Picea smithiana, Pinus wallichiana.*

ii. *Quercus semicarpifolia, Juglans regia, Populus ciliate, Acer caesium, Celtis australis, aesculus indica, Ulmus wallichiana, Pyrus pashia, Taxusbaccata, Machilus duthei, Prunus padus, Alnus nitida, (along nalla beds), Buxus wallichiana.*

iii. *Viburnum foetens, Arundinaria falcate, Plactranthus rugosus, Prinsepia utilis, indigofera spp.,Spiraea lindlayana, Skimmia laureola, Berberis aristata, rubus lasiocarpus, Rubus ellipticus, Cotoneaster spp., Sarcococca saligha.*

iv. *Rumex spp., Prunella vulgaris, Arisaema wallichiana, Plantago spp., Valleriana wallichii, Primula denticulate, Potentilla nepalensis, Impatiens spp., Podophyllum emodi, Atropa belledona, Galium spp., Urtica dioica, Iris spp., Fragaria vasca, Cynodon dactylon.*

v. *Rosa moschata, Hedera helix, Vitis semicordata, Clematis grata, Cuscuta reflexa, (stem)*

2.3.10 Kharsu Oak (Quercus semicarpifolia) Forest (12/C2a)

This forest type occurs along the upper fringes of the forests in Kandi and Rajouri Ranges. It covers about 0.7% the total area of this Division. ***Quercus semicarpifolia*** is the predominant species. Scattered trees of silver fir and spruce are also found intermixed.

2.3.11 Deciduous sub-alpine scrub (14/1s2) Deciduous apine scrub (15/C2) & Alpine pastures (15/C3)

These are not tree forest types and occupy about 5.55% of the area of this division. It occurs in Kandi and Rajouri Ranges at highest altitudes. Patches of dwarf junipers and Rhododendrons are also found along with herbaceous species like Primula spp. Anemone spp., Iris spp., Gentia spp., with many Ranunculaceous, Cruciferous and compositae species.

Table 2.1. Statement showing the working Circle wise number of stems in Rajouri Forest Division

Range	Working Circle	Species	Dia-Class Wise Number of Stems							Total
			<30	30-40	40-50	50-60	60-70	70-80	>80	
Rajouri	Chir Working Circle	Chir	636580	132576	104988	45610	19298	9301	3379	**951732**
		BL	167213	14851	3607	1449	660	354	110	**188244**
	Fir Selection Working Circle	Fir	20909	8489	7130	6888	4750	3063	4426	**55655**
		BL	201513	8630	2164	939	204	15	64	**213529**
	Rehabilitation Cum Protection Working Circle	Chir	260283	53626	27884	12739	6951	3092	1851	**366426**
		Fir	61890	11542	11009	10250	6191	6765	7996	**115643**
		Kail	7501	2246	454	202	651	380	294	**11728**
		BL	638232	39621	10985	4264	1430	945	1215	**696692**
	Sub. Total		**1994121**	**271581**	**168221**	**82341**	**40135**	**23915**	**19335**	**2599649**
Kandi	Chir Working Circle	Chir	112749	23481	18595	8079	3418	1647	598	**168567**
		BL	29616	2630	639	256	117	63	20	**33341**
	Fir Selection Working Circle	Fir	65890	26751	22469	21706	14967	9654	13949	**175386**
		BL	635022	27194	6821	2960	641	48	201	**672887**
	Rehabilitation Cum Protection Working Circle	Chir	204228	24364	18908	16819	9770	2510	1879	**278478**
		Fir	20721	8027	10288	16750	20344	14809	24111	**115050**
		BL	1404940	198030	48945	14148	3517	981	655	**1671216**
	Sub. Total		**2473166**	**310477**	**126665**	**80718**	**52774**	**29712**	**41413**	**3114925**
Kalakote	Chir Working Circle	Chir	574190	119583	94699	41140	17407	8390	3048	**858457**
		BL	150825	13396	3253	1307	595	319	99	**169794**
	Rehabilitation Cum Protection Working Circle	Chir	108298	31507	16866	6906	4548	2490	731	**171346**
		BL	192576	36710	9117	1625	812	181	60	**241081**
	Sub. Total		**1025889**	**201196**	**123935**	**50978**	**23362**	**11380**	**3938**	**1440678**
Division	**Total**		**5493176**	**783254**	**418821**	**214037**	**116271**	**65007**	**64686**	**7155252**

Table 2.2. Statement showing the Working Circle wise Growing Stock (Cum) in Rajouri Forest Division

Range	Working Circle	Species	Dia-Class Wise Growing Stock (Cum)						Total
			30-40	40-50	50-60	60-70	70-80	>80	
Rajouri	Chir Working Circle	Chir	63636	118637	100799	68315	45298	21680	**418365**
	Fir Selection Working Circle	Fir	7211	11105	20738	23268	20992	40236	**123550**
	Rehabilitation Cum Protection Working Circle	Chir	25743	31531	28174	24633	15065	11841	**136987**
		Fir	9820	17159	30484	30340	46371	71607	**205781**
		Kail	1718	618	458	2176	1680	1705	**8355**
	Sub total		**108128**	**179050**	**180653**	**148732**	**129406**	**147069**	**893038**
Kandi	Chir Working Circle	Chir	11271	21012	17853	12100	8023	3840	**74099**
	Fir Selection Working Circle	Fir	22725	34993	65352	73324	66153	126793	**389340**
	Rehabilitation Cum Protection Working Circle	Chir	11708	21373	37169	34584	12234	12008	**129076**
		Fir	6839	16026	49817	99662	101488	221871	**495703**
	Sub total		**52543**	**93404**	**170191**	**219670**	**187898**	**364512**	**1088218**
Kalakote	Chir Working Circle	Chir	57400	107010	90920	61620	40858	19555	**377363**
	Rehabilitation Cum Protection Working Circle	Chir	15139	19090	15272	16102	12151	4615	**82369**
	Sub total		**72539**	**126100**	**106192**	**77722**	**53009**	**24170**	**459732**
Division	**Total**		**233210**	**398554**	**457036**	**446124**	**370313**	**535751**	**2440988**

2.4. Injuries to which the crop is liable

2.4.1 The following are various agents responsible for causing direct or indirect injuries to these forests:

a) Man and his animals.
b) Forest fires.
c) Wild animals
d) Natural and climatic causes.
e) Parasites, pests and pathogens.

(a) Man and His Animals

2.4.2 Most extensive damage to the forest land and crop is caused by man and his animals. The uncontrollable increase in human and livestock population has resulted in excessive biotic pressure on these areas. Some of the major injuries caused in this manner are girdling of trees, lopping of trees, extraction of torch wood, forest fires (deliberate or accidental), grazing, grass cutting, illicit damages and encroachments. The details of damage cases booked during the period between 2001 -02 to 2013-14 is presented in Table No. 2.1.

2.4.3 Encroachments in the forest areas for cultivation and other purposes have been the biggest menace in this division. Absence of boundary pillars coupled with greed of the people has resulted in the encroachment in these forests. The encroachments are done chiefly for two purposes i.e. for agriculture and for grazing. Trees are girdled and allowed to die slowly or they are illicitly removed to clear the area which is later on ploughed for agriculture purposes and at times even the residential constructions are also made. The phenomenon of encroachment for grazing is specific to this division. The vast areas are enclosed by the encroachers or at times forests adjoining habitations are distributed by the inhabitants among themselves for the purpose of grass cutting and grazing their animals. It was astonishing to find out during the field exercises when came in contact with the local people that the forest areas are only those which have been enclosed by forest department and rest of area belongs to them. This sort of understanding is within the minds of the people. As already explained in Chapter-I, the encroachments are so rampant that the existence of Rajouri Forest Division in several places appears doubtful. The condition has deteriorated to such an extent that the staff of the division mostly do not exactly know the number of encroachments and the area involved in their respective territories. The reasons for encroachments can be cited as:-

a) Absence of boundary pillars and clear cut demarcation line.
b) Absence of foot paths along the boundary makes the boundary inspection difficult.
c) Absence of alternative employment in the area leads to the tendency of grabbing more land which is least productive.
d) Delay in detection of encroachment.
e) Insufficient demarcation record.
f) Increase in number of livestock needs more land for grazing.
g) Laxity and at times connivance on the part of executive staff.
h) Collusion of lower level revenue functionaries with the encroachers.

The above mentioned factors/ reasons are continuously in operation and resulting in the shrinkage of forest land.

2.4.4 The increase in construction activities and requirements of small timber for various purposes has resulted in illicit extraction of timber from forest areas. The detail of damage cases registered with various agencies and their status during the period of 2001-02 to 2012-13 is shown in the table appended at the end.

2.4.5 The forests of this division are under heavy pressure of grazing by permanent and nomadic livestock population. The grazing in these areas have been unscientific, uncontrolled and un-regulated. The pressure of grazing is much more than the carrying capacity of these forests resulting in depletion of ground flora and destruction of young crop especially in Chir areas. The excessive grazing causes hardening of soil and hampers the germination of seeds.

2.4.6 Collection of firewood from forests for various purpose by the people of neighboring areas is also responsible for injuries to the forest crop. The trees are lopped and sometimes even felled for supply of fuel wood to neighboring villages and towns. Looping is also done for feeding the livestock population in case of fodder trees like oak. Lopping makes the trees vulnerable to natural adversities and diseases.

2.4.7 Excessive and improper extraction of resin from Chir areas has made the crop vulnerable to fires, wind and other natural calamities.

2.4.8 Development activities of man like construction of roads through these forests is also responsible for damage to the vegetation. In such areas the slopes get destabilized and become vulnerable to landsides.

(b) Forest Fires

2.4.9 The forests of this division especially under chir crop suffer extensive damage due to fire. Although chir is fire hardy species but it becomes susceptible to fires due to accumulation of inflammable material on ground and due to unscientific and excessive tapping of resin. These forests face dangers of uncontrolled fire especially during summer months. It causes extensive damage to the standing and young crop. Inadequate fire protection measures have resulted in considerable area being damaged by fire each year. Most of the times the fire is caused by man deliberately. During the summer months, if the accumulated refuse on the chir forests floor is burnt deliberately or un-deliberately, the fire mostly becomes uncontrollable. The deliberate burning is done by the people of the area in order to get good crop of grass for grazing or cutting during the monsoons or to extend their encroachments over the forests lands.

(c) Wild Animals

2.4.10 The injuries caused to the forests by wild animals are much less as compared to the injuries caused by man and his animals. Some of the injuries caused by wild animals are up rooting of seedlings for eating of young roots and damage of chir seeds by monkeys, damage to young seedlings by Porcupine and pigs, Bears damage the younger trees of chir and oak by removing their bark but such damages is of negligible extent.

(d) Natural and Climatic Causes

2.4.11 Drought retards the growth of trees especially the younger regeneration and damages the seedlings and saplings. This damage is higher on southern aspects. Drought affected trees become less resistant to fire. Floods lead to landslides, erosion of soil and may ultimately cause uprooting of trees. Strong winds uproot or break the chir trees weakened due to excessive resin tapping or fire or both. At times heavy snowfall also uproots the trees or breaks the tops in the higher altitudes. Every year a few trees are struck by lightening and these trees die ultimately.

(e) Parasites, Pests and Pathogens

2.4.12 Generally healthy standing trees are not damaged by any of the above agents. Only damaged and fallen trees are attacked by them. Injury due to fungus is very little and almost negligible in this division. However, during 1989-90 chir defoliator (*Cryptothalia cramia*) attacked the chir forests of Rajouri Forest Division and seven compartments in Rajouri Range and eight compartments in Kalakote Range involving about an area of 2500 hectare was affected. The corrective measures were taken and the problem was brought under control.

TABLE 2.3. Table Showing Damage Cases in Rajouri Forest Division, Rajouri.

Year	DEPARTMENTAL CASES					COURT CASES					POLICE CASES				
	O.B	Receipt	Total	Disposal	Balance	O.B	Receipt	Total	Disposal	Balance	O.B	Receipt	Total	Disposal	Balance
2001-2002	252	155	407	155	252	123	2	125	0	125	72	1	73	0	73
2002-2003	252	357	609	384	225	125	14	139	0	139	73	0	73	0	73
2003-2004	225	234	459	222	237	139	2	141	0	141	73	1	74	0	74
2004-2005	237	257	494	261	233	141	5	146	0	146	74	1	75	0	75
2005-2006	233	234	467	202	265	146	4	150	0	150	75	3	78	0	78
2006-2007	265	316	581	434	147	150	3	153	0	153	78	2	80	0	80
2007-2008	147	202	349	216	133	153	2	155	4	151	80	1	81	0	81
2008-2009	133	268	401	281	120	151	7	158	0	158	81	0	81	0	81
2009-2010	120	356	476	328	148	158	8	166	0	166	81	2	83	0	83
2010-2011	148	155	303	147	156	166	3	169	0	169	83	2	85	0	85
2011-2012	156	63	219	78	141	169	1	170	0	170	85	1	86	0	86
2012-2013	141	69	210	50	160	170	6	176	0	176	86	1	87	0	87
2013-2014	160	53	213	32	181	176	2	178	2	176	87	3	90	0	90

B) THE FAUNA

2.5. General Description

2.5.1 Due to varied climatic conditions there is a variety of the fauna found in this tract. The sub-tropical zone and lower portion of the temperate zone is now well connected with roads and is littered with villages and "chaks". The ever increasing pressure of human population has definitely led to a sharp decline in the population of fauna specially game animals and birds, in this region. Even in the small alpine zone of this division, which abuts into the Pir Panjal mountain Range, the excessive interference by large herds of grazing animals and graziers has led to the destruction of certain species like wild goat, muskdeer, brown –bear, snow leopard etc. Apart from large scale killing of game animals and birds by man, the deforestation has led to a sharp decline in the habitat of wildlife and this has also led to a reduction in their number.

2.5.2 Undoubtedly the forests of this tract must have been full of a variety of wildlife in the recent past but the species of fauna, specially game animals and birds, found now are few. These area as under:-

Class Mamalia

(i) Carnivora

(a) Leopard (Panthera pardus)

2.5.3 It is locally known as "Chita" or "Chitra". Though its range of occurrence covers almost the entire tract of the division, leaving aside the small alpine zone, its number is very low now. Many a times it kills domestic cattle for food, due to a shortage of its wild preys.

(b) Snow Leopard (Panthera unicia)

2.5.4 It is slightly smaller than *Panthera pardus*, in size and inhabits high altitude zone of about 3500 meters of 4000 meters above msl. It possibly occurs in a very small number in the higher reaches of Budhal block. Little is known about the habits of this animal because of the difficult accessibility of its haunts in the higher altitudes. It has been included in the schedule –I of J&K Wildlife (Protection) Act, 1978 and its hunting is totally prohibited in the State.

(c) The Jungle Cat (Felis chaus)

2.5.5 With its long legs and comparatively short tail the jungle cat has a very distinctive appearance. Its pale green eyes give it a coldly cruel expression. It preys on small mammals, birds and when near villages on poultry also. A small number of this species inhabits the lower scrub forests of this division.

(d) The Leopard Cat (Felis bengalensis)

2.5.6 The leopard cat is about the size of domestic cat but rather longer in legs. Its colour and markings give it the aspect of a miniature panther. It preys upon small birds and animals and

is seldom seen because of its nocturnal habits. This beautiful forest cat is now almost extinct in this tract perhaps because of its wanton killing by poachers for its beautiful skin. It has been included in schedule I of J&K Wildlife (Protection) Act, 1978 and its hunting is total prohibited now.

(e) The Himalayan Black bear (Scienarctos thibetanus)

2.5.7 Its general colour is typically black with a very characteristic V- shaped breast mark which may be white, yellow or buff. Steep forested hills are the favoured habitat of this bear. In summer it is to be found near tree line (3000-3500 meters) but in winter most of these descend to lower areas. In summers they live largely on wild fruit and berries. Fields of ripening maize are raided in autumn. Insects, termites and the larvae of beetles provide variety to their diet. It is the most carnivorous of the bears and many living near villages kill sheep and goats and even larger cattle. Many a times even human beings are mauled or killed by this animal.

(f) The Brown bear (Ursus arctos)

2.5.8 Its heavier build and brown coat will suffice to distinguish it from the Himalayan black bear. The bare open peaks high above the tree line are the usual haunts of these bears. Only "Budhal" block of this forest division has some area of this type and there is a possibility of a small number of these bears being found in this area.

(g) Stone Marten (Marten foina)

2.5.9 Its build suggests a mixture of the squirrel and the cat. It has moderately long legs and tail about half as long as its head and body. It inhabits the temperate and alpine zones and is rarely seen below 1500 meters. It lives both in forests and on the barren heights above the tree line.

(h) The Himalayan Yellow Throated Marten (Martes flavigula)

2.5.10 A large animal than the "Stone marten" with a proportionately longer tail measuring about three- fourth the length of head and body. The yellow of the throat is emphasized by the dark bands running down the nape. They keep to the forest limits and are not found above the tree- line. The martens usually avoid human habitation.

(i) Jackal (Canis aureus)

2.5.11 This is a very common found frequently around human settlement throughout this tract. Their habits are mostly nocturnal. They are the nature's scavengers. "Jackel" has been declared a vermin as per the Jammu and Kashmir Wildlife (Protection) Act, 1978.

(j) The Indian Fox (Vulpes bengalensis)

2.5.12 This is the common fox of the Indian plains and is encountered mostly in the lower 'sub – tropical zone of the area. It has also been declared a vermin as per the J&K Wildlife (Protection) Act, 1978.

Insectivora

They Grey musk Shrew (Suncus murinus)

2.5.13 The pointed snout, depressed ears and teeth at once distinguish these shrews from rats, with which this species is commonly confused. These are found quite commonly throughout this tract.

(ii) Chiroptera

Fulvous fruit-bat (Rousettus leschenaultia)

2.5.14 This medium sized bat is commonly seen almost all over this tract and mostly lives amongst rocks and caves. These can be seen roosting in noisy colonies in caves and man-made structures such as tunnels, wells etc.

(iii) Rodentia

(a) The Five striped Palm Squirrel (Funambulus pennanti)

2.5.15 This is perhaps the commonest and most familiar of all Indian wild animals. It is not found in forests but has forsaken forests to live with man in and about this dwellings and fields and is seen almost all over the area.

(b) The Indian Porcupine (Hystrix indica)

2.5.16 Its hair are more or less completely modified into spines. Its neck and shoulders are crowned with a crest of bristles 15 to 30 cm long. The quills on the back are very profuse. Each quill is ornamented with deep brown or black and white rings.

It favours rocky hill sides and can be encountered almost over the entire tract. It can be quite damaging to the “nurseries” and young plantations.

(c) The Indian Hare (lepus nigricollic)

2.5.17 These are commonly found upto an elevation of about 2500 meters and generally weight between 2 to 3 Kg, when fully grown up.

(iv) Ungulata

(a) The Hog- deer (Axis porcinus)

2.5.18 It is locally known as “para” and its English name “Hog-deer” is probably due to its squat pig-like appearance and due to its hog- like movements. When running its keeps its head low down and moves without that bounding action so characteristics in dear. The small antlers are set upon very long bony pedicels. Though its number is small now, these are found almost all over this tract and are hunted as a big game.

(b) The Musk-deer (Moschus Moschiferus)

2.5.19 It is a little creature not more than 50 cm high at the shoulders which has been mercilessly persecuted for its "musk pod". Its possible existence in this area is perhaps in the topmost small portion of Budhal block. It has been included in schedule –I J&K Wildlife (Protection) Act, 1978 and its hunting is now totally prohibited.

(c) The Goral (Nemorhaedus goral)

2.5.20 It is a stocky goat like animals and generally weighs 25 to 30 Kg. Its local name is "Pijar". The race found in this area is the Grey-Goral. Its general colour is a yellowish grey suffused with black. It favours an elevation of 900 to 2750m, but may ascend even to 4000m. Its number in this area is small now. It's an important big game animal.

(d) The Indian bear (Sus scrofa)

2.5.21 It is found almost all over this tract up to an altitude of 2500 though its number is fast declining now. It forms an important big game of this area. These animals are omnivorous, living on crops, roots, tubers, insects and snakes.

(v) Primates

(a) The Rhesus Macaque (Macaca mulatta)

2.5.22 This is the common monkey of northern India and is found almost all over the tract of this division except that small area where the altitude rises above about 2500m. Troops of this species have been observed to be engaged in uprooting and chewing the chir seedlings in the chir forests.

(b) The Common Langur (Presbytis entellus)

2.5.23 This is the long – limbed, long tailed, black faced monkey seen as much above habitations as in the forests. They inhabit altitudes up to 3500 m above msl and are in general more arboreal in habits than macaques.

CLASS AVES (BIRDS)

2.5.24 The details of birds found in this Division are as under:-

S.No	English Name	Scientific Name	Remarks
01	Monal pheasant or Impeyan Pheasant	Lophophorus impejanus	A beautiful large bird with Brilliant metallic green head and crest (of wire-like spatual –tipped feathers), white patch on back and Cinnamon coloured broad and square –cut tail. It is found in high level Fir and sub-alpine zone in summer and descends down in winter

02	The Koklas pheasant.	Ceriornis Macrolophus	Size domestic fowl; Cock is grey above, Streaked blackish, chest nut below. Chest is brown lying down between two long metallic green horn-like tufts jutting out behind its metallic green head. A white patch on either side of the head is characteristic. It is mainly found in areas of Darhal and Budhal blocks.
03	The white crested Kaleej pheasant	Gennaeus Ramiltoni	Size is same as above. A bird with long sickle shaped black tail whitish rump & black above having bare scarlet patch round the eyes. Found mostly in the banj oak forests.
04	Red Jungle fowl	Gallus gallus	Size: village hen. Found almost all over in the chir zone of Rajouri Forest Division.
05	"Ram Chukor" or "The Himalayan snow cook.	Tetraogallus Himalayensis	Possibly found only in the top-most portion of Darhal and Budhal blocks.
06	The Chukor	Alectorisgraeca	A beautiful Pinkish grey- brown Partreidge (Larger that the partridge): found in the oak forests of Kalakote and Rajouri Ranges.
07	Grey Partridge	Francolinus pondicerianus	Size that of a half grown domestic hen. Very commonly found all over the sub-tropical zone of the Division.
08	Black partridge	Francolinus francolinus	Size same as above. Very commonly found in the entire sub-tropical zone of the Division.
09	Common or Grey quail	Cotumix cotumix	Size that of Dove. An almost tailess bird mainly found in the lower portions.
10	White backed of Bengal vultures	Pseudogyps bengalensis	Size $\pm$ Peacock. A dirty blackish brown vulture with naleed head and neck and white back. Found in the lower area of the division.
11	The Himalayan Griffon vulture	Gyps himalayensis	An enormous sized birds (largest in Himalayans) with long naked neck and un feathered bald head, sandy white or khaki in colour. Found in the higher zone.

12	Fulvous or Indian Griffon Vulture	Gyps fulvus	Smaller than the above, the adult is rich fulvous or cinnamon brown but often quite pale. Found in the higher zone.
13	Common Pariahkite	Milvus migrans	A large brown hawk with forked tail found allover the area and often seen flying over head.
14	Common peafowl	Pavo Cristatus	A long tailed bird with beautiful crest found in the lower sub-tropical areas. Included in schedule –I of J&K Wildlife (Protection) Act, 1978 and its hunting is totally prohibited.
15	The Shahin falcon	Falco peregrines peregrinator	Size: Somewhat larger than the house crow. A falcon with slaty black head and rusty red under parts, found almost allover the division.
16	Shikra	Accipiter badius	A hawk with a shy blue grey colour above and white below (size $\pm$ Pigeon). Found everywhere in the sub-tropical zone of the division.
17	Kestrel	Falco tinnunculus	Size $\pm$ Pigeon. A small falcon often seen checking itself in flight time and again and remains stationary in mid-air. Found almost allover this area.
18	Jungle Crow	Corvus macrorhynchos	House Crow +. A glossy jet black crow found almost allover in the division.
19	House crow	Corvus splendens	This is the common crow found allover specially along habitations.
20	Blue rock –pigeon	Columba –livia	Size House crow. A Slaty grey bird with metallic green, purple and magenta sheen on neck and upper breast. Found in rocky hills of Rajouri & Kalakote Ranges & also in semi domesticated condition.
21	Red wattled lapwing	Vanellus indicate	Size partridge + A bird with black breast, head and neck, white below, brown above and a Crimson fleshy wattle in front of each eye. Found in pairs almost allover the area near small ponds and puddles.

22	Rolled or Blue jay	Coracias banghalensis	Size: Pigeon. Mostly confined to the lower portion of the division and generally found perched singly on poles around cultivations.
23	Common Hawkeuckoo or Brain fever bird	Cuculus –varius	Size: Pigeon superficially very much like Shikra Hawk, found allover in this area.
24	Koel	Eudynamys scolopacea	Size: House Crow. Found in the sub-tropical and lower temperature zone, remains silent in winter and becomes increasingly noisy with the advance of hot weather.
25	The Red billed blue	Urocissa erythrorhyncha	Size: Pigeon. A long tailed (15”-17”) blue bird with black head, neck and breast, grayish white under parts, crimson bill and legs and long graduated tail. Found allover the area.
26	The Himalayan tree pie	Dendrocitta formosea	Size ± Myna. A long tailed(12”) grayish bird with black crown, ashy under parts and white sport in wing. Found almost allover the area.
27	Indian Myna	Acridotheres tristis	Size: Bulbul +.A dark brown bird with bright yellow bill and legs and bare skin round the eyes, found almost allover in the division except the higher areas.
28	Brahminy or Black headed Myna	Sturnus pagodarum	Size: smaller than the above, grey above redish below with glossy black crown. Seasonally found in the lower area of the division.
29	Jungle Myna	Acidotheres fuscus	Similar to Indian Myna but more grayish brown overall, devoid of yellow skin round the eyes. Found almost allover in the area except the lower most portions.
30.	Small yellow naped wood pecker	Picus chorolophys	Size:Myna. A yellowish green wood pecker with golden yellow muchal crest. Found in the lower portions of the Division.

31	Golden backed wood pecker	Dinopium benghalensis (Syn.Brachyptermus benghalensis)	Size. Myna +. A wood pecker plumage golden yellow and black and crimson crown and occipital crest. Found mostly in the sub-tropical zone.
32	The west Himalayan pied wood pecker	Dryobates himalayensis	Size ± Myna. A wood pecker with ared patch under tail and on the head, black back and white shoulders; found almost allover the area but mostly in the oak and fir areas.
33	The brown fronted pied wood pecker	Dryobates auriceps	Slightly smaller than the above, with cross- barred black and white back, found almost overall the area specially in the oak and Fir areas.
34	Hoopoe	Upupa epops	Size± Myna. A bird with Zebra like black and white markings on back and fan – shaped crest. Found in the lower sub-tropical zone of the area.
35	Pied crested cuckoo	Clamator jacobinus	Size± Myna with longer tail A handsome crested black and white cuckoo with shite tips of tail feather, found almost allover in this area.
36	Ring Dove	Streptopelia decaocto	A Pigeon sized dove with a narrow back half ring on the hindneck, found allover the areas seasonally.
37	Spotted Dove	Streptopelia chinensis	Size: Between Myna and Pigeon. A dove with white spotted pinkish brown and grey upper parts and white and black chess board on hindneck, found in the lower open areas.
38	The Rufous turtle Dove	Streptopelia orientalis	A Dove slightly smaller than the blue rock pigeon with a grey sported black patch on either side of hindneck. Found allover in the upper portions of the division, specially in summers.
39	Roseringed parakeet	Psittacula krameri	Size Myna +. A grassy green bird with a long pointed tail, red beak and red ring on the handneck, found allover the subtropical zone of this area.

40	Blossom headed parakeet	Psittacula cyanocephala	Size: Smaller than the above. A grassy green bird with bluish red head and maroon shoulder patch found almost allover in the division.
41	Himalayan whistling	Myiophoneus caeruleus	Size: Between Myna and Pigeon: A blue black bird found allover in this area.
42	White breasted kind fisher	Halcyon smymensis	Size Myna + A bird with deep chocolate brown head, neck and under parts, a white breast and long red bill, found near ponds, streams and water dliches.
43	Small blue Kingfisher	Alcedo-athis	Size: Sparrow +. A blue and green little King-fisher with rust coloured under parts short stumpy tail and long bill, found allover the lower portions near streams and ponds.
44	Common Babbler	Turdoides caudatus	Size: Bulbul. A brownish babbler with long graduated tail found in the lower portion of the division.
45	Jungle Babbler	Turdoides striatus	Size: Myna: Larger than the above and found in almost all the area except the higher portions.
46	Baya or Weaver bird	Ploceus philippinus	Size: Sparrow. Found only in the lower reaches of the area. It builds a swinging retort shaped nest.
47	The spotted fork-tail	Enicurus maculates	Size $\pm$ Myna. A spotted black and white bird with long and deeply froked tail, found near streams allover the area.
48	Grey Wag-tail	Motacilla caspica	Size $\pm$ Sparrow, A long tailed bird found near rocky streams allover the area mostly in winters.
49.	White Wag-tail	Motacilla alba	Size: Sparrow $\pm$ A white bird. Found near rivers and streams of the area mostly in winters.
50.	Yellow Wagtail	Motacilla flava	Size: Sparrow $\pm$ Chiefly yellowish in colour and keeps wagging its tail like other wagtails. Found allover the area

			during winter months.
51	Little egret	Egretta garzetta	Size: Village hen. A lanky snow shite marshy bird with black bill, long dropping crest and long legs, found near steams and ponds.
52	Cattle egret	Bubulcus-ibis	Size same as above, a white bird (in its non breading plumage) like the little egret but with a yellow bill. Found accompanying the grazing cattle.
53	Paddy Bird or Pond Heron	Ardeola grayii	Size: Cattle egret. An egret –like bird, earthy brown at rest, with white wings; found near water i.e Ponds, Paddy fields, Rivers etc.
54	Gold fronted chloropsis(green bulbul)	Choropsis aurifrons	Size± Bulbul. A grass green bird with bright golden forehead, purple and black chin and throat, found mostly in the lower portions of this division
55	White checked Bulbul	Pycnonotus leucogenys (Molpastes leucogenys)	Size Myna: A brownish bulbulwith black head, white checks and yellow under toot of tail. Found almost allover the area.
56	Redvented bulbul	Pycnonotus cafer (Molpastes cafer)	Size same as above. A bulbul with partially crested black head and Crisom patch below root of tail and a white rump. Found allover the area.
57	The west himalyan white threated laughing thrush	Garrulax whistleri	Myna ± sized. Crestless olive –brown and rust coloured bird with white cheeks and throat. Found almost allover the area.
58	The Himalayan Barred owlet	Glaucidium cuculoides	Pigeon –minus sized, dark brown, owlet- barred with whitish above and with white patch on throat, found allover in Chir and fir forests.

59	The spotted owlet	Athena brama	Size± Myna. A squate, white spottedgreyish brown little owl, with large round head and bulged yellow eyes; found almost allover the area.
60	Common swallow	Hirundos rustica	Size as above. A purplish blue swallow with pinkish white under parts and forked tail, found almost allover except higher zone.
61	Wire tailed swallow	Hirundos smithii	± Sparrow sized, bluish bird with chestnut cap, white under parts and two long "wires' in the tail. Found in the lower areas of this division.
62	The crested bunting	Melophus lathami	A sparrow –sized black and chestnut, crested bird; found allover in the lower portion of division.
63	Small green bee-eater	Merops orientalls	A sparrow sized green bird tinged with reddish brown on head and neck nad long pin –like pair of feathers; found allover in the lower portions.
64	Grey shrike	Lenius excubitor	A+ Myna sized silver gray bird with longish black and white tail, black stripe from bill backward through eye. Found only in the lower portion of the division.
65	Rufous backed shrike	Lanius schach	A ± Bulbul sized shrike with a black band through the eyes and forehead. Grey head and bright rufous lower back and rump. Found allover the area during summers.
66	Black Drongo (King crow)	Dicrurus adsimilis	Size ± Bulbul; Aglossy –black bird with long deeply forked tail, found allover in the division.
67	House sparrow	Passer domesticcus	This is the common sparrow associated with human habitations and is found allover near habitations.
68	Pied blushchat	Saxicola caprata	A sparrow sized black (female earthy brown) bird with white patches on rump, addomen and wings. Found allover except higher zones.

69	Indian Robin	Saxicoloides fulicata	Size: Sparrow + : A blackish bird with a white patch on wing, rusty red under root of cocked tail(Hen ashy brown). Found allover in lower open areas.
70	Tailor bird	Orthotomus sutorius	Size: Sparrow + : A small restless olive green bird with whitish under parts, rust coloured crown and two long, pointed feathers in the cocked tail. Found mostly in the lower zone.
71	Grey Tit	Parus major	A sparrow sized bird with glossy black head, white check patches, grey back and whitish under parts, found allover this area in parties.
72	Paradise flycatcher	Terpsiphone paradise	A bulbul sized silvery white(Male) bird with metallic black crested head and two very long, narrow ribbon like curved feathers in tail, found allover in the lower zone of the Division.
73	White spotted fantail flycatcher	Rhipidura albicolis	A ± Sparrow sized, cheery, restless smoke-brown bird with white eye brows white spoted breast and flanks, whitish abdomen & fanned –out tail, dropping wi8ngs. Found allover the area.
74	Golden oriole	Oriolus oriolus	A Myna sized bright golden yellow bird with blackish wings and tail and black streak through the eyes, found allover in the lower zone.
75	Common or Black redstart	Phoenicurus ochruros	Size: Sparrow. A slim active black and orange- chestnut bird, constantly shivering its tail (orange-chestnut) & dipping forepart of body. (Female brown and paler). Found almost allover this division.
76	The white capped redstart	Chaimarrornis leucocephalus	Size:- Sparrow + A robin like bird, black above, chestnut below, with snow-white cape and bright chestnut tail ending in a black band. Found commonly near streams in this area.

77	The Himalayan Nut cracker	Nucifraga Caryocatoctes	Size ± House Crow. A chocolate brown & umber brown bird, spotted with white above and below and having wedge-shaped bill. Found allover the Chir & Fir forests.
78	Black Bulbul	Microscelis psaroides	Size: About Myna. A dark slate coloured bird with an untidy black crest and red bill and legs. Commonly found in Oak Rhododendron forest & descends into lower areas in winter.

Injuries To Which The Fauna Is Liable

2.6.1 The fauna of the forests is liable to injuries by Man, Wildlife, Epidemics, atmospheric influences and fires.

Man

2.6.2 Man, undoubtedly, is the biggest enemy of the fauna (wildlife). Hunting of the wild animals and birds has always been a game for the man. Man has continued to undertake planned and sustained efforts to hunt and destroy the wildlife. Wildlife are hunted for their valuable skin fur and horns etc. Large forest areas have been cleared up and brought under the plough during the recent past thus destroying the habitat of the wildlife and consequently the wildlife. For this destruction also, man is solely responsible.

Wildlife

2.6.3 Many Forms of the wildlife live on other forms of the wildlife. But in this process the 'nature' controls the balance of the wildlife and all forms of wildlife continue to co-exist and live without disturbing the ecological balance.

Atmospheric Influences

2.6.5 Wildlife has generally an in-built strength to survive the vagaries of nature. Only the young ones of wild animals and birds are affected by the heavy snow, forest fire etc. Birds are the chief sufferers from heavy snowfall, rains and storms as the young birds and the eggs and destroyed by these atmospheric influences.

Fires

2.6.6 Sometimes the wild animals get trapped in the forest fires and are killed but this happens very rarely. Generally these wild animals have very keen senses and are capable of escaping away, well in time from such dangers.

CHAPTER-III

Utilization of the Produce

3.1. Agricultural Customs And Wants Of The Population

3.1.1 According to the 2011 census Rajouri district has a population of 642,415, The district has a population density of 244 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 28.14%. Rajouri has a sex ratio of 863 females for every 1000 males, and a literacy rate of 68.54%.

3.1.2 The biggest ethnic group is Muslims accounting for 58.29% of the population followed by Hindus, 39.24% and Sikhs 2.42%. The agriculture activity is engaging 75% of the total labour force.

3.1.3 The above figures are of whole of the Rajouri District. Since the present Rajouri Forest Division is spread over the geographical area of 53% of the whole of the geographical area of the Rajouri District, for the sake of convenience 53% of the gross figures of Rajouri District can be considered for the present Rajouri Forest Division.

3.1.4 There are two towns and 286 villages in the present Rajouri forest Division. On the basis of proportion of area as explained in para supra, the population of present Rajouri forest Division can be estimated to be 3.40 lakhs on 2011 census.

3.1.5 Gujjars form an important component of Muslim population in this division and generally inhabit the areas just bordering on or within the forests. Even the steep slopes of hills have been brought under the plough, in this tract. The encroachments in the forests are alarmingly large.

3.1.6 Most of the rural population is largely dependent upon the demarcated forests for meeting their timber requirements for agricultural implements, house building and repairs and for firewood as well as for grass, grazing and leaf fodder for their cattle. In addition to these requirements of the rural population, the timber and firewood requirements of the urban population and also that of Army are to be met with from these forests.

3.1.7 An exercise of socio-economic survey was conducted during the field work of the present working plan. The findings of socio-economic survey are given below.

3.1.8 Average size of the family works out to 7 persons per family. It works out to 7 persons per family. It works out to 48,640 house holds in the Rajouri Forest Division (Geographical area). The survey has shown that people prefer local varieties of trees/ plants for plantation. Government employees didn't show much interest in farm forestry, community forestry and Kissan nursery. Rest of the population is interested in above said activities but they have expresses constraints of land and funds.

Fuel Wood Requirements

3.1.9 The survey has shown that 76 quintals of fuel wood is required per family per annum. Out of the estimated households nearly 40% of the people are using modern source of energy such

as cooking gas, kerosene and electricity. Remaining 60% of the households i.e 29,184 still uses firewood. Hence, total fire wood requirement in the division works out to 22,17,984 quintals per year. This is in addition to requirement of the army in the area. Billets, twigs, agricultural wastes and cow dung constitute the major source of bio-fuel. Almost 65% of the fuel wood is obtained from the forests. Agricultural wastes and cow dung constitute 10% of fuel wood component whereas rest of the 25% component of fuel wood is obtained from trees and shrubs growing on private lands. Hence forests of the Rajouri Forest Division provide 14,41,689 quintals (1.44 laks metric tones) of fuel wood.

3.1.10 The survey has shown that there is moderate to acute shortage of fuel wood, fodder and timber in the various villages of the division. The educated people and government employees have been observed to prefer kerosene and cooking gas and hence they use less fuel wood. In many villages people are using cooking gas.

3.1.11 The following table shows the fire wood extracted and amount realized by Rajouri Forest Division from 2001-02 to 2012-13

Table 3.1. Details of firewood extracted/ sold in Rajouri forest division

Year	Qty. of Firewood extracted (Qtls)	Qty. of Firewood sold (Qtls)	Amount Realized (Rs.)
2001-02	819.00	690.00	81990
2002-03	1741.00	1313.75	150625
2003-04	914.75	966.10	97010
2004-05	1013.00	620.68	103108
2005-06	214.00	553.90	72215
2006-07	1329.00	520.00	178762
2007-08	280.00	653.60	100290
2008-09	984.00	1083.00	161100
2009-10	765.00	936.00	141900
2010-11	802.00	770.00	149882
2011-12	559.00	481.50	139595
2012-13	1282.10	830.00	359809
2013-14	2234.04	1066.94	175238

Timber Requirements

3.1.12 Assuming that about 7 cum of wood is required for construction of an average house for an average household size of 7 members. Assuming again that these houses need complete renovation in every thirty years, the annual requirement of timber on the account will be 48640 x 7/30 = 11350 cum (about 4.00 lakhs cft). Moreover new households are also coming into being at a fast pace due to rise in population i.e. roughly 550 houses annually. For these new constructions 3850 cum (1.36 lakhs cft) timber is annually required. Hence the total timber requirement of the division works out to be 5.36 lakhs cft annually. A portion of this requirement is met with the timber obtained from the private lands. Also significant quantity of timber requirement is being met by imported timber. It is estimated that about one lakh cft of timber requirement is met from the forest department sources. Against this requirement, timber given to the concessionists is shown in the Chapter–I whereas the timber sold in the sale depots in Rajouri Forest Division is shown in the Table 3.2. below.

Table 3.2. Details of timber sold in sale depots at Rajouri Forest Division

Year	Specieswise Timber Sold (Cft.)					Amount Realized (Rs.)
	Deodar	Kail	Fir	Chir	Total	
2001-02	126.09	3375.32	0.00	0.00	3501.41	809529
2002-03	943.88	2342.00	0.00	38.17	3324.05	734141
2003-04	1181.23	524.10	0.00	5161.42	6866.75	942559
2004-05	2945.61	1540.27	0.00	170.13	4656.01	1233766
2005-06	5854.09	544.49	0.00	0.00	6398.58	2104861
2006-07	0.00	0.00	0.00	0.00	0.00	0
2007-08	145.92	521.31	0.00	550.36	1217.59	106367
2008-09	50.66	1913.19	0.00	1404.83	3368.68	405934
2009-10	1822.98	8996.77	109.41	3893.32	14822.48	4185542
2010-11	1446.95	7556.48	575.74	4451.47	14030.64	3431186
2011-12	5785.00	8010.04	370.25	1748.85	15914.14	4157601
2012-13	5909.76	9910.73	1274.54	4437.32	21532.35	5899506
2013-14	5327.30	16013.44	4715.09	173.85	26229.68	7172014

Fodder Requirement

3.1.13 Total number of livestock of Rajouri District was estimated to be 13,74,304 animal units. Out of which 53% i.e 7,28,381 animal units reside in Rajouri division. As per survey per livestock unit requirement of fodder works out to be 35 quintals per annum. It means that 2,54,93,335 quintals of order is required in a year.

3.1.14 60% of the fodder requirement is met from the forests of the division 15% fodder comes from the agricultural wastes, 20% from trees, shrubs and grasses grown on private lands and 5% comes from Government lands other than demarcated forest lands. Hence total fodder requirement in this division works out to be 254.93 lakhs quintals annually and forests of this division contribute 165.70 lakhs quintals annually.

3.2. Markets and Marketable Products

3.2.1 Resin and timber are the two main forest products of this forest division. Chir and Fir are main timber species found in these forests. A major portion of these species is required to meet the local demand. However, commercial exploitation of timber in the form of sleepers, scantlings etc. is done by J&K SFC and exported to Jammu for further sale in open market. Table 3.3. shows the markings of Chir and Fir handed over to SFC Division Rajouri from 2001-02 to 2013-14 by this division.

Table 3.3. Details of Marking handed over to State Forest Corporation

S. No	Year	No. of B/L Poles / Trees Handed over	Volume (Cum) of Chir Trees Handed over
1	2001-02 to 2007-08	0	0.00
2	2008-09	572	2347.47
3	2009-10	0	0.00
4	2010-11	515	304.81
5	2011-12	135	569.41
6	2012-13	114	174.58
7	2013-14	0	0.00
	Total	**1336**	**3396.27**

3.2.2 Resin has become the most important non- timber forest product from the Division due to the revenue being earned by this division from the sale of resin. Earlier, some proportion of the resin was utilized in the resin processing units existing in this division. Presently these resin processing units are closed. Nowadays the resin is sold by auction to the units located in Jammu and outside the state. The following statement shows the quantity of resin extracted and revenue earned in Rajouri Forest Division from 2001-02 to 2013-14.

Table 3.4. Table Showing the Resin extraction details

S.No	Year	No. of Blazes Tapped	Resin extracted (in M. Tones)	Revenue (Rs.)	Expenditure on resin extraction
01	2001-02	546830	1847.992	3,33,22,015	1,60,18,876
02	2002-03	488896	2068.688	2,72,73,319	92,40,376
03	2003-04	541724	1898.885	3,93,28,460	1,44,01,970
04	2004-05	221024	642.271	1,82,37,395	73,49,638
05	2005-06	463016	1546.558	4,45,70,211	1,18,39,346
06	2006-07	349435	1129.236	14,78,011	88,50,670
07	2007-08	304985	1032.219	1,10,58,230	80,39,911
08	2008-09	150610	507.555	2,16,96,145	46,98,038
09	2009-10	108460	290.197	1,15,88,080	36,87,501
10	2010-11	80100	185.60	84,84,174	3,23,96,137
11	2011-12	19400	62.298	22,67,688	30,95,411
12	2012-13	16500	60.813	17,61,924	30,01,618
13	2013-14	30300	104.40	78,20,860	32,82,500

3.2.3 Broad leaved species as mostly utilized as fuel-wood by the local population. However, Chikri was used by locals for making combs, spoons, toothpicks and decoration pieces. Chikri products are sold to tourists visiting Shahadra Sharief Shrine. Hence Chikri products get exported to other parts of the State through these tourists. Excessive exploitation of Chikri has resulted in depletion of higher dia classes of Chikri. Khair (*Acacia catechu*) is distributed in the forests as well as private lands. It is exported to Jammu for extraction of Katha and Kutch.

3.2.4 Other saleable non - timber forest products from this division are Anardana, Kakarsinghi, Banafsha, Guchhi etc. Table shows the extraction of MFP in Rajouri Forest Division from 2001-02 to 2013-14.

3.3. Lines of Export

3.3.1 Resin tins are transported through mules by wage mates from forests to the transit depots established by the territorial division along the road sides. Wage mates are not allowed to use trucks to supply resin tins to the transit depots. From transit depots resin is lifted by resin processing units through their own trucks.

3.3.2 Timber extracted in the forests is brought to loading stations through various off road transportation means e.g. head carriage, pathroo, rope – ways etc. and then from these

loading stations transported through trucks to sales depots at Jammu by SFC. River and Nallah mahaning is not feasible in this division.

3.3.3 There is sufficient road net work in this division. The important roads are:-

(i) Jammu – Poonch national Highway
(ii) Rajouri- Kalakote – Siot road.
(iii) Rajouri – Darhal road
(iv) Rajouri –Kandi- Budhal road.
(v) Rajouri- Thanna Mandi –DKG road.
(vi) Thanna Mandi – Shahdara road.
(vii) Kallar- Agrati-Peer Badesar road.
(viii) Sailsui – Solki road.
(ix) Kesar Gala- Tata pani road.
(x) Kotli – Kalaban road.
(xi) Dhangri- Dhalori road.
(xii) Bhindi- Jamola road
(xiii) Kalakote – Mogla- Pouni road.
(xiv) Solki – Mogla road.

In addition many PMGSY roads are being sanctioned to connect all the small hamlets and there by most of the forest area have roadcoonectivity nowadays.

3.4. Method of Exploitation

3. 4.1 Dry and fallen trees are marked by carving a number at the base and making with hammer mark at the base of the tree. After the markings are conducted, these are handed over to SFC for extraction. The marking are classified into species, diameter classes, fit, green or dry. All the logging operations are carried out in accordance with the laid down norms.

3.4.2 Trees are felled by employing saw. First of all trees are converted into logs of desired size after felling. Logs are then converted into scants of marketable sizes which are brought down to loading stations through various off-road transportation means as per the feasibility (financial and technical)

3.4.3 Resin is extracted by rill method. Wage contract system is employed by the department for resin extraction. Chir compartments selected for tapping are grouped into lots. These lots are put to open auction for extraction of resin and its transportation to nearby transit depot. The extraction has to be carried out in accordance with laid down norms.

3.5. Past and Current Prices

3.5.1 The revised sale rate of timber in A, B and C concession zones, municipal council/ committee and municipal corporation areas was fixed by the State Government in 2006 and revised in 2009 as under.

Table 3.5. Statement showing the price of timber sold through TSD's

(Rs./Cft)

Year	Zone	Form	Deodar	Kail	Fir/ Spruce
	A	Log	161	102	59
		Sawn	202	121	81
	B	Log	246	160	120
		Sawn	281	193	136
	C	Log	Prevailing rate of J&K State Forest Corporation		
2006-07		Sawn	Prevailing rate of J&K State Forest Corporation		
	A	Log	185	130	74
		Sawn	215	160	104
	B	Log	345	245	138
		Sawn	375	275	168
	C	Log	513	360	205
2009-10		Sawn	543	390	235

3.5.2 The rates quoted above exclusive of taxes. 13.5% of VAT and developmental charges @ Re.1.00 per cft is also levied over and above the cost.

Table 3.6. Table showing the NTFP extracted in Rajouri forest division 2001-2002 to 2013-2014

S. No	Year	Anardana			Banafsha			Gucchi			Kakar Singhi			Buch			Revenue
		Qtls	Kg.	Gms	Qtls	Kg.	Gms	Qtls	Kg.	Gms	Qtls	Kg.	Gms	Qtls	Kg.	Gms	
01	2000-2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02	2001-2002	128	16	0	0	0	0	5	0	0	0	0	0	0	0	0	2,66,000
03	2002-2003	357	0	0	0	0	0	9	78	500	49	64	0	20	0	0	7,43,000
04	2003-2004	325	18	0	07	06	0	5	56	0	76	62	0	75	20	0	82,75,000
05	2004-2005	415	0	0	0	0	0	4	0	0	30	15	0	65	15	0	8,46,000
06	2005-2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07	2006-2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08	2007-2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09	2008-2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2009-2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	2010-2011	250	0	0	0	0	0	11	43	0	0	0	0	80	0	0	1,63,000
12	2011-2012	229	0	0	0	0	0	9	20	0	0	0	0	130	0	0	1,90,091
13	2012-2013	383	0	0	0	0	0	4	60	0	0	0	0	115	0	0	2,09,001
14	2013-2014	180	0	0	0	0	0	300	0	0	0	0	0	219	80	0	2,75,000

CHAPTER-IV

Activities of State Forest Corporation

4.1. Jammu & Kashmir State Forest Corporation

4.1.1 The J&K SFC was created by the act of legislation, namely The Jammu and Kashmir State Forest Act, 1978 and rules were framed in 1981. The forests were worked out by leases in the olden days and later the forest working was nationalised by The Jammu and Kashmir Nationalisation of Forest Working Act, 1987.

4.1.2 The Forest Department hands over the coupes to SFC and levies the royalty. Before the ban of green felling of trees, the SFC was handling huge volume of timber every year. Due to the imposition of ban on green felling by the State Government and the various directives issued by the Hon'ble Supreme Court of India regarding felling, resulted in least quantum of timber extraction by SFC. Later, the Hon'ble Supreme Court of India endorsed the Qualitative and Quantitative norms (popularly called as Q&Q Norms), proposed by the State. As per the Q&Q norms, 80 lakh cft of standing volume of conifer trees (dry, fallen; basically hygienic markings) can be cleared in the State for extraction every year, but except few years, the limit of 80 lakh cft was never touched hence it resulted in financial crunch to the corporation.

4.1.3 The State Forest Corporation suggests the available volumes from different compartments. If the compartment fits to be worked out as per the conditions imposed by Q&Q norms, then it is enumerated for dry/ fallen trees. After the issue of technical sanction and Administrative Approval, then the marking in the compartment is handed over to the SFC for extraction.

Table 4.1.Statement showing the volume (in cft) handed over to SFC from Rajouri Forest Division during 2001-02 to 2013-14

S. No	Year	No. of B/L Poles / Trees Handed over	Volume (Cum) of Chir Trees Handed over
1	2001-02 to 2007-08	0	0.00
2	2008-09	572	2347.47
3	2009-10	0	0.00
4	2010-11	515	304.81
5	2011-12	135	569.41
6	2012-13	114	174.58
7	2013-14	0	0.00
	Total	**1336**	**3396.27**

4.1.4 The SFC prepares the estimate for the timber operation, based on the expected out turn and calculates the financial cost for extraction and transportation of timber upto its central depots. Then the SFC allocates the work to the contractors for execution of timber operation

based on competitive bids. When the timber is dumped in the road head, the transportation of timber is permitted by either CF or the CCF (Territorial), after due verification of the stocks.

4.1.5 The entire operation of timber extraction and transportation shall be very closely monitored by the territorial field staff. From the starting of felling operation upto the disposal of debries and handing over the compartment back to the forest department, it should be monitored properly. The felling of marked trees shall start only after the proper handing over of the marking to the SFC. The felling shall always be on the Hill side; in rarest cases it is along the contour and never on the down side. The falling tree shall never injure the other standing trees. Likewise there are many conditions. The SFC shall report to the territorial department about the progress of the felling operation every month.

4.1.6 The felled tree is delimbed and logs of standard sizes are cut. The logs are debarked and rolled down to road head for further transportation in Kashmir valley, but extracted into scants in Jammu province. The 10'X10"X5" wooden sleepers are called as BG sleepers as it was meant for Broad Gauge Railway Sleepers. Apart from BG, the terms used by local people meant for under sized sleepers are *Pasale, Chakkoor* and *Dimdima*. The extracted scants are brought to road head either by head load, *Pathru* or aerial ropeway (*tar* span). The pathru is used when the extracted stuff is more than 30000 sleepers and intended to be transported from the higher elevation point to the lower destination through steeper path. When the sleepers have to cross longer distance and many deep valleys, the aerial ropeways are used. When the sleepers moves under the force of gravity, no extra mechanical power is required. If it has to move against the gravity, the diesel engines are used to power the lifting of scants against the gravity. If smooth moving water channel is available, the from the origin upto the destination, the scants are launched in water body and caught at the *boom* erected at the destination. From the road head the scants are loaded in trucks and transported. Form -25 (Transport permit) is issued by territorial division for monitoring the land transportation of forest produces.

4.1.7 Mostly, the timber is sold in open auction by SFC.

Table 4.2. Statement Showing the rates in vogue in SFC for timber operations during 2013-14 is as follows.

(All Figures in Rs.)

#	**Activity**	**Category**			
	SAWN FORM	**D**	**C**	**B**	**A**
(a)	Extraction (on FMM)				
1	Felling (per cft)	2.63	2.21	1.99	1.57
2	Hand Sawing ï under/odd size (per cft)	34.83	31.83	29.47	26.81
b.	Hand Sawing ï standard size (per cft)	39.81	36.37	33.68	30.64
(b)	Offï road Transportation (on DMM)				
3	Pathroo (per cft/Km of 33 chain)	5.82	5.66	5.52	5.37
4	Pacci nail (per Cft/Km of 33 chain)	2.18	1.96	1.96	1.88
5	Tarspan (per span/cft)	4.91	4.67	4.57	4.67
6	S.N Mahan (per cft per km of 33 chain)	1.53	1.44	1.44	1.33
7	Main Nallah Mahan (cft/Km)	1.33	1.33	1.33	1.33
8	Head carriage (forests) (per cft/chain)	0.43	0.43	0.43	0.43
9	Crane (per cft/Km)	7.36	6.99	6.99	6.99

10	H/C after nikkasi (per cft/chain)	0.45	0.45	0.45	0.45
(c)	Minor Related Activity (on DMM)				
11	Launching (S.N Mahaning) / Cft	0.32			
12	Nikassi (per cft)	0.64			
13	Stacking (per cft)	0.61			
	LOG FORM				
(d)	A. EXTRACTION (A1 +A3)	5.90			
	A1 CONVERSION	3.93			
14	A1.1 Debranching &Debarking /cft	0.80			
15	A1.2 Sawing &log marking/cft	3.13			
16	A3 Felling (per cft)	1.97			
17	Loading logs (per cft)	3.55			
18	Un- loading Logs (per cft)	0.04			

(e) Log Rolling

#	Log rolling upto Kutcha Loading Point (Per cft chain)	Norms Rate in Rupees
1	Category A (0-20 degrees)	0.73
2	Category B (20-30 degrees)	0.53
3	Category C (30-40 degrees)	0.38
4	Category D (> 40 degrees)	0.18

(f) Kutcha Road Transportation (Log Form)

Volume Slab Cft	Distance slab			
	0-50 km	6-10 km	11-20 km	Above 21 km
Upto 5000	2.69	2.06	1.61	1.26
5001-10000	2.64	1.91	1.35	0.93
10001-20000	2.51	1.86	1.32	0.91
20001-40000	2.39	1.76	1.25	0.86
40001-80000	2.26	1.63	1.14	0.76
Above 80001	2.13	1.53	1.07	0.71

(g) Pucca Road Transportation (Log Form)

#	Distance slab in Km	Rate in Rs/ cft/Km	Rate with 15% Contractorôs profit (Rs/cft/km)
1	0-20	0.27	0.31
2	20-40	0.24	0.27
3	40-70	0.22	0.25
4	Above 70	0.19	0.22

(h) Pucca Road Transportation (Sawn Form) – National Highways

#	Distance slab in Km	Rate in Rs/ cft/Km	Rate with 15% Contractorôs profit (Rs/cft/km)
1	0-50	0.14	0.16
2	51-100	0.13	0.15
3	101-150	0.12	0.13
4	Above 151	0.11	0.12

(i) Road Transportation (Sawn form)

Other than National Highways = Rs. 0.17/ cft/ km

(j) Loading charges (sawn timber) = Rs. 1.14/ cft

(k) Extraction in log form on old NPC procedure

Activity	Rate
Extraction including felling, conversion rolling etc. (all operations) upto KLP	At the average rate of Rs. 191 per labour per day as per NPC procedure

CHAPTER-V

Staff and labour supply

5.1. Staff

5.1.1 The following table shows the sanctioned and working strength of this division as it stood on 31st March 2014.

Table 5.1. Detail of Sanctioned and Working Strength of Rajouri Forest Division

S.No	Designation	Sanctioned Strength	Actually Working
A. EXECUTIVE			
01	Deputy Conservator of Forests	1	1
02	Assistant Conservator of Forests	1	2
03	Range Officers-I	4	2
04	Range Officers-II	1	0
05	Foresters	27	16
06	Deputy Foresters	13	16
07	Forest Guards	142	78
08	Malies	3	16
09	Watchers	0	66
10	Chowkidar	3	2
11	Helper	0	11
12	Class-IV	0	4
B. MINISTERIAL			
01	Accountant	1	1
02	Senior Assistant	1	0
03	Junior Assistant	4	1
04	Orderlies	3	5
05	Driver	1	1
06	Cleaner	1	0
	Total	**206**	**222**

5.1.2 Two retired Girdawars have been engaged to build up the demarcation record.

5.2. Labour

5.2.1 The labour employed in forest working is local as well as imported from other parts of State like Poonch District. The local labour is available in plenty for all the forestry operations that is extraction and off road transportation of timber, extraction of resin and plantation works. However the availability of local labour declines during the sowing and harvesting seasons of the agriculture crops. Local labour is also not available during the grass cuttings period after the monsoon. This grass cutting period is celebrated in the form of festival popularly known as " Letari" in the local dialect.

CHAPTER-VI

Past system of management

6.1. Past History

6.1.1 The present Rajouri Forest Division was a part of the old Mirpur Division till 1947. This old Mirpur Forest Division was constituted in 1919 and continued with minor changes here and there till 1947. When normalcy was restored after the 1947 disturbances, the Rajouri Forest Division was created which included portions of old Mirpur Division falling in Indian territory and a part of the old Poonch Jagir. This division was again birfurcated into Rajouri and Poonch Forest Divisions. While those portions which were earlier part of the old Mirpur Division were retained in Rajouri Forest Division, that is, it concided with present district Rajouri and the portions which were earlier part of the old Poonch Jagir were formed into Poonch Forest Division, that is, it coincided with present district Poonch. Very little information is available about the early history of the forests of present Rajouri Forest Division since all the old and essential records were destroyed in 1947 disturbances.

6.2. Past Management

6.2.1 During the working of pre-departmental period when no restrictions were imposed on the species, size or number of trees to be felled, all accessible valuable species were almost wiped out it shows that working in the forests was unscientific and sole objective of management was to collect maximum revenue.

6.2.2 In 1884 Ain-E-Janglat was introduced but the real conservancy started in1982 when the services of Mr. Mac Donell were requisitioned as Conservator of forests.

6.3. Dhar's Plan (1934)

6.3.1 The first attempt to prepare a working plan of these forests have been made by Sh. S.D. Dhar in 1934. Only areas under Chir crop were covered by this plan. The following working circles were constituted: -

1. Chir working Circle.
2. Un – regulated Working Circle

Chir Working Circle

6.3.2 This included all the commercial chir areas. These were to be worked under uniform system with rotation of 120 years, corresponding to an exploitable dia meter of 24 inches d.b.h and regeneration period was fixed at 30 years . Only PBI was allotted and the rest of the area was unalloted. Allotment to PBI was done in such a way so as to safeguard the future yield. Two fellings series were formed. Complete enumerations of trees 18" dia and over were done in the PBI. The yield was calculated for PBI alone and spread over a period of 30 years (coinciding with the regeneration period).

Y= V/N Where

V= Vol. of trees above 18" d.b.h. in PBI

N = 30 years (Regeneration Period)

The yield prescribed was as follows: -

1. Felling series I – 2, 31,000 cft
2. Felling series II – 2, 35,000 cft

Total for PBI of the entire working circle = 4, 66,000 cft.

6.3.3 The intensity, frequency and conduct of regeneration felling in PBI was left to the discretion of the DFO.

6.3.4 No operations were, however, prescribed for the rest of the working circle, because of unfavourable market conditions for a cheap timber like chir pine at that time. Requirements of local consumers, concessionists and Government Departments was to be met with from this area.

Unregulated Working Circle

6.3.5 This included all the uncommercial forests and those not included in the Chir Working Circle. No operations were prescribed for this working circle except to meet the demand of concessionsits etc.

Results

6.3.6 It will be fruitless and unnecessary to go into the merits or demerits of this plan or weigh achievements of fallings of the prescriptions carried out then on account of the disturbances in 1947 A.D and the unusual circumstances resulting from the disturbances in the western borders of this area taxed these forests beyond measure. After normalcy was achieved, the heavy demand of the Army had to be met, resulting in a terrible depletion of the valuable growing stock.

6.4. Dullu's Plan 1960-61 To 1980-81

6.4.1 Because of the reasons enlisted above Shri. J.N.Dullu's Working plan for the period 1960-61 to 1980-81 (the plan covered the forests under the present Nowshera and Poonch Division also) has been treated as the first working plan for these forests and not as a revision of the earlier Dhar's plan (1937-38 to 1946-47 A.D).

6.4.2 Shri. Dullu's plan was assumed to have been extended upto 1981-82 as the next revision was ready only by mid 1982 A.D).

6.4.3 The forests of the Rajouri Division were constituted into the following Working Circles, in Shri Dullu's Plan:

(1) Chir Interim Working Circle.
(2) Fir Selection Working Circle.
(3) Un- regulated and Uncommercial Working Circle.

1. Chir Interim Working Circle

6.4.4 The working circle contained all the commercial Chir Forests of the tract. It was observed that the percentage of mature and over mature trees of chir in comparison to the rest of the age classes is very low and there is a preponderance of young and middle aged trees. It was

therefore felt that it can't be allotted to any regular working circle, as allotment to any regular working circle would make it difficult of realizing any yield from PBI areas over a period of 20 years (i.e period of the plan) on sustained basis.

6.4.5 It was argued that the bulk of the crop in this working circle was of 12" -18" and 18" -24" dia group with adequate young crop elsewhere. Uniform or any regular system of working would envisage a considerable reduction of the "exploitable diameter" as well as the "rotation" (It was therefore proposed to manage the species under an Interim management till bulk of the crop in approach class passes on to exploitable size)

6.4.6 The average dia of the crop in this working circle was assumed at 16" dbh (o.b) and 52 years time was assumed to be required for an average dia of 16" to reach the exploitable dia of 24" dbh. Therefore. it was proposed to go over the entire working circle in these 52 years (felling cycle) (exploitable size = 24" dbh and rotation = 120 years).

6.4.7 The following is the summary of important prescriptions of this working circle:

(a) Silviculture system adopted: - No regular system but an Interim type of management.

(b) Rotation----------120 years corresponding to 24" dbh (o.b)

(c) Felling cycle---------- 52 years.

(d) Type of marking prescribed "Selection cum Improvement Fellings" in allotted area and "Thinning cum Improvement fellings" in the un-allotted areas of this working circle.

6.4.8 For the assessment of the growing stock of this working circle partial enumeration down to 12" dbh (o.b) to the extent of about 16% of the total commercial area only was done and enumeration results were amplified by simple proportion (by multiplying it by 6.13). From these enumeration figures, it is observed that the percentage of mature trees (i.e bdh (o.b) 24" or 60 cm) was about 10% amongst the crop of this working circle (of trees 12" dbh o.b and above)

6.4.9 During the period of plan (20 years), 20/25th of the total reduced commercial area was allotted for working. This worked out to 24,389.50 acres (reduced) and the 'normal annual coupe worked out to 1219.50 acres reduced to density 1."Annual coupe as per allotment of compartments on priority for the Ist 10 years period of plan was fixed at 1217.50 acres (reduced) and that for 2nd 10 years of plan was fixed at 1221.50 acres (reduced)

6.4.10 The working circle was divided into two felling series viz:

(a) Mendhar – Nowshera felling series.

(b) Rajouri – Dhaleri felling series.

6.4.11 The yield was prescribed to be realised and controlled by area. An indication of the volume likely to be available annually from the allotted area was worked out by using Brandis method as 15,00,000 cft.

Results

6.4.12 Leaving aside Mendhar Range as far as this working circle is concerned the allotted area was 1081.80 acres (reduced) annually for the Ist 10 years and 1085.90 acres (reduced) annually for the 2nd 10 years period. Thus during of plan a total of 21,677 acres (reduced) of commercial chir area only 12, 675 acres (reduced) has actually been gone over.

6.4.13 Annual yield in terms of volume was expected to be the tune of 15 lakh cft (using Brandis Method). Obviously this annual yield was expected from the annual coupe of 1219.50 acres (reduced). Thus the yield expectation was 1230 cft/ acre (reduced) from the area gone over from major markings in the allotted area of this working circle. However actual yield based on the average for all the areas gone over in the allotted area works out to only 614.40 cft/acre (reduced).

6.4.15 The total commercial area of the un-allotted block 80,656 acres, corresponding to 39028.30 acres (reduced) was proposed to be worked/ gone over in 25 years corresponding to the thinning cycle for ordinary thinning. Yield was to be regulated again by area and annual coupe was fixed at 3226.44 acres (gross) or 1561.13 acres (reduced). The areas prescribed to be gone over in 20 years (Plan period) was 27,722.50 acres (reduced) or 57,877 acres (gross). However the area actually gone over was only 3975.50 acres (reduced).

2. Fir Selection Working Circle

6.4.16 As far as the area under the present Rajouri Division Is concerned, this working circle included all the accessible and well stocked Fir areas. The constitution of the crop, in general, was said to be abnormal having more of mature and over mature trees and deficient in younger age classes. The working circle was prescribed to be worked under the selection system and fellings were prescribed to be of the nature of "Selection – cum-Improvement" type among trees of exploitable size and over and Improvement fellings in rest of the crop. Exploitable size for Fir was fixed at 30" dbh ob keeping in view the market demand and comparatively distant leads of the workable areas corresponding to this exploitable dia of 30" dbh ob a technical rotation of 180 years was adopted.

6.4.17 A felling cycle of 30 years was adopted to have sufficient intensity of fellings, consistent with the silvicultural necessity of the crop". The whole working circle was prescribed to be worked as one felling series.

6.4.18 Only partial enumeration down to 12" dbh o.b, over an area of about 25% of the total commercial area of the working circle including areas of the present Poonch Division carried out and figures amplified for the total area of the working circle (by simple multiplication)

6.4.19 Annual volume yield was calculated by the application of Brandis's method , taking tree as the unit of calculation and was fixed at 21,00,000 cft of Fir and 95,000 cft of Kail for the Present Rajouri and Poonch Divisions, combined. In respect of the areas under the present Rajouri Division annual prescribed yield of 7,00,000 cft of Fir was adopted (as per the control forms of the Rajouri Division).

6.4.20 No annual coupes were prescribed but in order to have an interim check the areas to be worked during the period of the plan i.e 20 years, were grouped into two almost equi-productive units, one each for 10 years period. It was prescribed that the marking be carried out to the limit of 10 years yield of the area allotted for working for the 10 years, whichever is reached first. The deficit of volume yield, if any, was not to be carried forward while excess yield if any was to be carried forward for the next period. In respect of the area under the present Rajouri Division, the area prescribed to be worked during 1st 10 years was 7524 acres and during 2nd 10 years it was 7529 acres i.e total area of 15,116 acres. Against this

only 1428 acres of area of the present Rajouri Division has been gone over for major markings during the plan period and about 12 lakhs cft (standing) of Fir has been harvested from this areas.

6.4.21 The volume yield prescribed to be harvested from this working circle, over a period of 20 years was to the tune of 140 lakhs cft. As against this only a total of 19.50 lakhs cft (including all types of markings) has been actually realised. Thus the volume yield realised has been only 14% of the prescribed yield over the entire period of the plan. Area gone over for major fellings is only about 10% of the area prescribed to be covered over the entire plan period.

(3) Unregulated and un-commercial Working Circle

6.4.22 This working circle included all forest areas that were not found fit for any systematic working on account of the nature of their crop, poor stocking , uneconomically long leads or/ and being situated on precipitous grounds and higher altitudes etc. It included treeless blanks of considerable expanse and above all some well stocked chir forests situated very near the cease fire line.

6.4.23 As far as Rajouri Division is concerned the total area allotted under this working circle was 1,62,986 acres.

6.4.24 For the purpose of method of treatment to be adopted, the area of this working circle was grouped under two series viz.

(a) Protection series.

(b) Miscellaneous series.

6.4.25 Only a total of 4941 acres of Rajouri Division was put under “Protection series” and the rest of 1,58,045 acres was put under the “miscellaneous series”.

6.4.26 In the area allotted to the “protection series” very conservative fellings under Selection cum-Improvement fellings” were prescribed in trees 30” dbh o.b only to meet the petty demands of the concessionists and no fellings, were to be carried out for financial considerations.

6.4.27 The “miscellaneous series” included the areas of the following categories:

(i) Oak and miscellaneous broadleaved species.

(ii) Blanks.

(iii) Well stocked chir forests on or near C.F.L

6.4.28 Out of category (i) only areas under “Banj oak and its associates” were proposed to be worked out to meet the fuel requirements of the people in important towns. The markings in such oak bearing compartments were to conform to “Improvement fellings” and ordinary thinnings in congested young crop. Only 6422 acres of area of the present Rajouri Division was kept under congested young crop. Only 6422 acres of area of the present rajouri division was kept under the category.

6.4.29 In respect of category (ii) i.e. Blanks the following was suggested

(a) The unstable blanks" along with dry farm lands and village waste lands outside the demarcated forests not coming within the scope of this plan be taken up for a 10 years integrated soil conservation scheme and the extent of area to be taken up will depend on the funds available. The blanks were to be closed and artificially stocked with suitable fast growing economic species. However no action on these action on these suggested lines seems to have been taken during the plan period.

(b) The stable blanks were to be protected as effectively as possible from the wanton lopping, grazing and browsing. In respect of category (iii) it was prescribed that the departmental requirement could be met from these forests as and when feasible with the previous sanction and approval of the Chief Conservator of Forests. Marking in such cases were to conform to those prescribed for chir in Chir Interim Working Circle.

Results

6.4.30 Shri. J.N. Dullu's plan was put into practice. In Chir working circle 21677 acres (reduced) of the allotted block was to be gone over. But only 12675 acres (reduced) was actually gone over. Similarly in the unallotted block out of 27722.50 acres (reduced), only 3975.50 acres (reduced) was actually gone over. In fir working circle, out of 15116 acres only 1428 acres in actual was gone over.

6.5. Sh. D.K. Ved's plan (1982-83 to 1991-92)

6.5.1 Sh. Dullu's plan was revised by Sh. D.K. Ved in 1982-83. Shri. Ved adopted all the management techniques of his time. Growing stock was calculated by point sampling technique (Bilterlich's method). Forests were classified according to Champion and Seth's classification. A protection working circle has been proposed for forests near Line of control and on steep and precipitous slopes. Resin (overlapping) working circle has been constituted for Chir areas where resin tapping can be carried out and the following working circles were constituted in the plan.

1. The Chir Working Circle.
2. The Fir Working Circle.
3. The Improvement Working Circle.
4. The Protection Working Circle.
5. The Resin (Overlapping) Working Circle.

1. The Chir Working Circle

6.5.2 This working circle is almost identical with the chir interim working circle of previous Working plan, baring only a few changes.

6.5.3 All the commercial chir forests of present Rajouri Forest Division, were allotted to this working circle. It was pointed out that the bulk of the crop in this working circle was of 30-40 cm, 40–50cm and 50-60cm class with adequate pole crop and therefore, its allotment to any regular working circle would make it difficult for realizing any yield from P.B.I areas over a period of 10 years (the plan period) on a sustained basis.

6.5.4 Uniform or any regular system of working would envisage a considerable reduction of the exploitable dia as well as rotation and since the timber of that size will not be acceptable in the market it was essential that these forests should be worked under some sort of an interim management so that by the time the trees in "approach class" pass on to the "exploitable dia", the forests receive the thinning and improvement operations as if worked under the regular system and removal of overwood as if worked under the selection system.

6.5.5 This type of management was to be continued in respect of Chir Forests allotted to this working circle, keeping in view, the paucity of exploitable size trees and difficulties in attempting conversion to uniformity at this state.

6.5.6 Exploitable size was fixed at 60cm dbh ob and a rotation of 120 years was adopted. A felling cycle of 50 years was adopted to correspond to the transitional period in which the entire area of working circle was to be gone over. The transition period of 40 years was arrived at by assuming that the average crop dia (of Chir) of the working circle was 40 cm and it would take 40 years for this dia to reach exploitable dia of 60 cm dbh.

6.5.7 This working circle was allotted only one felling series comprising of all the commercial chir areas of this working circle.

i) Area allotted for Working

6.5.8 During the plan period an area of 4500 ha (reduced) was allotted for working under the "Allotted block". The yield was prescribed to be realized and controlled strictly on area basis and normal coupe was worked out of 450 hac reduced to density1. The annual availability of volume which was to serve only as a guideline was however worked out using Brandis Method and was fixed as 21,000 cum. This was to serve only a guideline as yield was to be controlled strictly on area basis.

ii) Unallotted Area

6.5.9 The remaining commercial area of the working circle under Chir was kept under this unallotted black (35,641 hac gross) corresponding to 18, 022 hac reduced. In c c as much as the constitution of the crop, it differed from the allotted block extent of mature and semi-mature stand was comparatively less and that of middle aged and pole crop a little more. The whole area was proposed to be gone over in 20 years which was to correspond to the thinning cycle for ordinary thinning. Yield was gain to be regulated on area basis and annual coupe was 901 hac (reduced).

Results

6.5.10 At the time when Mr. Ved's plan was prepared almost all Chir Forests of the division were under resin tapping. The resin extraction was given preference to major fellings in the compartments, which were allotted for fellings. During the plan period of 10 years, it was prescribed to go over 4500 hac (reduced area). However, this prescription was not followed. Since the stress was laid only on resin tapping, the excessive tapping by cup and lip method proved very harmful for the chir trees. It resulted in drying of many trees as also deep cuts of cup and lip method made the tree trunks weak, thereby breaking them easily by wind. This is proved by the fact that from 1982-83 to 1995-96, dry chir markings to be tune of 4801

trees corresponding to 324298 cft were handed over to SFC by the present Rajouri Forest division.

2. The Fir Working Circle

6.5.11 This working circle contains all those relatively well stocked Fir Forests of this Division which were considered commercially exploitable. In toto, 4276.60 ha was allotted to this working circle. It was proposed to be worked under "Indian Selection System" keeping in view the terrain as well as shade loving character of the species. Selection –Cum- Improvement fellings were proposed to be carried out in rest of the crop. Main operation was the removal of overwood from amongst the groups of smaller size trees (advanced regenerations). 70 cm dbh ob was adopted as exploitable dia Rotation of 210 years and 30 years felling cycle was adopted. Only one felling series identical to the working circle was constituted. Annual yield has been worked out to 9500 cum by using "Brandis method".

Results

6.5.12 In this working circle also the prescription were not fully applied. Out of Seven compartments identified for felling, only two compartments namely Co. 36/K and Co. 31/K, were gone over during the plan period. Out of 1426 ha area prescribed only 337.68 ha was gone over. The yield extracted was 2,10,321 cft from Co. 36/K and 1,22,574 cft from Co. 31/KDR.

3. Protection Working Circle

6.5.13 This working circle included all forests that were of following categories:

(i) Those located on steep slopes and high altitudes, including under alpine pastures and forming important catchments areas.

(ii) Those located in close proximity of line of control and therefore, rendered commercially un exploitable and unapproachable for the most of part from any treatment because of presence and activities of defense personnel. These forests are mostly well stocked chi forests. The chief reason for their good stock is the protection these areas have been receiving against excessive biotic interference.

6.5.14 Total area allotted to this working circle was 3934 ha of present Rajouri Forest division. No quantitative assessment of the growing stock was undertaken in the areas allotted to this working circle either by point sampling or by partial/complete enumeration.

6.5.15 No fellings of whatever nature were prescribed in respect of category (I) above. It was proposed to take measures for control against fires, illicit damage and excessive grazing for this category. In respect of category (ii) whenever feasible departmental requirement was to be met with from well stocked chir forests and making in such was to conform to those prescribed for chir under chir working circle.

4. Improvement Working Circle

6.5.16 All the remaining forest areas of this division which were not allotted to any of the three working circles, described so far, were included in this working circles, described so far, were included in this working circle. The forest areas included in this working circle were categorized as under:-

(a) The forest area chiefly under broad leaved species (including Banj Oak) or completely blank or bearing only shrubs growth.

(b) The degraded forest areas which were potentially productive.

(c) The productive forest areas although adequately stocked with fir but considered unfit for commercially exploitable taking into account the heavy pressure of locals.

6.5.17 Most of the forests allotted to this working circle were from the uncommercial and un-regulated working circle of Sh. Dullu's plan and member of compartments were taken from " Fir Selection Working Circle " of Sh. Dullu's plan. The area allotted to his working circle was 43248 ha.

Results

6.5.18 Prescriptions of protection and Improvement Working Circles were implemented but the task was gigantic and requires continuation on bigger scale. Rehabilitation of degraded areas has been done by resorting to artificial regeneration, closure formation and soil conservation works, thereby promoting natural regeneration and increasing the bio-productivity of the area. 3303 ha area has been closed by the territorial division from 1984-85 to 1995-96.

5. Resin (Overlapping) Working Circle

6.5.19 This working circle overlaps all the chir areas falling in Chir Working Circle, Improvement Working Circle and even in protection Working Circle where resin tapping could be carried out without much difficulty. Special object of management was obtain maximum sustained yield of resin for resin and turpentine industry.

6.5.20 Most of the Chir areas (under resin tapping) were taken up for tapping in the year 1972-73 and 1973-74 Sh. Ved in his working plan observed that size of blazes (in actual practice) invariably exceeded the norms of width, depth, length and location. A considerably higher proportion of tapping space of each tree had already been used up.

6.5.21 He proposed that minimum dia of chir areas for resin tapping be raised from 35cm dbh ob to 40 cm dbh ob for single blaze and lower limit of dia for double blazes be raised to 70 cm dbh ob (instead of previous 60 cm).

6.5.22 It was prescribed that resin tapping would not be carried out in those compartments where the density of crop is very poor and in those compartment where it was noticed that continued resin tapping involving large scale violation of norms of size of blazes have harmed the crop and those compartments where crop is predominately young and the areas near the line of control.

6.5.23 It was prescribed to conduct resin enumeration after every five years. Traditional " French cup and lip Method" was proposed to be continued.

Results

6.5.24 Prescriptions for resin working circle were followed. Although the method of tapping was shifted from cup and lip method to rill method in 1988-89, but do's and don'ts were not implemented in letter and spirit. Timely enumerations have not been carried on. At places, sparsely dense crop is also been tapped. Deviations in size of blaze, in number of blazes as well as dia class of trees can also be seen. In order to make up the prescribed minimum load per blazes, the resin extraction mates, sometimes, resort to illicit practices. This leads to excessive tapping of Chir trees which results in driage and wind breaks. Further more, illicit felling also occurs at times in Chir areas. All these factors lead to decrease to in number of blazes. This number has already decreased from 25,63,253 channels in 1980-81 to 18,03,084 in 1995-96 (rajouri 7,74,474 and Noweshra 10,28,610 blazes). Moreover very little space is left in trees for future resin tapping due to above mentioned reasons.

6.6. Sh. Suresh Kumar Gupta's Plan (2001-02 to 2010-11)

6.6.1 The author prescribed for the constitution of Chir working circle, Fir working circle and Rehabilitation cum Protection working circle.

6.6.2. Chir Working Circle

6.6.2.1 The author prescribed the shift of management of the crop from Uniform System to Selection System. 107 compartments were allocated to this Working Circle with a total area of 14120 Ha and the Commercial area of 10013 Ha. He prescribed an increase of exploitable size from 60 cm to 70 cms dbh in conformity with the order issued by the Govt. of J&K. The total number of stems was estimated to be 13,30,174 with the volume of 14,56,923 cum. He recommended 50 year duration for the felling cycle with one felling series. The volume of growing stocks estimated to be 145.50 cum per Ha.

6.6.2.2 The author advocated the removal of 5300 cum annually from the coupe of 200 Ha.The available cut per Ha was forcasted to be 26.50 cum per Ha, which was considered to be within safe limits.

Results

6.6.2.3 The recommendations regarding management of Chir crops could not be followed due to ban on green felling by the Govt. of J&K and by the Hon'ble Supreme Court of India. Eventhough the annual removal of 5300 cum was recommended, a total volume of 3396.27 cum was handed over to State Forest Corporation during the period of 13 years from 2001-02 to 2013-14.

Table 6.1.Statement showing the volume (in cft) handed over to SFC from Rajouri Forest Division during 2001-02 to 2013-14

S. No	Year	No. of B/L Poles / Trees Handed over	Volume (Cum) of Chir Trees Handed over
1	2001-02 to 2007-08	0	0.00
2	2008-09	572	2347.47
3	2009-10	0	0.00
4	2010-11	515	304.81
5	2011-12	135	569.41
6	2012-13	114	174.58
7	2013-14	0	0.00
	Total	**1336**	**3396.27**

6.6.3. Fir Selection Working Circle

6.6.3.1 The author prescribed the continuation of management of the crop under Selection System. 24 compartments were allocated to this Working Circle with a total area of 4089 Ha. He prescribed the exploitable size of 80 cms dbh in conformity with the order issued by the Govt. of J&K. The total number of stems was estimated to be 4,45,210 with the volume of 10,22,392 cum. He recommended 30 year duration for the felling cycle with one felling series. The volume of growing stocks estimated to be 396.77 cum per Ha.

6.6.3.2 The author advocated the removal of 4400 cum annually from the coupe of 136 Ha.The available cut per Ha was forcasted to be 32.35 cum per Ha, which was considered to be within safe limits.

Results

6.6.3.3 The recommendations regarding management of Fir crops could not be followed due to ban on green felling by the Govt. of J&K and by the Hon'ble Supreme Court of India. Eventhough the annual removal of 4400 cum was recommended, no commercial felling was carried out during the period of 13 years from 2001-02 to 2013-14.

6.6.4. Rehabilitation cum Protection Working Circle

6.6.4.1 295 compartments with an area of 51999 Ha was assigned to this Working Circle. No yield was prescribed. Only removal for the needs of concessiontists were allowed.

6.6.5. Resin Tapping

6.6.5.1. As per the policy of the Govt. every year the number of blazes put under resin extraction is reduced. 5,42,429 blazes were laid in 2000-01 for resin extraction which was reduced to 16,500 blazes during 2012-13. During the period between 2000-01 to 2012-13 38,33,409 blazes were laid for resin extraction. The statement of yearwise compartmentwise number of blazes laid for resin extraction is enclosed in Annexure XIII. In the field, the conditions

prescribed for resin extraction is not followed in letter and spirit which resulted in driage of the crop and breakage of stem due to Wind.

6.7. Past Revenue and Expenditure

6.7.1 The following table shown Revenue and Expenditure of Rajouri Forest division from 2000-2001 to 2012-13.

Table 6.1. Revenue and Expenditure of Rajouri Forest Division

Year	*Revenue (Rs.)*	*Expenditure (Rs.)*
2000-2001	3,01,14,485	3,82,50,720
2001-2002	3,46,26,833	3,97,69,464
2002-2003	3,27,16,495	4,51,42,794
2003-2004	4,35,98,122	4,30,47,240
2004-2005	2,05,84,388	3,58,43,983
2005-2006	4,71,57,294	4,26,61,430
2006-2007	1,57,71,995	4,12,71,618
2007-2008	2,37,80,731	4,05,82,010
2008-2009	2,31,02,214	3,82,60,702
2009-2010	1,67,00,988	5,39,34,092
2010-2011	1,30,30,505	7,14,71,095
2011-2012	72,80,190	7,14,51,469
2012-2013	85,38,730	7,73,52,300
2013-2014	1,59,18,128	8,53,42,800

CHAPTER-VII

STATISTICS OF GROWTH AND YIELD

7.1. Inventory Method Adopted

7.1.1 In the present working plan Bitterlich's method of point sampling has been adopted for the assessment of growing stock. For resin blaze analysis 0.1 Ha sample plot method is adopted.

7.1.2 Since the forests of the division are heterogeneous in nature, the method was stratified random sampling i.e. stratification of the heterogeneous forests into more or less homogenous units. The stratification of the growing stock was done on the basis of condition, composition and silvicultural requirements of the crop besides method of treatment adopted for the area. Following strata/ sub –strata were accordingly constituted:

(i) Chir Stratum
(ii) Fir Stratum
(iii) Rehabilitation Stratum
  (a) Chir sub- stratum
  (b) Fir sub- stratum
  (c) Kail sub- stratum
  (d) Broad leaved sub- stratum
  (e) Blank and scrub sub- stratum

7.1.3 The sample size required for an optimum survey of the crop was computed at predetermined precision of 10% at 95% probability level. The following formula was used in the pilot survey conducted for this work out the number of sample points to be studied.

$$N = \frac{(CV \times T)^2}{(E\%)}$$

Where N = Number of samples required to achieve the desired accuracy "E" with probability level implied by value "t"

T= A constant denoting the reliability of estimates or level of statistical significance or statistical Probability of 95%. Also called students "t"

CV= Co- efficient of variation, a relative measure of dispersion.

E% = Percentage of error desired for the mean. Also called maximum permissible error in the sampling design.

7.1.4 On the basis of pilot survey, 829 numbers of samples were calculated for study in the whole of the division which means that sampling was 0.115%.

7.1.5 These sample points are selected by fixing the coordinates using pair of random numbers on sample frame which is then transferred on the base map and then on relevant G.T. Sheet of the area. After this, the sample points are located on the ground in the field with the help of Global Positioning System (GPS). After locating the point on ground the exercise at each sample point was carried out by using a wedge prism of BAF of 1. Wedge prisms of BAF 1

were used so that at each point more number of trees get tailed in a sweep of 360^0. Diameter and height of tailed trees were recorded on tally sheet.

7.1.6 Calculation of basal area/ha., number of trees per ha and volume per ha were done by using standard formula as below:-

(a) Basal area per ha= Basal Area Factor x Number of tallied trees at the point.

(b) $$\text{No. of trees/ha (N)} = \text{BAF} \times \sum_{i=1}^{n} 1/$$

Where BAF = Basal area factor of wedge prism used.

1/Bi = Summation of the reciprocals of the basal area of trees tailed at the point.

(c) $$\text{Volume per hectare} = \text{BAF} \times \sum_{i=1}^{n} \frac{i}{Bi}$$

Where BAF = Basal area factor of wedge prism used

$\frac{Vi}{Bi}$ = Summation of the ratio $\frac{Vi}{Bi}$

Vi= Volume of the 'i' th tallied tree at the point

Bi= Basal Area of the 'i'th tallied tree at the point

The number of tree per ha and volume per ha were calculated diameter class wise at each point.

7.1.7 Mean value of the above named three variables were calculated by computing the arithmetic average of all the sample points of a stratum/ sub-stratum. Further it was subjected to statistical analysis to check the value of standard error percentage. The results of these analysis are given in the following chapter.

7.1.8 In order to have high degree of accuracy 50 sample plots (each of 0.1 ha) were laid in the compartments where sample points were located. Sample plots were randomly distributed in all the ranges of the division. Complete enumeration was done in these plots to find out dia-class wise number of tree per ha. The results confirmed the out come of point sampling analysis.

7.2. Quality Class

7.2.1 The quantity of fir found in this area is generally I except on exposed southern aspects and spurs and ridges where it falls down to quality II. The growth of 'Fir' had been observed to be somewhat slower in this locality. Therefore, it can be reasonably assumed that on an average "Fir" in this locality achieves dbh (ob) of 80 cms in 225 years.

7.2.2 The quality class of Chir found in this area is generally II/III to III. An average Chir tree of quality II takes about 150 years to achieve a dbh (ob) of 70 cms.

7.3.Volume Table

7.3.1 For the purpose of calculation of volume, Kulu Volume Table was used.

Table 7.1. Kulu volume table (volume in m^3)

Dia Class (Cms)	Deodar	Kail	Fir/Spruce	Chir
10-20	0.13	0.13	0.13	0.00
20-30	0.13	0.13	0.13	0.00
30-40	0.76	0.76	0.85	0.48
40-50	1.33	1.36	1.56	1.13
50-60	2.10	2.27	2.97	2.21
60-70	3.14	3.34	4.90	3.54
70-80	4.39	4.42	6.85	4.87
80-90	5.66	5.35	8.30	6.20
90-100	6.85	6.14	9.40	6.99
100 & above	7.56	6.74	10.19	7.48

7.4. Regeneration Survey

7.4.1 The main objective of regeneration survey is to assess whether or not there is adequate regeneration in forest areas. Definition of adequate regeneration depends on desired number per ha of established plants. For this survey 2500 established plants per ha have been considered as adequate. A height of 3 m and above has been considered as established height because conifers of this height are considered to escape browsing. All other regeneration having the height smaller than established height was considered unestablished. Current year seedlings were classified as recruits. 4 unestablished plants were considered as equivalent to one established plants. It is assumption that out of four unestablished plants, one will attain the establishment height.

7.4.2 One hectare plot was considered as a sampling unit and since 2500 established plants per hectare was considered as adequate stocking, 4 Sq.m i.e 2 x 2mt. quadrant forms the convenient recording unit. Representative compartments from each working circle were selected and 1-3 sampling units were randomly dropped in the map of each pre-selected compartments. These sampling units were located on the ground.

7.4.3 Taking the point, located on the ground, as centre 90m straight base line (45m on either side of the point in any direction as per the convenience of the survey party) was drawn. This line was divide into 9 equal segments of 10m width each indicating the base of survey lines. These survey were numbered 1 to 10 and recording of each survey line was done separately.

7.4.4 From the base of each survey line, a 100m survey line perpendicular to the direction of base line was drawn and along this survey line, at a distance of every 10 m interval, a recording unit of 4 Sq.m i.e 2 x 2mt was laid. In this way 10 recording units were laid on each survey line and in all the 10 survey lines, 100 recording units were laid.

7.4.5 In each recording unit (quadrant) the following observations were made and ratings recorded accordingly:

i. If there was at least one established plant, the quadrant was considered completely stocked and the rating of the quadrant was recorded as 4.
ii. In the absence of established plant in the quadrant, the number of unestablished plants were counted. In case of presence of 4 or more unestablished plants in the quadrant , the rating of 4 was recorded and for lesser number of plants in the quadrants, the actual number of plants were recorded as rating for the quadrant. If there was not

even a single unestablished plant in the quadrant, zero rating was recorded. In this manner every quadrant got a rating 0, 1, 2, 3 or 4.

7.4.6 The total ratings of all the 10 quadrants of a survey line gave the score of a survey line and total of all the 10 survey lines (i.e., total of 100 quadrants) of a regeneration plot gave the total score of a plot. Total score of the plot was divided by 4 to get the regeneration status of the given plot i.e. 1 hectare. The division of total score by 4 was required because we were taken the ratings 4 times e.g. one established plants in a quadrant was/were given rating 4.

Ratings of quadrants = X_1 , X_2, X_3 ----------X_{10}

Ratings of quadrants = $X_1+X_2+X_3$ ----------$+X_{10}$

Total score of regeneration plot i.e 1 hectare = total of all the 10 survey lines (say x)

Regeneration status of that hectare or plot = X /4

= (Say y)

7.5. Resin Channel Survey:

0.1 ha circular sample plots were laid down in the forest compartments of Chir Working Circle and Rehabilitation cum Protection Working Circle and Chir trees were evaluated for resin channel exercise. 177 sample plots were laid down. Number of channels and number of rills present on each surveyed tree as well as available space for rills on each surveyed tree were recorded. The results of this exercise are given in Chapter XV on Non- Timber Forest Produce (Overlapping) Working Circle.